FMC Idaho LLC, Pocatello, Idaho

Volume 1 - Report

Supplemental Remedial Investigation Report for the FMC Plant Operable Unit

May 2009

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ACRONYMS/ABBREVIATIONS

µg/kg	micrograms per kilogram
µR/hr	microrem per hour
1,1,1-TCA	1,1,1-Trichloroethane
AFM	Anderson Filter Media
ALM	Adult Lead Methodology
AOC	Administrative Order of Consent
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
BAPCO	Bannock Paving Company]
bgs	below ground surface
BLM	Bureau of Land Management
bns	below native surface
BTEX	benzene, toluene, ethylbenzene, xylene
ºC	degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	calibration factor
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLP	Contract Laboratory Program
CO	carbon monoxide
COC	constituent of concern and chain of custody
COD	coefficient of the determination
COPC	constituent of potential concern
cpm	counts per minute
CSM	Conceptual Site Model
CV	comparative value
DAF	dilution attenuation factor
DEM	Digital Elevation Model
dpm	disintegrations per minute
DQA	Data Quality Assessment
DQO	data quality objective
EDD	Electronic Data Deliverable
EMF	Eastern Michaud Flats
EPA	Environmental Protection Agency
EPC	exposure point concentration

ER	equipment rinseate
FBD	fluid bed dryer
FCR	field change requests
FeP	ferrophos
FMC	FMC Corporation
FS	feasibility study
FSP	field sampling plan
ft	feet
ft/day	feet per day
FU	flux units
g	gram
GC	gas chromatograph
GC/NPD	gas chromatograph/ nitrogen phosphorus detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCL	hydrochloric acid
Hg	mercury
HHRA	Human Health and Risk Assessment
HQ	hazard quotient
hr	hour
HRGS	high resolution gas chromatograph
HRMS	high resolution mass spectrometry
HSA	hollow-stem auger
ICP	inductively coupled plasma
ICR	incremental cancer risk
ID	inner diameter
IDEQ	Idaho Department of Environmental Quality
IDW	investigation derived waste
ISE	ion-selective electrode
IWW	industrial waste water
K-40	potassium-40
keV	kilo electron volt
km	kilometer
lb	pound
LCS	laboratory control sample
LDR	land disposal restriction

m	meter
MCA	mulit-channel analyzer
MCL	maximum contaminant level
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
MS	mass spectrometer
MS/MSD	matrix spike/matrix spike duplicate
MWSLF	municipal solid waste landfill
MWH	MWH Americas, Inc.
mrem	millirems
NA	not applicable
NaI	sodium iodide
NCP	National Contingency Plan
NAREL	National Air and Radiation Environmental Laboratory
NFA	No Further Action
NIST	National Institute of Standards and Technology
NORM	naturally occurring radioactive materials
NPD	nitrogen/phosphorus detector
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OD	outer diameter
OSHA	Occupational Safety and Health Administration
OU	operable unit
P4	elemental phosphorus
PAH	polynuclear aromatic hydrocarbon
Pb-210	lead-210
PCB	polychlorinated biphenyl
PCDT	pond closure decant treatment
PCE	tetrachloroethene
pCi	picoCuries
pCi/m^2-sec	picoCuries per square meter per second
pcf	per cubic foot
pg/g	picogram per gram
PH_3	phosphine
PIC	pressurized ionization chamber
PID	photoionization detector
Po-210	polonium-210

PPE	personal protective equipment
Precipitator Dust	phossy solids, phossy wastes, precipitator slurry
PSCS	Preliminary Site Characterization Summary
PWTP	Phossy Waste Treatment Plant
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
Ra-226	radium-226
RAI	reference area investigation
RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RF	response factor
RI	Remedial Investigation
RL	reporting limit
Rn-222	Radon-222
ROC	radionuclides of concern
ROD	Record of Decision
ROPC	Radiological COPC
RPD	relative percent difference
RPM	Remedial Project Managers
RSD	relative standard deviation
RU	remediation unit
SB	soil boring
SC	study constituents
SD	standard deviation
SDG	Sample Deliver Group
SFS	Supplemental Feasibility Study
SIA	specific investigation areas
SOP	Standard Operating Procedures
SOW	Statement of Work
SRI	Supplemental Remedial Investigation
SS	surface soil
SSL	soil screening level
SUA	southern underdeveloped area
SVOC	semivolatile organic compounds
SW	source water
SWMU	solid waste management unit

TB	trip blanks
TCE	trichloroethene
TCLP	toxicity characteristics leaching procedure
TIP	Technology Innovation Program
TISAB	total ionic strength adjustment buffer
TP	test pit
TPH	total petroleum hydrcarbons
U-238	uranium-238
UCL	upper confidence limit
UMTRCA	Uranium Mill Tailings Radiation Control Act
USCS	unified soil classification system
USEPA	United States Environmental Protection Agency
VCO	voluntary compliance order
VOA	volatile organic analysis
VOC	volatile organic compound
VSP	Visual Sampling Plan
WAL	working action level
Work Plan	Supplemental Remedial Investigation Work Plan
WRS	Wilcoxon Rank Sum
WUA	western underdeveloped area

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This Executive Summary presents a brief overview of the scope and findings of a Supplemental Remedial Investigation (SRI) performed by FMC Corporation at the FMC Plant Operable Unit (OU), a part of the Eastern Michaud Flats (EMF) Superfund Site. The SRI was performed to meet the requirements of the *Supplemental Remedial Investigation Work Plan for the FMC Plant OU* (SRI Work Plan; MWH, 2007) and the Statement of Work (SOW) incorporated in the *Administrative Order on Consent for the Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) for the FMC Plant Operable Unit* (AOC, October, 2003).

The EMF Site includes two adjacent phosphate ore processing facilities, owned and operated respectively by the J.R. Simplot Company (Simplot) and FMC Idaho LLC (FMC). The Simplot-owned properties at the Site are referred to as the Simplot Plant OU; the FMC-owned properties comprise the FMC Plant OU. The adjoining area impacted by the companies' operations that neither company owns is referred to as the Off-Plant Subarea. The SRI was limited to the portion of the FMC Plant OU where the former FMC elemental phosphorus processing facility was located. This area, located south of Highway 30, is referred to as the FMC Plant Site.

As identified in the *Supplemental RI/FS Scoping and Planning Memo* (BEI, 2004a) the SRI and SFS focus on the potential for exposure to shallow soils and residual fill/source materials under a future commercial or industrial land use scenario, as well as the potential for migration of constituents from soils and fill/source materials through the subsurface to groundwater. The air and groundwater pathways were evaluated on a site-wide basis in the *1997 Feasibility Study* (BEI, 1997). In order to facilitate scoping and planning the SRI/SFS, the FMC Plant Site was divided into 24 Remediation Units (RUs). RUs were created by grouping one or more Solid Waste Management Units (SWMUs) with similar processes, characteristics, and types of chemicals of potential concern (COPCs) and radionuclides of potential concern (ROPCs).

ES.2 SRI FIELD INVESTIGATION SCOPE

The SRI consisted of multiple investigations of surface and subsurface soil. These investigations evaluated COPCs/ROPCs at the FMC Plant Site, identified COCs and ROCs associated with sources at each RU, and assessed the potential risks of these COCs/ROCs to human health and the environment. The SRI sampling programs and studies were designed and conducted to fill the data gaps identified in the *RI Update Memorandum* (BEI, 2004b) and the *SRI Work Plan*. Data were collected during the SRI under four major field programs:

1. Risk Assessment Program data collection:
    - Surface gamma survey
2. SFS Program data collection:
    - Depth, volume, and lateral extent of fill materials
    - Potential for leaching of COPCs/ROPCs from fill materials to underlying soils

3. Shallow Subsurface Delineation Program data collection:
    - Elemental phosphorus (P4) lateral delineation
    - Kiln scrubber pond lateral delineation
    - Phossy waste pond lateral delineation
4. Specific Investigation Areas (SIAs) Program data collection:
    - Organic solvent investigation
    - Fuel investigation
    - Coke investigation
    - PCB investigation
    - Leaching potential investigation
    - Precipitator dust on roadways investigation
    - Phossy water and precipitator solids constituents in soils investigation
    - Underground piping, sumps and other structure inventory
    - Pond Closure Decant Treatment (PCDT) water on roadways investigation
    - Radon flux investigation
    - Gamma dose rate investigation

In addition to these four programs, a P4 investigation at the capillary fringe downgradient of RU 1 was performed. A fill characterization study also was implemented at the request of EPA to supplement the historical fill material data to be used in the risk assessment. Both of these investigations were added during execution of the SRI field work and were approved by EPA as addenda or field modifications to the *SRI Work Plan*.

ES.3 PRINCIPAL FINDINGS OF THE SRI

The following subsections present a summary of the principal finding for each SRI field investigation program. For these SRI field programs, FMC performed extensive sampling and analyses of surface and subsurface soils including:

- More than 680,000 surface gamma measurements were collected,
- 500 radon flux measurements were collected,
- More than 900 soil borings were drilled through fill and native soils, and

- Approximately 1,400 sample intervals were obtained for chemical analysis with more than 4,000 chemical analyses performed on the soil samples resulting in more than 20,000 individual constituents. The analytical parameters included metals, radionuclides, fluoride, and organic compounds including volatile organic compounds (VOCs) for fuel, shop, and lab related solvents, semi-volatile fuel PAHs, coke PAHs, and PCBs.

The principal findings of the SRI analyses and evaluations are described below.

ES3.1 Nature and Extent of Contamination

As described in Sections 4 and 5 of this SRI Report, the SRI findings provide sufficient information to characterize the nature and extent of COCs/ROCs associated with the fill materials and incidental source materials at the FMC Plant Site. The types of fill and incidental source materials associated with each RU were identified through sampling within the RU, boundary (i.e., perimeter) sampling, and review of operational records and process descriptions. Fill materials in each RU were characterized based on analyses of each fill type from samples collected historically and during the SRI.

With few exceptions (i.e., only in the presence of a sustained hydraulic head or limited applied hydraulic head), COCs/ROCs do not leach from these source and fill materials into the underlying soils, and thus they do not pose a threat to groundwater. The potential groundwater impacts from the RUs that formerly operated with a sustained hydraulic head (i.e., RUs 1, 2, 8 (former kiln scrubber ponds), 9 (former kiln scrubber overflow pond), 10 (IWW basin and ditch), 22b, and 22c) or potential limited head (RU 16 and the RUs that contain underground process piping (RUs 1, 2, 3, 8, 12, 13, 22b, and 24) were investigated on a site-wide basis during the original EMF RI. An updated evaluation of groundwater conditions at the FMC Plant OU is presented in the *Groundwater Current Conditions Report* (*GWCCR*). The *GWCCR* addresses not only the FMC Plant Site, but the FMC Plant OU as a whole.

ES3.2 Risk to Human Health and the Environment

A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. Table ES-1, *Summary of Total Incremental Cancer Risks and Incremental Hazard Quotients,* provides the risk assessment results for each RU. For a majority of the RUs, risks to potential future workers associated with exposure to residual fill materials exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in these RUs exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) also exceed ROD RAOs for select incidental fill/source materials present in several RUs. However, given that the fill/source materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill/source materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

The presence of P4 in the subsurface within some RUs (RUs 1, 2, 12, 13, 22b, and 22c and RUs with the presumed presence of P4 due to underground process piping) represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

ES3.3 Information to Support the SFS

Based on the results of the Supplemental HHRA, all of the RUs evaluated in the SRI will proceed to the SFS for evaluation of remedial alternatives. The nature and extent of contamination associated with the primary source materials at the FMC Plant Site including fill, incidental source materials, and P4 and the risks posed to human health and the environment have been sufficiently bound to evaluate remedial alternatives for each of the RUs. While additional lateral delineation will ultimately be required at a few RUs (RUs 8, 13, and 22b), there is sufficient information to proceed to the SFS remedial alternatives evaluation so long as the needed further delineation is performed/confirmed at a later stage of the CERCLA process (such as during remedial design). Remedial design and remedial action activities can adequately delineate the extent of contamination (and therefore the extent of remedial action) taking into account historical information, RI data, SRI data, and further delineation/confirmation sampling as appropriate. Conservative assumptions regarding the additional area/volume of impact would allow evaluation of remedial alternatives, and those assumptions could be verified later in the CERCLA process. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

Section 1
INTRODUCTION

1.1 BACKGROUND REGARDING THE EMF SITE, THE 1996-1997 RI/FS, THE 1998 RECORD OF DECISION, AND THE 2003 AOC FOR AN SRI/ SFS AT THE FMC PLANT OU

The FMC Plant Operable Unit (OU) is a part of the larger Eastern Michaud Flats (EMF) Superfund Site, and is located in southeastern Idaho, approximately 2.5 miles northwest of Pocatello, Idaho. The EMF Site was listed on the National Priorities List (NPL) on August 30, 1990. The EMF Site includes two adjacent production facilities, a former FMC Corporation elemental phosphorus processing plant that ceased operation in 2001 and a phosphate fertilizer processing facility operated by the J.R. Simplot Company. The EMF Site is shown on Figure 1-1 and encompasses both the FMC and Simplot plants and surrounding areas affected by releases from these facilities. FMC, Simplot and EPA entered into a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Administrative Order on Consent (AOC) in May 1991 under which the companies agreed to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the site. During the RI/FS the site was divided into three "Subareas:" 1) the FMC Subarea, consisting of the FMC plant and other FMC-owned properties at the site; 2) the Simplot Subarea, consisting of the Simplot plant and other Simplot-owned properties at the site; and 3) the Off-Plant Subarea, consisting of the remainder of the site. EPA changed these designations to the FMC Plant OU, the Simplot Plant OU, and the Off-Plant OU after its June 1998 *Record of Decision for the EMF Site* (*1998 ROD*, EPA, 1998).

As required under the 1991 AOC, FMC and Simplot developed a number of EMF Site studies and reports. These included the January 1994 *Preliminary Site Characterization Summary* (*PSCS*, BEI, 1994), the August 1996 *EMF Remedial Investigation Report* (*RI Report*, BEI, 1996), and the April 1997 *Feasibility Study Report FMC Subarea* (*FS Report*, BEI, 1997). EPA reviewed and approved these reports. EPA conducted the baseline ecological and human health risk assessments concurrently with the companies' RI/FS work and issued the final reports for those studies respectively in July 1995 and July 1996. The conclusions of those risk assessments were incorporated into the *FS Report* and the *1998 ROD*.

The *1998 ROD* addressed all three Subareas at the EMF Site. The following were the major remedial action components for the FMC Subarea:

- Cap the Old Phossy Waste Ponds (identified in the SRI as Remediation Unit [RU] 22b) and the Calciner Solids Storage area (RU 16), and line the Railroad Swale (RU 22c) to reduce or eliminate infiltration of rainwater and prevent incidental exposure to contaminants.

- Monitor the groundwater and implement legally enforceable controls that would run with the land to prevent use of contaminated groundwater for human consumption under current and future ownership. The groundwater monitoring and enforceable controls were required to continue until chemicals of concern (COCs) and radionuclides of concern (ROCs) in groundwater declined below the Maximum Contaminant Levels (MCLs) or, in the absence of applicable MCLs, risk-based concentrations (RBCs) for those substances.

- Implement legally binding land use controls that would run with the land to prevent potential future residential use and control potential worker exposures under any future ownership.

- Implement a contingent groundwater extraction/treatment system if contaminated groundwater migrates beyond company-owned property and into adjoining springs or the Portneuf River. Contaminant containment was required to be achieved via hydrodynamic controls such as long-term groundwater gradient control through low level pumping. Extracted groundwater would be treated and used at the FMC Plant Site as a substitute for the unaffected groundwater that otherwise would have extracted and used in plant operations.

- Conduct operation and maintenance on capped areas and, if implemented, the groundwater extraction system.

The Idaho Department of Environmental Quality (IDEQ) concurred with the selected remedies. The Shoshone-Bannock Tribes sent EPA comments that were not supportive of the ROD, mainly regarding the FMC Plant Subarea and the Off-Plant Subarea. Due to the fact that EPA had received only minor comments regarding the proposed RD/RA at the Simplot Subarea, the United States proceeded with entry of a Remedial Design/Remedial Action (RD/RA) consent decree only with Simplot and only with respect to its plant Subarea, re-designated at that time as the Simplot OU. The consent decree for the Simplot OU was entered in May 2002.

FMC ceased production of elemental phosphorus from phosphate ore at its Pocatello facility in December 2001. This led EPA and FMC to enter into an AOC in October 2003 (SRI/SFS AOC) for a Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) at the FMC Plant OU. This was driven primarily by EPA's finding that additional investigations and evaluations were needed at the plant areas that had been actively operated at the time of the RI/FS but where operations had terminated with the plant shutdown. After the SRI/SFS is completed, it is anticipated that EPA will issue an Amended ROD specifying the FMC Plant OU remedial action requirements.

The SRI/SFS AOC and Statement of Work (SOW) specifies the following deliverables and actions:

1. Submit a Supplemental RI/FS Scoping and Planning Memorandum. The final version of this deliverable, *SRI/SFS for the FMC Operable Unit Scoping and Planning Memorandum* (*Scoping and Planning Memo*, BEI, 2004c) was dated February 2004 and approved by EPA in a letter dated February 20, 2004.

2. Submit a Remedial Investigation Update Memorandum, to 1) update the Conceptual Site Model (CSM) and identify former working areas at the plant that had been excluded from the 1998 ROD; 2) compile data regarding the nature and extent of contamination for pathways and former working areas not previously evaluated in the RI/FS; 3) develop a RBC for elemental phosphorus; and 4) update the Remedial Investigation Report. FMC submitted the final version of this document, *RI Update Memorandum for the FMC*

Operable Unit (*RI Update Memo*, BEI, 2004b), in December 2004. It was approved by EPA in a letter dated May 26, 2005.

3. Submit a Work Plan for the Supplemental Remedial Investigation, including a Supplemental RI Sampling and Analysis Plan and SRI Health and Safety Plan. The final version of this deliverable, *SRI Work Plan for the FMC Plant OU* (*SRI Work Plan*, MWH, 2007), was dated May 2007. EPA approved it on May 14, 2007.

4. Perform a Supplemental Remedial Investigation as prescribed by the EPA-approved *SRI Work Plan*. FMC conducted the SRI field work between May and December 2007. This report sets forth the findings of that investigative work.

5. Submit a Work Plan for a Supplemental Feasibility Study of remedial alternatives at the FMC Plant OU. FMC will provide this work plan to EPA by no later than the date required under the SRI/SFS AOC.

6. Submit a Supplemental Feasibility Study Report that evaluates remedial alternatives for the FMC Plant OU and proposes a selected remedy for adoption in the Proposed Plan and Amended ROD. FMC will provide this report to EPA by no later than the date required under the SRI/SFS AOC.

These efforts will support an Amended ROD for the FMC Plant OU. The data gaps identified in the *Scoping and Planning Memo* and the *RI Update Memo* largely related to the former FMC Plant Site that is located south of Highway 30. The *SRI Work Plan* and field work accordingly were directed at the FMC Plant Site property. This report refers to this area as the "FMC Plant Site." The Amended ROD, in contrast, will have a broader focus and address the FMC Plant OU as a whole. The FMC Plant OU encompasses not only the former FMC Plant Site but also the FMC-owned properties north of Highway 30, with the exception of the Tesco property that FMC acquired after the 1998 ROD. That property was never evaluated during the RI/FS and has not been addressed in this CERCLA process. It will instead be addressed under Resource Conservation and Recovery Act (RCRA) corrective action authorities.

1.2 DESCRIPTION OF THIS REPORT AND SRI SCOPE OF WORK REQUIREMENTS

This SRI report provides the results and assessment of the results of the field investigations conducted pursuant to the EPA-approved *SRI Work Plan*. As discussed above, these studies addressed the FMC Plant Site and not the FMC properties north of Highway 30. FMC has conducted certain post-RI evaluations at those properties, but FMC did not carry out that work pursuant to the *SRI Work Plan* and accordingly those evaluations are not presented in this SRI report. Separately, however, FMC will provide EPA with an update memorandum summarizing post-RI soil sampling at its properties located north of Highway 30 and a groundwater current conditions report that addresses the entire FMC Plant OU. Those updates will supplement the information presented in this SRI report to support an SFS and Amended ROD for the FMC Plant OU as a whole.

1.2.1 SRI Scope of Work Requirements

This SRI report is based on the EPA-approved *SRI Work Plan*. The *SRI Work Plan* was developed to address the additional data needs identified in the *Scoping and Planning Memo*. FMC conducted the SRI investigations between May and December 2007 following EPA approval of the *SRI Work Plan*.

In order to facilitate scoping and planning the SRI/SFS, the FMC Plant Site was initially divided into 23 RUs. RUs were created by grouping one or more Solid Waste Management Units (SWMUs) with similar processes or characteristics, including the types of COPCs/ROPCs they contain. Figure 1-2 shows the FMC Plant Site as divided into the 24 RUs identified in the *SRI Work Plan* (an additional RU [RU 24] was added at that time). Table 1-1 provides a description of each RU.

1.2.2 SRI Objectives

As stated in the *Scoping and Planning Memo*, Attachment A SOW - Task 1.1, the site-specific objectives for the SRI/SFS are as follows:

1) Ensure that all areas have been adequately characterized and that CERCLA remedial actions are consistent with the closures and remedial actions at other areas of the site where requirements/actions are already in progress.

2) Identify areas that pose unacceptable risk for the range of reasonably anticipated future land uses that would not be under the direct control of FMC.

3) Clean up hazardous substances, pollutants, and contaminants released to the environment and control further releases to assure protection of human health and the environment.

4) Minimize the need for long-term care and maintenance.

5) Conduct actions compatible with future land use and development needs.

As confirmed by the 2003 SOW, the SRI/SFS, like the original RI/FS will take into account the anticipated future uses of the site and will apply EPA's One Cleanup Program policy so that the CERCLA process also meets parallel RCRA corrective action requirements. The SRI/SFS AOC and SOW acknowledge that the FMC Plant Site includes 1) hazardous waste management units that have been closed in accordance with RCRA and RCRA consent decree requirements, and 2) former Calciner Ponds where FMC has conducted remedial action pursuant to a consent order with IDEQ. The SRI/SFS process excludes evaluation of these units.

1.2.3 Report Organization

The organization of the SRI report is based on the suggested RI report format provided in the EPA document *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988).

Section 1 includes descriptions of the FMC facility operations and summarizes previous environmental investigations with potential relevance to the EMF facilities.

Section 2 describes the physical characteristics of the FMC Plant Site and surrounding area based on the results of the EMF RI investigations and the SRI, and includes information on the following:

- Regional hydrology and geology
- Drainage and surface water hydrology
- Site geology
- Site hydrogeology
- Climate
- Demography and land use
- Ecology

Section 3 describes the field programs that were conducted during the SRI, including data collection equipment and procedures and soil sample analytical methods.

Section 4 describes on an RU-by-RU basis the nature and extent of chemical constituents that appear to be associated with the FMC Plant Site activities. The discussion includes a contamination assessment, which summarizes risks to potential future receptors from exposure to existing surface and subsurface fill materials via the pathways identified in the CSM. In addition, concentrations of detected constituents in underlying native soils are compared to soil screening levels (SSLs) to evaluate the extent to which site-related constituents have migrated into underlying soils at levels that could pose a threat to groundwater and/or future workers should the fill material be excavated.

Section 5 summarizes the findings of each field program and presents the key conclusions for the program as a whole and, where appropriate, for individual RUs. The fate and transport of chemical constituents detected during the SRI are considered in the updated CSM presented in Section 5.

The following section summarizes historic FMC facility operations, previous environmental studies, and COPCs/ROPCs. Specifically, Section 2.2 discusses the FMC facility manufacturing, by-product handling, and waste management operations. Section 2.3 discusses previous investigations. COPCs/ROPCs are summarized in Section 2.4.

As required by the 2003 SOW, this SRI report includes tabulated results and sample location figures, and includes as appendices the validated analytical results, field data, field observations and logs, the Supplemental Human Health Risk Assessment (Supplemental HHRA) and all other SRI information.

1.3 FMC SITE DESCRIPTION AND OPERATIONAL HISTORY

1.3.1 FMC Site Description

The FMC Plant Site is located approximately 2.5 miles northwest of Pocatello, Idaho, and 1 mile southwest of the Portneuf River, a tributary of the Snake River. The FMC Plant Site is south of Highway 30, covers approximately 1,150 acres, and historically contained all of the process operations used for the production of elemental phosphorus. The Plant Site adjoins the western boundary of the Simplot Don Plant, as shown on Figure 1-1. There are an additional 212 acres owned by FMC located north of Highway 30 (excluding the 9-acre Tesco property) that are also part of the FMC OU. Figure 1-1 also shows where the FMC OU is located in the State of Idaho and in relationship to the municipalities of Pocatello and Chubbuck.

The FMC Plant OU is on privately-owned fee land, most of which is located within the exterior boundaries of the Fort Hall Indian Reservation. The easternmost portion of the FMC Plant OU is located outside the reservation boundary. The FMC Plant OU consists of essentially all the property that FMC owns at the EMF Site, and includes the FMC Plant Site located south of Highway 30 and all the properties apart from the former Tesco property that FMC owns north of that highway.

The terrain is generally flat for several miles from the southwest, clockwise through north-northeast of the Simplot facility. East of Pocatello, the Pocatello Mountain Range rises from about 4,400 feet to about 6,500 feet above mean sea level. Southeast of the FMC and Simplot facilities is the city of Pocatello, located in the funnel-shaped Portneuf River Valley. The valley virtually closes at the southern end of Pocatello. The north end of the Bannock Range lies just south of the FMC Plant Site. The Bannock Range and Michaud Flats meet along an escarpment that runs east-west through the FMC Plant Site. Within the facility, the slag pile covers this feature. However, it is evident in the western portion of the site. Information on land use in the EMF Site study area is presented in Section 3.6 of the *EMF RI Report*.

A more detailed description of the site's physical characteristics can be found in Section 2.0 of this SRI report. Additional detailed information on the geology and hydrogeology of the EMF Site study area and the FMC Plant OU is presented in Sections 3.1 and 3.3, respectively, of the *EMF RI Report*. Appendix K of the *EMF RI Report* presents details of the hydrogeologic modeling effort that was conducted during the RI study.

1.3.2 Historic FMC Plant Process Description

The FMC Plant Site ceased production in December 2001. From 2002 through 2006, the facility process operations were decommissioned and the facility infrastructure was demolished to ground level. This subsection provides a summary of FMC facility operations during production which began in 1949 and operated through 2001.

The FMC Plant Site produced elemental phosphorus from phosphate-bearing shale ore mined regionally. Ore was shipped to FMC via the Union Pacific Railroad during the summer months. Because ore could not be shipped during the winter months, it was stockpiled on the facility property (within RU 7) to ensure a steady ore supply for processing throughout the year. The estimated quantity of ore processed at the plant was about 1.5 million tons per year. Figure 1-2

shows the designated RUs within the FMC Plant Site and indirectly shows locations of the former buildings, processes, ponds, wastes, etc. mentioned in the process description below.

The ore was crushed, screened, and formed into briquettes prior to heat treatment (known as calcining). Oversize material screened from the ore (known as bull rock) was stockpiled either in RUs 15 or 19. The calcining process (located within RU 8) involved heating the ore briquettes to a sintering temperature of approximately 1,200°F. Rotary kilns were used to perform the ore calcining prior to 1968. In 1968 the rotary kilns were replaced with traveling grate calciners. Carbon monoxide (CO), a by-product of the phosphorus furnace reaction, was used as fuel to fire the calciners. The off-gas from the kilns/calciners passed through wet scrubbers prior to discharge to the atmosphere. The scrubber liquor blowdown was initially managed in surface impoundments located in RUs 8 and 9 (known as the kiln ponds).

With the installation of the calciners, a new surface impoundment (known as the calciner pond) was installed and put into service beginning in 1968. This unlined pond was located within RU 14. Beginning in 1986, a series of lined calciner ponds were built and put into service (within RU 14). Settled and dried solids from these calciner ponds were removed and stockpiled south of the calciner ponds located within RU 16. The surface impoundments within RU 14 (Ponds 1C, 2C, 3C, 4C, and 5C) were closed and capped under a voluntary order with the State of Idaho and are not addressed in the SRI/SFS process.

The calcined ore briquettes (known as nodules) were either sent directly to the proportioning area (located within the easternmost portion of RU 1) or stockpiled within RU 9 for later use. The nodules were blended in the proportioning area with coke and quartzite (known as silica) to make the phosphorus furnace feed. This mix of nodules, coke and silica was fed into four electric arc furnaces located within RU 1. The furnace reaction primarily yielded gaseous elemental phosphorus, CO gas, slag, and ferrophos (FeP). The elemental phosphorus gas was subsequently condensed to a liquid state and stored in sumps and tanks prior to shipment off-site as product.

Elemental phosphorus will burn upon contact with air. Therefore, to prevent oxidation, the condensed phosphorus product was kept covered with water from the time it was produced through loading and transport off-site. All of the elemental phosphorus product manufacturing and handling processes were located within RU 1, with exception of long-term phosphorus storage tanks located in RU 6.

Slag, in a molten state at 2300 °F, was periodically drained from the furnaces and discharged to the slag pit located within RU 2. The slag was the remnant from the ore and silica feed stock and formed a dense, glassy solid upon cooling. Slag from the FMC process is comprised primarily of calcium, silica, and minor amounts of other constituents. After solidifying, the slag was loaded and hauled to the slag pile located in RU 19 or to Bannock Paving operations located in RU 20. Bannock Paving (an independent road construction company) stored, crushed, sized, sold and hauled slag aggregate. Another furnace by-product, FeP, was also crushed and sized by Bannock Paving for FMC to sell as a commercial product. Bannock Paving also stockpiled and dried coke in RU 20 as part of the furnace feed preparation.

The phosphorus furnaces were cooled with non-contact cooling water produced from on-site wells. The non-contact cooling water, carrying the heat removed from the furnace operations, was discharged to the Portneuf River (under a National Pollutant Discharge Elimination System [NPDES] permit) through a series of underground pipes and open surface trenches. The surface trench carrying the non-contact cooling water has been designated as RU 10.

Other process water (known as phossy water) was used to isolate elemental phosphorus from contact with air and to slurry precipitator dust (another furnace by-product). Phossy water and precipitator slurry were typically managed separately in a series of surface impoundments located to the west of the elemental phosphorus furnaces. A number of these surface impoundments (Ponds 8S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18A, 8E, and 9E) were closed and capped under EPA-approved RCRA closure plans and are not subject to the SRI/SFS (designated as RU 22a). Numerous other surface impoundments were historically dewatered and/or covered. These ponds, which had ceased receiving wastes prior to termination of their Bevill exemption and thus were not closed under RCRA, are located within RU 22b. The railroad swale (designated as RU 22c) was designed as a stormwater retention area but also received phossy water from process spills.

Other RUs that were ancillary to the elemental phosphorus production process include the following:

- RU 3 – Receiving, stores, paint shop and phosphorus decontamination building
- RU 4 – Office buildings
- RU 5 – Process control laboratory and drainfield
- RU 11 – Used equipment storage area
- RU 12 – New equipment storage/staging area and mobile shop
- RU 13 – Pond 8S recovery process area and metal scrap preparation area
- RU 17 – Recyclable material landfill
- RU 18 – Plant landfill
- RU 21 – On-plant railroad spurs (not included in other RUs)
- RU 23 – Plant roads (not included in other RUs)
- RU 24 – Plant areas not included within other RUs

More detailed information regarding the ore processing, by-product handling, and waste management operations at the FMC Plant Site is provided in Sections 1.1.2 through 1.1.3 of the *EMF RI Report*. Descriptions of the plant feedstocks and by-product materials that are found as fill and surface materials are included in Section 1.3.3 below.

1.3.3 Description of FMC Plant Site Feedstock and By-product Materials

The following subsections provide a brief description of process materials encountered at the FMC Plant Site. These materials consist of raw materials used in the process, by-products, and process wastes and include the following: 1) slag, 2) ore (including raw ore, calcined ore, and bull rock), 3) precipitator solids, 4) phossy solids, 5) silica, 6) ferrophos, and 7) coke. The physical, radiological, and chemical characteristics of each of these materials are discussed below.

1.3.3.1 Description of Slag

Slag was produced as a by-product of the phosphorus furnace reaction. Slag was crushed, screened, stockpiled (within RU 20) and sold as a road base material and also stockpiled on-site in RU 19. FMC used slag as a fill material within many of the RUs at the FMC Plant Site. This material is relatively homogeneous in terms of inorganic constituent concentrations because of the uniform composition of furnace feed needed to produce P4 to product specifications.

Physical Characteristics. Slag is dark gray, angular, gravel-like material that is very hard.

Radiological Characteristics. Slag has been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, potassium-40, lead-210, polonium-210, and radium-228. A summary of activities for these isotopes in historical slag samples is presented in Table 1-3 and these activities are also presented in Table F-1 of the *RI Update Memo*. In addition, slag was sampled as part of the SRI roadway studies and analyzed for radium-226, uranium-238, potassium-40, lead-210, and polonium-210. The radionuclide sample results from the SRI are discussed in Section 4.

Chemical Characteristics. Table1-4 presents total metals and fluoride concentrations in historical slag samples. In addition, slag was sampled as part of the SRI roadway studies and analyzed for metals and fluoride.

1.3.3.2 Description of Ore

Raw ore was transported to the FMC Plant Site via railcar from the mine. Ore was unloaded from railcars, stockpiled, reclaimed from the stockpile, crushed, and screened, all within RU 7. When plant operation ceased, some raw ore was sold and shipped off-site while some remained at the ore stockpile in RU 7. The remaining ore has been leveled to grade. Raw ore remains on the surface within most of the RU 7 area and some of surface of RU 9. Ore, ore by-products (such as bull rock), and calcined ore can be found in RU 2 (briquetting operation), RUs 8 and 9 (kiln/calciner operations), RU 15 (oversized ore, used electrodes and baghouse dust area), and RU 19 (slag and bull rock pile).

Physical Characteristics Phosphate ore is typically described as phosphorites and/or phosphatic shales and mudstones. However, the physical appearance of raw phosphate ore, as encountered on the FMC Plant Site, is visually similar to a brown, silty soil. The phosphate-bearing mineral is calcium fluorapatite. Calcined ore is slightly lighter in color, but with the same overall physical, radiological, and chemical characteristics. Bull rock consists primarily of larger particles (plus 6-inch) of limestone, unweathered phosphate rock, chert, and silica.

Radiological Characteristics. Ore has been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, potassium-40, lead-210, polonium-210, and radium-228. A summary of activities for these isotopes in historical ore samples is presented in Table 1-3 and these activities are also presented in Table F-1 of the *RI Update Memo*. The 1987 EPA aerial gamma survey of the FMC Plant OU showed elevated gamma dose rate levels associated with ore pile areas. Photo Ionization Chamber (PIC) measurements performed during the EMF RI indicate that external gamma rates are measurably above background (BEI, 1996, Appendix O-2) for ore. In addition, ore was sampled as part of the SRI fill characterization study and analyzed for gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, and polonium-210. The radionuclide sample results from the SRI are discussed in Section 4.

Chemical Characteristics. Table 1-4 presents total metals and fluoride concentrations in ore. In addition, ore was sampled as part of the SRI fill characterization study and analyzed for fluoride and metals. The fluoride and metal sample results from the SRI are presented in Section 4.

1.3.3.3 Description of Precipitator Solids

Precipitator solids (otherwise referred to as precipitator slurry, precipitator dust, and/or fluid bed dryer [FBD] slurry/prills) were produced in the electrostatic precipitators immediately downstream of the phosphorus furnaces. Between 1950 and 1954, precipitator dust was handled in a dry form as it came out of the precipitators. There were a number of operational and safety problems with this method of operation. In 1955, a slurry system was installed for all the precipitators. The precipitator dust was slurried at the bottom of the electrostatic precipitators with water and pumped to a series of ponds located in RU 22b. When possible (e.g., phosphorus content was not too high), precipitator slurry was allowed to air dry in these ponds. Dried precipitator slurry (precipitator solids) was reclaimed from these ponds and sold as a fertilizer additive due to its high zinc content. These ponds were closed during a period from 1972 through 1976 by covering with various materials, including soil, dried precipitator dust, prills, ore, and slag.

In 1976, an FBD was installed to dry the precipitator slurry. This was done with the goal of eliminating the need for further precipitator slurry ponds and to produce “prills,” which were preferred by customers for fertilizer blending. During operation of the FDB, precipitator slurry was pumped to Pond 10S (a single-lined pond built in 1976) directly from the precipitator slurry pots. Pond 10S provided surge capacity for the slurry feed to the FBD. The slurry sent to Pond 10S was later dredged and fed into the FDB to produce marketable prills. With the shutdown of the FBD in the mid-1980s, new lined ponds were constructed to again manage precipitator slurry in ponds. Pond 10S was allowed to air dry but was not “closed” with a cover as were other ponds of this type. Thus, precipitator solids have remained at the surface at Pond 10S to the present day.

Physical Characteristics. Precipitator solids are typically described as “fine-grained, dark-gray-to-black material.”

Radiological Characteristics. Precipitator solids have been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, potassium-40, lead-210, polonium-210,

and radium-228. A summary of activities for these isotopes in historical precipitator solids samples is presented in Table 1-3 and these activities are also presented in Table F-1 of the *RI Update Memo*. Elevated levels of lead-210 and polonium-210 are associated with precipitator solids (labeled "Precipitator Slurry/Phossy Wastes" in Table 1-3). In addition, precipitator solids were sampled as part of the SRI fill characterization study and analyzed for gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, and polonium-210. The radionuclide sample results from the SRI are discussed in Section 4.

Chemical Characteristics. Table 1-4 presents total metals and fluoride concentrations in historical precipitator solids samples. In addition, precipitator solids were sampled as part of the SRI fill characterization study and analyzed for fluoride and metals. The fluoride and metal sample results from the SRI are presented in Section 4.

1.3.3.4 Description of Phossy Solids

Phossy solids (otherwise referred to as phossy water solids, oxidized phossy solids, and/or phossy slurry) were produced throughout the phosphorus manufacturing process and were typically solids (consisting of ore dust, coke, dust, silica dust, slag dust and/or precipitator dust) containing phosphorus within a water stream. The phossy solids accumulated within the water stream as a result of contact with phosphorus-containing process streams (e.g., phosphorus product and phosphorus sludge). These various phossy water streams were accumulated within sumps/drains/tanks and pumped to slurry ponds located to the west of the furnace building, where the phossy solids were allowed to settle and accumulate. These ponds were maintained with a water cover to prevent oxidation of phosphorus with air. Early phossy water ponds, i.e., those that ceased operation before RCRA management requirements became applicable, were eventually "closed" by dewatering and covering with other fill materials such as precipitator dust slag, and/or native soils.

Physical Characteristics. Phossy solids that were allowed to dry typically resulted in oxidation of the phosphorus leaving "gray to dark-gray or black sediments." However, the appearance of phossy solids can vary depending on the content of the solids (i.e., ore, coke, slag, silica or precipitator dust).

Radiological Characteristics. Phossy solids have been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, potassium-40, lead-210, polonium-210, and radium-228. A summary of historic activities in phossy solids areas are presented in Table 1-3 and these activities are also presented in Table F-1 of the *RI Update Memo*. In addition, a phossy solids sample was collected as part of the SRI fill characterization study and analyzed for gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, and polonium-210. The radionuclide sample results from the SRI are discussed by RU in Section 4.0.

Chemical Characteristics. Table 1-4 presents total metals and fluoride concentrations in historical phossy solid samples. In addition, a phossy solids sample was collected as part of the SRI fill characterization study and analyzed for fluoride and metals. The fluoride and metal sample results from the SRI are presented in Section 4.

1.3.3.5 Description of Silica

Silica (quartzite) was mined locally (off the FMC Plant Site) and hauled to the FMC Plant Site by truck. The silica was stockpiled on-site in RU 9 and was used as a component of the phosphorus furnace feed. Silica was later used as a fill material during plant decommissioning to bring excavated areas up to grade (e.g., RU 3, RU 4, RU 5, and RU 10).

Physical Characteristics. Silica formerly used at the FMC Plant Site is an orange to pink, angular, gravel-like material that is very hard.

Radiological Characteristics. Silica has been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, lead-210, polonium-210, and radium-228. A silica sample was collected as part of the EPA 1977 radiological survey of Idaho phosphate ore processing. The results from this sample can be found in Table 1-3. These data are also presented in Table F-1 of the *RI Update Memo*.

1.3.3.6 Description of Ferrophos

Ferrophos was produced as a by-product of the phosphorus furnace reaction. Ferrophos was crushed, screened, stockpiled (within RU 20) and sold for metal recovery. Small stockpiles of ferrophos are still present on the surface in RU 20 and RU 22b and sales of ferrophos continue to the present day. Incidental amounts of ferrophos were also noted in SRI borings from RUs 6 and 12. This material is relatively homogeneous in terms of inorganic constituent concentrations because of the uniform composition of furnace feed needed to produce P4 to product specifications.

Physical Characteristics. Ferrophos is a dense, dark gray, angular, gravel-like material with a metallic appearance.

Radiological Characteristics. Ferrophos has been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, potassium-40, lead-210, polonium-210, and radium-228. A summary of historic activities for these isotopes in ferrophos is presented in Table 1-3. These activities are also presented in Table F-1 of the *RI Update Memo*.

Chemical Characteristics. Table 1-4 presents total metals and fluoride concentrations in historical ferrophos samples.

1.3.3.7 Description of Coke

Coke was brought to the plant by rail and truck. Coke was used as a feed material to the phosphorus furnaces. Coke generally was unloaded at RU 7. Some coke was unloaded and stockpiled at RU 20 to be dried prior to introduction into the process. Coke and coke fines are present on the surface within RU 20.

Physical Characteristics. Coke is a light density, black material ranging in size from dust to 1-inch particles.

Radiological Characteristics. Coke has been analyzed for uranium-238, uranium-234, thorium-230, thorium-232, radium-226, lead-210, polonium-210, and radium-228. A summary of historic activities for these isotopes in coke is presented in Table 1-3. These activities are also presented in Table F-1 of the *RI Update Memo*.

Chemical Characteristics. Coke chemical characteristics were taken from Table 4.3 of the VRP Site Characterization Report – Former Kemmerer Coke Plant, Wyoming. This plant site was the source of most of the coke used at the FMC Plant Site.

1.3.4 Site History

1.3.4.1 Plant Process History

Elemental phosphorus production operations at the facility began in 1949. The site was primarily in agricultural use prior to construction of the phosphorus production facility in the late 1940s. Other than plant production expansions, the production process changed little from the time plant operations began until operations ceased in 2001. Some notable exceptions include:

- The ore calcining process was changed in 1968 from a rotary kiln process to a moving grate process. As a result the kiln ponds located in RUs 8 and 9 were taken out of service and the calciner ponds in RU 14 were put into service.

- The precipitator slurry handling process was changed in 1976 at which time the FBD was put into service. With this process change, the precipitator slurry was pumped from the slurry pots in the furnace building to Pond 10S. From Pond 10S, the slurry was dredged and pumped to the FBD where the slurry was dried into "prills" and then sold as a fertilizer additive. The FBD was taken out of service in 1989 and the precipitator slurry was then pumped to and managed in lined ponds until cessation of operations in 2001.

- The ore handling process was changed in 1990 from using bull dozers to push and mix the ore on a surface stockpile to a stacker/reclaimer process utilizing two parallel ore trenches. Both of these processes were located within RU 7.

- The source of the phosphate ore used in the plant was changed in 1994 from Gay Mine to Dry Valley Mine.

- In 1997, the slag ladling process was initiated on the first of the four furnaces. This involved collecting molten slag in a ladle, hauling the ladle to the slag pile, and dumping the molten slag at the slag pile. All four furnaces were converted to slag ladling by the end of 2000. The slag continued to be stockpiled in RU 19.

1.3.4.2 Plant Decommissioning

With the cessation of production at the facility in December 2001, a number of process decommissioning activities were performed, including the following:

- Isolation and securing of process equipment and utilities.
- Demolition and decontamination of process buildings and equipment down to ground level. Recyclable scrap was sold and hauled off-site. Non-recyclable scrap was placed in the demolition debris landfill (RU 17).
- Demolition of site office buildings down to ground level (with the exception of the Training Center building in RU 4 and an office building in RU 20). Most recyclable scrap was sold and hauled off-site. Most non-recyclable scrap was placed in the demolition debris landfill (RU 17).
- Recovery and sale of a portion of the ore stockpile. Remaining ore was pushed into the ore trenches, contoured, and seeded. Sales of the stockpiled ferrophos have continued.

The only process equipment currently left in place is the rotary railcar dumper located in RU 7. This equipment was left in place for potential application to future site development. Decommissioning activities were completed in fall 2006.

1.3.4.3 RCRA Pond Closures

The FMC facility first became subject to the RCRA Subtitle C regulations in March 1990 due to the removal of the Bevill Exemption from certain mineral processing wastes. Numerous surface impoundments (Ponds 8S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18A, 8E, and 9E) were used at the facility for management and disposal of process waste streams that became regulated as RCRA hazardous wastes. A RCRA Consent Decree entered on July 13, 1999 required FMC to close and cap these ponds in accordance with RCRA and Consent Decree requirements. These ponds have all been closed and are currently under RCRA post-closure care.

Table 1-2a provides background information on the RCRA ponds. While these ponds and the associated post-closure activities are not subject to the SRI/SFS, the CERCLA remedial actions selected in the Amended ROD must be integrated with the ongoing RCRA post-closure requirements at these ponds to avoid any potential conflict between the CERCLA and RCRA actions.

1.3.4.4 Pond 16S Gas Extraction and Treatment

Pond 16S, one of the RCRA-regulated ponds, covers a surface area of 10.2 acres and contains 140 acre-feet of treated precipitator slurry and phossy water. Pond 16S received phossy water and lime-treated precipitator slurry from the furnace building, the phos dock, phosphorus decontamination residues, and water from other ponds. Pond 16S was closed when it had accumulated solids to its capacity. The unit ceased receiving wastes in September 1999. Closure was performed in accordance with the EPA-approved Pond 16S *Closure Plan*, November 1998, revised July 2003 (BEI, 2003). Initial closure (fill and a temporary cover) was completed in October 2000 with the final cover construction completed in the fourth quarter 2004.

The mixture of high-pH wastes with phosphorus residue wastes in Pond 16S has resulted in the generation of phosphine (PH_3) gas, which has been measured at in well casings in which temperature monitors had been installed for post-closure monitoring. In response, FMC initiated operation of perimeter gas extraction and carbon treatment systems to remove and treat the PH_3 gas. On January 13, 2007, EPA issued a *Unilateral Administrative Order for Removal Actions* (UAO, 2006) that required FMC to design, build, and operate a larger scale gas extraction and treatment system with the goal of reducing PH_3 concentrations under the Pond 16S cap to 10 percent of the lower explosive limit (approximately 2,000 ppm PH_3) for a period of 12 consecutive months. This work is proceeding under EPA direction, pursuant to the UAO.

1.3.4.5 Calciner Pond Closures

As described above, the calciner ponds (Ponds 1C, 2C, 3C, 4C and 5C) received calciner scrubber blowdown water. FMC has always maintained its position that the calciner and calciner ponds operations are exempt from RCRA hazardous waste regulation pursuant to the Bevill exemption for mineral processing waste. Although IDEQ has not agreed with that position, IDEQ and FMC entered into a Voluntary Consent Order (VCO) for the Calciner Ponds Remedial Action in July 2002. Paragraph V of the VCO states as follows: "*To effectively address and remediate any contamination at the Calciner Ponds which are located at the facility outside the boundary of the Fort Hall Indian Reservation, and without admitting liability or any issue of fact or law, FMC voluntarily agrees to the following provisions, terms and actions of this Consent Order.*" Therefore, the VCO does not prejudice either party's legal positions related to the regulatory status of the calciner ponds. The VCO instead represents an agreement to effectuate a mutually agreeable outcome without litigation. The IDEQ-approved remedial action for these ponds involved the installation of a RCRA-equivalent cover system. The remedial action was completed at the calciner ponds in 2005 and completion of the remedial action was acknowledged by IDEQ in 2006. The Calciner Ponds are currently under post-remedial monitoring and maintenance pursuant to the VCO and Remedial Action Plan.

Table 1-2b provides background information on the calciner ponds. While these ponds and their ongoing monitoring and maintenance are addressed by the VCO and not separately in the CERCLA process, the CERCLA remedial actions selected in the Amended ROD must be integrated with the ongoing VCO requirements at these ponds to avoid any potential conflict.

1.4 SUMMARY OF PREVIOUS EMF INVESTIGATIONS

The FMC Plant OU has been the subject of a number of environmental investigations. Many of these are detailed in the *EMF RI Report*. Previous investigations, reports, and decision documents that provide pertinent background to the SRI are discussed below.

1.4.1 Preliminary Site Characterization Summary (PSCS)

The *PSCS* presented the preliminary results of the RI and fulfilled the objective to provide an initial characterization of the EMF Site. The *PSCS* characterized potential sources of releases, on-site and off-site soils, groundwater, surface water, and sediments, and included a survey of ecological resources, demography, and land uses within the EMF study area. Consistent with the

RI, the *PSCS* addressed the entire EMF Site, i.e., both the FMC and Simplot facilities as well as adjoining areas not owned by either company. The *PSCS* was prepared prior to the shutdown of the FMC phosphate ore processing operations.

The following are some of the key observations made in the *PSCS* regarding the potential sources, groundwater, soils, surface waters, and surface water at the site:

- Potential sources were identified as the phosphate rock feedstock used by both the FMC and Simplot facilities as well as the products, by-products and waste streams generated as result of phosphate rock processing. The COPCs/ROPCs found in common in the feedstock, products, by-products and waste streams were cadmium, chromium (total), fluoride, total phosphorus, vanadium, iron, lead, silver, zinc, gross alpha and gross beta.

- Although control measures had been taken at both facilities that were found to have greatly reduced releases of constituents to groundwater, on-site shallow groundwater was found to have been impacted by releases from unlined waste management facilities at both facilities. The primary constituents associated with these impacts were found to be arsenic, chloride, fluoride, nitrate, selenium, sodium, and sulfate. While the natural alkaline pH of the soils in the EMF area was found to be an important attenuation factor for metals, constituents associated with Simplot and FMC activities were detected at Batiste Spring and Swanson Road Spring.

- While there are significant fill materials (such as slag, phosphogypsum, and phosphate ore) covering most of both facilities, on-site subsurface soil quality was found to have been impacted only where either a sustained hydraulic head transported constituents from source materials into the underlying soils or where mechanical mixing of the source materials and subsurface soils had taken place.

- While process changes were found to have greatly reduced airborne dispersion of process materials, EMF-related constituents were detected immediately north and east of the facilities in off-site soils, suggesting historical deposition of windblown particulates from both facilities. The PSCS described the subsurface soils located outside the companies' properties as not having been impacted by airborne releases.

The *PSCS* concluded that sampling results generated as of the date of that report demonstrated that there was minimal human or ecological exposure to site-related constituents in groundwater, surface water, sediments, on-site soils, and off-site soils.

1.4.2 EMF Remedial Investigation (RI)

FMC and Simplot conducted the EMF Site RI/FS under the 1991 AOC with EPA. In 1996, the companies issued and EPA approved the *EMF RI Report* characterizing the nature, extent, fate and transport of chemical constituents likely released from FMC and Simplot facility operations.

During the RI, FMC and Simplot performed extensive sampling and analyses of surface and subsurface soils, groundwater, surface water, sediment, aquatic and terrestrial ecology, and air. More than 1,500 groundwater samples were taken and more than 60,000 analyses were

performed. Approximately 3,600 air samples were taken and analyzed for more than 20 constituents. A detailed emissions inventory was developed for both facilities and atmospheric dispersion models were used to characterize air emissions impacts. Industrial feedstocks and potential sources of constituent releases at both facilities were characterized. Soil samples were taken at 200 locations to a depth of as much as 70 feet.

Outside the processing facilities, soils were sampled on a radial grid at regular intervals along 16 compass directions up to a distance of approximately 3 miles. Approximately 250 surface water and sediment samples were collected and about 7,500 analyses were performed. Both aquatic and terrestrial exposures were characterized to support the *EMF Baseline Ecological Risk Assessment* (*Baseline ERA*, E&E 1995) that was performed by EPA's contractor, E&E.

The RI characterized the nature and extent of chemical constituents likely released from the FMC and Simplot processing facilities and the potential migration of these constituents within various media. The principal findings of the RI for soils include:

- Soils containing the highest levels of facility-related constituents are confined to the FMC and Simplot operational areas. These areas exclude residential uses.
- Although concentrations of site-related constituents are elevated primarily on properties owned by FMC and Simplot, there are off-site areas with concentrations above background levels.

The RI also characterized the nature and extent for other media, not within the SRI scope, including:

- Groundwater
- Surface Water and Sediments
- Terrestrial Ecology
- Air

1.4.3 LDR Plant RCRA Baseline Assessment for Soils (ZIMPRO Pilot Test Report, 2001)

A demonstration of a test procedure and associated quality assurance and quality control (QA/QC) protocols for the FMC Pocatello Phossy Waste Treatment Plant (PWTP) ZIMPRO™ Demonstration Test was conducted in 1999–2000 (BEI, 1999). Analysis of process stream samples from the PWTP demonstration run provided data needed to evaluate how well the process met the RCRA land disposal restriction (LDR) standards and the 1999 RCRA Consent Decree requirements for the FMC Pocatello facility. Data were also used to design and operate a full-scale PWTP and prepare future RCRA Part B and air permit applications for the full-scale treatment plant.

1.4.4 Secular Equilibrium Study

A work plan to assess secular equilibrium in the EMF Site surface soil was prepared in July 2004 (BEI, 2004a) to verify the assumption of secular equilibrium between uranium-238 and radium-226 that was described in the *EMF RI Report* surface soil investigation. In July 2003, EPA requested a supplemental investigation by FMC and Simplot regarding an evaluation of radium-226 and uranium-238 in the upper six inches of surface soils in the Off-Plant OU to verify this assumption. A work plan to assess secular equilibrium in the EMF Site surface soil was prepared in July 2004 (BEI, 2004a). The secular equilibrium study field work was performed during 2004. As part of the field work, EPA requested and received split samples. Those were analyzed by the EPA National Air and Radiation Environmental Laboratory (NAREL). The results of samples analyzed by both EPA and the companies were reported to EPA on May 19, 2006. All the sample results were consistent with radioactive equilibrium between radium-226 and uranium-238. Specifically, the report stated that "[t]he Companies believe that the 2004/2005 work demonstrates that radium-226, a radionuclide in the uranium-238 decay series, is in secular equilibrium with uranium-238, which supports the original assumption made by EPA's contractor—Ecology and Environment—in the baseline human health assessment for the EMF Site."

1.5 CONSTITUENTS OF CONCERN – FMC PLANT SITE SOILS

The following sections provide background information on radiological, organic, and inorganic COCs/ROCs and COPCs/ROPCs that were identified prior to conducting the SRI. As shown in Table 1-5, the EMF ROD identified a list of COCs/ROCs in soil based on the findings of the EMF RI and the *Human Health Risk Assessment for the EMF Site* (*EMF HHRA*, E&E, 1996). The COCs/ROCs identified in the ROD were updated for the FMC Plant OU in the *RI Update Memo* as shown in Table 1-5 based upon: 1) evaluation of historical (RI and post-RI) data for the FMC Plant OU, (i.e., not including Simplot Plant OU data), and 2) screening against updated SSLs or RBCs. These updated SSLs or RBCs were sometimes greater than or less than the RBCs identified in the *EMF HHRA*. The list of COPCs/ROPCs evaluated for soils during the SRI are also listed in Table 1-5 and are based on the *RI Update Memo* as well as comments received during the development of the *SRI Work Plan*. The SRI COPCs/ROPCs are further discussed below.

1.5.1 Radiological COPCs (ROPCs)

Radioactivity present at the site results from naturally-occurring radionuclides in native soil, and in feedstocks and waste streams historically processed at the FMC plant. This section provides a general discussion regarding naturally-occurring radioactivity present at the site, descriptions of the FMC plant site activities that concentrated certain radionuclides in the process waste streams, and the rationale for the radiological parameters selected for analysis in the SRI.

As documented in Appendix K of the *RI Update Memo*, native soils at the FMC Plant Site have been shown to contain naturally-occurring uranium-238 (U-238), uranium-235 (U-235), thorium-232 (Th-232), and potassium-40 (K-40). Thorium-232 and its daughters have been seen only in low concentrations. Uranium-235 and its daughters are also usually detected at the normal isotopic concentrations. However, uranium-235 is only naturally present at very low

concentrations (less than approximately 0.7 percent of all uranium). Uranium-238 has several daughters that FMC has concluded are in radioactive equilibrium with the parent.

As also documented in Appendix K of the *RI Update Memo*, several of the source materials historically processed at the FMC Plant Site contain uranium-238, its daughters, and/or potassium-40 at levels that exceed those in background soils. This due to the relatively high levels of uranium-238 in the phosphate ore that FMC processed. Above-background radiological risks at the FMC Plant Site are associated with exposure to these naturally-occurring radioactive materials (NORM).

Although there were no activities at the FMC Plant Site that could create radionuclides, there were processing activities that concentrated certain radionuclides in process waste streams. Uranium-238 daughters, with lower boiling points, could be boiled off during high-temperature processing operations (kiln/calciner operations and the furnace operations) and thereby be concentrated in the waste streams from these operations. Uranium-238 has a boiling point of 3,818°C and did not appreciably boil off, but passed through the process and remained in the slag.

Radium-226, lead-210, and polonium-210 have boiling points of 1,737°C, 1,740°C, and 962°C, respectively. These low-boiling-point radionuclides (relative to uranium) could be expected to be concentrated in kiln/calciner off-gas solids (kiln/calciner solids) and/or in furnace precipitator dust (precipitator/phossy solids).

Radioactive parameters selected for analysis during the SRI were based upon the findings of the risk analysis performed using available isotope-specific data for the various source materials historically processed at the FMC Plant Site. The data, methods, assumptions and findings of this analysis are presented in Appendix K of the *RI Update Memo* and Appendix B of the *SRI Work Plan*. Specifically, external exposure to gamma radiation was shown to be the primary risk driver, although risks associated with ingestion of lead-210 and inhalation of polonium-210 are also potentially significant for any workers exposed to precipitator dust/phossy solids. While the *RI Update Memo* determined that the risks associated with ingestion and inhalation of other radionuclides were shown to be insignificant, additional isotope-specific data were collected during the SRI to confirm that conclusion. Based on the RI and SRI findings, the only radionuclides present at the FMC Plant Site that have the potential to be of concern from a risk perspective are uranium-238, the daughters of uranium-238 (i.e., radium-226, lead-210, and polonium-210) and potassium-40. These radionuclides are described in the following subsections.

1.5.1.1 Uranium-238 (U-238)

Naturally-occurring uranium-238, with a half life of 4.5×10^9 years, is found in feedstocks, by-products, and waste material at the FMC Plant Site due the relatively high levels of uranium-238 in FMC's phosphate ore. Activities of this isotope in historical samples of FMC Plant Site feedstocks, by-product, and waste materials are listed in Table 1-3. These activities are also listed in Appendix B of the *SRI Work Plan* and Appendix K of the *RI Update Memo*. Also reported in these documents are the activities that were listed in the *EMF RI Report*. The

background native soil value is 3.88 pCi/g (E&E, 1996). The elevated uranium-238 activities in ore and slag are similar, and range from 18.6 to 30.7 pCi/g and 20.0 to 26.0 pCi/g respectively.

1.5.1.2 Radium-226 and Radon-222 (Ra 226 and Rn-222)

A daughter product of uranium-238 decay, radium-226 has a half-life of 1,600 years. Activities of this isotope in historical samples of FMC Plant Site feedstocks, by-product, and waste materials are listed in Table 1-3. These activities are also listed in Appendix B of the *SRI Work Plan* and Appendix K of the *RI Update Memo*.

Radium-226 decays to Rn-222, a gas that can be released to the atmosphere. Rn-222 has been demonstrated to be a health concern where the gas is confined in an occupied space with little or no air turnover (e.g., a basement of a building). However, this is not a concern at the FMC Plant Site since, under the terms of the 1998 ROD, any future buildings will include radon control measures. Whether Rn-222 emanation is a potential risk with respect to outdoor workers under future site development is a current data gap that was evaluated during the SRI. Targeted radon measurements were taken to support the SFS, and were also used to characterize potential impacts to outdoor workers in the risk assessment. Radon flux measurements were performed in RUs 7, 19 and 22b.

1.5.1.3 Potassium-40 (K-40)

With a half-life of 1.28×10^9 years, potassium-40 is naturally present in the phosphate ore and the FMC by-products. Activities of potassium-40 in FMC Plant Site feedstocks, by-products, and waste materials are listed in Table 1-3. These activities are also listed in Appendix B of the *SRI Work Plan* and Appendix K of the *RI Update Memo*.

1.5.1.4 Lead-210 (Pb-210)

Lead-210, a low-boiling-point radionuclide with a half-live of 22.3 years, was concentrated in the furnace precipitator dust. Activities of lead-210 in FMC Plant Site feedstocks, by-products, and waste materials are listed in Table 1-3. These activities are also listed in Appendix B of the *SRI Work Plan* and Appendix K of the *RI Update Memo*.

1.5.1.5 Polonium-210 (Po-210)

Polonium-210 has a half-life of 138 days. Activities of polonium-210 in FMC Plant Site feedstocks, by-products, and waste materials are listed in Table 1-3. These activities are also listed in Appendix B of the *SRI Work Plan* and Appendix K of the *RI Update Memo*.

1.5.2 Inorganic COPCs

Non-radiological COCs and COPCs described in the *RI Update Memo* as shown on Table 1-5 include a specific list of inorganics and a focused list of volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs) as shown on Tables 1-6, 1-7 and 1-8. The COCs and COPCs list for VOCs and PAHs were expanded from the list developed in the *RI Update Memo* based upon comments received during development of

the *SRI Work Plan*. For all of these inorganic COCs and COPCs, methods of analysis are described in Section 3.

1.5.2.1 Elemental Phosphorus (P4)

Elemental phosphorus (P4) was the primary product manufactured at the FMC Plant Site during operation. However, because P4 oxidizes spontaneously and burns vigorously when in contact with air, P4 was managed only in certain areas of the facility and was stored under water to prevent contact with air and thus oxidation.

1.5.2.2 Metals

Phosphate ore contains elevated concentrations of many metals. As such, any location on the FMC Plant Site where ore and ore-related materials, slag, processing by-products, or waste streams were processed, stored, or disposed, may have concentrations of metals above background.

Based upon historical sampling and analyses during the RI, migration of metals from ore/ore-related materials or from slag to underlying soils does not appear to be likely. However, reference studies were performed at RU 7 (to represent ore leaching potential) and at RU 20 (to represent slag leaching potential) to determine if these materials leached metals into underlying soils.

1.5.2.3 Fluoride

The phosphate-bearing mineral in phosphate ore is a fluorapatite and as such contains 2.5 to 3.0 percent fluorine. Areas within the FMC Plant Site thus may have levels of fluoride above background.

1.5.3 Organic COC/ COPCs

Organic COCs and COPCs (see Table 1-6) were associated with specific investigation areas. The specific analytes for each investigation area were established based upon the following: 1) known use of a solvent on-site (i.e., toluene, benzene, and methylene chloride), 2) process knowledge of process materials (i.e., coke), 3) IDEQ-published lists for fuel release investigations (IDEQ, 2002), and 4) compounds reported as detected in soil samples collected during the RI. Area-specific organic analytes to be investigated are described below.

1.5.3.1 Lab-Related Solvents

Lab-related solvents included the following: benzene, carbon disulfide, chloroform, methylene chloride, tetrachloroethene (PCE), toluene, trichloroethene (TCE), and 1,1,1-trichloroethane, (1,1,1-TCA) and 2-butanone. These analytes were addressed at specific investigation areas in RUs 4 and 5. The lab-related solvents are either known or suspected of having been used in the lab, or were detected during the RI.

1.5.3.2 Shop-Related Solvents

Shop-related solvents included the following: chloroform, methylene chloride, PCE, TCE, 1,1,1-TCA and 2-butanone. These analytes were addressed at SIAs within RUs 12 and 20 where shop-related solvents were suspected to have been used or released. Both of these RUs had maintenance shops. Shop-related solvents are either known or suspected of having been used in these shops, or were detected during the EMF RI.

1.5.3.3 Fuel-Related VOCs/PAHs

Fuels-related VOC/PAHs included the following: benzene, ethylbenzene, toluene, xylene (collectively referred to as BTEX), acenapthene, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, fluorene, fluoranthene, naphthalene, phenanthrene, and pyrene. These analytes were addressed at specific investigation areas within RUs 12 and 20 where fuels were known to have been stored, dispensed, or released. Both of these RUs had gasoline and diesel fuel storage tanks, fuel dispensing areas, and known fuel spills to the ground surface.

1.5.3.4 Coke-Related PAHs

Coke-related PAHs included the following: acenapthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene,and pyrene. Soil samples were analyzed for these PAHs in specific investigation areas of RUs 7 and 20, where coke was unloaded, stored, and/or processed.

1.5.3.5 PCBs

PCBs include all chlorinated biphenyl congeners. PCB investigations were conducted only at RU 12, in the area of the transformer salvage area.

1.5.4 Comparative Values

Throughout the *SRI Work Plan* and this report, the term “comparative value (CV)” is used with respect to the SRI data evaluations. A CV may be RU-specific, sample-specific, and/or specific to the COCs/ROCs or COPCs/ROPCs. For example, the CV may be a cumulative target risk threshold; SSLs for P4, metals, fluoride and organics; or background concentrations for arsenic and specific radioisotopes. In the case of gamma radiation exposure, the CV may be a pre-determined gamma count rate (as measured with a sodium iodide detector during the radiation surface survey), or a pre-determined risk-based gamma exposure rate (as measured quantitatively with a PIC instrument).

1.5.4.1 Radionuclide, Inorganic, and Organic SSLs

As detailed in Section 4 of the *RI Update Memo*, P4 SSLs, and future commercial/industrial worker SSLs for inorganic and organic COPCs/ROPCs were developed and updated in accordance with guidance that EPA developed after the *EMF HHRA*. The approved *SRI Work Plan* listed this more recent EPA guidance as a criterion for evaluating the SRI results.

Consistent with EPA guidance for deriving SSLs for Superfund sites (EPA, 2002a), the updated CSM for the FMC Plant OU (BEI, 2004b) identified additional receptors that could potentially be exposed to site-related contamination. Specifically, in addition to outdoor future commercial/industrial workers, the following potential receptors were also identified:

- Indoor commercial/industrial workers
- Construction workers
- Utility workers
- Nearby residents

The SSLs for each of these receptors, as shown in Tables 1-6 and 1-7, serve as a basis for evaluating existing data and additional analytical data obtained during the SRI.

With respect to the ROPCs listed in Table 1-7, updated SSLs were not derived in the *RI Update Memo* because background concentrations of these constituents at the FMC Plant Site already exceed EPA's default $1x10^{-6}$ target risk threshold (per Table K-6 of the *EMF HHRA*). The HHRA determined that excess lifetime cancer risks to future workers from background external gamma radiation exposure alone is 4.6×10^{-4}.

1.5.4.2 Total Gamma Comparative Value

Risk-based CVs were used during the SRI to inform field data collection activities. Previous investigations have shown that risks at the FMC Plant Site are primarily driven by radiological exposures. As discussed in EPA's OSWER Directive 9200.4-18 (*Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination* [EPA, 1997]), EPA generally sets site-specific remediation levels for carcinogens (including radionuclides) at a level that represents an excess upper-bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}. However, the OSWER Directive further notes that "the upper boundary of the risk range is not a discrete line at 1×10^{-4}…." and that "[a] specific risk estimate around 10^{-4} may be considered acceptable if justified based on-site-specific conditions." EPA stated in the OSWER Directive that a 15 millirems (mrem)/yr dose, with an equivalent risk of 3×10^{-4}, is at the upper end of remediation levels that have been selected at radioactively contaminated CERCLA sites.

For purposes of informing the field data collection activities, a 3×10^{-4} increased lifetime cancer risk (i.e., above background) was used as a guideline for characterizing the screening radiological CV in the SRI.

1.5.4.3 Radon Flux Comparative Value

The primary goal for the radon flux evaluations was to quantify the radon flux emission rates from several RUs to support development of remedial alternatives. The measured radon flux will be compared against the UMTRCA guideline of 20 pCi/m2/sec.

1.5.4.4 Representative Background Levels

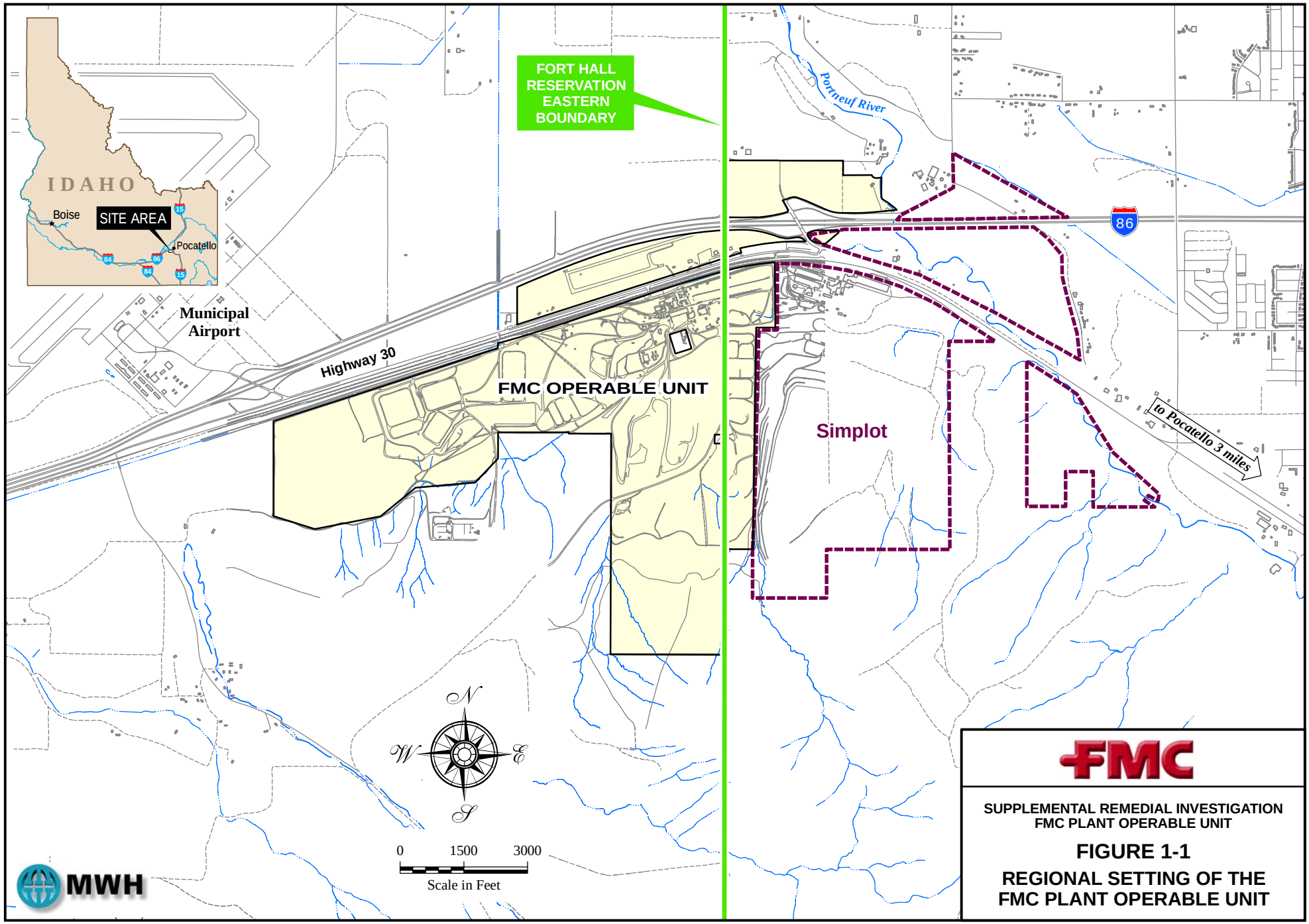
Soil constituent levels (i.e., representative levels) were developed by EPA, above which soil may be identified as potentially affected by EMF facilities operations. These levels were used for the data evaluations during the EMF RI.

As described in Section 4.2.1 of the *EMF RI Report*, the development of representative levels was complicated by several factors including the geologic history of the Pocatello area (e.g., diverse soil types) as well as the potential to have surface soils around the EMF Site enriched in constituents due to historic land use unrelated to the EMF facilities, such as irrigation, application of soil amendments during agricultural use, and vehicle exhaust, as well as through natural soil development processes. Some of these chemical constituents are the same as those associated with EMF facilities operations.

FMC and Simplot developed representative levels independent of EPA's development of the levels during the EMF RI. The Companies' levels and the approach used to develop the levels were presented in Section 4.1 of the EMF *PSCS*. Separate sets of representative levels were developed for surface and subsurface soils. Some of the Companies' levels were higher than those developed by EPA; others were lower. A comparison of the EPA and Company-developed levels is provided in Table 4.2.1-2 of the *EMF RI Report*.

Discussions between the Companies and the EPA on the use of the two data sets resulted in EPA rejecting the alternative values developed by the Companies. Although the Companies used EPA's levels in the *EMF RI Report* to assess potential EMF effects, the Companies reserved the right to reevaluate them should any difference between the Companies' levels and those set by EPA affect the scope of remedial action at the site. FMC similarly has used EPA's levels in the SRI data evaluations set forth in this report. The EPA levels are included with the metals, fluoride, and radionuclide SSLs in Table 1-7.

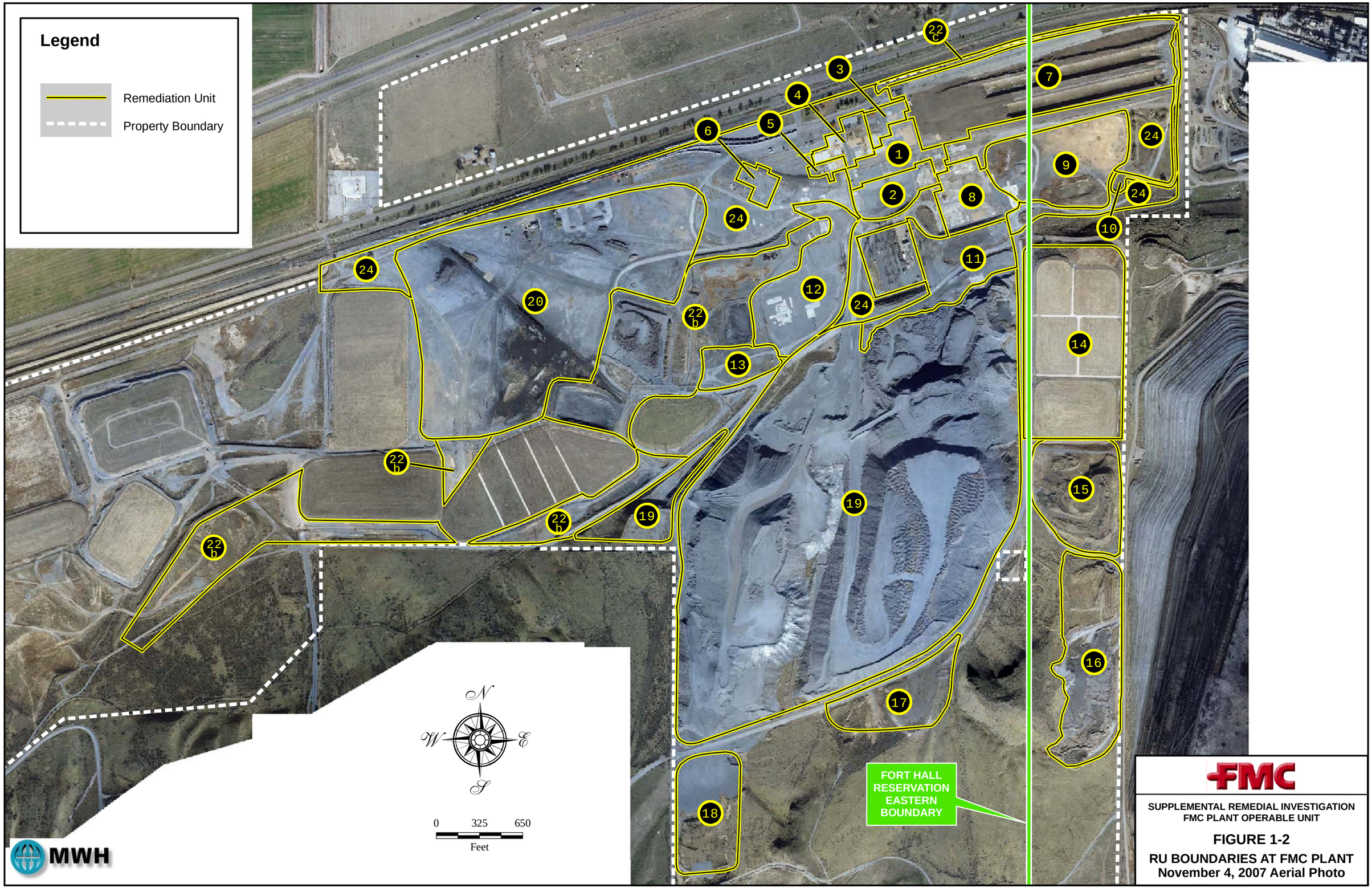
FILE *Fig 1-01 Regional Setting_508.mxd* *5/03/08*



SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 1-1

REGIONAL SETTING OF THE FMC PLANT OPERABLE UNIT



FILE Fig 1-02_RU Bndries at FMC Plant_208.mxd 4/14/08

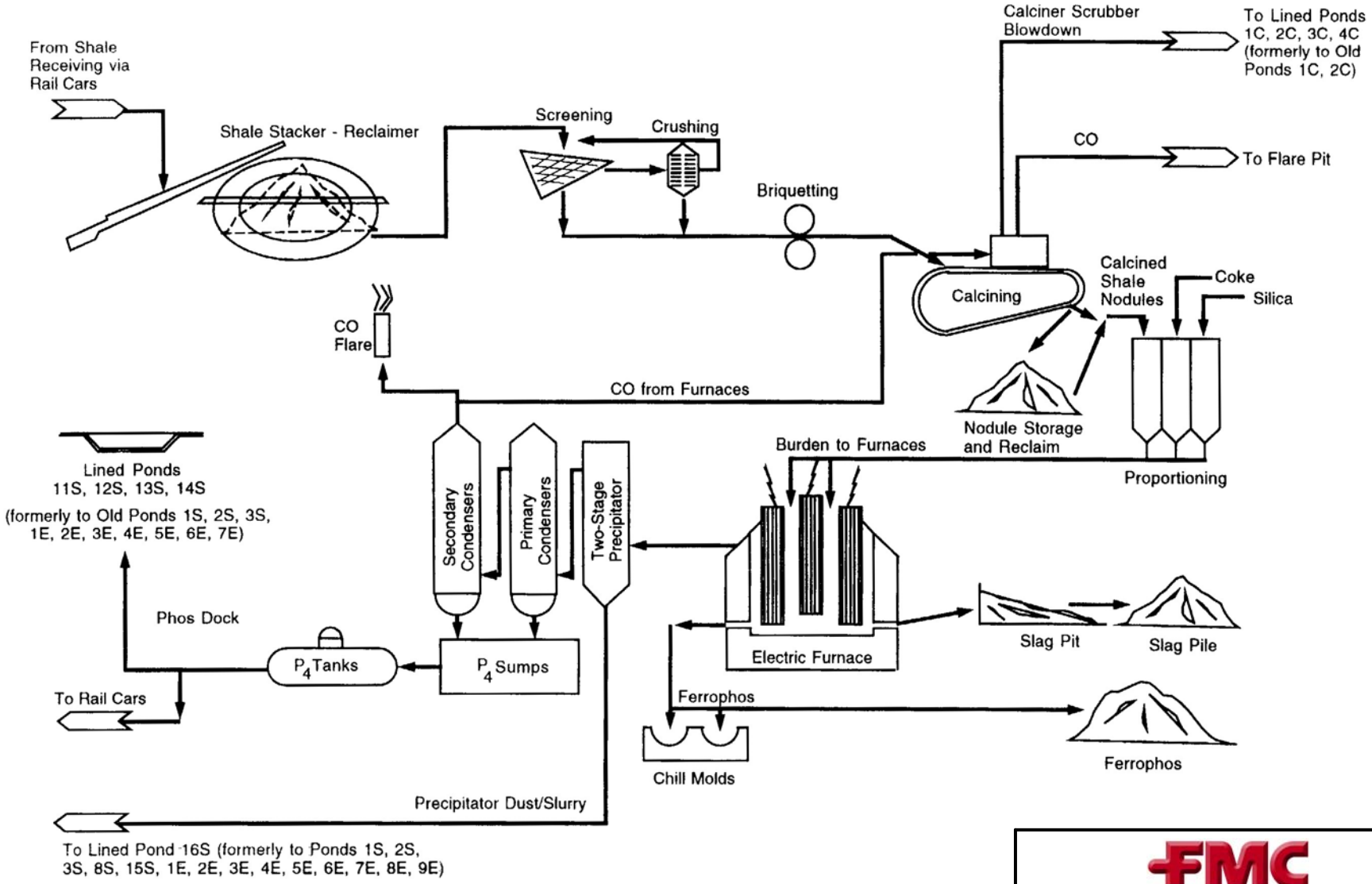
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 1-2

RU BOUNDARIES AT FMC PLANT
November 4, 2007 Aerial Photo

FILE *Fig 1-03 FMC Flow diagram.ai 5/1/08*



Note: "Old" ponds are those that are no longer operational.
Source: Taken from Figure 1.1-2 from EMF RI Report (BEI, 1996)

MWH

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 1-3

FMC PLANT PROCESS FLOW DIAGRAM

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 7)

Remediation Unit Number, Name, and Size	Description
RU 1: Furnace Building, Phos Dock and Secondary Condenser 4.1 acres	RU 1 encompasses the furnace building, secondary condenser, and Phos Dock. These were the primary P_4 production, storage, and handling areas within the facility. Four P_4 furnaces with condensers, sumps, scrubbers and ancillary equipment were in the furnace building. The Phos Dock was the storage and railcar loading facility and the secondary condenser was used to recover additional P_4 from the furnace off-gas. The following SWMUs were included in RU-1: • SWMU# 13 Andersen filter media (AFM) washing unit • SWMU# 41 (partial) Stacks and vents • SWMU# 54 Phos Dock area • SWMU# 36 & 55 Railcar loading and unloading areas; paved area north of furnace bldg. including Phos Dock • SWMU# 60 Secondary condenser/former fluid bed dryer area • SWMU# 68 Railroad spurs (portion within RU 1) • SWMU# 73 Satellite areas for spent AFM • SMWU# 74 East AFM bin area • SMWU# 75 Precipitator dust slurry pots • SWMU# 76 Medusa scrubber blowdown collection tank • SWMU# 77 Phos Dock, Andersen scrubber blowdown sump, & north solid tank • SWMU# 78 Washdown collection sumps - furnace building area • SWMU# 79 Northeast collection sump - furnace building area • SWMU# 80 Southeast collection sump - furnace building area • SWMU# 81 Furnace washdown collection tank (V-3600) • SWMU# 82 Facility-wide wastewater piping system (within RU 1) • SWMU# 86 V-3700 tank and associated piping • SWMU# 90 V-3800 tank and associated piping • SWMU# 91 NOSAP intercept tank (T-8010) • SWMU# 104 #3 P4 sump • SWMU# 38 Road segments within RU 1
RU 2: Slag Pit 3.7 acres	Pit on south side of furnace building for tapping slag from furnaces. Operated with standing water, then water spray to cool slag. In 1999/2000, FMC converted to slag ladling and slag was no longer in contact with bottom surface of pit. The following SWMUs are included in RU-2: • SWMU# 5 Slag pit wastewater collection sump (RCRA closure completed Oct. 2005 per EPA approved closure plan) • SWMU#102 Former slag pit (prior to slag ladling) • SWMU# 82 (partial) Facility-wide waste water piping system (within RU 2) • SWMU# 38 Road segments within RU 2

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
RU 3: Receiving Stores, Paint Shop and P_4 Decon 1.3 acres	Located in the northern part of the facility. It is a relatively flat-lying area, with several buildings and paved areas. It is north of the Phos Dock and furnace building and south of the Railroad Swale. RU 3 consists of storage buildings and shops. It was a P_4 decon area used to clean and decon equipment containing P_4. The following SWMUs are included in RU-3: • SWMU# 66 Boiler fuel tank and pipeline area • SWMU# 72 Former satellite storage area for waste paint solvents • SWMU# 92 P4 maintenance cleaning facility (decon building) • SWMU# 38 Road segments within RU 3
RU 4: Office Buildings and Training Center 2.5 acres	RU 4 is immediately to the west of RU 3 and north of RU 5. Several buildings are within RU 4 including the change house, administrative office buildings, and training center. It is relatively flat-lying with a gentle slope to the north. The following SWMUs are included in RU-4: • Boring FO28 area • SWMU# 99 Drum storage area at Training Center • SWMU# 68 Railroad spurs within RU 4 • SWMU# 38 Road segments within RU 4
RU 5: Lab and Old Drainfield 0.6 acres	Lab used for assays and product QC. Drainfield used to dispose fluids generated from analyses, now closed. The lab disposed various solutions and organic solvents in the seepage pit and in 1980 that practice was ceased. In 1995 the seepage pit was grouted. The following SWMUs are included in RU-5: • SWMU# 1 Drum storage unit (RCRA closure completed Apr. 2003 per EPA approved closure plan) • SWMU# 39 Chemical lab drain pit • SWMU# 70 Satellite storage area for spent laboratory solvents • SWMU# 68 Railroad spurs within RU 5 • SWMU# 38 Road segments within RU 5 • SWMU # 61 Laboratory chemical disposal area
RU 6: Former Long-Term Phos Storage Tanks 1.4 acres	Twelve steel phos storage tanks with railcar loading facility. The tanks were 104,000 gallons. Tanks were filled by transporting P_4 in Railcars from the Phos Dock, so there is no underground P_4 piping leading to RU 6. Tanks were removed in 1990's. The RU is located on a fairly level area of the FMC Plant, and it is bounded by roads to the south and east and a railroad spur line on the northeast. The following SWMUs are included in RU-6: • SWMU# 63 Long-term phosphorus storage tanks • SWMU# 68 Railroad spurs within RU 6 • SWMU# 101 Railcar loading overflow tank

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
RU 7: Shale Unload, Crushing and Stockpile 25.0 acres	RU 7 is located in the Northeast portion of the FMC OU, adjacent to the JR Simplot facility. Historic and air photos show this area has been used for ore handling since the plant began operation in 1949. Other materials handled within RU 7 include coke, which was unloaded from the railcars and placed on conveyors to the furnace building. Railcar dumper, ore handling equipment, crushing and sieving equipment, and ore stockpiles were present. The following SWMUs are included in RU-7: • SWMU# 37 Shale ore handling areas • SWMU# 105 Coke unloading building • SWMU# 68 Railroad spurs within RU 7 • SWMU# 38 Road segments within RU 7
RU 8: Former Kiln Scrubber Ponds and Calciners 6.7 acres	The calciners were built over the footprint of the former kiln scrubber ponds in the 1960's. The former kiln scrubber ponds operated from 1949 through the late 1960's and were dredged prior to back filling the ponds to grade in preparation for the construction of the calciners. The former kiln scrubber ponds were used to clarify kiln scrubber water before recirculation to scrubbers. The calciners were used to dry and harden ore briquettes before processing. The following SWMUs are included in RU-8: • SWMU# 12 Wastewater treatment unit • SWMU# 35 Three kiln scrubber ponds • SWMU# 67 Former flare pit for carbon monoxide • SWMU# 41 Stacks and vents (i.e., calciner system) • SWMU# 103 New horizontal flare pit • SWMU# 38 Road segments within RU 8
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond 12.9 acres	The silica stockpile area was expanded over the footprint of the kiln scrubber overflow pond in the 1960's. Overflow pond was used when there was excess water in the kiln scrubber ponds. After conversion to calciners, all kiln scrubber ponds were filled/covered with silica. The following SWMUs are included in RU-9: • SWMU# 51 Kiln (scrubber) overflow pond (under nodule fines pile) • SWMU# 106 Nodule pile • SWMU# 38 Road segments within RU 9
RU 10: IWW Pond and Ditch 1.3 acres	IWW pond received non-contact cooling water, and the ditch conveyed water to a pipe at the FMC/Simplot boundary. The ditch and basin were backfilled with surplus silica, and the pipe has been plugged and abandoned. The following SWMUs are included in RU-10: • SWMU# 49 Industrial wastewater basin • SWMU# 50 Industrial wastewater ditch

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
RU 11: Equipment Area South of Calciners 8.4 acres	RU 11 is located at the northern edge of the slag pile. It slopes to the north toward the calciners. It is a bare area, formerly used for equipment storage and staging. The following SWMUs are included in RU-11: • SWMU# 38 Road segments within RU 11
RU 12: Former RP&S Area and Mobile Shop 11.6 acres	RU 12 is located in the central portion of the FMC OU. A Mobile shop was used for heavy equipment maintenance and included parts washing/degreasing station, waste oil tank and underground fuel tanks. The former LDR facility, PCB Storage Shed (removed in 2000), and the Mobile Shop are the buildings located in RU 12. These SWMUs are included in RU-12. • SWMU# 57 Transformer salvage area • SWMU# 58 PCB storage shed • SWMU# 71 Satellite storage areas for waste degreasing solvents • SWMU# 64 (partial) Phossy waste pipeline cleanout areas and intervals • SWMU# 65 (partial) Precipitator slurry pipeline cleanout areas and intervals • SWMU# 82 (partial) Facility-wide wastewater piping system (within RU# 12) • SWMU# 83 High-pressure steam cleaning station • SWMU# 84 Used oil collection tank • SWMU# 38 Road segments within RU 12
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area 3.6 acres	RU 13 is located in the south-central portion of the facility and immediately south-west of RU 12, and is adjacent to several old ponds. This area contained the former process facility for recovering P_4 from phossy pond sediments (closed and dismantled under a RCRA Closure Plan). The metal scrap preparation area was used to prepare scrap metal prior to shipment to off-site recycling. The following SWMUs are included in RU-13: • SWMU# 4 Former 8S recovery process (RCRA closure in 1993 closure plan) • SWMU# 64 Phossy waste pipeline cleanout areas and intervals • SWMU# 65 Precipitator slurry pipeline cleanout areas and intervals • SWMU# 82 (partial) Facility-wide Wastewater Piping System within RU# 13 • SWMU# 38 Road segments within RU 13 • SWMU# 107 Portable storage tanker for dielectric fluid
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area 11.7 acres	RU 15 is located south of the calciner ponds in the Bannock Range area. It is south of the main plant area, and east of the slag pile, near the FMC property boundary with Simplot. Area to the south of the former calciner ponds used to store oversize ore (periodically reclaimed), baghouse dust for ore-handling facilities, and used electrodes (the majority have now been sold). The following SWMUs are included in RU-15: • SWMU# 69 Oversize ore (bullrock), broken and used electrode, baghouse dust storage and recycling, and used conveyor belt area • SWMU# 38 Road segments within RU 15

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
RU 16: Calciner Solids Stockpile 15.1 acres	Area south of the calciner ponds (RU 15) where FMC placed solids from the calciner ponds as these ponds filled with scrubber water solids. As the material in the calciner scrubber water settled out and accumulated in the ponds, it was removed from the ponds and stockpiled within the boundaries of RU 16. The following SWMUs are included in RU-16: • SWMU# 16 Calciner solids pile • SWMU# 17 Calciner pond sediment areas south of calciner ponds [SWMU 17= "Storage Area B"] • SWMU# 38 Road segments within RU 16
RU 17: Recyclable Material Landfill 8.1 acres	Area to the south of the slag pile used for disposal of non-salvageable construction materials. Wastes may include scrapped building materials (concrete, steel and wood) and furnace dig-out material. The following SWMUs are included in RU-17: • SWMU# 89 Roadway landfill (also referred to as Construction Debris/Recycle Landfill) • SWMU# 38 Road segments within RU 17
RU 18: Plant Landfill 9.4 acres	Southernmost remediation unit. Used by FMC for disposal of office waste, etc. Wastes may include scrapped building materials, filter media, asbestos insulation, furnace dig-out material, and minor amounts of spent solvents and oily residuals. The following SWMUs are included in RU-18: • SWMU# 45 Landfill (also referred to as solid waste landfill) • SWMU# 38 Road segments within RU 18
RU 19: Slag Pile, Bull Rock Pile 151.5 acres	Largest RU within the FMC Plant OU. The vast majority of the volume is slag. The bull rock pile is distinct from the slag pile and consists of reject oversized ore. The former plant landfill and buried railcars are included within this RU. Wastes in the old landfill may have included scrapped building materials, filter media, asbestos insulation, furnace dig-out material, and minor amounts of spent solvents and oily residuals. The following SWMUs are included in RU-19: • SWMU# 42 Slag pile • SWMU# 44 Landfill (old) • SWMU# 38 Segment of FMC surface road network
RU 20: Former Bannock Paving Area 61.6 acres	Large, relatively flat-lying RU that was leased by Bannock Paving Company (BAPCO) for asphalt production, slag crushing and sales of slag, coke receiving and drying, and ferrophos crushing and loading. BAPCO began operations at RU 20 in 1969 and vacated the leased area in 1996. The following SWMUs are included in RU-20: • SWMU# 46 Railcar loading and unloading area-BAPCO • SWMU# 47 BAPCO Areas • SWMU# 47 (incl. in # 47) Coke settling pond (former BAPCO Unit)

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
	• SWMU# 48 Surface roads within RU 20 • SWMU# 68 Railroad spurs within RU 20
RU 21: Other Onsite Railspurs NA	Several thousand feet of rail spurs served the FMC plant. The rail spurs are generally located near the northern plant boundary, and were used to deliver coke, ore, and heavy equipment. FMC used the rail spurs to load and transport P4 product. These are rail spurs that are not included within the boundaries of other RUs. Some were built with a slag base. The following SWMUs are included in RU-21: • SWMU# 68 Railroad spurs
RU 22b: Old Ponds 37.7 acres	Old ponds that were used to receive phossy water from the furnace building that ceased operation before RCRA permit requirements became effective. The location and extent of each pond is well-documented by plant data and historic air photos. All old ponds have had hydraulic head removed. The following SWMUs are included in RU-22b: • SWMU# 6 Area 9S • SWMU# 19 Pond 1E • SWMU# 20 Pond 2E • SWMU# 21 Pond 3E • SWMU# 22 Pond 4E • SWMU# 23 Pond 5E • SWMU# 24 Pond 6E • SWMU# 25 Pond 0S • SWMU# 26 Pond 00S • SWMU# 27 Pond 1S • SWMU# 28 Pond 2S • SWMU# 29 Pond 3S • SWMU# 30 Pond 4S • SWMU# 31 Pond 5S • SWMU# 32 Pond 6S • SWMU# 33 Pond 7S • SWMU# 34 Pond 10S (Including precipitator dust pile atop Pond 10S) • SWMU# 43 Ferrophos storage areas • SWMU# 52 Pond 7E • SWMU# 53 Old Pond 7S Tree-Line Area • SWMU# 56 Drum storage area for other nonhazardous wastes [see SWMU 59] • SWMU# 59 Waste oil storage area • SWMU# 62 Area west of mobile shop

TABLE 1-1

REMEDIATION UNITS AND DESCRIPTIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Remediation Unit Number, Name, and Size	Description
	• SWMU# 64 (partial) Phossy waste pipeline cleanout areas and intervals • SWMU# 65 (partial) Precipitator slurry pipeline • SWMU# 82 Facility-wide wastewater piping system within RU 22b
RU 22c: Railroad Swale 2.4 acres	Low-lying, narrow swale adjacent to the railroad track north of the phos dock area. It received releases of phossy water from spills within the RU 1 area. It was partially lined in 1993. The following SWMUs are included in RU-22c: • SWMU# 18 Railroad swale
RU 23: Road Segments not within RU Boundaries 23.0 acres	This RU accounts for road segments that are not included within the boundaries of other RUs. Many plant roads were built with slag base to handle the heavy equipment (slag haulers, etc.). Many of these roads were paved during the 1990's to reduce fugitive dust emissions. The following SWMUs are included in RU-23: • SWMU# 38 Surface roads
RU 24: Plant Areas not within RU Boundaries 52.5 acres	This RU includes disturbed areas of the plant site that are not associated with other RUs or SWMUs. This RU does not include areas of the plant site that were not disturbed or that contain only non-impacted native soils (e.g., the southern and western undeveloped areas). • SWMU# 38 Road segments within RU 24 • SWMU# 64 (partial) Phossy waste pipeline cleanout areas and intervals • SWMU# 65 (partial) Precipitator slurry pipeline cleanout areas and intervals • SWMU# 82 (partial) Facility-wide wastewater piping system within RU 24

TABLE 1-2A

DESCRIPTION OF RCRA-CLOSED PONDS
SUPPLEMENTAL REMEDIAL INVESTIGATION[1]
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Pond Number	Description of Wastes Received	Date Put Into Service	Pond Size (acres)	Date Last Received Waste	Post-Closure Status
8E	Precipitator slurry, phossy water and phossy solids	1984	4.1	1997	Post-closure monitoring
9E	Precipitator slurry	1986	12.9	1994	Post-closure monitoring
8S	Phossy water and phossy solids	1970	3.2	1981	Post-closure monitoring
11S	Phossy water and phossy solids	1980	1.9	1993	Post-closure monitoring
12S	Phossy water and phossy solids	1980	2.2	1993	Post-closure monitoring
13S	Phossy water and phossy solids	1980	2.2	1993	Post-closure monitoring
14S	Phossy water and phossy solids	1980	2.6	1993	Post-closure monitoring
15S	Phossy water and phossy solids	1982	9.4	1993	Post-closure monitoring
16S	NOSAP Precipitator slurry, phossy water and phossy solids[2]	1993	10.2	1999	Post-closure monitoring and gas extraction and treatment
17	NOSAP Slurry [2]	1998	9	2001	Post-closure monitoring
18A	Phossy water and precipitator slurry	1998	3.8	2001	Post-closure monitoring
18B	Clarified overflow from Pond 18A	1998	12.4	2001	Clean closed

[1] Other Pre-RCRA, unlined ponds are grouped as RU 22b
[2] Non-hazardous slurry assurance project (NOSAP) slurry consisted of treated precipitator slurry

TABLE 1-2B

DESCRIPTION OF CLOSED CALCINER PONDS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Pond Number	Description of Wastes Received	Date of Construction	Pond Size (acres)	Date Last Received Waste	Post-Closure Status
1C	Treated calciner scrubber blowdown	1986	2.5	2001	Post-closure monitoring
2C	Treated calciner scrubber blowdown	1986	2.2	2001	Post-closure monitoring
3C	Treated calciner scrubber blowdown	1988	2.8	2001	Post-closure monitoring
4C	Treated calciner scrubber blowdown	1988	2.8	2001	Post-closure monitoring
5C	Calciner scrubber solids	1993	5.7	2001	Post-closure monitoring

TABLE 1-3

RADIONUCLIDE ACTIVITIES IN BACKGROUND NATIVE SOILS AND POTENTIAL SOURCE MATERAILS AT THE FMC OU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Material	Sample	Data Source	Sample Type[a]	Sample ID	Units	Assoc. with Potassium			<- parents -- Uranium-238 Decay Series -- daughters ->															Thorium-232 Decay Series					
						Potassium-40			Uranium-238			Uranium-234			Thorium-230			Radium-226			Lead-210			Polonium-210			Thorium-232			Radium-228		
						actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual
Background Soil	Native subsurface soils [h]	Bechtel 1996			pCi/g	20.5			3.88												3.03			3.58								
Phosphate Ore	FMC Ore	Bechtel 1996	PSW	FOSFPO01	pCi/g	10.9	2.46		24.2	6.92											1.7	0	U									
	Phosphate Rock (ore) [c]	EPA 1977			pCi/g				22	3.2		22	2		22	4.1		26	19		27	12		22	3		0.43	0.12		0.89	0.28	
	Phosphate Rock (ore) sample #1[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				22.3	3.35		22	3.3		21.4	0.641		24.3	0.243		27.7	0.9		21.5	3.2		0.483	0.0676		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				22	5.5		21	5.2		23	1.1		26	0.93		2.7	0.69		24	2.4		0.3	0.11		0.78	0.76	
	Phosphate Rock (ore) sample #2[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				21.0	3.05		20.6	2.99		24.1	0.723		24.0	0.24		31.8	1.9		22.8	3.3		0.516	0.0722		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				20	2.2		22	2.4		24	1.00		27	0.94		6.4	0.83		22	1.3		0.37	0.13		0.74	0.66	
	Phosphate Rock (ore) sample #3[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				22.2	3.11		21.4	2.99		22.2	0.666		21.3	0.213		29.4	1.5		25.2	3.7		0.439	0.0636		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				23	2.3		23	2.3		19	0.96		14	0.68		4.7	0.76		21	1.7		0.49	0.16		0.98	0.68	
	Phosphate Rock (ore) sample #4[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				21.8	3.15		21.7	3.15		22.8	0.648		19.4	0.194		27.7	1		19.4	1.5		0.441	0.0639		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				26	4.7		22	4.7		23	0.99		30	1		5.8	0.8		22	1.7		0.42	0.14		0.67	0.65	
	Phosphate Rock (ore) sample #5[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				21.9	3.07		21.8	3.05		22.1	0.662		21.1	0.211		15.4	1.3		21.5	1.5		0.454	0.0635		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				24	4.0		24	3.9		23	1.0		29	0.98		6.5	0.82		23	1.6		0.46	0.15		<0.65		U
	Phosphate Rock (ore) sample #6[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				20.5	2.97		20.7	3.00		22.0	0.66		20.8	0.208		31.9	1.8		22.4	0.9		0.479	0.0646		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				22	3.2		21	3.0		17	0.87		53	1.3		7.2	1		21	2.4		0.36	0.13		<0.81		U
Nodules (Calcined Briquettes)	Calcined Rock (aka nodules) [c]	EPA 1977			pCi/g				24	1.8		23	2.2		23	2		25	8.6		18	8.6		<2.65		U	0.47	0.1		0.97	0.48	
	Calcined Briquettes (aka nodules) sample #1[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				23.5	3.53		23.8	3.56		21.6	0.648		24.2	0.242		19.1	0.3		ND		U	0.479	0.0574		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				24	2.0		22	2.0		23	1.00		28	0.97		8.1	0.9		9.2	1.1		0.5	0.15		1.3	0.84	
	Calcined Briquettes (aka nodules) sample #2[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				23.0	3.22		22.3	3.12		23.0	0.689		21.8	0.218		20.5	0.3		ND		U	0.404	0.8606		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				22	1.8		22	1.7		23	0.98		20	0.82		6.5	0.85		8.5	0.88		0.52	0.15		<0.73		U
	Calcined Briquettes (aka nodules) sample #3[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				22.3	3.23		21.9	3.18		22.7	0.68		22.4	0.224		25.1	0.6		ND		U	0.575	0.0719		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				24	1.9		22	2.0		23	1.0		31	1.0		8.7	0.93		11	1.2		0.44	0.14		1.5	0.83	
	Calcined Briquettes (aka nodules) sample #4[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				23.6	3.3		23.2	3.25		23.8	0.713		20.3	0.203		17.4	0.6		ND		U	0.410	0.0636		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				23	1.6		23	1.5		23	0.95		25	0.91		5.2	0.77		9.3	0.86		0.49	0.14		<0.74		U
	Calcined Briquettes (aka nodules) sample #5[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				23.7	3.32		23.1	3.23		21.4	0.641		20.7	0.207		12.8	1.3		<2.65		U	0.465	0.0674		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				25	2.4		26	2.5		24	1.0		29	0.98		5	0.77		11	1.1		0.42	0.14		<0.78		U
	Calcined Briquettes (aka nodules) sample #6[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				23.9	3.7		23.0	3.56		20.9	0.627		21.6	0.216		15.2	1.5		ND		U	0.522	0.0705		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				25	2.5		23	2.3		24	1.0		32	1.0		9.7	0.94		9.0	0.89		0.42	0.13		<0.63		U
Silica	Silica [c]	EPA 1977			pCi/g				1.5	1.4		<0.86		U	1.6	0.53		1.7	0.24		0.67	0.55		2.6	0.9		0.69	0.37		<0.89		U
Coke	Coke [c]	EPA 1977			pCi/g				<0.51		U	<0.44		U	<0.23		U	0.78	0.17		2.4	0.62		<1.3		U	<0.69		U	<0.95		U
	Coke Supplement [c]	EPA 1977			pCi/g				<0.59		U	<0.95		U	<0.20		U	0.7	0.16		0.61	0.54		0.98	0.11		<0.22		U	<0.91		U
	Coke Settling Sediment Pond	Bechtel 1996	PSW	FWSCSP01	pCi/g	0.926	0.48	UJ	3.11	0	U										6.64	0	U									
Ferrophos	Ferrophosphorus [c]	EPA 1977			pCi/g				19	4.9		21	5.2		0.42	0.27		0.27	0.11		1.1	0.58		<0.57		U	0.26	0.2		0.99	0.94	
	Ferrophos	Bechtel 1996	PSW	FWSFSA01	pCi/g	2.3	0.77		4.68	1.85	UJ										1.26	0	U									
	Ferrophos	Bechtel 1996	PSW	FWSFSA02	pCi/g	0.794	0.33	UJ	9.69	1.9											1.34	0	U									
	Ferrophos	Bechtel 1996	PSW	FWSFSA03	pCi/g	2.04	0.71		12.3	2.68											1.39	0	U									
Slag	Slag [c]	EPA 1977			pCi/g				25	7		25	6.7		26	11		32	13		11	7.9		<16		U	0.59	0.29		0.96	0.46	
	Slag sample #1[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				29.4	4.41		28.4	4.25		25.5	0.764		22.8	0.228		11.6	1.0		8.27	2.86		0.648	0.081		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				25	4.2		27	4.4		29	1.4		37	1.1		2.3	0.67		8.3	1.3		0.52	0.19		<0.80		U
	Slag sample #2[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				22.2	3.1		21.2	2.96		25.8	0.774		23.2	0.232		11.1	1.7		ND		U	0.632	0.0789		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				26	2.4		27	2.4		11	0.40		40	1.2		0.86	0.61		2.4	0.50		0.20	0.055		<0.76		U
	Slag sample #3[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				21.6	2.92		21.6	2.91		26.3	0.789		24.8	0.248		6.6	0.6		23.7	5.85		0.533	0.0693		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				29	2.6		27	2.5		28	1.1		36	1.1		2.1	0.68		11	1.1		0.47	0.15		1.6	0.86	
	Slag sample #4[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				27.7	3.88		27.2	3.81		26.6	0.797		32.5	0.325		7.8	0.7	.	ND		U	0.672	0.084		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				25	2.3		29	2.4		23	0.95		37	1.1		0.69	0.62		3.3	0.45		0.66	0.16		<0.76		U
	Slag sample #5[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				18.6	2.32		19.7	2.46		28.1	0.843		32.3	0.323					ND		U	0.627	0.0783		<1.0		U

TABLE 1-3

RADIONUCLIDE ACTIVITIES IN BACKGROUND NATIVE SOILS AND POTENTIAL SOURCE MATERAILS AT THE FMC OU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Material	Sample	Data Source	Sample Type[a]	Sample ID	Units	Assoc. with Potassium			<- parents -- Uranium-238 Decay Series -- daughters ->																		Thorium-232 Decay Series					
						Potassium-40			Uranium-238			Uranium-234			Thorium-230			Radium-226			Lead-210			Polonium-210			Thorium-232			Radium-228		
						actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual	actual value	uncertainty	qual
Slag (continued)	EMSL Laboratory results	EPA 1977			pCi/g				24	3.3		24	3.3		33	1.5		37	1.1		1.4	0.66		11	0.95		0.73	0.22		<0.80		U
	Slag sample #6[g]	EPA 1977																														
	EERF Laboratory results	EPA 1977			pCi/g				20.3	2.64		20.4	2.65		27.3	0.819		33.3	0.333		16.7	2.8		ND		U	0.683	0.0854		<1.0		U
	EMSL Laboratory results	EPA 1977			pCi/g				28	2.0		27	2.0		31	1.2		23	0.87		4.2	0.82		8.0	0.72		0.70	0.18		<0.76		U
	FMC Slag	Bechtel 1996	PSW	FWSSSA01	pCi/g	8.48	2.09		24.4	7.22											4.66	0	U									
	FMC Slag	Bechtel 1996	PSW	FWSSSA02	pCi/g	7.38	2.18		28.1	7.14											4.55	0	U									
	FMC Slag	Bechtel 1996	PSW	FWSSSA03	pCi/g	8.09	1.85		26.3	7.52											4.52	0	U									
	FMC Slag	Bechtel 1996	PSW	FWSSSA04	pCi/g	9.22	1.91		22.1	6.34											3.7	0	U									
	FMC Slag	Bechtel 1996	PSW	FWSSSA05	pCi/g	10.9	2.16		30.7	8.90											4.35	0	U									
	FMC Slag	Bechtel 1996	PSW	FWSSSA06	pCi/g	9.05	2.61		26.5	8.34											4.58	0	U									
Calciner Pond Wastes	Calciner Pond 2C - Liquid	Bechtel 1996	PSL	CALPOND2	pCi/L													0.62	0.16	U									-0.5	0.40	U
	Calciner Pond 2C - Liquid (3/12/03 sample)	Hazen 2003	PSL	C351/03-1	pCi/L	44,400[f]			<1[b]						0	0.6	U	0.9	1		8.4	4.2		18	4		0	0.6		1	1.7	U
	Water Discharged to Calciner Ponds - time composite	Bechtel 1996	PSL	FSWCPW01	pCi/L													0.34	0.11	UJ									-0.4	0.70	U
	Sediment in Calciner Ponds	Bechtel 1996	PSW	FSDCPW01	pCi/g	70.4	8.34		17.5	7.96											1.7	0	U									
Precipitator Slurry/Phossy Wastes	Precipitator Slurry Discharged to Pond 8E - time composite	Bechtel 1996	PSL	FSWPS88E	pCi/L													103	4.48										-2.7	1.00	U
	Precipitator Slurry Discharged to Phase IV Ponds - time composite	Bechtel 1996	PSL	FSWPWSIV	pCi/L													1.9	0.56	J									-2.4	1.10	U
	Fluid Bed Dryer Prills (dried precipitator dust)[c]	EPA 1977			pCi/g				<71		U	<91		U	<24		U	13	0.65		52	1.8		440	27		<17		U	1.9	1	
	Sediments from Pond 11S	Bechtel 1996	PSW	FWSP1101	pCi/g	25.9	3.16		4.46	0	U										352	89.4										
	Sediments from Pond 12S	Bechtel 1996	PSW	FWSP1201	pCi/g	27.4	3.5		4.98	0	U										465	117										
	Sediments from Pond 15S	Bechtel 1996	PSW	FWSP5S01	pCi/g	22	3.32		3.93	4.14	UJ										204	53.8										
	Sediments from Pond 8S	Bechtel 1996	PSW	FWSP8S01	pCi/g	13.1	2.28		0.694	3.28	UJ										230	60.4										
	Sediments from Pond 9E	Bechtel 1996	PSW	FWSP9E01	pCi/g	50.7	5.78		8.36	5.32											0.782	0	U									
	Phossy Waste (V-3600/V-3700/V-3800 composite)	Astaris 2001	PSW	G-0620 115-1	pCi/g	163[f]			<3[e]						2.2	0.9		10	2		1,240	17		510	8		0.3	0.4		0	1.5	U
	Phossy Waste (V-3600/V-3700/V-3800 composite)	Astaris 2001	PSW	G-0620 115-2	pCi/g	176f			<3[e]						1.5	0.7		10	2		1,240	17		540	8		0	0.2	U	0.6	1.5	U
	Phossy Waste (V-3600/V-3700/V-3800 composite)	Astaris 2001	PSW	G-0620 118-1	pCi/g	157f			<1[e]						13	5		7.5	1.7		1,340	40		750	20		0	1.2	U	0.3	1.2	U
	Phossy Waste (V-3600/V-3700/V-3800 composite)	Astaris 2001	PSW	G-0620 118-2	pCi/g	157f			<19[e]						3.4	2.6		11	2		1,370	40		720	20		0.4	1.4	U	0	1.2	U
IWW System	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWA	pCi/L													0.89	0.15	U									-0.30	0.80	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWD	pCi/L													0.31	0.10	U									-2.90	0.30	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWE	pCi/L													0.46	0.10	U									-1.50	0.60	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWF	pCi/L													0.79	0.13	U									-0.30	0.40	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWG	pCi/L													0.18	0.08	U									6.50	0.80	
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWH	pCi/L													0.63	0.12	U									-1.10	0.40	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWN	pCi/L													0.00	0.1	U									0.00	0.30	U
	IWW Ditch Discharge (July 1993)	Bechtel 1996	PSL	O307IWP	pCi/L													0.18	0.08	U									-0.70	0.30	U
	IWW Ditch Discharge (Sept. 1992) - time composite	Bechtel 1996	PSL	FSWIWW01	pCi/L													0.72	0.17	UJ									-0.2	0.60	U
	IWW Ditch Sediments	Bechtel 1996	PSW	FSDIWW01	pCi/g																											
	IWW Ditch Sediments	Bechtel 1996	PSW	FSDIWW02	pCi/g																											
	IWW Ditch Sediments	Bechtel 1996	PSW	FSDIWW03	pCi/g																											
	IWW Ditch Sediments	Bechtel 1996	PSW	FSDIWW04	pCi/g																											
	IWW Ditch Sediments	Bechtel 1996	PSW	FSDIWW05	pCi/g																											
	IWW Ditch Sediments (composite)	Bechtel 1996	PSW	FSDIWW06	pCi/g																											
Railroad Swale	Water in Railroad Swale - location composite	Bechtel 1996	PSL	FWWRRS01	pCi/L													1.59	0.23										-0.3	0.50	U
	Sediment in Railroad Swale	Bechtel 1996	PSW	FSDRRS01	pCi/g																											

Notes:

Blank result cells - radionuclide not analyzed

J = Estimated value.

U = Not detected.

Table reproduced from Table F-1 of RI Update Memo (BEI, 2004b) and Appendix B, Table B-1 from SRI Work Plan (MWH, 2007)

[a] Station location code used in EMF Site remedial investigation

[b] Uranium as U (pCi/g) calculated from total uranium; U-238 not reported, but is < U (pCi/g)

[c] As stated in EPA report Table 3, data are average results from both EMSL and EERF laboratories except for lead-210 and polonium-210 (corrected) which are average of EERF values only from Appendix C, Tables C-1, C-2 and C-3 of EPA report.

[e] Uranium as U (pCi/g) calculated from total uranium; U-238 not reported, but is < U (pCi/g)

[f] K-40 calculated from total potassium assuming natural abundance of K-40 is 0.0118%

[g] EPA collected 6 samples of phosphate ore, 6 samples of calcined briquettes, and 6 samples of slag in December 1976 from the FMC facility. These samples were split. One set was analyzed at EPA's EMSL laboratory and the other set was analyzed at EPA's EERF laboratory. Table C-1 provides analytical results for phosphate ore samples, Table C-2 provides results of calcined briquettes (also called nodules at the FMC facility), and Table C-3 provides results for slag samples. EPA noted that the EMSL results for lead-210 were found to be in error by up to a factor of 5 too low.

[h] Data are 95th percentile representative background levels developed by EPA and reported in Table 4.2.1-1 of the RI Report (Bechtel, 1996).

Astaris 2001:Pre-Start Up LDR Radionuclides Study

Bechtel 1996: EMF Site Remedial Investigation Report

EPA 1977: Radiological Surveys of Idaho Phosphate Ore Processing -- The Thermal Process Plant

Hazen 2003: Report of Analysis for Sample Calciner 2-C 03/12/2003

TABLE 1-4

CONCENTRATIONS OF INORGANIC PARAMETERS IN FMC FEEDSTOCK, BYPRODUCT, AND WASTE SAMPLES
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Parameter	Phosphate Ore	Calciner Pond Sediment	Coke-Settling Pond Waste	Ferrophos Composite		Ferrophos Composite	Pond 11S Waste	Pond 12S Waste	Pond 15S Waste	Pond 8S Waste Sediment	Pond 9E Waste Sediment	Slag					
	FOSFPO01	FSDCPW01	FWSCSP01	FWSFSA01	FWSFSA02	FWSFSA03	FWSP1101	FWSP1201	FWSP5S01	FWSP8S01	FWSP9E01	FWSSSA01	FWSSSA02	FWSSSA03	FWSSSA04	FWSSSA05	FWSSSA06
Aluminum	12400	11400	718	1650	1430	2330	4030	3940	2600	1350	4620	23600	25800	26900	24400	25700	24500
Antimony	16.8 UJ	59.2 J	13.9 U	61.4 J	42.3 J	28.5 J	37.2 J	47 J	54.4 J	189 J	54.6 J	14.9 UJ	14.5 UJ	14.2 UJ	14.6 UJ	14.1 UJ	14 UJ
Arsenic	14.6 J	6.7 UJ	0.49 UJ	0.52 UJ	1.8 UJ	3.7 UJ	36.1 J	20.4 J	90.9 J	256 J	17.1 J	0.51 UJ	0.48 UJ	0.52 UJ	0.5 UJ	0.48 UJ	0.58 UJ
Barium	105	94.6	25.5	23.6	14.5	23.4	48.2	48.8	30.6	18.7	50.8	223	229	254	214	251	233
Beryllium	1.9	1.3	0.18 U	4.1	1.7	1.8	0.29	0.35	0.2 U	0.19 U	0.37	1.9	2.1	2	1.8	1.9	1.9
Boron	74.3	2640	11.7 J	4.8	7.6	6.1	55.9 J	79.6 J	34.9 J	30.4 J	136 J	97.8	67.5	88.9	68.6	88	83.9
Cadmium	77.8 J	426 J	2.6	0.98 UJ	0.99 UJ	2.8 UJ	2040	2030	1100	1360	2410	2.8 UJ	1.2 UJ	13 J	32.4 J	103 J	4.3 UJ
Calcium	232000	284000	3930	17000	16900	24300	27000	26500	21900	13200	33200	274000	283000	291000	255000	286000	290000
Chromium	822	531	8.2	6320	2550	2370	107	133	116	71.6	192	238	230	290	172	280	273
Cobalt	0.87 U	1.7 U	0.9	29.1	14.7	12.6	3.1	1.8	0.79 U	0.74 U	6.6	1.2 U	1.6 U	1.6 U	1.6 U	1.4	1.6
Copper	104	58.9	7.3 J	851	453	404	68 J	74.9 J	42.2 J	41.7 J	75.4 J	15.8	10.9	17.9	11.9	17.7	17
Fluoride	13200	191000	228	1790	1890	3370	17100	15900	8850	8600	16100	14400	17800	17300	12400	16500	16200
Iron	8910 J	5440 J	2570	84500 J	38500 J	32800 J	1520	1630	1360	877	1980	1150 J	772 J	1160 J	1970 J	1530 J	1410 J
Lead	12.1 UJ	30.9 UJ	5.7 J	6.1 U	6.1 U	6 U	332 J	386 J	185 J	201 J	338 J	6 U	5.8 U	5.7 U	5.9 U	5.7 U	5.6 U
Lithium	11.8 UJ	23.1 UJ	9.1 U	1.2 UJ	1.1 UJ	2.2 UJ	9.5 U	8.7 U	9.9 U	9.3 U	9 U	16.5 UJ	17.2 UJ	19.5 UJ	17.9 UJ	18.9 UJ	18 UJ
Magnesium	2000	4730	371	474	262	710	1280	1100	704	549	951	3200	3200	3580	5510	3610	3690
Manganese	122	91.8	49.6	307	264	190	80.8	49.4	53.2	37.9	52	114	127	169	205	168	126
Mercury	0.36 UJ	0.31 UJ	0.24	0.11 UJ	0.08 UJ	0.24 UJ	0.24	0.46	0.23	0.74	0.82	0.17 UJ	0.05 UJ	0.12 UJ	0.05 UJ	0.05 UJ	0.39 UJ
Molybdenum	15 U	32.5 U	3.6 U	151	93.2	90.6	7.1	6.7	4.5	3.7 U	6.6	2.5 U	2.5 U	2.4 U	2.5 U	2.4 U	2.4 U
Nickel	126	79	9.1 U	1150	727	535	16.2	16.4	17.6	16.2	26.5	8.8	3.8 U	8.8	6.5	11.9	7.9
Orthophosphate	3460	13200	15.9	37.5	13.7	31.1	7910	10100	10100	9710	4030	46.1	44.6	91.1	57.2	30.3	104
Total Phosphorus	65900	91000	306	1510	902	1070	28000	25100	24200	21300	33500	1900	1610	4580	3800	3930	5680 J
Potassium	3540	79800	192	549	410	663	20100	19100	11400	7910	31300	6780	7130	8160	7700	8220	7360
Selenium	6.1 J	3.8 UJ	1.4 U	2.6 UJ	0.24 UJ	1.1 UJ	49.6	16.5	13.3	10.8	45.3	4.5 J	4.6 J	2.8 UJ	4.3 J	6.9 J	4.9 J
Silver	5.1	25.1	0.72 U	47	27	26.7	199	198	106	116	218	2.6	2.3	4.8	4.9	3.7	4.3
Sodium	3400	20300	565 J	553	583	593	2750 J	2670 J	2070 J	1630 J	4580 J	4200	4110	3970	3730	4210	4180
Sulfate	NA	NA	764	NA	NA	NA	210	20 U	20 U	20 U	20	NA	NA	NA	NA	NA	NA
Thallium	26.2 R	50.35 R	0.1 UJ	23.6 R	23.8 R	23.1 R	26	9.4 J	16.63 J	22.9	39.4	23.2 R	22.6 R	22.2 R	22.8 R	22 R	21.8 R
Vanadium	996	607	7.1	6330	2610	2630	68.5	93.4	84.1	42.9	169	215	183	243	150	249	250
Zinc	991 J	6000 J	67.4	97.3 J	70.3 J	169 J	26600	20200	11400	10400	21400	52.5 J	36.4 J	194 J	450 J	136 J	85.5 J

Note:
Data from Table 4.2.3.1 of EMF RI Report (BEI, 1996)

TABLE 1-5

COPCS/ROPCS AND COCS/ROCS IN SOILS IDENTIFIED IN THE EMF ROD, FMC PLANT OU RI UPDATE MEMO, AND INVESTIGATED DURING THE SRI SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Parameter	EMF ROD	RI Update Memo	SRI
Antimony	X		X
Arsenic	X	X	X
Barium			X
Beryllium	X		X
Boron	X		X
Cadmium	X	X	X
Chromium			X
Cobalt			X
Copper			X
Coke PAHs and Metals			X[a]
Fluoride	X		X
Gross alpha	X[b]		b
Gross beta	X[b]		b
Lead			X
Lead-210	X	X[c]	X[c]
Liquid Petroleum Fuels[d]		X	X
Lithium			X
Manganese	X		X
Mercury	X		X
Molybdenum			X
Nickel	X		X
PCBs		X	X
Elemental Phosphorus (P4)		X	X
Polonium-210	X	X	X
Potassium-40	X		X
Radium-226	b	X	X
Radon	b, e		X
Selenium	X		X
Silver	X		X
Solvents[f]		X	X
Thallium	X		X

TABLE 1-5

COPCS/ROPCS AND COCS/ROCS IN SOILS IDENTIFIED IN THE EMF ROD, FMC PLANT OU RI UPDATE MEMO, AND INVESTIGATED DURING THE SRI SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Parameter	EMF ROD	RI Update Memo	SRI
Thorium-230	b		
Uranium			X
Uranium-238	X		X
Vanadium	X		X
Zinc	X		X

Notes:

[a]see Tables 1-6 and 1-8 for list of SRI coke PAHs and TCLP analytes

[b]individual radionuclides potentially responsible for elevated gross alpha and gross beta levels are also COPCs

[c]Lead-210 and Polonium-210 are known to occur in precipitator dust and phossy solids.

[d]RI Update Memo included benzene, toluene, ethylbenzene, and xylenes. See Table 1-6 for SRI liquid petroleum fuel constituents.

[e] retained as a COPCs mainly for evaluation of potential radon infiltration into buildings under alternate future commercial or industrial uses at the site.

[f]RI Update Memo included TCE, PCE, Chloroform, 2-Butanone, and 1,1,1 TCA. See Table 1-6 for SRI lab- and shop-related constituents.

TABLE 1-6

SOIL SCREEN LEVELS AND REPORTING LIMITS FOR ORGANICS IN SOIL
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Compound	Commercial/ Industrial Worker SSL[a] (mg/kg)	Construction Worker SSL[a] (mg/kg)	Utility Worker SSL[a] (mg/kg)	SSL Protective of Groundwater[a, b] (mg/kg)	Reporting Limit (mg/kg)
Organic Compounds for Liquid Petroleum Fuels					
Benzene	2	5	17	0.03	0.005
Ethylbenzene	390	390	400	13.0	0.005
Toluene	650	650	650	12.0	0.005
Xylenes, total	300	300	300	220	0.01
Acenapthene	37,000	260,000	1,000,000	570	0.01
Anthracene	180,000	1,000,000	1,000,000	12,000	0.01
Benzo(a)pyrene	0.2	4	34	8	0.01
Benzo(b)fluoranthene	2	41	340	5	0.01
Benzo(k)fluoranthene	23	410	3,400	49	0.01
Benzo(a)anthracene	2	41	340	2	0.01
Benzo(g,h,i)perylene	18,000	13,000	110,000	110,000	0.01
Chrysene	230	4,100	34,000	160	0.01
Fluorene	24,000	170,000	1,000,000	560	0.01
Fluoranthene	24,000	170,000	1,000,000	4,300	0.01
Napthalene	12,000	260,000	1,000,000	59	0.01
Phenanthrene	18,000	13,000	110,000	840	0.01
Pyrene	18,000	130,000	1,000,000	4,200	0.01
Organic Compounds for Laboratory-Related Solvents					
Benzene	2	5	17	0.03	0.005
Carbon disulfide	720	160	590	32	0.005
Chloroform	200	120	450	0.5	0.005
Methylene Chloride	22	72	260	0.02	0.005
Tetrachloroethylene (PCE)	1	6	21	0.06	0.005
Toluene	650	650	650	12.0	0.005
Trichloroethene (TCE)	0.1	0.4	1	0.06	0.005
1,1,1-trichloroethane (1,1,1-TCA)	1,200	1,200	1,200	2	0.005
2-butanone	26,000	14.000	27,000	91	0.005
Organic Compounds for Shop-Related Solvents					
Chloroform	200	120	450	0.5	0.005
Methylene Chloride	22	72	260	0.02	0.005
Tetrachloroethylene (PCE)	1	6	21	0.06	0.005
Trichloroethene (TCE)	0.1	0.4	1	0.06	0.005
1,1,1-trichloroethane (1,1,1-TCA)	1,200	1,200	1,200	2	0.005
2-butanone	26,000	14,000	27,000	91	0.005

TABLE 1-6

SOIL SCREEN LEVELS AND REPORTING LIMITS FOR ORGANICS IN SOIL
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Compound	Commercial/ Industrial Worker SSL[a] (mg/kg)	Construction Worker SSL[a] (mg/kg)	Utility Worker SSL[a] (mg/kg)	SSL Protective of Groundwater[a, b] (mg/kg)	Reporting Limit (mg/kg)
Polynuclear Aromatic Hydrocarbons for Coke					
Acenaphthene	37,000	260,000	1,000,000	570	0.01
Anthracene	180,000	1,000,000	1,000,000	12,000	0.01
Benzo(a)anthracene	2	41	340	2	0.01
Benzo(a)pyrene	0.2	4	34	8	0.01
Benzo(b)fluoranthene	2	41	340	5	0.01
Benzo(k)fluoranthene	23	410	3,400	49	0.01
Chrysene	230	4,100	34,000	160	0.01
Dibenzo(a,h)anthracene	0.2	4	34	2	0.01
Fluoranthene	24,000	170,000	1,000,000	4,300	0.01
Fluorene	24,000	170,000	1,000,000	560	0.01
Indeno(1,2,3-cd)pyrene	2	41	340	14	0.01
Naphthalene	12,000	260,000	1,000,000	59	0.01
Pyrene	18,000	130,000	1,000,000	4,200	0.01
Polychlorinated biphenyls					
Total monochlorinated biphenyls	24	420	3,400	0.9	0.0002
Total dichlorinated biphenyls	24	420	3,400	0.9	0.0005
Total trichlorinated biphenyls	24	420	3,400	0.9	0.001
Total tetrachlorinated biphenyls	24	420	3,400	0.9	0.002
Total pentachlorinated biphenyls	0.8	15	120	0.9	0.002
Total hexachlorinated biphenyls	0.8	15	120	0.9	0.002
Total heptachlorinated biphenyls	0.8	15	120	0.9	0.001
Total octachlorinated biphenyls	0.8	15	120	0.9	0.001
Total nonachlorinated biphenyls	0.8	15	120	0.9	0.0005
Decachlorinated biphenyl	0.8	15	120	0.9	0.0002

Notes:

[a] Soil screening levels (SSLs) developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* EPA (2002), supplemented with current toxicological data.

[b] The SSLs protective of groundwater incorporate a dilution-attenuation factor (DAF) of 20.

Acronyms/Abbreviations:

See List of Acronyms and Abbreviations for definitions

TABLE 1-7

SOIL SCREENING LEVELS AND REPORTING LIMITS FOR INORGANICS IN SOIL
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Parameter	Background* (mg/kg)	Commercial Industrial Worker SSL (mg/kg)	Construction Worker SSL (mg/kg)	Utility Worker SSL (mg/kg)	SSL Protective of Groundwater[c] (mg/kg)	Reporting Limit (mg/kg)
Antimony	2.2	454	104	1,360	5	0.2
Arsenic	7.7	7.7[a]	14.6	173	7.7[d]	0.8
Barium	188	61,700	8,360	109,000	1,600	20
Beryllium	1	645	61.0	792	63	0.1
Boron	12.8	223,000	5,210	67,800	450	1
Cadmium	1.9	860	81.3	1,060	8	0.2
Chromium	27.5	1,000,000[b]	551,000	1,000,000[b]	38	3
Cobalt	7.6	553	52.2	679	630	0.8
Copper	12.6	42,000	22,000	286,000	9,400	1
Fluoride	600	68,100	33,000	430,000	12,000	60
Lead	29.1	800[e]	800[e]	800[e]	800[e]	3
Lead-210	3.03 pCi/g	3.03 pCi/g[a]	7.44 pCi/g	96.7 pCi/g	3.03 pCi/g[d]	0.2 pCi/g
Lithium	16.1	22,700	11,900	155,000	4,200	2
Manganese	482	23,500	77,100	1,000,000	482[d]	50
Mercury	0.16	340	464	6,030	2	0.02
Molybdenum	2.15	5,670	2,750	35,800	81	0.2
Nickel	15.5	6,450	404	5,250	130	2
Phosphorus	NA	22.7	117	1,000	NA	0.5
Polonium-210	3.58 pCi/g	269 pCi/g	43.3 pCi/g	563 pCi/g	3.58 pCi/g[f]	0.2 pCi/g
Potassium-40	20.5 pCi/g	20.5 pCi/g[a]	20.5 pCi/g[a]	136 pCi/g	20.5 pCi/g[f]	2 pCi/g
Radium-226	3.88 pCi/g	3.88 pCi/g[a]	3.88 pCi/g[a]	12.3 pCi/g	3.88 pCi/g[d]	0.2 pCi/g
Selenium	1.36	5,670	2,750	35,800	5	0.1
Silver	1.9	5,670	2,750	35,800	34	0.2
Thallium	0.27	77.2	374	4,870	.7	0.03
Uranium	NA	3,400	491	6,390	900	1
Uranium-238	3.88 pCi/g	3.88 pCi/g[a]	20.6 pCi/g	267 pCi/g	3.88 pCi/g[d]	0.2 pCi/g
Vanadium	45.4	7,950	3,500	45,500	6,000	5
Zinc	52.8	340,000	165,000	1,000,000[b]	12,000	5

Note:
[*] background from EMF ROD (EPA/541/R-98/034), Table 11
[a] default to background since the Site Worker SSL is less than background
[b] default to 1E+06 since SSL is greater than 1E+06
[c] A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
[d] default to background since the SSL protective of groundwater is less than background
[e] SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
[f] Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 1-8

TOXICITY CHARACTERISTICS MAXIMUM CONCENTRATION LEVELS FOR METALS AND SEMI-VOLATILE ORGANIC COMPOUNDS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Parameter	Maximum Concentration Level (mg/L)	Reporting Limit (mg/L)
Arsenic	5	0.50
Barium	100.0	10.0
Cadmium	1.0	0.1
Chromium	5.0	0.50
Lead	5.0	0.50
Mercury	0.2	0..02
Selenium	1.0	0.1
Silver	5.0	0.5
o-cresol	200.0	20.0
m-cresol	200.0	20.0
p-cresol	200.0	20.0
cresol	200.0	20.0
1,4-Dichlorobenzene	7.5	0.075
2,4-Dinitrotoluene	0.13	0.013
Hexachlorobenzene	0.13	0.013
Hexachlorobutadiene	0.5	0.05
Hexachloroethane	3.0	0.30
Nitrobenzene	2.0	0.20
Pentachlorophenol	100.0	10.0
Pyridine	5.0	0.50
2,4,5-Trichlorophenol	400.0	40.0
2,4,6-Trichlorophenol	2.0	0.20

Section 2
REGIONAL AND FMC PLANT SITE PHYSICAL CHARACTERISTICS

2.1 INTRODUCTION

This section describes the regional physical characteristics and the physical characteristics of the FMC Plant Site, south of Highway 30, including geology, hydrogeology, surface water hydrology, area soils, climate, demography, land use and ecology. The physical characteristics described in this section are summaries of the observations made during this SRI, the *EMF RI*, and the *FS Report for the FMC Subarea*.

2.2 GEOLOGIC SETTING

2.2.1 Regional Geology

As described in Section 3.1.1 of the *EMF RI Report*, the FMC Plant Site and surrounding area are located at the juncture between the Basin and Range physiographic province to the south and the Snake River Plain to the north (Dohrenwend, 1987). The FMC Plant OU is located at the northern base of the Bannock Range where it merges with the Michaud Flats. The Bannock Range is part of the Basin and Range Province and the Michaud Flats is part of the Snake River Plain. The southern undeveloped area of the FMC Plant OU is located at the northern end of the Bannock Range and the former operational areas of the FMC elemental phosphorus production facility are located primarily on the Michaud Flats. The FMC Plant OU is underlain by a sequence of Starlight Formation volcanics and sediments, overlain by the interfingered American Falls Lake Beds-Sunbeam Formation. These are overlain by Michaud Gravel and Aberdeen Terrace deposits. Finally, a mantling of loess is present at higher elevations and a veneer of alluvium covers lower areas. Loess deposits are much thicker in portions of drainages where they have been reworked and redeposited. The regional geology, including the FMC Plant OU, is shown on Figure 2-1 as mapped by K.L Othberg in an unpublished report by the Idaho Geological Survey in April 1997.

The Snake River Plain was created when the Cedar Butte Basalt dammed the Snake River near the town of American Falls, forming an ancient lake that extended up to the Bannock Range foothills and included the FMC Plant OU (Stearns et al., 1983). The ancient lacustrine sediments were named the American Falls Lake Beds by Carr and Trimble (1963) and are mostly clay with minor silt, sand, and localized gravel.

About 15,000 years ago, a catastrophic flood from ancient Lake Bonneville in northern Utah flowed down the Portneuf River Valley onto the Snake River Plain including the Michaud Flats of the current FMC Plant OU and into the lake created by the Cedar Butte Basalt Dam (Scott et al., 1982; Houser, 1992). The flood waters filled the ancient basalt-dammed lake, and overtopped the lava dam. The Cedar Butte Basalt dam ultimately was breached during the Bonneville flooding, thus draining the lake. The divide between Lake Bonneville and the Portneuf River Valley was rapidly downcut as water flowed from Lake Bonneville (Malde,

1968). The flood waters deposited extremely coarse-grained sediments named the Michaud Gravel along the Portneuf River Valley and into the Michaud Flats (Trimble and Carr, 1961). The Michaud Gravel consists of mostly quartzite and other quartz-rich metamorphic lithologies, with minor basalt. Sediment can be exceptionally coarse in the flood channels; quartzite and basalt boulders up to 8 feet (2.5 meter) in diameter occur in downtown Pocatello (Trimble, 1976).

2.2.2 Site Geology

A detailed description of site geology is presented in the *EMF RI Report* Section 3.1.2 and was based on the drilling and geologic logging program. A hydrogeologic cross section based on drilling completed by Bechtel during the RI is shown on Figure 2-2. The cross section (C – C') extends from the southeast near the Slag Pile across the FMC Plant OU to the Northwest and ends near Highway 30.

The stratigraphy of the FMC Plant OU generally can be described as discontinuous layers of unconsolidated sediments deposited on an erosional surface that was incised in volcanic bedrock. The sedimentary units immediately above the bedrock are gravels derived from volcanic rocks. The stratigraphy at the FMC Plant OU includes, in ascending order, volcanic bedrock units (rhyolite, tuff, and some basalt), coarse volcanic and quartzitic gravels, fine-grained sediments of the American Falls Lake Bed, Michaud gravels, Aberdeen alluvial terrace deposits (locally) and loess deposits of calcareous silts and clays. Loess is present at both higher elevations and lower elevations of the site in varying thicknesses. Loess deposits are much thicker in portions of drainages where they have been reworked and redeposited. During RI and SRI drilling, loess was described as fine sandy silt in texture with some areas of thinly bedded alluvial gravels locally.

Fill material encountered during drilling and excavating consisted of reworked native soil, imported soil and other materials generated during the facility operations. The materials were stored and/or placed around the FMC Plant Site during the operation of the facility and during decommissioning activities. The fill material types and thickness are discussed in detail in Section 4 for each RU. Fill and other source material at the FMC Plant Site observed during SRI drilling included reworked native (loess, sand, and gravel), slag, ore (including calcined ore and bull rock), ferrophos, concrete, asphalt, silica, calciner pond solids, phossy solids, precipitator solids, and coke (and coke fines). Soil types encountered during SRI drilling include loess, gravels and clays. Material up to boulder size and possibly larger was encountered beneath the site during the drilling at RU 1 at depths below 60 feet bgs. Bedrock was encountered during drilling at RU 15 and 16 and included basalt, rhyolite, and tuffs.

2.3 HYDROLOGY

2.3.1 Regional Hydrology and River Morphology

Major surface water features of the region near the FMC Plant OU include the Snake River, Portneuf River, and the American Falls Reservoir as shown on Figure 2-3 and described in greater detail in Section 3.2.1 of the *EMF RI Report*. The American Falls Reservoir is an

impoundment of the Snake and Portneuf rivers and other smaller creeks near the FMC Plant OU that discharge into the reservoir at its eastern end.

The Snake River has a moderately straight river channel, downcut into the basalts of the Snake River Plain. In places, the river is significantly entrenched into the basalts.

Upstream of the American Falls Reservoir, the Snake River drainage is 11,310 square miles (2.9 million hectares), including watersheds of the Blackfoot River, Henry's Fork, Teton River, and portions of western Wyoming.

The Portneuf River drainage area is approximately 1,250 square miles. Predominantly fine-grained deposits collected from point bars, chute bars, and the local floodplain of the river were sampled during the RI field investigation. Upstream of the FMC Plant OU, the Portneuf River flows in a relatively steep valley between the Pocatello and Bannock ranges. East of the FMC Plant OU, the river emerges onto the Michaud Flats along the base of the Bannock Range. The river runs across the flats incised in a shallow, flat-bottomed valley that widens from about 0.5 mile (0.8 kilometers) at the Bannock Range to over 1.5 miles (2.4 kilometers) near the reservoir. At the reservoir, the broad flat-bottomed area is called the Fort Hall Bottoms.

The river course increases in sinuosity from the Bannock Range area to the Fort Hall Bottoms. Where there is a distinct increase in gradient (typically 0.19 percent), the river becomes moderately straight. Where the gradient decreases (typically 0.11 percent), the river follows a high sinuosity pattern.

The American Falls Reservoir covers 88 square miles (22,800 hectares), and has a capacity of 1.7 million acre-feet (2,097 million cubic meters). The reservoir level fluctuates seasonally, with high levels occurring during peak runoff in spring. During high water levels, the reservoir floods much of the Fort Hall Bottoms, as evidenced by stressed trees along the banks (Fenwick, 1993a). Sediments deposited in the American Falls Reservoir likely originate from a large number of watersheds and reflect anthropogenic activities throughout this area.

2.3.2 Site Hydrology and Drainage

There are no naturally-occurring perennial surface water systems within the FMC Plant OU. The nearest major surface water feature is the Portneuf River that is located at the northeastern boundary of the FMC Plant OU as shown on Figure 2-3. Natural drainages within the FMC Plant OU primarily consist of small ephemeral streams that channel flow from the Bannock Range to the Michaud Flats. Within the FMC Plant Site these natural drainages have been significantly modified by plant operations and site decommissioning.

Surface runoff within the FMC Plant Site is infrequent and is contained within that area. When storm runoff occurs it does not run outside the FMC Plant Site but is contained in the storm drainage ditches and depressions, and eventually evaporates or infiltrates. Modeling of storm runoff within the FMC Plant Site for the maximum 24-hour storm of record (1.82 inches) indicated that runoff would be completely contained within that area (BEI, 1996).

The EMF RI site investigation found no channels by which stormwater would normally discharge from the FMC Plant Site, other than the former NPDES-permitted IWW ditch outfall from the FMC Plant Site to the Portneuf River, which was eliminated and the piping plugged in 2002. The FMC Plant Site is separated from the Portneuf River by the Union Pacific Railroad, Highway 30, and Interstate 86. The bed of the railroad and highway grades are raised above the adjacent terrain and form multiple barriers separating the FMC Plant Site from the river.

2.4 HYDROGEOLOGIC SETTING

2.4.1 Regional Hydrogeology

The Eastern Snake River Plain is underlain by basalt and gravel aquifers that are recharged mostly by underflow from surrounding mountain ranges. Some recharge occurs as irrigation return and deep percolation from precipitation. Several rivers flow onto the Snake River Plain, infiltrate underground, and the water ultimately discharges to the Snake River. Groundwater flow through the basalts of the Snake River Plain occurs primarily in thin interflow zones: thin gravel and fracture zones between basalt flows and in the fracture of the basalts (some of the basalts are columnar basalts, with a large interconnected fracture network). Regionally, the Snake River defines the base level for other smaller rivers such as the Blackfoot and Portneuf rivers.

The Michaud Flats are underlain by the same prolific basalt and gravel aquifers. These aquifers are recharged by underflow from the adjoining Bannock and Pocatello mountain ranges and from significant downvalley underflow from the Pocatello Valley aquifer. Smaller drainages also provide underflow to the aquifers. Direct infiltration from precipitation and irrigation return is another recharge source. Within the mountainous areas, there are no regionally continuous hydrostratigraphic units. Groundwater flows through undifferentiated volcanic and sedimentary rock units, with flow focused to sediment-filled valleys incised into the mountains. At the transition between mountainous areas and flatlands, there are alluvial fan deposits where groundwater flow occurs primarily within sand and gravel lenses.

Within the Michaud Flats, the aquifer system can be divided into a shallow aquifer and a deeper aquifer. The shallow aquifer is Michaud Gravel which typically is overlain by a silt aquitard that is locally unconfined. The deeper aquifer is comprised of the gravel and volcanics of the Sunbeam and Starlight Formations, and the Big Hole Basalt. The deeper aquifer is the primary water-producing aquifer within the Michaud Flats. The deeper aquifer underlies the American Falls Lake Beds, the regional aquitard between the shallow and deeper aquifers (Houser, 1992).

The nature of the gravel aquifer in the Michaud Flats (unconfined verses semi-confined) depends on the occurrence of fine-grained units within the saturated zone. In some areas, fine-grained units may act as local aquitards, and, in other areas, the upper aquifer appears to be confined. The fine-grained units occur more frequently nearer to the Bannock Range, which is expected because the Bannock Range is a source of colluvial materials deposited onto the Michaud Gravel.

The Michaud Gravel is a productive aquifer associated with the highly permeable deposits of the Bonneville Flood. Agricultural, industrial, and domestic water supply wells extract groundwater from the regional aquifer. There are numerous agricultural production wells in the Michaud Flats north of the FMC Plant OU. These agricultural wells tap into an aquifer that is typically less than 100 feet below ground surface, with aquifer thicknesses greater than 150 feet. A deep, confined, bedrock aquifer exists in the basalt beneath the Michaud Flats. Further information regarding the agricultural production wells is found in the *GWCCR* for the FMC Plant OU. These production wells are shown on EMF RI Figure 3.6-5 and listed on Table 3.6-2.

Groundwater that flows into the regional aquifer system discharges to the Portneuf River (via springs and base flow contribution), American Falls Reservoir, or to one of the numerous springs and seeps in the Fort Hall Bottoms. Groundwater discharges to the Portneuf River along the reach from I-86 downstream to the American Falls Reservoir. The river gains approximately 200 cubic feet per second (cfs) flow along this reach as groundwater discharges through the riverbed and springs.

2.4.2 Site Hydrogeology

There are three distinct hydrogeologic areas underlying the FMC Plant OU, each with characteristic stratigraphic, hydrologic, and geochemical features. These have been designated the Michaud Flats, Bannock Range, and Portneuf River Valley hydrogeologic areas.

The Michaud Flats groundwater enters the FMC Plant OU from the southwest and west and occupies the northwestern part of the site. It has higher sodium chloride content than other groundwater in the area. Hydraulic conductivities are relatively high (30 to 100 feet per day [ft/day]). The geology of the Michaud Flats is the Michaud Gravel, Aberdeen Terrace deposits (reworked Michaud Gravel), and local fine-grained units with abundant deposits. Deeper gravels can be volcanics, especially where the Michaud Flats area merges with the Bannock Range.

Bannock Range groundwater enters the FMC Plant OU from the south where it primarily occupies the southern undeveloped area. Water can be described primarily as calcium-bicarbonate rich. This area has relatively lower hydraulic conductivity values (0.03 to 28 ft/day), steep hydraulic gradients, and typically thinner saturated thicknesses of volcanic gravels.

Portneuf River Valley groundwater is found only at the northeastern extent of the FMC Plant OU north of Highway 30 near the Portneuf River. This groundwater is similar to the Bannock Range groundwater, but is more alkaline. The geology in this area generally consists of relatively thick deposits of highly permeable Michaud Gravel. Hydraulic conductivities are relatively high (28 to 4,800 ft/day) as there appear to be very few if any fine-grained units within the gravels.

The American Falls Lake Beds form an aquitard that separates the shallow from the deeper aquifers within the Michaud Flats area. These lacustrine clays and silts have very low permeability and are regionally extensive, extending from the Bannock Range area to the American Falls Reservoir, where they crop out along the reservoir embankment. The AFLB are not present along part of the Portneuf River in the area of Batiste Springs. The Bonneville Flood

may have scoured the AFLB, consistent with Trimble's (1976) map of boulder deposition patterns that indicate a main flood channel in this area.
Groundwater level depths range from more than 150 feet below ground surface (bgs) in the southern portion of the FMC Plant OU (northern edge of the Bannock Range) to about 45 feet in the northwestern area of the FMC Plant Site. In the northern portion of the FMC Plant OU (north of Highway 30), groundwater generally is about 60 feet bgs. At the FMC Plant Site, the SRI sampling encountered groundwater at depths typically greater than 90 feet bgs. These groundwater depths were observed in both soil and bedrock.

In the western portion of the FMC Plant OU, Michaud Flats groundwater in the shallow aquifer moves from the southwest and west to the east toward the Portneuf River. Across the southern boundary of the FMC Plant OU, groundwater flows north from the Bannock Range. Michaud Flats and Bannock Range groundwater systems mix together within the FMC Plant OU and the surrounding area. In the northeastern corner of the FMC Plant OU and surrounding area, Bannock Range, Michaud and Portneuf River Valley groundwater mix together (BEI, 1996).

As shown on Figure 2-4, groundwater beneath the FMC Plant Site (south of Highway 30) generally flows to the north from the Bannock Range and then to an east-northeasterly flow as the Bannock Range groundwater merges with the Michaud groundwater system.

2.5 AREA SOILS

Soils at the FMC Plant Site originated from deposition by fluvial erosion and deposition (alluvium), collection at the base of slopes (colluvium), weathering in place (residuum), and deposition by wind (loess). The rivers and streams within the Snake River Plain include the Snake River, Portneuf River, Bannock Creek, and other small intermittent streams on and near the FMC Plant Site.

As described in Section 1.2 of the *EMF RI Report* and in Section 2.2.2 from the *FS Report*, the area including the FMC Plant Site is underlain to some depth by soils consisting of calcareous silts and clays (loess). These silts and clays have an average pH greater than 8 and, because of their calcareous nature, a high buffering capacity. The high pH will act to neutralize acidic materials, precipitate cations that form carbonate solutions, and provide for numerous cation exchange opportunities for trace elements.

The silts are of greatest thickness in the western and central portions of the FMC Plant Site and extend to the south beyond the FMC Plant OU boundary (BEI, 1997).

2.6 CLIMATE

The FMC Plant OU is located in a region where the climate is semi-arid, characterized by a wide range of temperatures. The warmest temperatures generally occur from June through August (daily mean maximum temperature 86.8 ºF), and the coldest temperatures occur from December through February (daily mean minimum temperature 15.1ºF). The highest and lowest temperatures recorded at the Pocatello Municipal Airport were 104 ºF in August 1969 and minus 33 ºF in February 1985 (NOAA, 2007). The mean evaporation during the summer is 29.76 inches (762 mm) for the 3-month period, and 3.36 inches (86 mm) for the winter months.

The average annual precipitation for the region is 11.53 inches per year, with the greatest amount of precipitation occurring during the spring months. The areal and seasonal distribution of precipitation also influences hydrogeologic characteristics. Precipitation patterns in the region are strongly linked to topography, with larger amounts of snow and overall precipitation falling at higher elevations in the Bannock Range to the south of the site. The higher elevations of the Bannock Range serve to recharge areas for aquifers in the valleys.

Regional air movement is generally from the west/southwest, with local wind flow patterns controlled by the rugged topography. Pocatello Airport data show a prevailing wind direction from the south-southwest, with a strong predominance of wind from the entire southwest quadrangle. Mean annual wind is 10 mph. In the summer months, moisture-laden air from the Gulf of Mexico and Caribbean regions produce thunderstorms.

2.7 DEMOGRAPHY AND LAND USE

The EMF study area evaluated during the RI included portions of the cities of Pocatello and Chubbuck, unincorporated areas of Bannock and Power counties, the Fort Hall Indian Reservation, and U.S. Bureau of Land Management (BLM) lands. Land use in the study area included areas zoned for agriculture and various land uses, including residential, commercial, and industrial. Current land uses and zoning have not changed significantly from uses during the RI evaluation. In addition, future land uses are not expected to change significantly from current uses. This conclusion is supported by the fact that future zoning of the EMF facilities and surrounding area is not expected to change from the zoning that is currently in place. Information regarding demography and land use evaluations for the EMF Site and surrounding areas is included in Section 3.6 of the *EMF RI Report*. The following focuses on demographics, land use and receptors within and immediately surrounding the FMC Plant OU.

2.7.1 Demographics

The EMF study area includes portions of the cities of Pocatello and Chubbuck. The 2000 populations of Pocatello and Chubbuck were estimated at 51,466 and 9,700 respectively (U.S. Census Bureau, 2000).

Unincorporated areas in Bannock and Power counties are used principally for agriculture. Scattered residences (mainly isolated farmhouses) occur in the unincorporated areas, along with one small subdivision. Population statistics are not available for these unincorporated areas.

2.7.2 Current and Future Land Use

The entire FMC Plant OU, both the portions within and outside the Fort Hall Reservation boundary, is located on fee land. The area surrounding the FMC Plant OU is used for industrial, agricultural and isolated residential purposes, with little change expected in the future.

2.7.2.1 Current Land Use

The FMC Plant Site and the FMC properties north of Highway 30 are bordered to the north by property owned by the City of Pocatello and used for land application of municipal sewerage

sludge, by the Chevron Texaco bulk petroleum tank farm, and by property owned by Rowlands, Inc, used primarily as a property housing a former milk packaging plant and currently in use for storing recreational vehicles and boats. To the east, FMC properties are bordered by properties owned by the JR Simplot Company, upon which the Simplot Don plant is located. To the south, FMC properties are bordered by lands held in trust by and for the Shoshone-Bannock Tribes which are not developed, and by property owned by Idaho Power to support power distribution in the area. The FMC properties, the Simplot plant site, and other properties extending over four miles to the southwest along Highway 30 are currently zoned "heavy industrial" and generally in use as such. Additionally, Power County zoning restrictions apply a one-half mile buffer zone around the industrial zoned property, which prohibits any non-industrial use with this buffer area. Appendix A includes a map provided by Power County depicting the zoning, the ½ mile buffer and property ownership, as well as the Power County zoning ordinance. The limited residential development to the northeast and south/southwest within the buffer zone is grandfathered by the zoning ordinance, because its construction pre-dated the ordinance. However the ordinance prohibits the expansion or replacement of those grandfathered areas. Land use within this area is generally consistent with that at the time of the EMF RI.

2.7.2.2 Future Land Use

Future land use information, as discussed in Section 3.6 of the *EMF RI Report*, was based primarily on comprehensive plans (which are long-term planning documents) obtained from the municipalities of Chubbuck and Pocatello and from Bannock and Power counties. As confirmed by the Power County Zoning Map included in Appendix A**,** there has been only minimal change in future long-term land use plans for the area at and near the FMC Plant OU since the time of the RI/FS. Further, Power County has stated in a letter to EPA (also attached as part of Appendix A to this report) that it does not foresee making any changes to its current land use zoning at or near the FMC Plant OU.

2.7.3 Potential Receptors

Four categories of potential future receptors were identified in the CSM, as detailed in the *RI Update Memo*. These four categories of receptors for the FMC Plant OU consist of the following: Commercial/Industrial Worker, Utility Worker, Construction Worker and Near-by Residents. A Maintenance Worker, who would use the existing roadways to access work areas, is also identified for evaluation in the Supplemental HHRA for the FMC Plant OU.

The Near-by Resident receptor is to be addressed in the CERCLA process for the EMF Site Off-Plant OU, as any reasonably anticipated residential exposures would take place outside the FMC Plant OU and any exposures would not be limited to releases from FMC sources. However, it should be noted that the only residential development to have occurred since the EMF RI is approximately 2 miles from the FMC site. Future residential development at or adjacent to the FMC Plant OU is not reasonably possible, based both on the Power County zoning and development information available from the cities of Chubbuck and Pocatello. The Power County zoning that is currently in place, which the county has stated it plans to keep in place for the foreseeable future, prohibits future residential development within ½ mile of the FMC and

Simplot properties. This likely will be effective in maintaining the heavy industrial zoning for the area.

Under current conditions, potential exposures at the FMC Plant OU are limited to site workers engaged in conducting monitoring and maintenance at the closed RCRA ponds and the capped calciner ponds, gas extraction and treatment at Pond 16S under the CERCLA 2006 UAO, and RCRA post-closure and calciner ponds post-remedial action groundwater monitoring. Current workers could be exposed to contamination through 1) incidental contact with by-products and waste materials remaining at the FMC Plant Site, 2) ingestion, 3) inhalation of fugitive dust and 4) dermal absorption. In addition, current workers could be exposed to gamma radiation emanating from the residual by-products and waste materials. Finally, current workers could also be exposed to ongoing emissions from the adjacent Simplot facility.

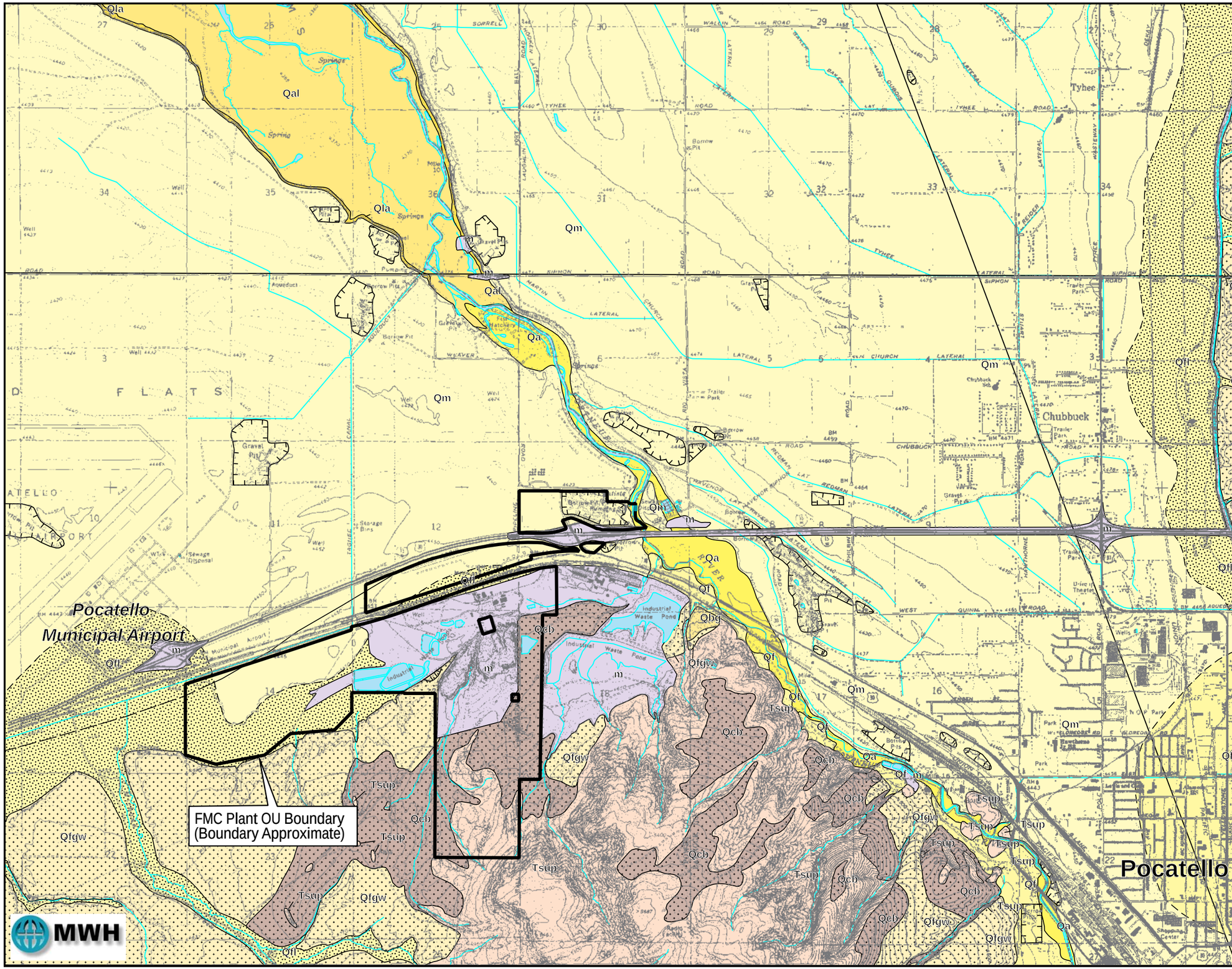
Workers constructing and operating the Gas Extraction System on Pond 16S pursuant to the CERCLA 2006 UAO would also have potential exposures to phosphine gas, but all work at the closed RCRA ponds including Pond 16S is conducted pursuant to FMC's Pond Safety rules. Those rules require personnel entering the area to wear personal phosphine monitors, set to alarm at the 8-hour OSHA threshold limit value for phosphine, and leave the area in the upwind direction if the alarm sounds. Ambient air monitoring conducted downwind of Pond 16S as required under the UAO has not detected phosphine. Thus, Pond 16S worker exposures are not considered to be different from other site workers.

The potential exposure pathways and their characterization relevant to each of the potential current and future receptors are discussed in detail in the *Supplemental HHRA*, which is presented in Section 4 of this report.

2.8 ECOLOGICAL

The EMF study area consists of both terrestrial and aquatic habitats. These are described in the *EMF Baseline Ecological Risk Assessment* (*Baseline ERA*) (E&E, 1995), as well as in Section 3.7 of the *EMF RI Report*.

Pursuant to the SRI/SFS AOC and SOW, FMC evaluated the potential ecological risk issues related to the FMC Plant OU. FMC presented the results of this evaluation in Section 5 of the *RI Update Memo* as was approved by EPA on May 26, 2005. That section, entitled "Ecological Assessment of the Undeveloped Southern and Western Portions of the FMC Plant OU," is included as Appendix B to this SRI report.



DESCRIPTION OF MAP UNITS

m	Made ground (historical)—Artificial deposits of disturbed, transported, and emplaced construction materials derived from various local sources. Primarily formed in the construction of highways, irrigation ditches, and industrial sites.
Qa	Alluvium of lower Portneuf River and Pocatello Creek (Holocene) — Stratified and interfingering deposits of sand and gravel veneered by silty reworked loess.
Qal	Alluvium and lacustrine deposits of the Portneuf River and Ross Fork delta (Holocene)- Laterally discontinuous beds of sand, silt, clay, muck, and peat.
Qf	Alluvial-fan and debris-flow deposits (Holocene)—Muddy sand and gravel and beds of silty redeposited loess.
Qfl	Alluvial-fan deposits composed mostly of reworked loess (Holocene)—Primarily bedded to massive silt that is redeposited loess.
Qm	Michaud Gravel (late Pleistocene)—Bouldery gravel and sand; more sand in channeled-flow pathways and in distal parts of deposit where grain size decreases.
Qbg	Gravel deposits of the Bonneville Flood, undifferentiated (late Pleistocene) Pebble gravel deposited in eddy bar of Bonneville Flood.
Qfgw	Loess-mantled alluvial-fan gravel of Wisconsin age (late Pleistocene)—Crudely stratified muddy sand and pebble- to boulder-sized gravel mantled with loess.
Qfgo*	Loess-mantled alluvial-fan gravel of the ancesteral Pocatello Creek (early Pleistocene?) — Crudely stratified, muddy and sandy pebble-to cobble-sized gravel manteld with loess.
Qcb*	Loess-mantled bedrock colluvium (Pleistocene)—Wind-blown and redeposited loess that mantles, interfingers with, or is mixed with stony colluvium derived from local bedrock.
Tsup	Rhyolite porphyry unit—Porphyritic rhyolite,

Source: Idaho Geological Survey, April 1997

N
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0 3000
Feet

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

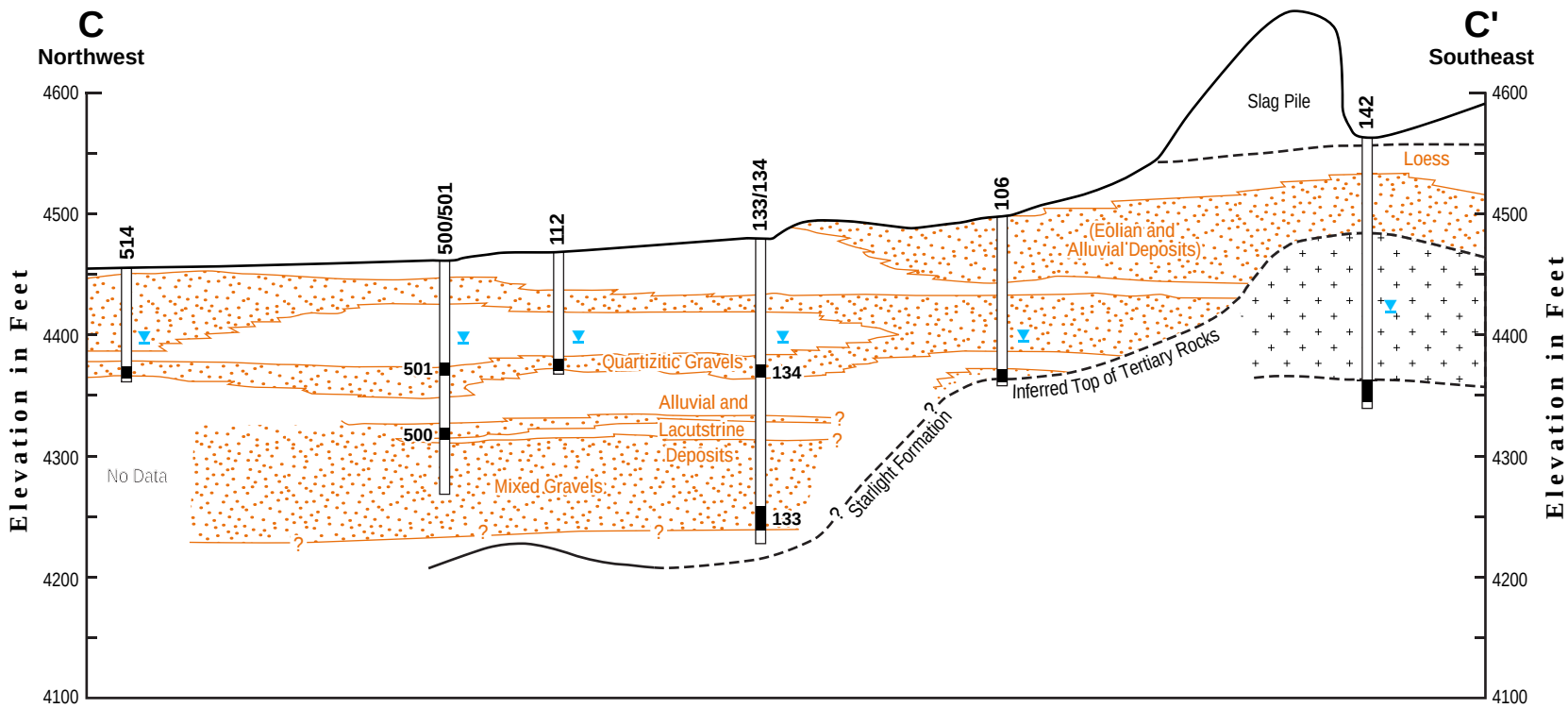
FIGURE 2-1

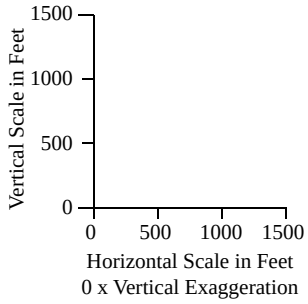
REGIONAL GEOLOGY

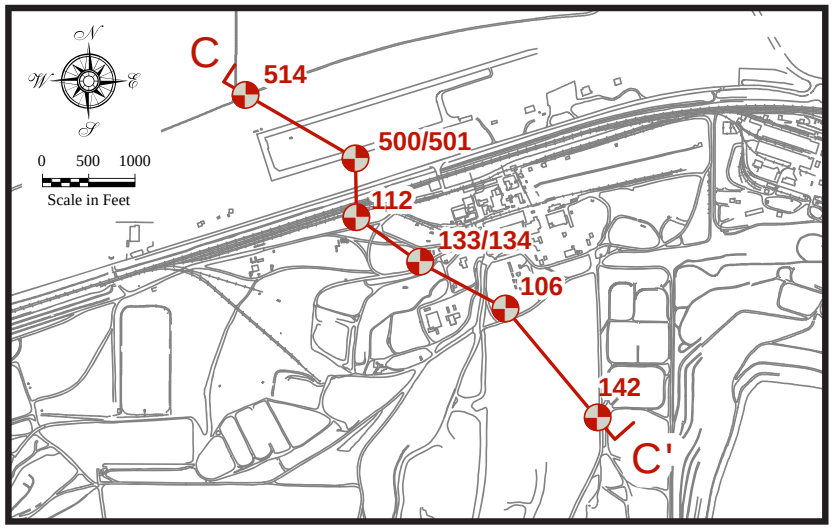
MWH

FILE *Fig 2-1 Regional Geologic map.ai 4/11/08*

FILE *Fig 2-2- Hydro Cross Section C-C_309.ai 3/27/09*







- Approximate groundwater level
- Screened interval

Source: RI for the EMF Site, Bechtel, 1996.

MWH

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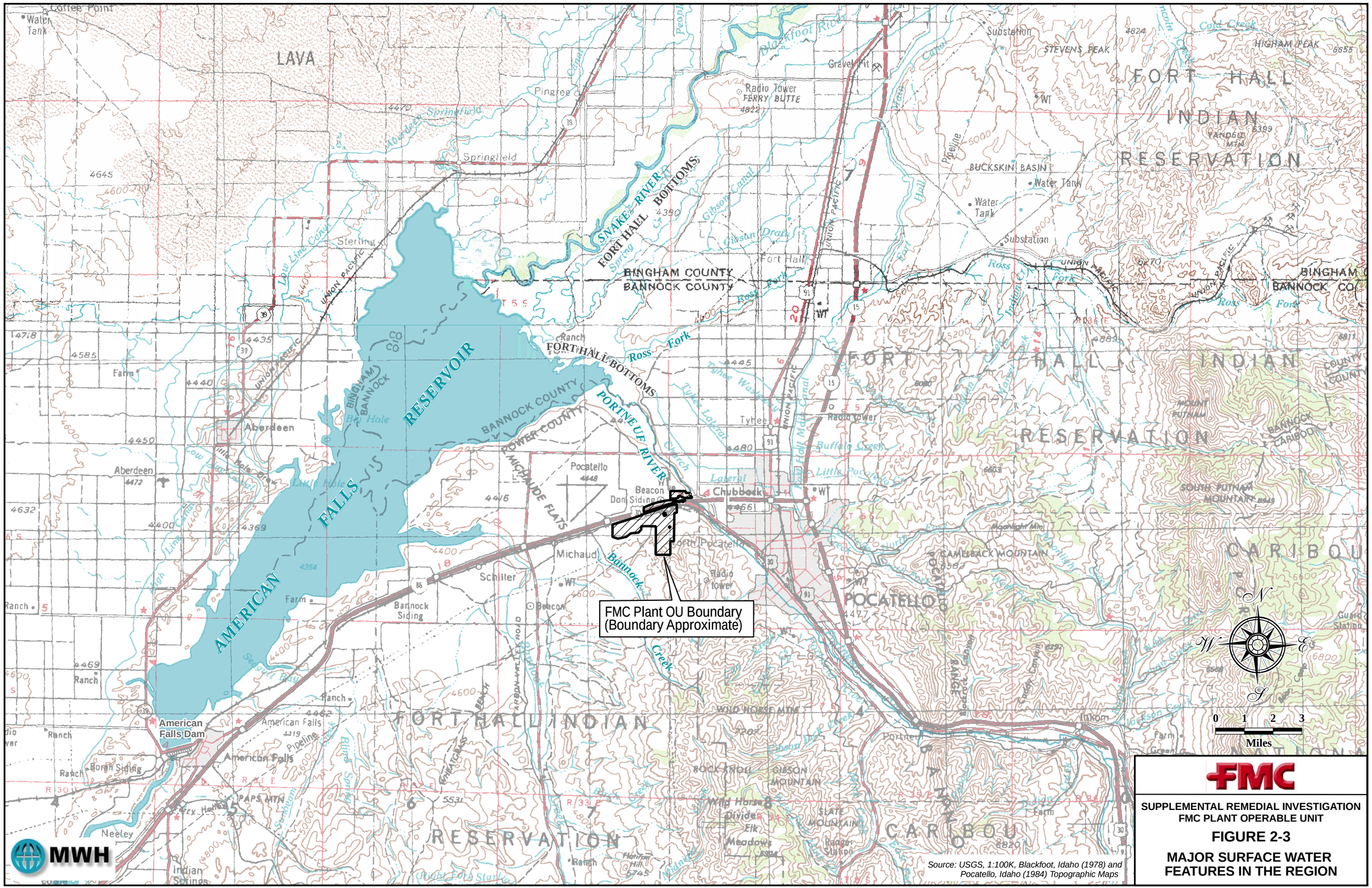
FIGURE 2-2

HYDROGEOLOGIC CROSS SECTION C-C′



FMC

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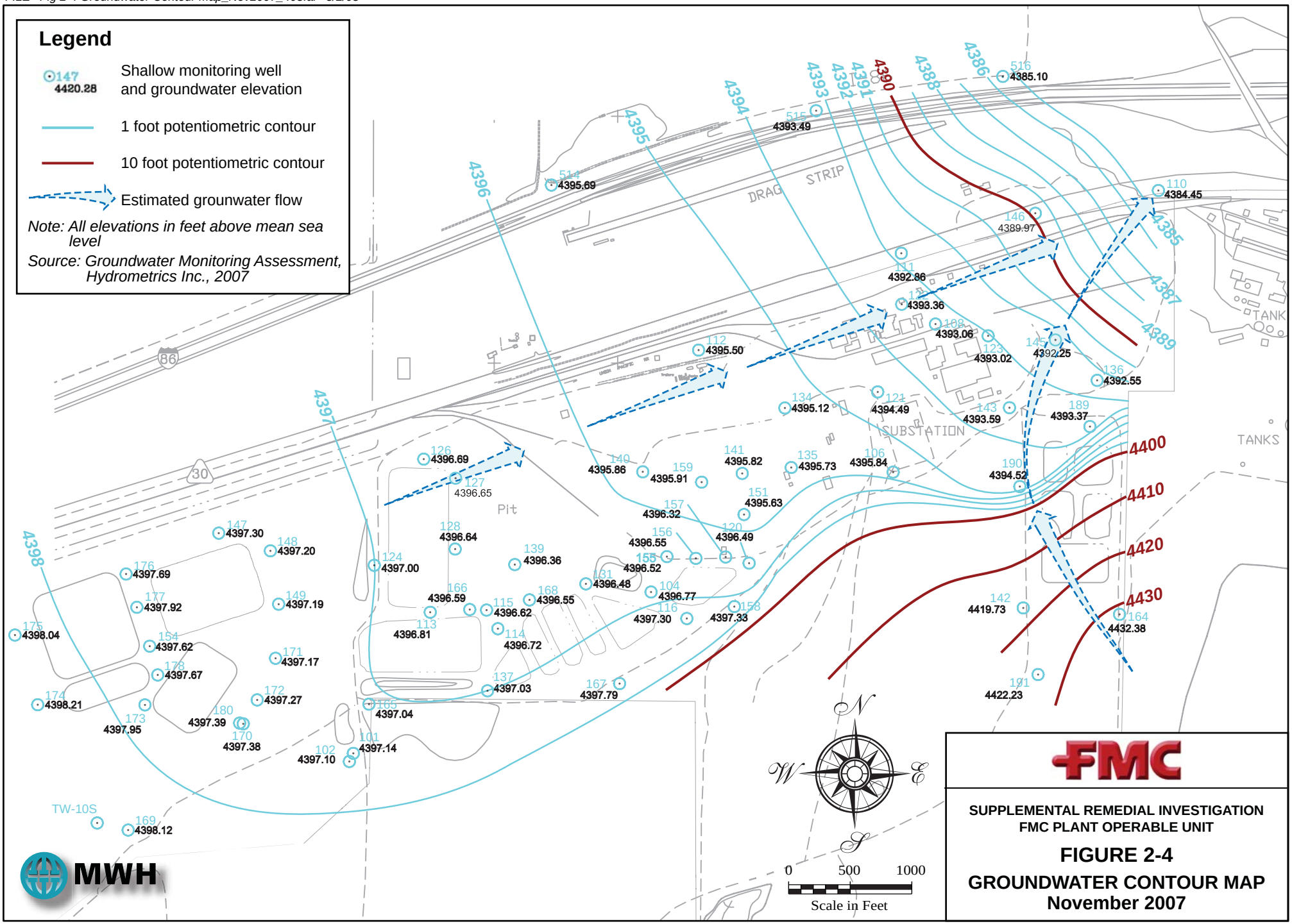
FIGURE 2-3

MAJOR SURFACE WATER FEATURES IN THE REGION

MWH

FILE Fig 2-3_Major Surface Water Features_408.mxd 4/11/08

FILE *Fig 2-4 Groundwater Contour Map_Nov2007_408.ai 5/2/08*



Section 3
SRI FIELD INVESTIGATION PROGRAMS AND TECHNIQUES

This section summarizes the SRI field programs conducted at the FMC Plant Site during 2007. Included in this section are the objectives and rationale for each SRI field program, discussions of the field programs conducted at individual RUs, and the equipment/procedures that were used to complete each field program.

3.1 FIELD INVESTIGATION PROGRAMS AND RATIONALE

3.1.1 Introduction

Field activities associated with the SRI began with the May 14, 2007 EPA approval of the two-volume *SRI Work Plan*, which included the *SRI Field Sampling Plan for the FMC Plant Operable Unit (FSP)*. As identified in the *RI Update Memo*, there were data gaps at specific RUs within the FMC Plant Site with respect to 1) threats to groundwater and 2) potential exposures to workers that could occur under future commercial/industrial use of the property. The RUs requiring follow-up investigation consisted largely of the former working areas within the FMC Plant Site that were not investigated during the initial RI while the facility was still operating. Investigation of these areas became practical following plant shut down in December 2001 and completion of facility decommissioning in 2006. The *RI Update Memo* divided the FMC Plant Site into multiple RUs, as listed below and shown in Figure 3-1.

- RU 1 - Furnace Building, Phos Dock and Secondary Condenser
- RU 2 - Slag Pit
- RU 3 - Receiving Stores, Paint Shop and P_4 Decon
- RU 4 - Office Buildings and Training Center
- RU 5 - Lab and Old Drainfield
- RU 6 - Former Long-Term Phos Storage Tanks
- RU 7 - Shale Unload, Crushing and Stockpile
- RU 8 - Former Kiln Scrubber Ponds and Calciners
- RU 9 - Silica Stockpiles and Former Kiln Scrubber Overflow Pond
- RU 10 - IWW Pond and Ditch
- RU 11 - Equipment Area South of Calciners
- RU 12 - Former RP&S Area and Mobile Shop

- RU 13 - Pond 8S Recovery Process and Metal Scrap Preparation Area
- RU 15 - Oversize Ore, Used Electrode, Baghouse Dust Area
- RU 16 - Calciner Solids Stockpile
- RU 17 - Recyclable Material Landfill
- RU 18 - Plant Landfill
- RU 19 - Slag Pile, Bull Rock Pile
- RU 20 - Former Bannock Paving Area
- RU 21 - Other On-site Railspurs
- RU 22b - Old Ponds
- RU 22c - Railroad Swale
- RU 23 - Road Segments not within RU Boundaries
- RU 24 - Plant Areas not within RU Boundaries

The lateral boundaries of the individual RUs were drawn based on knowledge of past activities and materials handled within the RU. In many cases, the RU was easily defined because it is bounded by roads, structures, or other features. A limited number of activities occurred within the defined RUs and the activities involved a known set of material. A number of RUs also contained areas that required different data collection designs (i.e., sampling requirements) based upon, for example, the presence of a SWMU in an RU, as was discussed in the *RI Update Memo*. Table 1-3, found in Section 1.0, provides a description of the facilities and their conditions, as well as the SWMUs present within the individual RUs.

As identified in the *RI Update Memo*, one of the primary objectives of the SRI data collection was to address data gaps needed to support a risk assessment for those RUs with a remediation vision of "no further action necessary" (also referred to as NFA). This investigation work centered around collecting data to characterize risks to potential future workers. In addition, for those RUs where the remedial vision was capping/cover, the SRI data collection addressed data gaps regarding the horizontal extent (i.e., lateral limits) of future cap/cover boundaries. SRI data collection activities also investigated specific areas of concern (also referred to as "specific investigation areas"). During this phase of the field work, specific localized areas with known or suspected historical releases of site-related constituents to the ground surface or subsurface were investigated. In conjunction with the field activities mentioned above, sample data needed to support the SFS were collected from areas of the FMC Plant Site found to be associated with unacceptable levels of risk to potential future workers, based upon the evaluation of data initially collected under the Risk Assessment Program.

Data were collected during the SRI under four major field programs:

- Risk Assessment Program
- SFS Program
- Cap/Cover (Shallow Subsurface) Delineation Program and
- Specific Investigation Areas (SIAs) Program (consisting of organic solvent, liquid petroleum fuels, coke constituents, PCB, leaching potential, precipitator dust, phossy water, underground piping, PCDT, and radon flux field investigations)

In addition to these major field programs, a fill characterization program was implemented when the SRI was in progress.

Figure 3-2, an SRI data collection concept map, was provided in the *SRI Work Plan* as a guide to these SRI data collection programs. The Cap/Cover Delineation Program and SIAs Program data collection activities were performed as depicted on the far right flow path of Figure 3-2 at RUs with remedial visions of capping or at those RUs where data collection was necessary because of known or suspected historic localized releases of COPCs/ROPCs.

For those RUs with an NFA remediation vision (as depicted in the far left flow path of Figure 3-2), data necessary to comprehensively evaluate risks to potential future workers within 5-acre exposure units across each RU were scheduled for collection under the following phased approach:

1) A gamma radiation screening scan to identify areas of the FMC Plant Site with risks from external exposure to gamma radiation, the primary pathway of human health concern identified in the RI, potentially below an upperbound risk-based threshold (CV[1])

2) PIC dose rate measurements to confirm the gamma radiation screening scan finding that risks from external exposure to gamma radiation are below the CV and

3) Collection of surface and subsurface soil samples from areas below the gamma CV to evaluate risks from pathways other than gamma exposure (i.e., incidental soil ingestion, inhalation) in the Supplemental HHRA

Per the concept map, sampling under the Risk Assessment Program was discontinued for RUs found to exceed the upperbound risk-based CV within either step 1) or 2). For these RUs, historical data characterizing the composition of fill/source materials present in the RU would be used to bound risks to potential future workers in the Supplemental HHRA, and the emphasis of

[1] Risk-based CVs were used during the SRI to inform field data collection activities; in particular, for determining whether a candidate NFA RU should follow the risk assessment or preliminary SFS data collection path (per Figure 1-7). Regarding the measurement of total gamma exposure under future worker scenarios, the CV is a defined level above background that is equivalent to the upper end of remediation levels that have been selected at radioactively contaminated CERCLA sites (i.e., 3x10-4 above background), consistent with EPA's OSWER Directive 9200.4-18 (Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination).

subsequent SRI data collection efforts shifted from risk assessment to subsurface characterization to support the SFS (as depicted on the far right flow path of Figure 3-2). In all cases the gamma dose rate measurements made during the SRI field work were above the CV. Decision scenarios 2 and 3, therefore, were unnecessary. Once it was determined that the gamma CV was exceed in RUs, which had previous had an NFA vision, SFS sampling was conducted. This SFS sampling served to delineate the depth of fill in the RU and the spatial extent of the SFS borings in RUs essentially served to laterally delineate fill in these RUs.

In addition to the four primary field programs described above, several additional investigations were added to the scope while the SRI was in progress based upon the initial SRI findings. For example, a fill characterization study was implemented, at EPA's request, based upon the initial finding that all NFA RUs exceeded the gamma CV. EPA expressed concern that historical data characterizing the composition of fill and source materials across the FMC Plant Site were insufficient to perform the bounding assessment of risks to potential future workers in the Supplemental HHRA. Consequently, the fill characterization study was performed per EPA's recommendations and approval to address this perceived data gap. In addition, based upon the observation of P4 in the capillary fringe of several
RU 1 cap delineation borings, a P4 investigation was conducted to delineate the extent of P4 in the capillary fringe downgradient of RU 1. Both of these investigations were added during implementation of the SRI field work and were approved by EPA as addenda to the SRI work plan as discussed in Section 3.4. The final field programs conducted during the SRI at each RU and their findings are discussed in Section 4.

The SRI field work was conducted between May 16, 2007 and December 5, 2007. Table 3-1 summarizes the SRI data collection activities and presents the following information for each RU:

1) Individual field programs that were conducted

2) Rationale for each field program

3) DQOs for each field program

4) Specific field activities performed under each field program

5) Analyses that were conducted on samples collected during individual field programs and

6) Data uses planned for the information that was collected

Decision rules, as resented in the approved *SRI Work Plan*, generally dictated the field activities that were necessary during the SRI and described any follow-up work that might be necessary based on initial sample results. Table 3-2 contains information regarding compliance with the decisions rule(s) that were presented in the approved *SRI Work Plan* and contains the following information for each RU:

1) The RU name

2) Individual field programs that were conducted

3) Decision rules for each field program and

4) Compliance with decision rules during the SRI

The general rationale for the four primary field programs conducted during the SRI, and the fill characterization study added during the SRI, are discussed below. The FMC Plant Site areas encompassed by each field program are depicted on Figure 3-3 to 3-12. Final sample locations in each RU for each field program conducted during the SRI are depicted in Section 4. If contaminants of concern were detected, they also are included on the figures in Section 4.

3.1.2 Risk Assessment Program

This program was targeted upon the collection of COPC/ROPC data to perform an assessment of risks to potential future workers within 5-acre exposure units in each RU where the FMC remediation vision was NFA.

It was previously determined in the *RI Update Memo* that incremental cancer risks associated with exposure to ROPC concentrations in the majority of fill/source materials across the FMC Plant Site (ore, calcined nodules, slag, calciner pond sediment, and precipitator dust/phossy solids) exceed the upper end of remediation levels that have been selected at radioactively contaminated CERCLA sites (i.e., 3x10-4 above background). Moreover, it was determined that the external gamma radiation exposure pathway makes up over 90 percent of the total incremental cancer risk associated with ore, calcined nodules, slag, and calciner pond sediment.

In light of the *RI Update Memo* findings, the Risk Assessment Program was conducted in a phased approach, with initial data collection focused upon evaluating the risk-driving pathway (i.e., external gamma exposure). Specifically, during the SRI gamma surveys were performed at RUs 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 20, 21, 23, and 24 as shown on Figure 3-3. Due to the large areas requiring gamma measurement, the *SRI Work Plan* approach was to initially perform a gamma surface radiation screening survey utilizing a sodium iodide detector (NaI) to identify areas of the site potentially associated with gamma exposure rates below the upperbound risk-based threshold (CV) at radioactively contaminated CERCLA sites. Confirmatory quantitative gamma dose-rate measurements would be made using a PIC in areas found to potentially be below the gamma CV during the screening survey. Surface and subsurface soil samples would only be collected and analyzed for COPCs/ROPCs, to characterize risks from other potential exposure pathways (i.e., ingestion and inhalation) in those areas found to be associated with potentially acceptable levels of gamma exposure. For RUs found to exceed acceptable gamma exposure levels, historical data characterizing the composition of fill/source materials present in the RU would be used to bound risks to potential future workers in the Supplemental HHRA, and the emphasis of subsequent SRI data collection efforts shifted from risk assessment to subsurface characterization to support the SFS (as described in Section 3.1.3 below and depicted on the far right flow path of Figure 3-2).

As described in Section 4, the gamma screening survey measurements were higher than the upperbound risk-based CV across all RUs evaluated. Consequently, confirmatory PIC measurements and surface/subsurface soil samples were not collected during the SRI, in accordance with the SRI data collection concept map shown in Figure 3-2. The gamma radiation scan methods are further described in Section 3.3 and the results are discussed by RU in Section 4.

3.1.3 SFS Program

Based on the results of the gamma scan surveys described above (i.e., surface gamma radiation exceed the CV in an RU), the data collection activities followed a predefined sampling decision path during the SRI to support the SFS as depicted in Figure 3-2. Specifically, data were collected to determine the depth/volume of fill materials (consisting primarily of ore and slag) overlying native soils, and the extent of contaminant migration into native soils beneath these fill materials. The spatial extent of the SFS borings in RUs also served to laterally delineate fill in these RUs. These SFS evaluations were performed at the same RUs that were evaluated using the gamma radiation surface scans depicted on Figure 3-3 (i.e., RUs 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 20, 21, 23, and 24).

To evaluate the potential for constituents to migrate into the native soil underlying the fill, three reference area studies were performed. Each study defined the extent to which a particular fill material type (i.e., ore, slag, or coke) leached COPCs/ROPCs into the native soil. Findings from the reference area studies were used in the SFS and were applied to the RUs listed above. For example, if an RU is covered primarily with slag, the underlying soil would be compared to the "slag" reference study to evaluate whether COPCs/ROPCs leached into the native soils beneath the slag.
The three reference studies conducted during the SRI consisted of the following:

- *Ore* reference area investigation (RAI): RU 7 (excluding the coke handling building)
- *Slag* RAI: RU 20 (excluding specific investigation areas)
- *Coke* RAI: RU 20 (excluding specific investigation area)

Results of the SFS and reference study evaluations are further discussed by RU, as appropriate, in Section 4.

3.1.4 Cap/Cover Delineation Program

The *RI Update Memo* identified data gaps associated with RUs where an engineered cap/cover was identified as the remediation vision (see Figure 3-4). Data gap analysis conducted in the *RI Update Memo* indicated there were insufficient data to confidently delineate the limits of the areas in these RUs where covers or caps will be evaluated during the SFS alternatives analysis.

The cap/cover delineation investigations that were performed during the SRI fell into three categories: 1) P4, 2) the former kiln scrubber ponds, and 3) the former phossy waste ponds.

These studies are described by RU in Section 4 and listed below[2].

- P4 Cap/Cover Delineation
  - RU 1 - Furnace Building, Phos Dock and Secondary Condenser
  - RU 2 - Slag Pit
  - RU 22c - Railroad Swale
- Former Kiln Ponds Delineation
  - RU 8 - Former Kiln Scrubber Ponds and Calciners, extending into RU 9 (Former Kiln Scrubber Overflow Pond)
- Former Phossy Solids Delineation
  - RU22b - Old Ponds, potentially extending into RUs 12, 13, 20, and 24 and beyond the southern and western boundaries of RU 22b

3.1.5 Specific Investigation Area (SIA) Programs

Thirteen SIA studies were conducted during the SRI field program following the detailed data gap analysis presented in the *RI Update Memo*. Below, the rationale for each SIA is discussed. Multiple SIAs were conducted in some RUs, resulting in SIA designations in a single RU ranging from SIA1 to a maximum of SIA5. These are noted in the SIAs discussions below and in Table 3-1.

3.1.5.1 Organic Solvent SIAs

Investigations of potential solvent hotspots were identified as a data gap in the *RI Update Memo*. Therefore, SIA studies to evaluate the extent of the solvent contamination in specific RUs were required as depicted on Figure 3-5, summarized by RU in Table 3-1, and briefly discussed below.

The need for organic solvent studies was identified in the following RUs. These results are discussed by RU in Section 4.

- RU 4 - Office Building and Training Center - RU 4 SIA1 - potential impacts from RU 5 - Lab and Old Drain Field near EMF RI boring F028B
- RU 5 - Lab and Old Drain Field – RU 5 SIA1 - potential impacts due to the disposal area behind the laboratory and the chemical lab seepage pit

[2]Cap delineation information was not required at this time for RUs 15, 16, 17, 18 and 19 to support SFS evaluation of remedial alternatives. Cap delineation in these RUs will be performed in conjunction with remedial construction and confirmation, if the remedial vision of capping is selected as a remedial alternative.

- RU 12 - Former RP & S Area and Mobile Shop - RU 12 SIA1 - potential spills in the areas west of the Mobile Shop. Note: The Mobile Shop is actually in RUs 22b and 12. Only that portion of the shop that is associated with RU 12 was investigated.

- RU 20 - Former Bannock Paving Area - RU 20 SIA2 - potential spills from the BAPCO shop

The organic solvent SIAs were performed in a phased approach. In the first phase investigation, the potential migration of organic solvents into the upper 10 feet of native soil was evaluated. After completion of the first phase, the study results and an evaluation of the results were presented to EPA. Based on discussions with EPA, a Phase 2 study would either be required or not. If a Phase 2 study was necessary to further evaluate potential migration to groundwater, FMC would propose a study to EPA for approval. However, as further discussed in Section 4, Phase 2 investigations were not required for any of the Organic Solvent SIAs.

3.1.5.2 Fuels SIAs

Liquid petroleum fuel SIAs were performed to investigate the potential release of liquid petroleum fuels into shallow subsurface soils, as shown on Figure 3-6, summarized by RU in Table 3-1 and briefly discussed below:

- RU 12 - Former RP & S Area and Mobile Shop - RU 20 SIA1 and RU 20 SIA2 - spills associated with the fuel islands, and potential fuels associated with the high pressure steam cleaning station and area west of the mobile shop

- RU 20 - Former Bannock Paving Area - RU 20 SIA1 - potential spills associated with the BAPCO shop and hot batch plant areas

If the presence of petroleum hydrocarbons was confirmed, the risk associated with the potential impact to future site workers and the potential impact to groundwater required further investigation. The investigations were performed in a phased approach. The first phase investigated the potential migration of liquid petroleum fuels into the upper 10 feet of native soil. After completion of the first phase, the study results and an evaluation were presented to EPA. Based on discussions with EPA, a Phase 2 study would either be required or not. If a Phase 2 study was necessary to further evaluate potential migration to groundwater, it would be proposed for EPA approval. The need for liquid petroleum fuels SIAs was identified in the following RUs. These investigation results are discussed by RU in Section 4.

3.1.5.3 Coke Constituents SIAs

The *RI Update Memo* determined that there were data gaps regarding the characterization of coke constituents. The coke constituents agreed upon in the *SRI Work Plan* for further characterization were semi-volatile PAHs. Investigations were performed at the RUs where coke was handled in order to:

1) Evaluate potential releases of PAHs associated with coke into the underlying soils (0-to-2-foot below native soil (bns)

2) Serve as a reference area for evaluating risks to future workers in other RUs where coke is present at the surface and shallow subsurface

3) Evaluate the potential for migration to groundwater in areas with a sustained hydraulic head (e.g., ponds, settling basins) and

4) Characterize coke to determine whether it exhibits any RCRA hazardous waste characteristics.

Therefore, SIA studies for coke constituents were conducted at the RUs shown on Figure 3-7, and summarized by RU in Table 3-1. The following RUs were evaluated in this SIA program:

- RU 7- Shale Unloading, Crushing and Stock Pile – RU 7 SIA 1 - subsurface migration of PAHs into underlying soil associated with the coke railcar unloading building

- RU 20 - Former Bannock Paving Area - RU 20 SIA3 - subsurface migration of PAHs into underlying shallow soil associated with the coke handling area and settling basins

- RU 20 - Former Bannock Paving Area - RU 20 SIA4 - potential migration of coke COPCs/ROPCs to underlying soils and groundwater associated with the coke settling basins

- RU 20 - Former Bannock Paving Area - RU 20 SIA5 - characterization of coke associated with the coke handling area and settling basins

The results of these investigations are discussed by RU in Section 4.

3.1.5.4 PCBs SIAs

The *RI Update Memo* determined that the PCB sampling pattern at RU 12 - Former RP&S Area and Mobile Shop - Transformer Storage Area in the EMF RI was too sparse to perform an analysis of RU 12 that would support a decision regarding the need for PCB remediation. Therefore, an investigation of PCBs in soil was needed to adequately characterize this area. This was the only PCB investigation identified and it is summarized in Table 3-1 and shown on Figure 3-8. The results from this investigation are discussed in Section 4.

3.1.5.5 Leaching Potential SIAs

As identified in the *RI Update Memo*, current soil conditions in the vadose zone beneath the two areas had not been fully characterized in the RI and constituted a data gap. Therefore, the need for SIA studies associated the stockpiles was identified at the RUs listed below and depicted on Figure 3-9.

- RU 15 - Oversized Ore, Used Electrodes, Baghouse Dust Area - RU 15 SIA1 - potential migration of COPCs/ROPCs to groundwater

- RU 16 - Calciner Solids Stockpile - RU16 SIA1 - potential migration of COPCs/ROPCs to groundwater

Although RUs 15 and 16 never had ponded materials (i.e., a sustained hydraulic head), free liquids may have been present in calciner solids areas at RUs 15 and 16. Free liquids, if present in the solids removed from the calciner ponds and placed in RUs 15 or 16, may have seeped into underlying soils. These investigations are summarized in Table 3-1 and the results are discussed in Section 4.

3.1.5.6 Precipitator Dust Distribution SIAs (along Roadways)

Roads at the FMC Plant Site were either slag roads or constructed of a slag base and asphalt with a slag aggregate. Until approximately 1992, precipitator dust/phossy solids may have been occasionally applied to the roads during winter months for traction (as an alternative to salt). An SIA was necessary to determine if precipitator dust/phossy solids were applied on roads as presented in the "Other Studies" section at the end of Table 3-1.

The SIA included roadway segments within both RU 23 and other RUs. The results of that investigation accordingly are not discussed under RU 23 in Section 4, but within Section 4.24, which discusses the entire set of data collected for precipitator dust during the SRI. Road locations selected within the FMC Plant Site for this investigation were either close to the precipitator dust/phossy solids storage area or were high traffic-hazard areas where traction materials were necessary for safe operations as listed below.

- Area 1 - slag pit -haul road intersection with plant roadway (the intersection with the greatest safety concern)
- Area 2 - contractor access road at the contractor gate area (historically, a congested traffic area)
- Area 3 - near the northeast corner of the furnace building (most congested traffic area in this part of the plant)
- Area 4 - pond access road (precipitator dust/phossy solids were hauled over this road)
- Area 5 - east slag pile access road (routine heavy truck traffic) and
- Area 6 - road to contractor's yard (most congested traffic area in this part of the plant)
- Area 7 - reference or comparative road in the southern region

3.1.5.7 Phossy Water in Soil SIAs

Potential impacts to shallow soils due to drainage or leakage of phossy water within specific RUs were not characterized during the EMF RI. Phossy water contained small quantities of P4. Therefore, investigations were necessary that focused both on visual evidence of P4 (i.e.,

smoking or burning conditions), as well as analytical evaluation of P4 in the fill/native soil interface. The need for phossy water SIA studies was judged necessary for the RUs listed below.

- RU 3 - Receiving Stores, Paint Shop, and P4 Decon - RU3 SIA1 - migration to underlying shallow soils from surface water drainage flowing overland from RU 1-Furnace Building, Phos Dock, and Secondary Condenser to RU 22c - Railroad Swale

- RU 6: Former Long Term Phos Storage Tanks – RU 6 SIA3 - migration to underlying shallow soils from potential tank leakage and overflow spills

These investigation areas are shown on Figure 3-10 and summarized by RU in Table 3-1. The phossy water results are discussed by RU in Section 4.

3.1.5.8 Phossy Water and Precipitator Solids in Soil SIAs

The *RI Update Memo* determined that confirmation sampling of the IWW dredged sediments and material remaining in the pond and ditch was needed. The extent of constituents associated with phossy water and precipitator solids in RU 10 was not adequately characterized during the EMF RI for purposes of evaluating potential exposures after the FMC process facility shutdown. The sediments within the pond and ditch as well as dredged sediments at their edge may contain minor levels of P4 from inadvertent discharges of phossy water and minor amounts of precipitator/phossy solids to the IWW system from the furnace building. Because these areas of RU 10 contained a mixture of phossy water wastes and precipitator solids, this investigation was separated from the "phossy water only" investigations conducted at RUs 3 and 6 discussed above.

The IWW pond and ditch specific investigation within RU 10, as shown on Figure 3-10, addressed two areas:

- RU 10 - The Industrial Wastewater Pond - RU 10 SIA1 - potential migration of phossy water and precipitator solids COPCs/ROPCs to pond sediments and shallow native soils

- RU 10 - The Industrial Wastewater Ditch - RU 10 SIA1 - potential migration of phossy water and precipitator solids COPCs/ROPCs to shallow native soils

The investigation of these areas at RU 10 is summarized in Table 3-1 and results discussed in Section 4.

3.1.5.9 Underground Piping, Sumps, and Other Structures SIA

The need to determine the potential for COPC/ROPC leakage (primarily elemental phosphorus, inorganics, and radionuclides) from underground piping, launders, sumps and other structures was identified during the data gaps evaluation in the *RI Update Memo*. The *SRI Work Plan* identified the RUs listed below (as shown on Figure 3-11 and summarized by RU in Table 3-1) as having a need for determining potential leakage from underground piping, sumps and other structures.

- RU 1 - Furnace Building, Phos Dock and Secondary Condenser - evaluate potential leaks between the surface and the capillary fringe from P4 sumps and phossy water piping

- RU 2 - Slag Pit - evaluate potential leaks between the surface and the capillary fringe from P4 sumps and phossy water piping

- RU 3 - Receiving Stores, Paint Shop, and P4 Decon – evaluate potential leaks to shallow soils from storm water piping

- RU 12 - Former RP & S Area and Mobile Shop - evaluate potential leaks to shallow soils from phossy water piping

- RU 13 - Pond 8S Recovery Process and Metal Scrap Preparation Area - evaluate potential leaks to shallow soils from phossy water piping

- RU 22b - Old Ponds - evaluate potential leaks to shallow soils from phossy water piping

- RU 24 - Plant Areas not within RU Boundaries - evaluate potential leaks to shallow soils from phossy water piping

During the SRI, these investigations were planned in a phased approach to evaluate potential leaks to shallow soils from underground piping, sumps, and structures. Phase one for the underground piping SIA was to identify and compile available information regarding remaining piping, sumps and structures (including the piping/sump/structure size), material of construction, and any process knowledge regarding the potential residual process materials (and thus COPCs/ROPCs) that may be remaining in the pipes/ sumps/ structures. The findings of phase one presented in this SRI report were based upon review of existing drawings, construction records, aerial maps/photos, and interviews with former plant personnel knowledgeable about the plant process and site.

The need to collect additional Phase 2 data concerning underground pipes/ sumps/ structures was based on the outcome of all other data collection activities conducted during the SRI, i.e., whether the RU remained designated as NFA or proceeded to the SFS because it required remediation for other reasons. As presented in Section 4, all of the RUs will proceed to the SFS and thus a Phase 2 investigation was not required to complete the SRI.

It was also determined during the SRI that underground piping, sumps, and structures extended beyond those RUs listed above. The inventory is therefore site-wide to capture all underground piping, sumps and structures deemed necessary to support SFS decisions.

3.1.5.10 Pond Closure Decant Treatment (PCDT) Roadway SIA

The application of PCDT-treated water to FMC Plant Site road segments for dust suppression was identified as a data gap. This investigation included plant roads within RU 23 and also applied to road segments within the boundaries of other RUs. In order to evaluate whether

PCDT water had been applied to slag roadways, the study was designed to evaluate roadways with and without PCDT water application as discussed below.

- PCDT water for road dust suppression was most heavily applied on a slag road within RU 20 starting at the water treatment facility and running north and then west toward RU 20. Therefore, evaluation of a road segment in RU 20 represented a worst case scenario (i.e., road with the greatest application of water treated at PCDT).

- Dust suppression water was never applied to many road segments within the plant, including the slag haul road running north-south in the center of RU 19. Therefore, a road segment in RU 19 was considered a reference area (i.e., a slag covered road with no PCDT water application).

Instead of discussing PCDT water application on road segments within individual RUs in Section 4, the PCDT Roadway SIA is presented as a specific study (not within a specific RU) in Section 4. The PCDT Roadway SIA also is discussed in the "Other Studies" section at the end of Table 3-1.

3.1.5.10.1 Radon Flux Measurements SIAs

RUs with the greatest potential for radon flux exists are those with the highest levels of radium-226 in the source materials locations there (slag, ore, and phossy pond sediments) as reported in Table F-1 from the *RI Update Memo*. The RUs where radon flux emission rates were measured consisted of the following:

- RU 19 - Slag Pile - evaluate radon emission rates from the uncovered slag pile

- Test Cap Soil Cover - evaluate radon emission rates if the slag pile is above the defined levels

- RU 19 – evaluate radon emission rates from the uncovered Bullrock Pile

- RU 22b – evaluate radon emission rates from the uncovered Old Phossy Ponds

- RU 7 – evaluate radon emission rates from the Shale Unload, Crushing and Stockpile Area

Determination of the radon flux for various materials in the RUs listed above will assist with the evaluation of remedial alternatives in the SFS. These flux rates likely will be relevant to the design of caps/covers for these areas to meet the UMTRCA guidelines for radon in the event these guidelines are identified as an ARAR in the SFS. In addition, these data will be used to evaluate the potential for radon flux to be a concern within other RUs that contain residual fill material. These radon flux investigation areas are shown on Figure 3-12 and summarized by RU in Table 3-1. The radon flux results also are discussed by RU in Section 4.

3.1.5.11 PIC Measurement SIAs

The Western Undeveloped Area (WUA) is located on the far western portion and the Southern Undeveloped Area (SUA) is located on the far southern portion of the FMC Plant Site. Both of these undeveloped areas are "undisturbed" in that they were never used as operational process areas, for raw material or waste storage/accumulation, or as traffic ways. The only potential impact from EMF site operations would have been from deposition of FMC and Simplot air emissions. There also are areas in the WUA that were used as a cap cover borrow source during construction of the RCRA pond caps in, which concluded in 2005.

Measurements of the gamma dose rate to evaluate the potential impacts from air emission were performed during the SRI in the following areas:

- Southern Undeveloped Area on FMC property
- Western Undeveloped Area on FMC property

The gamma dose rate investigations in these two areas are described in the "Other Studies" section of Table 3-1 and the results are discussed in Section 4.

Additionally, PIC measurements were collected at a depth of approximately 5 feet bgs in slag and ore, the plant materials associated with the highest level of gamma exposure due to their high radium-226 content. These data are used to evaluate if worst-case exposures exceed the gamma dose CV for construction or utility workers. These data are incorporated into the Supplemental HHRA, the results of which are discussed on an RU-specific basis in Section 4.

3.1.5.12 P4 Capillary Fringe SIA

During the SRI, P4 was encountered in soil collected at the capillary fringe above shallow groundwater (at approximately 80 feet bgs) in the borings that were drilled to define the potential cap boundaries proposed for RU 1. Additional borings were necessary to define the approximate horizontal extent of P4 in the soils at the capillary fringe. This additional investigation is summarized in Table 3-1 and the findings are discussed in Section 4.

3.1.6 Fill Characterization Study

Based on discussions with EPA during the SRI field work in August 2007, an additional investigation was undertaken to characterize specific FMC Plant Site fill materials. Specifically, this investigation was performed per EPA's recommendations and approval to address the Agency's concern that historical data characterizing the composition of fill and source materials across the FMC Plant Site were insufficient to bound potential risks to future workers. The additional samples consisted of specific materials that were historically managed at the plant, including both source materials (e.g., phosphate ore) and waste streams (e.g., precipitator solids). The objective of the fill characterization study was to collect samples of the following materials:

- Phosphate ore
- Precipitator solids

- Phossy solids
- Calciner solids
- Kiln solids

The analytical data resulting from this sampling will be used, in conjunction with existing information, to perform a Supplemental HHRA to bound potential risks to future workers from exposure to residual fill materials at the FMC Plant Site.

A work plan addendum for this field effort was submitted to EPA for approval, as discussed in Section 3.5. The fill characterization investigations are summarized in the "Other Studies" section of Table 3-1. The results that are pertinent to the Supplemental HHRA are discussed in Section 4.

3.2 SAMPLE TYPES AND DESIGNATIONS

3.2.1 Environmental Samples

SRI sampling was conducted at the FMC Plant Site targeting data gaps at specific RUs. Table 3-3 and summarizes all the environmental samples collected and analyzed during the SRI field programs at each RU. The table summarizes the field programs conducted at each RU, their designations, sample depth, date of sample collection, sample type (primary or colocated), and analytes.

As described in Section 3 of the *SRI Work Plan* and Section 5.1 of the *SRI FSP*, a coding system was used during sampling to uniquely identify each sample collected. This system, or sample designation, allows for quick and accurate data retrieval and the tracking of all samples collected during the SRI. The sample designations were recorded on the label attached to each sample, in the field logbook, on the chain-of-custody forms, and on soil boring tracking sheets, where applicable.

Two types of samples were collected during the SRI field program: discrete samples and composite samples. These were collected and designated as discussed below.

Discrete Soil Samples. Designations for discrete samples collected during the SRI are comprised of four parts as described below.

- Part 1 corresponds to the Remediation Unit RU followed by the number of the RU, or corresponds to a particular SRI program when it was conducted at several RUs. For example, "***RU 20***" is used for samples collected at RU 20 and a "***PRECIP***" sample designation is used for precipitator solids roadway study that was conducted throughout several RUs.

- Part 2 corresponds to the type of investigation within the RU. Investigation types included SFS, SIA and Cap Delineation (CAP) investigations. Those RUs with one SIA were reported as SIA1. For RUs with multiple SIAs, the SIA is followed by a

designated number. For example, an SIA investigation in Area 2 at RU 20 was referred to as "RU20-***SIA2***".

- Part 3 of the sample designation is the acronym that identifies the sample type. Sample types include: Surface Soil (SS), Soil Boring (SB), and Test Pit (TP). The acronym follows the type of investigation in the sample designation. For example, in RU20, SIA2 and soil boring number 004, it was referred to as "RU20-SIA2-***SB004***".

- Part 4 of the sample designation identifies the depth interval from which the sample was collected. Soil samples were collected either on multi-foot intervals or from discrete depths. For example a discrete soil sample collected in RU 20, SIA2, SB004 and at a depth of 2 feet bgs was reported as "RU20-SIA2-SB004 ***(2')***".

Composite Soil Samples. Composite samples were designated similarly to the discrete samples discussed above. Composite samples have individual soil boring designations and samples were recorded sequentially at each RU. The composite sample designation includes the RU from which it came (RU 20), investigation program (SFS), the sample type (SB) followed by the acronym "C" for composite, and finally the depth interval where the individual samples were collected. For example, the fourth composite comprised of five borings for an SFS sample collected at RU 20 is designated "RU20-SFS-SBC004 (0-2 ft bns)".

3.2.2 Quality Assurance/Quality Control (QA/QC) Samples

QA/QC samples were collected for source-water (SW), equipment rinseate (ER) blanks, trip blanks (TB), blind replicate or colocated samples, and matrix spike/matrix spike duplicate (MS/MSD) samples. These QA/QC samples, with the exception of the colocated and MS/MSD samples, were given a sequential number that corresponded to the number of samples collected. Field QA/QC sampling procedures are discussed in Section 3.3.7 of this report.

In order to collect blind replicate samples, another boring or "co-located boring" was installed within approximately two feet of the original boring. Blind replicate or colocated soil samples had unique sample and boring designation. Colocated or blind replicate samples were given a "200-series" soil boring number that included the RU where the sample was collected, investigation type, sample type and sample depth. For example, the 20th boring in RU 20 is labeled SB020. The colocated boring at this location is SB220. An original environmental sample collected from 4 feet bgs in SB 20 would be designated RU20-SIA1-SB020 (4'). The corresponding blind replicate sample collected in the colocated boring would be designated "RU20-SIA1-SB220 (4')".

MS/MSD samples were collected at selected sampling locations for laboratory QA/QC. Samples collected for matrix spike/matrix spike duplicate analyses included "MS/MSD" following the sample identification. For example, an MS/MSD sample collected from RU 20, SIA2, SB004, from 2 feet bgs would have been recorded as "RU20-SIA1-SB004 (2') MS/MSD".

3.3 FIELD EQUIPMENT AND PROCEDURES

Field equipment and procedures used during the SRI are listed below and described in the following subsections:

- Section 3.3.1 - Field Documentation
- Section 3.3.2 - Surface Soil Sampling
- Section 3.3.3 - Subsurface Soil Sampling including Drilling and Trenching/Test Pit Excavation
- Section 3.3.4 - Soil Sample Types, Equipment, and Collection Procedures
- Section 3.3.5 - QA/QC Samples – Types, Equipment, and Procedures
- Section 3.3.6 - Sample Handling, Chain-of-Custody, and Shipping
- Section 3.3.7 - Equipment Decontamination
- Section 3.3.8 - Investigation-Derived Waste (IDW)
- Section 3.3.9 - Radiological Investigations - Equipment and Procedures
- Section 3.3.10 - Land Surveying

Field procedures followed during this SRI are described in the *SRI Work Plan*, in the *SRI FSP*, and in Section 3.3 below. Any deviations from the original scope of work are further described as part of field modifications in Section 3.4. The procedures used for evaluation of the analytical data are discussed in Section 3.5.

3.3.1 Field Documentation Procedures

Specific guidelines were followed and specific forms were used to collect and retain data during the SRI, as described in:

- Sections 5.0, 6.0, 7.0 and 8.0 of the *SRI FSP*
- Appendix C- Field Forms and B- Standard Operating Procedures of the *SRI FSP*
- Sections 1.6 and 3.0 of the *SRI Work Plan*

All field logbooks used were bound, ruled, and paginated. All entries in logbooks were completed in indelible ink. Corrections were made by drawing a line through the erroneous information and initialing the change. “White-out” or its equivalent was not used. Copies of the SRI field logbooks are located in Appendix C.

Field forms for the SRI were presented in Appendix C of the *SRI FSP* and included Soil Sample Log Form, Soil Boring Log Forms, Unified Soil Classification System, Trench Test Pit Log Form, and the GPS Benchmark Check Form. These forms were completed as appropriate during the SRI.

- Soil Sample Log Forms were completed in the field and were used to track VOC samples. Data on the Soil Sample Log Forms included RU number, Sample ID, sample depth, time, preservative, analyte, and vial weight. Copies of the completed Soil Sample Log Forms are in Appendix C.

- Soil Boring Log Forms were completed in the field for all subsurface investigations using hollow-stem auger drilling, percussion hammer drilling, and hand augers. Subsurface material including fill and native soil were logged by a qualified MWH geologist or engineer and samples were then collected and submitted for analyses. Copies of the completed Soil Borings Log Forms are presented in Appendix C.

- Unified Soil Classification System (USCS) Form was used as a guide for soil logging procedures primarily in native soil. The USCS provided definitions for soil descriptions, letter symbols, and divisions of soil types.

- Trenching and Test Pit Log Forms were completed in the field for all trenches or test pits excavated and sampled. Subsurface materials including fill and soil were logged by a qualified MWH geologist or engineer. Copies of the completed Trenching and Test Pit Log Forms are presented in Appendix C.

- GPS Benchmark Check Forms were completed in the field for each day that sample locations were located and marked. Copies of the completed GPS Benchmark Check Forms are presented in Appendix C.

3.3.2 Surface Soil Sampling Equipment and Procedures

Surface soil grab samples were collected at specific locations by carefully removing the top layer of soil or debris to the desired sample depth with a decontaminated spade, shovel, or equivalent. If compositing of the sample was required, samples were placed into clean containers, placed on ice and transported to the compositing area. Unless instructed otherwise by MWH, samples received by the laboratory were analyzed “as received.” There was a concerted effort to remove extraneous material (e.g., rocks, leaves, sticks) at the time of sample collection.

3.3.3 Subsurface Soil Sampling Equipment and Procedures

This section describes the equipment and procedures used to collect subsurface samples during the SRI. Four methods were used to collect subsurface soil samples during the SRI including 1) hollow-stem auger drilling, 2) percussion hammer drilling, 3) hand augering, and 4) trenches and test pits. Undisturbed samples were brought to the surface of each boring using split-spoon samplers in both hollow-stem auger and percussion hammer soil borings. Grab samples were collected during trench and test pit sampling. Hand auger sampling and some disturbed samples

were collected during auger and percussion hammer drilling where undisturbed samples could not be collected due to split-spoon refusal.

Logging of fill material was completed by describing the material type including grain size, moisture content, color and other observations such as odor or staining during the drilling of each soil boring. Native soil was logged following the guidelines of the Unified Soil Classification System (USCS) and other information was collected including: the Munsell® soil color, moisture content, density, plasticity and other information including odors, staining and bedding.

Soil Boring Logs and Trench Test Pit Logs are presented in Appendix C. Field logs were transcribed into Geosystems® and were minimally edited for clarity and consistency.

Several investigations were conducted without prior field reconnaissance and included sample/ boring locations that had been placed on a square grid cast on random origin. As a result, some sample locations were in areas that were not accessible to sampling equipment (e.g., foundations, underground utilities, overhead power lines, etc.). When an original sample location was not accessible, the location was moved by randomly selecting a direction (north, south, east, or west) and moving approximately two to five feet in that direction. This process was repeated until the new sample/boring location was accessible.

3.3.3.1 Auger Drilling

Hollow-stem auger (HSA) drilling is described in Section 4.2.1 and SOP-10 (Appendix B) of the *SRI FSP*. HSA drilling was completed in RUs 1 through 13, 16, 20, 22b, 22c, 23, and 24. HSA drilling was completed for both shallow soil borings (less than 20 feet bgs) and for deeper borings that were completed to groundwater (approximately 100 feet bgs).

All HSA drilling was completed using a truck-mounted CME 750 or equivalent-sized drill rigs owned and operated by the Layne Christensen Company from Salt Lake City, Utah. The hollow-stem augers used for this investigation were 4.25-inch inner diameter (ID) with an 8-inch outer diameter (OD) in five-foot lengths per auger flight. Undisturbed samples were collected using split-spoon samplers during the drilling. The split-spoon sampler was 2-inch in diameter and 2 feet in length. At the required sample depth, the split-spoon sampler was driven 2 feet into the undisturbed soil using a calibrated 140-pound (lb) hydraulic driven hammer falling 30 inches during each blow. Blow counts were recorded for each of the four, 6-inch intervals and recorded on the field log sheet. Split-spoon samplers were decontaminated initially and prior to reuse as discussed in Section 3.3.10.

Soil penetrated by the augers was brought to the ground surface as soil cuttings by the rotating augers. Grab samples from the soil cuttings were used for geological logging purposes where split-spoon samples were not collected. In rare situations, soil cuttings were used to collect an analytical sample when split-spoon refusal was encountered.

If refusal was met before the targeted sampling depths was achieved, the borehole was backfilled and relocated within a five-foot radius of the original sampling location. In borings where there was refusal, a maximum of two attempts were made to install a successful boring. These replacement borings were located randomly between two and five feet from the original boring as described above. Sampling refusal was generally accepted if more than 50 blows were

required to advance the sampler 6 inches or if the sampler was bouncing on a large rock and there was no evidence of penetration by the split-spoon. If samples were successfully collected at shallower depths prior to refusal, these samples were retained from the original boring.

3.3.3.2 Percussion Hammer Drilling

Percussion hammer drilling is described in Section 4.2.2 and SOP-10 (Appendix B) of the *SRI FSP*. Percussion hammer drilling was completed in RUs 1, 15, and 16. The percussion hammer drill was used at locations where samples were to be collected from depths not easily attained by auger drilling, in coarse-grained sediments with gravel and cobbles, in weathered bedrock, and at soil boring locations intended to be completed to the groundwater table (i.e., deeper locations). The boreholes were abandoned in some drilling locations where there was refusal because of non-weathered bedrock (volcanic bedrock) or if the material was too large to penetrate (boulders or larger). Borings that had refusal in RUs 15 and 16 were not re-drilled, consistent with the *SRI Work Plan* Section 2.1.13 guidelines. Borings with refusal because large material was encountered during the RU 1 SIA1 were moved to a new location as described above and re-drilled.

Percussion hammer drilling was completed using a truck mounted AP-1000 drill rig equipped with a diesel driven percussion hammer owned and operated by the Layne Christensen Company from Salt Lake City, Utah. The percussion hammer rig drives dual walled drill pipes into the subsurface without rotating the drill pipe. The soil cuttings were evacuated to the surface through the center of the dual walled drill pipe by compressed air. The drill pipe used for the SRI investigations had an ID of 4.25 inches and OD of about 9 inches and a length of 10 feet. The lead drill bit had an OD of approximately 10 inches.

Undisturbed samples for chemical, geotechnical, and geologic logging were collected using split-spoon samplers during percussion hammer drilling. The split-spoon sampler was 2-inch diameter and 2 feet in length. To collect an undisturbed sample during percussion hammer drilling, the split-spoon was lowered through the inside of the drill pipe on a wire line. At the designated depth for sample collection, the split-spoon sampler was driven 2 feet into the undisturbed soil in front of the drill bit using a calibrated 140-lb hammer falling 30 inches during each blow. Blow counts were recorded for each of the four, 6-inch intervals and recorded on the field log sheet. Split-spoon samplers were decontaminated initially and prior to reuse as discussed in Section 3.3.8.

Soil cuttings were brought to the surface through the inner drill pipe, and were discharged from the drill pipe through a hose and finally through a cyclone mounted on the side of the drill rig. Grab samples of the soil cuttings were used for geological logging purposes and rarely as environmental samples in very dense soil or bedrock where the spilt-spoon sampler could not penetrate these materials.

Geotechnical samples were collected only during RU 1 SIA1 sampling using four 6-inch brass liners (or sleeves) stacked inside the 2-foot split-spoon sampler. The split-spoon sampler with brass liners was installed, and then was driven in the same manner as the split-spoon sampler without liners discussed above. After the 2-foot sampler was retrieved from the soil boring and opened, the ends of each brass liner were capped and sealed. Then, the outside of the brass liner

was cleaned and labeled indicating all of the appropriate sample information including the top and bottom of the brass sleeve. After attaching the labels, the brass liners were placed in sealed Ziplock bags for storage prior to their submittal for geotechnical analyses.

3.3.3.3 Hand Augering

A hand auger was used in areas that could not be accessed by conventional drilling equipment or at surface or near surface sampling locations as described in Section 4.2.6.4 of the *SRI SFP*. A hand auger was used to collect samples from shallow soil samples generally less than two feet deep for chemical analyses. A hand auger was used to collect soil samples in combination with shallow excavated test pits in RU 7 inside the ore trenches, in RU 7 for the fill characterization activities, and in RU 10 at the southern end of the drainage ditch within the IWW pond.

Hand augers used during this the SRI had a stainless steal auger bucket 3 ¼ inches in diameter and 6 inches long. If refusal was encountered the location was moved as described in the introduction to this section (Section 3.3) and a new boring was attempted.

3.3.3.4 Borehole Abandonment

Below is a summary of borehole abandonment methods for both hollow-stem auger and percussion hammer drilling methods. Soil boring abandonment procedures are detailed in Section 4.2.4 and SOP-10 (Appendix B) of the *SRI FSP*.

Abandonment was completed either by placing the soil cuttings back down the soil boring or with hydrated bentonite chips depending on the purpose of the soil boring as described below. Abandonment methods were recorded on the Soil Boring Logs located in Appendix C in this report.

For borings intended to be less than 10 feet bgs or borings to native soil (approximately 10 to 20 feet bgs), boreholes were abandoned using the soil cuttings from the soil boring placed back in the soil boring in the approximately the same order as they were removed. If there was excess soil from the boring, it was spread on the surface adjacent to the boring.

For deeper borings, for example those drilled to the soil-groundwater interface, the boreholes were abandoned with hydrated bentonite chips, even if groundwater was not encountered. Bentonite chips were placed into the borehole through the hollow-stem augers or percussion hammer drill pipe. As the hollow-stem augers or percussion drill pipes were extracted from the soil boring, facility water and additional bentonite chips were added until all of the augers or drill pipe were removed from the borehole. In borings where the bentonite was added to the ground surface, the boring was checked for settlement after all of the hollow-stem augers or drill pipe had been removed. If settlement occurred, additional bentonite was added to the soil boring until no further settlement was observed. Soils and fill materials from these borings were uniformly spread on the ground adjacent to the soil boring.

For soil borings drilled through surface asphalt, an asphalt patch was used to restore the asphalt surface after the soil boring had been completed and the augers or drill pipe removed. Borings were checked for settlement and additional asphalt was added, if necessary.

3.3.3.5 Trenches and Test Pits

Trenches and test pits were used for soil sampling or fill characterization in RUs 7, 10, 22b, and 22c. PIC measurements were collected inside test pits at 10 locations in RUs 7, 11, 12, and 19. Five of the PIC test pit locations were located within ore. Another five were located in slag. Equipment and procedures for trenches and test pit excavations are described in Section 4.2.5 and SOP-11 of the *SRI FSP*.

The trenches and test pits for sampling and collecting PIC measurements were completed using a motorized rubber tired backhoe operated by qualified Kase Warbonnet personnel. The trenches and test pits primarily were completed in areas of the site that were not accessible by the drilling equipment. At these locations, subsurface soil samples were collected within test pits or trenches. If the depth to the 0-to-2-foot bns sample was less than three ft bgs, soil samples were extracted by using a hand auger within the test pit as described in the Section 3.3.3.3. At depths greater than 3 feet, multi-increment composite samples were collected directly from the backhoe bucket (e.g., fill characterization at F056B). In some instances, such as the cap delineation investigation in RU 22c, test pits were used to visually identify material and a boring adjacent to the test pits was used to collect a native soil sample. Grab soil samples also were collected from the backhoe bucket. After sampling and logging had been completed, the excavation was backfilled with soil from the excavation. Soil was replaced in roughly the sequence that it had been removed with any of the upper fill material placed last (i.e., on top). Excavated soil was replaced in one to two-foot lifts and each lift was compacted using the backhoe or excavator bucket.

3.3.4 Soil Sample Types, Equipment, and Collection Procedures

The equipment and procedures that were used to collect surface and subsurface soil samples during the SRI are discussed in this section. In many cases, the equipment and/or procedures were unique for the analytes being collected as discussed below.

3.3.4.1 Surface Soil Sampling (PCBs, Fill Characterization, and Coke)

Surface soil samples were homogenized in the field prior placing the soil in sampling containers for shipment to the laboratory. The samples were placed into new, appropriately sized sample jars provided by the laboratory. Surface soil sampling was performed in RU 12 for PCBs sampling, in RU 20 for collection of coke samples for TCLP analysis, and in RUs 16 and 22b for fill characterization activities.

During collection of PCB and fill characterization samples, soil from surface samples was placed into a stainless steel bowl and thoroughly mixed. The samples were placed in an appropriately sized sample container. If more than one sample container was required, a scoop of soil was alternately placed in the appropriate container until the jar was filled appropriately.

The coke sediments in the three settling basins of RU 20 were sampled for TCLP analysis in accordance with EPA guidance for sampling storage bins, roll-off boxes, or collection hoppers (USEPA, 2002b). Each settling basin was divided into four approximately equal sections. One sample location was then randomly selected within each quadrant of the sediment basin. A decontaminated shovel was used at each sample location to scoop through the sediments in the

coke settling basins. The coke sediments ranged in thickness from a few inches to approximately two feet. Coke sediments were collected with a shovel from the surface to the base of the concrete basins and were placed Ziplok bags. One vertical composite aliquot was generated from each of the four quadrants. The four aliquots were placed into a 5-gallon bucket and subsampled according to methods used for metals, fluoride, and radionuclide described below.

The surface soil samples from the former coke unloading and storage area were multi-increment composites collected from 0-to-6 inches bgs. A total of 20 increments made up the composite sample. The 20 increments were placed into Ziplok container and subsampled according to methods used for metals, fluoride, and radionuclide described below. One composite sample was generated from each of the three areas of the coke settling basins, and one composite sample was collected from the coke storage area. These samples were sent to the laboratory for analysis of TCLP metals and SVOCs.

3.3.4.2 Volatile and Semi-Volatile Organic Compound Sampling

Samples for VOC analysis (fuels and solvents) were collected immediately upon retrieval of the split-spoon sample interval, in accordance with U.S. EPA Method 5035A and Section 3.2.5 of the *SRI Work Plan* and SOP-13 of the *SRI FSP*.

Prior to collecting SRI samples for analysis, it was determined in the field that some sample material contained carbonate minerals (likely from natural sources) and effervesced upon contact with the sodium bicarbonate preservative solution in the laboratory-supplied sample vial. While the amount of off-gas generated by the effervescence was minor, a decision was made that any loss of volatiles through effervescence would compromise the samples' integrity. As a result, the designated laboratory provided vials filled with a pre-measured amount of methanol and deionized water (replacing sodium bicarbonate) for the SRI.

Using an approved disposable TerraCore® sample collection device, approximately 5 grams (g) per sample were collected and placed in each of the three sample vials provided by the laboratory, which contained a preservative solution of either methanol or deionized water. The weights of the sample vials were measured on a calibrated balance scale both prior to and after adding the soil sample to the vial. These weights of the sample vials were recorded and were used to determine the exact amount of soil sampled collected by the TerraCore® sampler. The sample vials' weight, both empty and filled, were recorded to the nearest 0.01g. The soil samples were immediately placed in a cooler with ice and stored at 4°C for transport to a laboratory. Sampling information was recorded as shown on the completed forms in Appendix C. The data analytical tables are located in Appendix D.

Samples for fuel SVOC and coke PAH analysis were collected by using TerraCore® samplers to collect approximately 10g of sample. The samples were placed in two laboratory-provided unpreserved sample vials. This method was used so that the laboratory did not have to subsample or handle the sample upon arrival at the laboratory.

3.3.4.3 Metals, Fluoride, and Radionuclides

During the SRI, shallow subsurface soil samples for metals, fluoride and radionuclides were collected using various sampling equipment and methods including a split-spoon sampler, hand

auger and, in some cases, grab samples, as described below. Hand augers were used to collect soil samples in locations that were not accessible to conventional drilling equipment or at near surface sampling locations (generally two feet deep or less). After retrieving the six-inch long auger bucket to the surface, the sample was removed and placed in a Ziplok container. Hand auger soil samples then were collected for metals, fluoride, and radionuclides analyses and were subsampled and composited as described below. The auger buckets, spoons, trowels, and bowls were decontaminated prior to reuse and stored in clean plastic bags. Equipment decontamination procedures are discussed in Section 3.3.7.

Grab samples were used to collect environmental samples for metals, fluoride, and radionuclides where the spilt-spoon sampler could not penetrate very dense soil or bedrock. The soil sample was retrieved using a stainless steel scoop to collect soil cuttings from the top of the auger string at the ground surface or from the cyclone of the percussion hammer. After samples were retrieved, they were logged, placed in a clean container (Ziplok bag), labeled, and hand-delivered to the on-site sample preparation area for subsampling as described below. Grab and split-spoons samples collected from RUs 15 and 16 were not composited or subsampled.

Subsampling and Compositing. This section describes subsampling and compositing methods used during the SRI for collection of metals, fluoride, and radionuclides samples. Subsampling is the incremental splitting or reducing of the sample size using the modified bed blending/ Japanese slab cake method. Compositing is the combining of two or more samples that are thoroughly mixed together and then subsampled. Representative subsamples were collected as described in detail in SOP-16, subparts -16A, -16B, and/or 16C of the *SRI FSP*.

After a soil sample was brought to the surface, the sample was measured, logged, placed in a clean container (Ziplok bag) and labeled. During breaks in the drilling or as the subsampling and compositing team became available; the samples were hand-delivered to the on-site sample preparation and compositing area. As described in SOP-16A of the *SRI FSP*, subsampling and compositing of samples required certain techniques in order to obtain a representative sample. The subsampling method described in SOP-16A was used. The method consisted of the following steps:

1) Native colluvial and alluvial soil were sieved with a #4 (4.75 mm/ 0.187 inch) decontaminated mesh sieve to remove large debris such as sticks, artifacts and rocks. Large soil clods or other soil aggregates that did not pass through the sieve were broken up to fit through the #4 mesh sieve. Samples of native soil consisting of fine-grained loess did not require sieving unless they contained rocks or other artifacts greater than approximately 0.25 inches.

2) Any remaining artifacts (e.g., roots, twigs, etc.) that passed through the #4 sieve were removed.

3) The mass of rocks and artifacts removed from the soil was measured and recorded. A description of removed material was recorded on soil sampling forms. The removed material was archived in a labeled container.

4) The sieved native soil material was transferred into a decontaminated stainless steel mixing bowl. Individual soil samples collected for composite samples were combined following sieving. Clods or other soil aggregates were broken up using a clean spatula or mixing spoon and the entire contents were then mixed thoroughly using the clean spatula or mixing spoon.

5) The mixed soils were spread on an inert surface of new butcher paper by slowly pouring the material while moving the sample container from left to right to form a rectangular pile. The entire sample was emptied onto the butcher paper in this manner.

6) A spatula or other tool was used to shape the pile into a four foot long rectangle with a uniform top surface.

7) A tape measure was placed along side of the rectangular soil and was used to determine a minimum of 20 equal-sized segments.

8) Cross-sectional cuts were made with a stainless steel rectangular scoop. The cuts were made perpendicular to the long side of the rectangle and at the center of each segment.

9) A minimum of 20 equal increments were collected by means of the rectangular scoop. The entire contents of each of the rectangular scoop were emptied back into the original mixing bowl to complete the subsampling.

10) The subsampled soil contents of the mixing bowl were again thoroughly mixed using the original spatula or mixing spoon.

11) The entire amount of mixed subsample was weighed and recorded, then transferred into a labeled and pre-cleaned sample container provided by the laboratory. If more than one sample container was required, alternate shoveling with a mixing spoon or spatula was used to fill the required containers. The containers were tightly sealed, placed into a cooler with ice to achieve a sample temperature of 4° C, and shipped to the laboratory for analysis of metals, fluoride, and radionuclides.

12) Shipping procedures are outlined in Section 3.3.6 of this report.

13) All equipment used during sampling including the work surface, mixing bowls, mixing spoons or spatulas was decontaminated. The butcher paper was removed from the sampling surface and properly disposed of. The decontamination procedure is described in Section 3.3.7 of this report.

Subsamples submitted to the laboratory were further processed (e.g., through particle size reduction and splitting) as appropriate to the analytical process, so that representative samples for analysis were obtained. The laboratories adhered to specific sample preparation SOPs for the subsampling. Subsampling methods for soils potentially containing elemental phosphorus are further described below.

3.3.4.4 Elemental Phosphorus Sampling

As described in SOP-16B and SOP-16C of the *SRI FSP*, the SIAs and cap delineation programs were based on collection of fill material and native soil samples over the 0-to-2-foot and the 2-to-10-foot bgs and bns intervals for P4, metals, fluoride, and radionuclides. Samples for the discrete 0-to-2-foot intervals were subsampled and submitted to the analytical laboratory. Multiple 2-foot split-spoon samples were used to create the 2-to-10-foot sample, with each being extracted by the analytical laboratory and the individual extracts were then analyzed.

After retrieving a soil sample, the field sampling team minimized disturbance to it and exposure to air. The field sampling team looked for evidence of burning or smoking, which would be indicative of the presence of P4. No sample observed to contain P4 was submitted for analysis. If P4 was not observed at the field drill site, the sample was left intact (as much as possible), placed in a labeled Ziplok bag, and initially purged with nitrogen to remove oxygen. The Ziplok bags were purged three times with nitrogen and tightly sealed in a manner to not to allow oxygen to enter the bag. Nitrogen gas was supplied through polyethylene tubing from a gas cylinder with a valve to regulate the flow of nitrogen into the bag. After purging, the Ziplok bags were placed in a cooler with ice so that the samples were not exposed to the elements such as heat and sunlight. The samples were transported to the on-site sample preparation and compositing area as soon as practical.

Procedures performed at the on-site sample preparation and compositing area were limited to subsampling for samples to be analyzed for P4 within a disposable glove-box with a nitrogen maintained environment.

The sample container was emptied into a single pile on a pre-weighed stainless steel bowl. Artifacts were carefully removed, weighed, and archived. Fractional shoveling was performed for the P4 subsampling following the guidelines and methods below.

1) In the mixing bowl, any clumps were broken up with a clean spatula.

2) The technician chose a scoop/spatula size that resulted in no less than 10 scoops per fraction and preferably 20 or more scoops per fraction. There were an equal number of scoops per fraction. If interrupted during the splitting process, the technician would leave the scoop in the last fraction to receive a scoop, so the technician could restart without introducing a bias.

3) One or more of the fractions was chosen randomly for the P4 subsample with a mass of 100 to 200 grams as the goal.

4) The randomly-chosen sample for P4 was placed in a plastic sample bag, and the excess headspace was removed by squeezing the bag shut and closing the Ziploc.

5) The Ziploc bag then was placed in a brown glass jar or an opaque plastic jar of a size chosen to minimize headspace. The sample was refrigerated until placed into a bagged-ice cooled cooler for shipment to the analytical laboratory.

The fractions not chosen for the P4 subsample served as the subsample for metals, fluoride and radionuclides and were placed in a labeled container for additional sample preparation as described in Section 3.3.4.3 above.

3.3.5 QA/QC Samples – Types, Equipment, and Procedures

Throughout the SRI field program, QA/QC samples including source water samples, equipment rinseate blanks, trip blanks and colocated samples (blind replicates) were collected as described below.

3.3.5.1 Source Water Samples

Source water at the facility was sampled before initiating field work for the SRI as described in Sections 3.3 and 6.2 of the *SRI FSP*. A potable water source and tap was selected at the FMC Plant Site to provide water for drilling, steam cleaning, equipment decontamination and hydrating bentonite. The facility source water was obtained from a designated outlet source and was transported to the point of use in clean portable water tanks. One source water sample per month was collected throughout the sampling program from the portable water tanks. Deionized and distilled water (DI water) was used to collect equipment rinseate blanks and for decontamination of small equipment. This water also was sampled monthly.

The source water samples (facility source water and DI water) were analyzed for VOCs, SVOCs, fluoride, P4, total metals, and radionuclides each month, as appropriate. These results are reported in Appendix E.

3.3.5.2 Equipment Rinseate Blanks

As described in Section 6.1 of the *SRI FSP*, equipment rinseate blanks were collected during soil sampling events. The equipment rinseate blanks were prepared in the field by passing DI water of known quality over the decontaminated equipment such as split-spoon samplers, mixing bowls, rectangular compositing scoops, and mixing spoons. After passing over the decontaminated equipment, the deionized water was collected in appropriately-sized laboratory provided containers.

Sampling information for the equipment rinseate blanks was recorded in the field log book and included the type of equipment sampled, the soil samples taken prior to and after the equipment rinseate was collected, and the date and sampling area. This sample identification procedure was used to associate the equipment rinseate samples with a specific team's field decontamination procedures on that day. Analytical results for the equipment rinseate blanks are reported in Appendix E.

3.3.5.3 Trip Blanks

As described in Section 6.3.1 of the *SRI FSP*, trip blanks were prepared and provided by a designated off-site laboratory. The trip blanks consisted of preserved 40-ml sample vials that were used when samples were analyzed for VOCs using EPA Method 8260B. Trip blanks were only necessary when soil samples for VOCs were being collected during the field program. When VOC samples were scheduled for collection, trip blanks were placed in

shipping coolers that were taken to the field along with the sample containers and were used to detect possible VOC contamination introduced during sample handling and shipment. The trip blanks were not opened in the field and were returned to the laboratory in every sample cooler containing samples to be analyzed for VOCs. The trip blanks were treated by the laboratory in exactly the same manner as the associated environmental sample. Analytical results for the trip blanks are reported in Appendix E.

3.3.5.4 Colocated or Blind Replicate Samples

As described in Section 6.4 of the *SRI FSP*, colocated (blind replicate) soil samples were collected at a frequency of one per ten investigative samples or one per SFS decision unit, whichever was more frequent. The colocated samples were obtained by drilling or digging down to the same depth adjacent to the original borehole (typically a distance of one to two feet from the original boring). Colocated samples during HSA drilling were required for sample intervals down to 10 ft bgs. This included the 0-to-2-foot bgs composite samples, the 0-to-2-foot bns composite samples, the 2-to-10-foot bgs composite samples, and the discrete samples for organics or metals between the surface and 10 feet bgs. Colocated samples collected during hammer drilling included sampling at 10-foot intervals to the total depth of the borehole.

3.3.6 Sample Handling, Chain-of-Custody, and Sample Shipping

Discrete, grab, composite, and QA/QC soil samples collected during the SRI were handled and shipped as discussed below.

3.3.6.1 Sample Handling

After collection, all samples were properly stored to prevent degradation of the sample prior to analysis in accordance with the specifications set forth in Table 3-4. This table is replicated from the *SRI Work Plan* and summarizes sample container type, preservative type, and holding time for specific parameters collected during this site investigation. Sample handling, as applicable, included adding the appropriate chemical preservative (liquid and gas phase) to the sample, storing the sample in a cool environment (4° C), and analyzing the sample within prescribed holding times. Data qualifier tables in the Data Validation Report in Appendix E present information for samples where holding times or temperature requirements were not met.

3.3.6.2 Chain-of-Custody

Each sample and/or measurement was properly documented to facilitate timely, accurate, and complete analysis of data. The documentation system was used to identify, track, and monitor each sample from the point of collection through final data reporting. The chain-of-custody forms were filled out in triplicate that included the original or first page followed by two copy pages. The original page was sent with the sample to the designated laboratory and the two copy pages were used for sample tracking and for reference. Chain-of-custody protocol was implemented and followed for all samples. A sample was considered to be in a person's custody if it was: 1) in a person's physical possession, 2) in view of the person after taking possession, or 3) secured by that person so that no one could tamper with it.

Chain-of-custody forms were used to ensure that the integrity of samples was maintained. Each form included the following information:

- Sample identification number
- Date of collection
- Time of collection
- Sample depth
- Analytical parameter
- Method of sample preservation
- Number of sample containers
- Shipping arrangements including airbill number and carrier
- Recipient laboratories
- Sampler's initials
- Signatures of parties relinquishing and receiving the sample at each transfer point

Whenever changes of custody took place, both parties signed and dated the chain-of-custody form, with the relinquishing person retaining a copy of the form. The party that accepted custody of the sample inspected the custody form and all accompanying documentation to ensure that the information was complete and accurate. Any discrepancies were noted on the chain-of-custody form.

3.3.6.3 Sample Packaging and Shipping

All samples were shipped to designated off-site laboratories for analysis by the overnight carrier Federal Express. Samples were packaged and shipped in accordance with applicable U.S. Department of Transportation regulations. Samples were sealed in the appropriate laboratory provided sampling container or containers. A signed custody seal was placed on the outside of the sample container on both the front and the back of the container lid. The samples were packed securely in an ice chest and samples were preserved in accordance with the specifications detailed in Table 3-4. For those samples requiring preservation at 4 °C, the samples were placed on ice in coolers in the field immediately after being placed in the appropriate sampling containers. Sufficient water ice (not "blue ice" or similar products) was utilized to cool the samples during shipment. Sufficient packing material was placed in each ice chest to minimize the potential for sample bottles to shift and become damaged or broken during shipment. If a drain plug was present on the shipping container, it was closed and sealed on the inside and outside with duct tape.

The originals of the analysis requests and chain-of-custody forms were sealed in a waterproof plastic bag and placed inside the shipping container prior to sealing the container. The cooler was taped shut using strapping tape over the hinges and custody seals were placed across the top and sides of the cooler lid. The custody seals ensured the integrity of each sample container and cooler from the time the sample was collected until it was opened by the laboratory. Two or more custody seals were signed, dated, and placed on the front and back of the sample cooler prior to transport. Clear tape was placed over the custody seals to prevent inadvertent damage during shipping.

Packaged samples were shipped to three different laboratories for analysis. Samples for organic analyses were shipped to Test America in Sacramento, California (i.e., VOCs, PAHS, and PCBs). Paragon Analytical in Fort Collins, Colorado and its parent company DataChem of Salt Lake City, Utah performed the inorganic analyses, including TCLP analyses. Samples for P4 analysis were purged with N_2 and shipped directly to DataChem analysis. All inorganic samples, except for P4, were shipped to Paragon for additional subsampling.

3.3.7 Equipment Decontamination

Sampling equipment including split-spoons, mixing bowls for compositing, mixing spoons, compositing scoops, hand augers and down hole drilling equipment including hollow-stem augers, drill bits and percussion hammer drill pipe was decontaminated prior to field activities and between uses as described below. The proper decontamination of sampling and drilling equipment is essential to prevent cross-contamination.

Sampling equipment such as split-spoons, mixing bowls, mixing spoons and compositing scoops that were used to collect and prepare samples were decontaminated between samples using a wash with a phosphate-free, laboratory grade detergent of Liqui-Nox®. Solutions were made in accordance with the manufacturer's guidelines, followed by a double rinse with potable source water.

Equipment such as HSA, drill bits and percussion hammer pipe was decontaminated using a high pressure washer capable of delivering water at a minimum temperature of 180 degrees Fahrenheit. Decontamination of this equipment was completed at a designated lined pad designed to collect all of the water and solid material generated during decontamination. Decontamination water and solid material generated during the steam cleaning process was handled as IDW according to Section 7.0 and SOP-7 of the *SRI FSP* as described in Section 3.3.8 below.

3.3.8 Investigation Derived Waste

The NCP, codified in 40 Code of Federal Regulations (CFR) Part 300, requires that IDW generated during a CERCLA site investigation be managed in compliance with all applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the urgency of the situation. As in most site investigations, IDW was generated during field investigation program conducted under the *SRI Work Plan*.

IDW generated during the SRI field activities included the following media and waste types:

Fluids	Solids
Decontamination fluids and wastewater	Soils and soil cuttings Decontamination solids Disposable equipment (i.e., Terracore samplers, sampling equipment, & other consumables) Spent personal protective equipment (PPE)

All the materials listed above were characterized as described in the subsections below to determine if they were hazardous wastes per 40 CFR § 262.11 for purposes of handling and disposal. IDW was managed and characterized following the guidance in Section 7.0 and SOP-7 of the *SRI FSP*.

3.3.8.1 Soil and Soil Cuttings

Soil and soil cuttings were characterized using existing information and best professional judgment. Soil and soil cuttings were kept within the AOC unit (i.e., RU) where they were generated, and were placed back into the pit, trench or borehole where they originated and in the general order in which they were removed. This ensured that there were no additional hazards created at the site and that site conditions remained essentially unchanged.

3.3.8.2 Decontamination Solids and Fluids

Fluids and solids generated at the decontamination pad were contained and characterized through the use of existing information, soil analytical results, fill TCLP analyses, and best professional judgment. Washwater fluids were segregated from solids to the extent practicable. Washwater and solids generated during decontamination were placed in containers (e.g., drums) prior to waste determination. Other decontamination solids such as cleaning utensils and PPE also were containerized while awaiting waste determination.

Decontamination solids IDW that were determined to be nonhazardous based on soil analytical results and process knowledge were disposed of in the FMC Plant Site landfill (RU 18). Liquid IDW determined to be nonhazardous was disposed of as nonhazardous waste on-site. Decontamination IDW (either liquid or solid) that was determined to be hazardous was managed per the procedures presented in SOP-7 of the *SRI FSP* and disposed at an off-site RCRA facility.

Four drums of decontamination water and one drum of solids were characterized as hazardous based on the solvent results in RUs 5 and 12. The drums were disposed at the US Ecology Idaho, Inc. facility in Grand View, Idaho. Additional details of this characterization are located in Appendix G.

3.3.8.3 Spent Sampling-Related Equipment and PPE

Spent and used sampling-related equipment and PPE were contained in drums and characterized through the use of existing information, soil analytical results, fill TCLP analyses, and best professional judgment. Spent sampling-related equipment and PPE IDW that were determined to be nonhazardous were disposed in the FMC Plant Site landfill (RU 18). Spent sampling-related equipment and PPE IDW that were determined to be hazardous were managed per the procedures presented in SOP-7 of the *SRI FSP* and disposed at an off-site RCRA facility.

One drum of spent sampling-related equipment (e.g., Terracore samplers, paper towels, etc) and PPE (i.e., gloves) was characterized as hazardous based on the solvent results in RUs 5 and 12. The sampling equipment and PPE were consolidated into a single drum along with the solids described in Section 3.3.8.2. The drum was disposed at the US Ecology Idaho, Inc. facility in Grand View, Idaho. Additional details of the characterization are located in Appendix G.

3.3.9 Radiological Investigations - Equipment and Procedures

For gamma radiation measurements, two methods were used during the SRI: 1) GPS-linked gamma-ray surveys using a NaI detector, and 2) gamma exposure rate measurements using a PIC. GPS-linked gamma surveys were conducted in RUs where there was a potential for no further action (NFA). PIC measurements were performed in the undeveloped areas to correlate the NaI gamma counts to a gamma exposure rate. In addition, radon flux measurements were collected in several RUs to evaluate radon emanation from different source materials. The equipment used and procedures followed for each of these radiological investigations are described below.

3.3.9.1 GPS-Linked Gamma Radiation Surface Scan

Two gamma-ray surveys were conducted at the FMC Site. The first was a gross, high energy gamma-ray survey performed at the RUs listed in Section 3.1.2 using a gamma detector without a lead collimator. The second was a gamma survey where a cylindrical lead collimator (shield) was placed over the detector so that the detector responded to gamma rays emitted directly beneath the detector. The collimated detector survey was performed over a 2.2-acre slag area that had been covered by native soil as a test plot for studying the effectiveness of the soil cover in attenuating gamma rays. The unshielded gamma radiation survey was performed in RUs having the potential for NFA as determined by previous studies.

Ludlum Model 44-10 high energy gamma detectors were carried or affixed to a project vehicle at a height of approximately 18 inches above the ground surface. Each of the detectors was coupled to a Ludlum Model 2221 ratemeter/scaler set in ratemeter mode and window “open.” Each detection system was coupled to a Trimble Pro-XRS GPS receiver and TSCe datalogger. Gamma count rates and associated x- and y-coordinates were recorded every 1 second. The survey was conducted at a transect spacing of 8 to 10 feet and a speed of approximately 3 feet per second.

The shielded survey was performed over the soil cover area in RU 19. The same detection system, GPS coupling, survey height, transect spacing and speed were used as the instruments were carried over the soil cover. Two concentrically-aligned cylindrical lead shields covered the

detector. The inner shield, 0.25-in thickness, was manufactured by Ludlum for the Model 44-10 detector. It covered the entire length of the detector. The inner shield was placed within another cylindrical shield, 0.5 inch thick and approximately 6 inches long.

Daily function checks of the radiation detection systems were performed in accordance with SOP-19 of the *SRI FSP* using an NIST-traceable cesium-137 source (Eberline S/N 4054-02). Function checks were performed at the beginning and end of the day at a project reference point in the FMC trailers, located approximately ¼ mile from the site entrance. One-minute integrated counts were recorded with the source at a fixed distance from the detector. One-minute background counts were also recorded and subtracted from the gross counts in counts per minute (cpm). Function check data and calibration sheets for each of the detection systems are included in the Radiological Characterization Report in Appendix F.

At the end of each day, the data were downloaded from the Trimble data loggers onto a laptop computer. The geopositional data were differentially corrected in GPS Pathfinder software using base station data maintained by Idaho State University in Pocatello. The differential correction attributes sub-meter accuracy to the geopositions obtained by the Trimble Pro-XRS GPS system. The data were downloaded into ArcGIS software for processing and display. Data from the gamma radiation surface scans are discussed by RU in Section 4.

3.3.9.2 PIC Measurements

Gamma-ray exposure rate measurements in µR/hr were performed in the field using a PIC manufactured by Reuter-Stokes. The measurements were collected at the SUA and WUA, and at 10 locations for subsurface measurements in fill and 21 locations for the comparison against the NaI detector. The correlation study is discussed below in Section 3.3.9.3. Above-ground measurements were collected with the base of the PIC detector approximately 1 meter above the ground surface.

Below-ground measurements were collected in trenches dug in areas characterized by thick slag and residual ore. The PICs were suspended from a beam placed over the center of the trench. The height of the PIC detector base varied from 1 and 1.5 meter from the trench bottom.

Integrated count data were recorded at each measurement location using a counting time of 20 minutes. The integrated mean, maximum, minimum, and standard deviation of the exposure rates for each location were recorded on a field form.

Function checks were conducted daily for each PIC detector, before and after use, under identical conditions that were used to establish the acceptable control limits discussed above. The two PICs were set at fixed locations, using ground markings near one of the FMC office trailers. A cesium-137 check source was placed in reproducible, consistent contact with the detector, using a marking on the PIC casing. Integrated background and source counts were recorded after a counting time of 20 minutes. Function check data are included in the Radiological Characterization Report in Appendix F. The PIC data for the western and southern undeveloped areas and subsurface fill locations are discussed in Section 4.

Gamma Count Rate-Exposure Rate Correlation. Both the sodium iodide detector and PIC instruments measure gamma radiation in air. The sodium iodide detector system measures the

rate that the detector interacts with gamma rays in cpm and has a higher sensitivity than the PIC, but is energy dependent. The PIC is a highly accurate ionization chamber for measuring exposure rate in µR/hr but requires a long count time.

The sodium iodide detector is more efficient than the PIC for use in large area surveys. By performing the large area gamma surveys with sodium iodide detectors, then developing a correlation between the two instruments, exposure rates derived from the sodium iodide measurements can be compared to the CV specified in the *SRI Work Plan*. The *SRI Work Plan* stated that areas exceeding the cpm level associated with the CV will be forwarded to the SFS. Areas not exceeding this cpm level were further evaluated with the PIC. The demarcation between the two areas was called the working action level (WAL) in the *SRI Work Plan*.

ERG field personnel collected 21 colocated static gamma counts and exposure rate measurements to develop the correlation between gamma counts and exposure rates. These locations are depicted on Figure 3-13. The locations were biased towards areas where gamma shine was not relatively high; that is, where gamma count rates remained relatively constant at 18 inches, 1 meter, and 2 meter above ground surface. In addition, locations were chosen where it was assumed that the range of the exposure rates would encompass the CV.

ERG employed two of the unshielded 2-inch by 2-inch sodium iodide detectors that were used in the initial gamma survey. The systems were assigned labels “C” and “D” for the correlation study. A 20-minute integrated count was taken at each of the 21 locations with the detector suspended on a tripod at 18 in. above the ground surface. Exposure rate measurements were then collected at a 1-meter height at each location, directly above the location where the sodium iodide detectors were held. Exposure rates were determined after 20-minute integrated counts. Duplicate gamma count and exposure rate measurements were collected at a frequency of 20 percent. These correlation data and evaluation of the WAL are included in Appendix F. The WAL that was equivalent to 21.3µR/hr CV was 18,500 cpm. This count rate is equal to the lower 95 percentile. The comparison of the gamma radiation surface scan data to the WAL of 18,500 cpm is discussed by RU in Section 4.

3.3.9.3 Radon Flux Measurements

Electret ion chambers were used to obtain a measure of radon emissions over the time of exposure. The electrets and ion chambers were manufactured and calibrated by Rad Elec, Inc. of Frederick, Maryland. Measurements were conducted using criteria defined in EPA Method 115, which requires 100 measurements for each identified region.

Radon flux measurements were taken on evenly spaced grids with a random origin for approximately 24 hours per location. The measurement locations were sited using the Trimble ProXRS GPS navigation system with a TSCe datalogger.

The electret ion chamber has two components: an electrically charged disk (the electret) and an air-filled collection chamber in which the electret is placed. Two types of electret ion chambers were employed at each location: the E-PERMTM H and E-PERMTM S chambers.

At each measurement location, the H and S chambers were installed adjacent to one another. The ground under each chamber was cleared of vegetation and rocks. The H chamber was

inserted a few centimeters into the ground. The chamber-ground interface was covered with sand when the ground resisted insertion of the chamber. The ground surface below the S chamber was covered with aluminum foil, to prevent the radon flux from entering the chamber.

The electret ion chambers were deployed over approximately 24-hour periods. After retrieval, the electret's voltages were read on an E-Perm SPER-1 electret reader. The reader was function checked before and after each use, using a set of two vendor-supplied reference electrets that were not deployed to the field. ERG's Radiologcial Characterization Report in Appendix F includes additional details regarding the radon flux measurements as well as the equations used to determine the radon flux. The radon flux results are discussed by RU in Section 4.

3.3.10 Land Survey

Prior to sample collection, the sample locations were determined from coordinates from a base map. These locations were surveyed with a GPS unit prior to sampling activities. A Trimble GEO Explorer GPS instrument was used to map the test pit, borehole, PIC and other sampling locations. The level of accuracy usually ranged between sub-foot and sub-meter. The accuracy of the GPS unit was documented based on field checks of surveyed benchmarks at the FMC Plant Site and recording the GPS coordinates. Completed benchmark check forms are located in Appendix C. All measurements were referenced to the State Plane Coordinate System, North American Datum 1983 and the North American Vertical Datum 1988.

3.4 DEVIATIONS FROM THE SRI WORK PLAN

Field modifications or deviations were changes that were identified by the field personnel and required a change to SOPs, approved methodologies, and routine procedures in order to perform and/or improve data collection. None of the deviations significantly changed or compromised any of the SRI objectives or conclusions. Field modifications were developed, proposed or implemented due to one or more of the following reasons:

- Unforeseen field conditions
- Health and safety of field personnel
- Efficiency of sample collection and analysis
- Equipment, methods or procedures that proved to be inappropriate, inadequate, or unworkable in the field

Field modifications were communicated in the following ways:

- Minor field modifications were communicated in the bi-weekly conference call with EPA and other agencies and in the monthly reports. Timely input from SRI personnel was addressed in the proposed and implemented field modifications.
- Significant field modifications were communicated as soon as possible via email to all SRI personnel. Timely input from SRI personnel was addressed in the proposed and implemented field modifications. Significant field modifications were also

communicated to EPA in the bi-weekly conference call and in the monthly reports. EPA personnel determined if formal approval of the significant field modifications was required.

Deviations from the *SRI Work Plan* were captured in Field Modifications or Field Change Requests (FCRs). These FCRs were reviewed and approved by EPA. There were 12 FCRs submitted to the EPA that were approved following discussions. These 12 approved FCRs are listed in Table 3-5 and are presented in detail in Appendix H.

3.5 EVALUATION OF ANALYTICAL DATA

3.5.1 Quality Assurance Program

Prior to starting the SRI field activities, a QA program was developed. The purpose of this program was to define the policy, organization, functional activities, and QA/QC protocols that would be used to meet the DQOs of the SRI. Descriptions of the DQOs and procedures associated with the field program, including sampling collection, sample custody, laboratory analysis, and QC and QA for the SRI are presented in the *SRI Work Plan*.

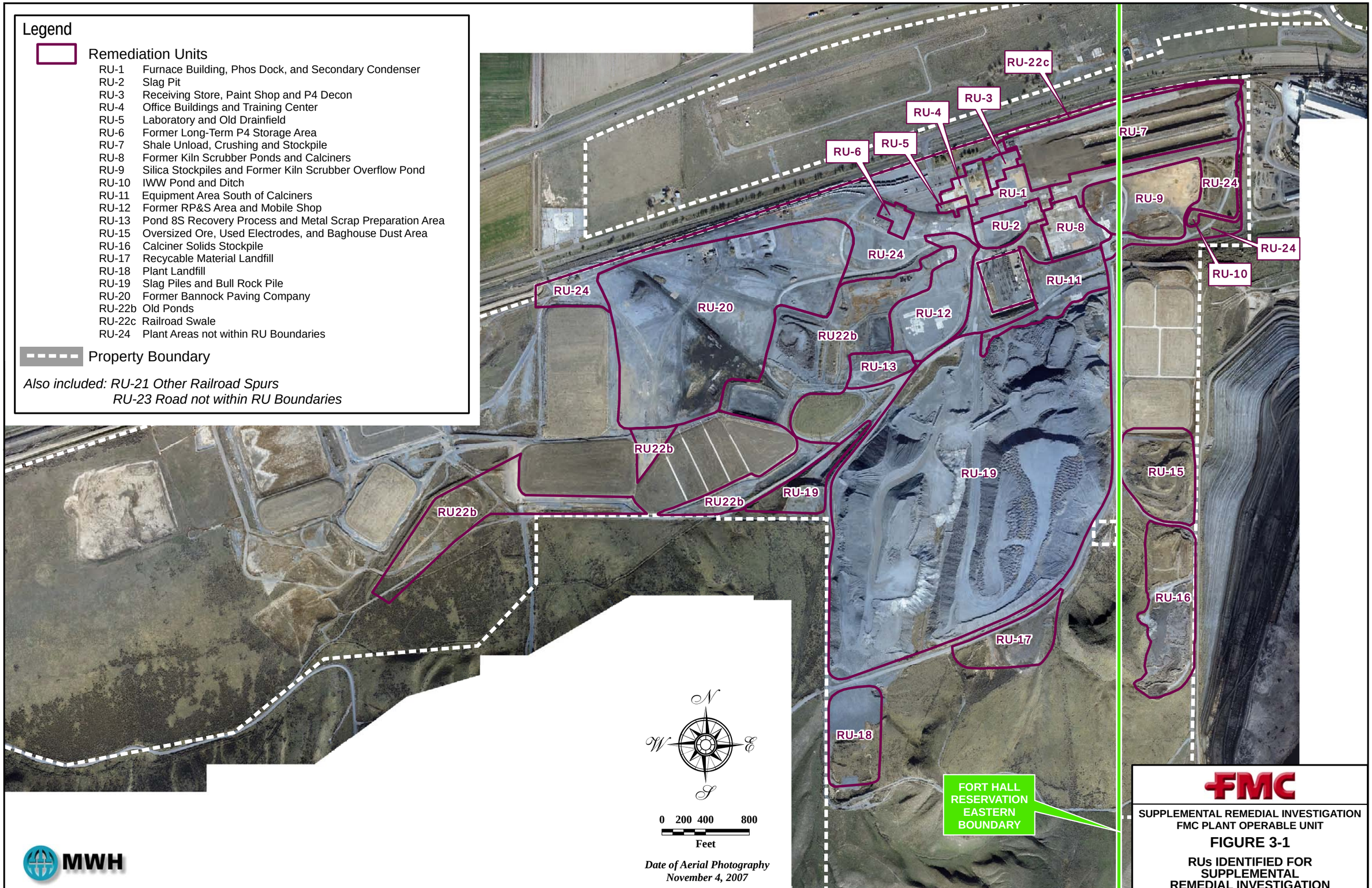
3.5.2 Selection of Analytical Methods

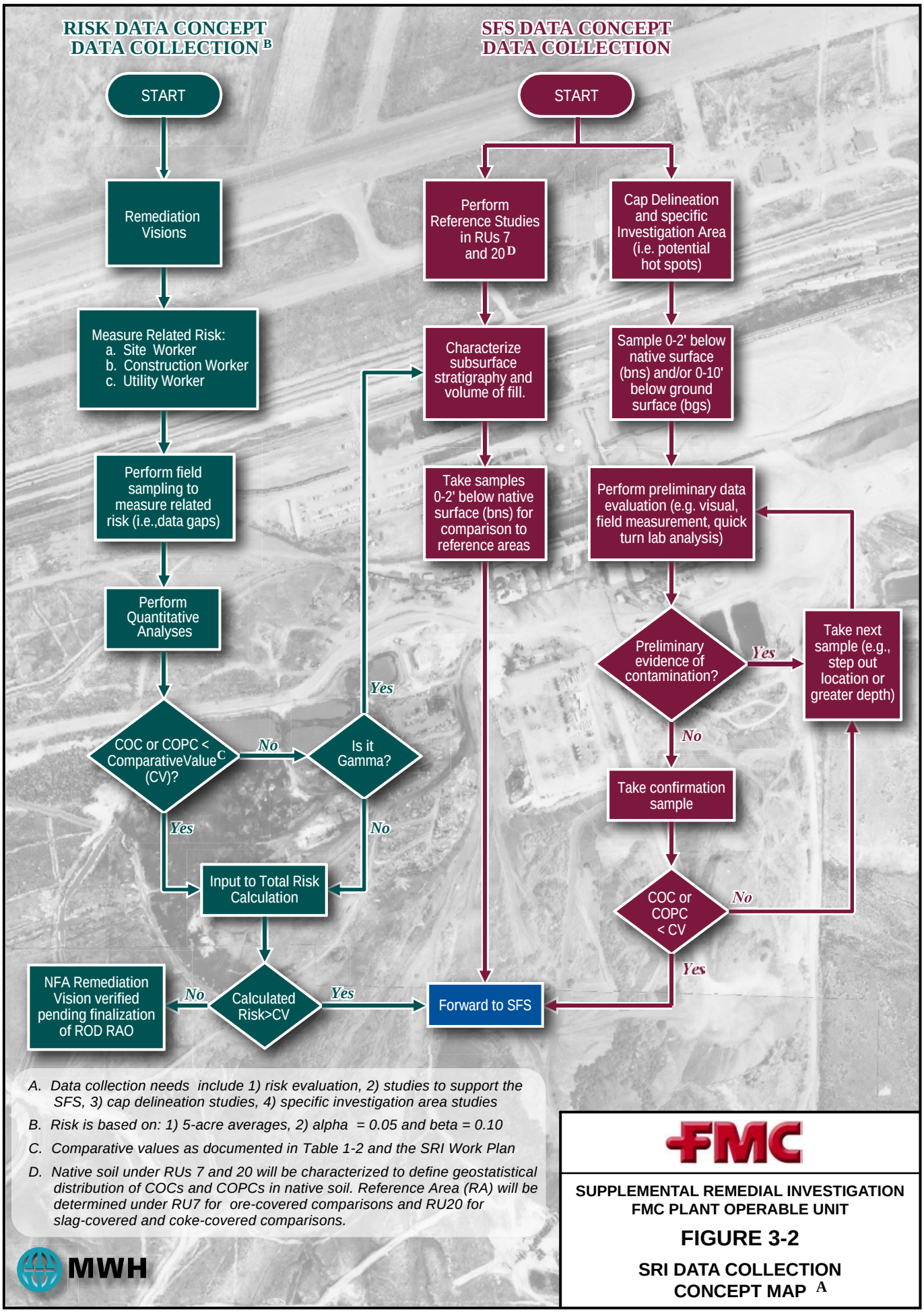
Laboratory analytical methods used during the SRI are summarized in Table 3-4. All analytical methods were performed in accordance with the *SRI Work Plan* and *FSP*. The method of analysis was selected based on the DQOs and, in particular, the achievement of analyses sensitive enough to evaluate data at the comparative values (e.g., SSLs). Test America (FKA STL) of Sacramento, California performed the VOC, PAH, and PCB analysis. Paragon Analytics of Fort Collins, Colorado performed the radionuclide and mercury analysis. DataChem of Salt Lake City, Utah performed the metals (with the exception of mercury), fluoride and P4 analysis.

3.5.3 Review of Analytical Data

The laboratories provided the analytical results as an electronic data deliverable (EDD) and in a hard-copy version to the validation company LDC. Upon receipt, all data were reviewed by a qualified chemist from LDC to determine if they were valid. During the data validation review, the chemist looked at each analyte that was detected to evaluate whether its presence in the sample was attributable to environmental conditions, or if it was an artifact from field or laboratory procedures. The initial data package from each laboratory for each analytical method was reviewed at Level IV. Once the laboratory had demonstrated the ability to produce a data package that met Level IV review criteria, the practice of performing a Level III review with 10-percent Level IV reviews was implemented. As a result, the review of SRI data from contract laboratories was generally at Level III and approximately 10 percent of the data generated were validated at Level IV.

All data qualifiers, as well as the reason for using the qualifier, are discussed in the Data Validation Report (Appendix E). Once the data were reviewed, validated, and qualified, they were downloaded by a computerized database into summary tables. The results of the data validation are summarized in the Data Validation Report provided in Appendix E.


Legend
Remediation Units
RU-1 Furnace Building, Phos Dock, and Secondary Condenser
RU-2 Slag Pit
RU-3 Receiving Store, Paint Shop and P4 Decon
RU-4 Office Buildings and Training Center
RU-5 Laboratory and Old Drainfield
RU-6 Former Long-Term P4 Storage Area
RU-7 Shale Unload, Crushing and Stockpile
RU-8 Former Kiln Scrubber Ponds and Calciners
RU-9 Silica Stockpiles and Former Kiln Scrubber Overflow Pond
RU-10 IWW Pond and Ditch
RU-11 Equipment Area South of Calciners
RU-12 Former RP&S Area and Mobile Shop
RU-13 Pond 8S Recovery Process and Metal Scrap Preparation Area
RU-15 Oversized Ore, Used Electrodes, and Baghouse Dust Area
RU-16 Calciner Solids Stockpile
RU-17 Recycable Material Landfill
RU-18 Plant Landfill
RU-19 Slag Piles and Bull Rock Pile
RU-20 Former Bannock Paving Company
RU-22b Old Ponds
RU-22c Railroad Swale
RU-24 Plant Areas not within RU Boundaries
Property Boundary
Also included: RU-21 Other Railroad Spurs
RU-23 Road not within RU Boundaries
RU-22c
RU-3
RU-4
RU-5
RU-6
RU-7
RU-1
RU-2
RU-8
RU-9
RU-24
RU-11
RU-10
RU-20
RU-12
RU22b
RU-13
RU-19
RU-15
RU-16
RU-17
RU-18
FORT HALL RESERVATION EASTERN BOUNDARY
N
W
E
S
0 200 400 800
Feet
Date of Aerial Photography
November 4, 2007
MWH
FMC
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT
FIGURE 3-1
RUs IDENTIFIED FOR SUPPLEMENTAL REMEDIAL INVESTIGATION
FILE Fig 3-01 RUs Ident Supp Rem Invest_508.mxd 5/16/08



A. Data collection needs include 1) risk evaluation, 2) studies to support the SFS, 3) cap delineation studies, 4) specific investigation area studies

B. Risk is based on: 1) 5-acre averages, 2) alpha = 0.05 and beta = 0.10

C. Comparative values as documented in Table 1-2 and the SRI Work Plan

D. Native soil under RUs 7 and 20 will be characterized to define geostatistical distribution of COCs and COPCs in native soil. Reference Area (RA) will be determined under RU7 for ore-covered comparisons and RU20 for slag-covered and coke-covered comparisons.

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FIGURE 3-2

SRI DATA COLLECTION CONCEPT MAP A

FILE Fig 3-02 SRI Data Collection Concept_308.ai 3/27/07

FILE *Fig 3-03 Risk Exposure_308.mxd 3/27/08*

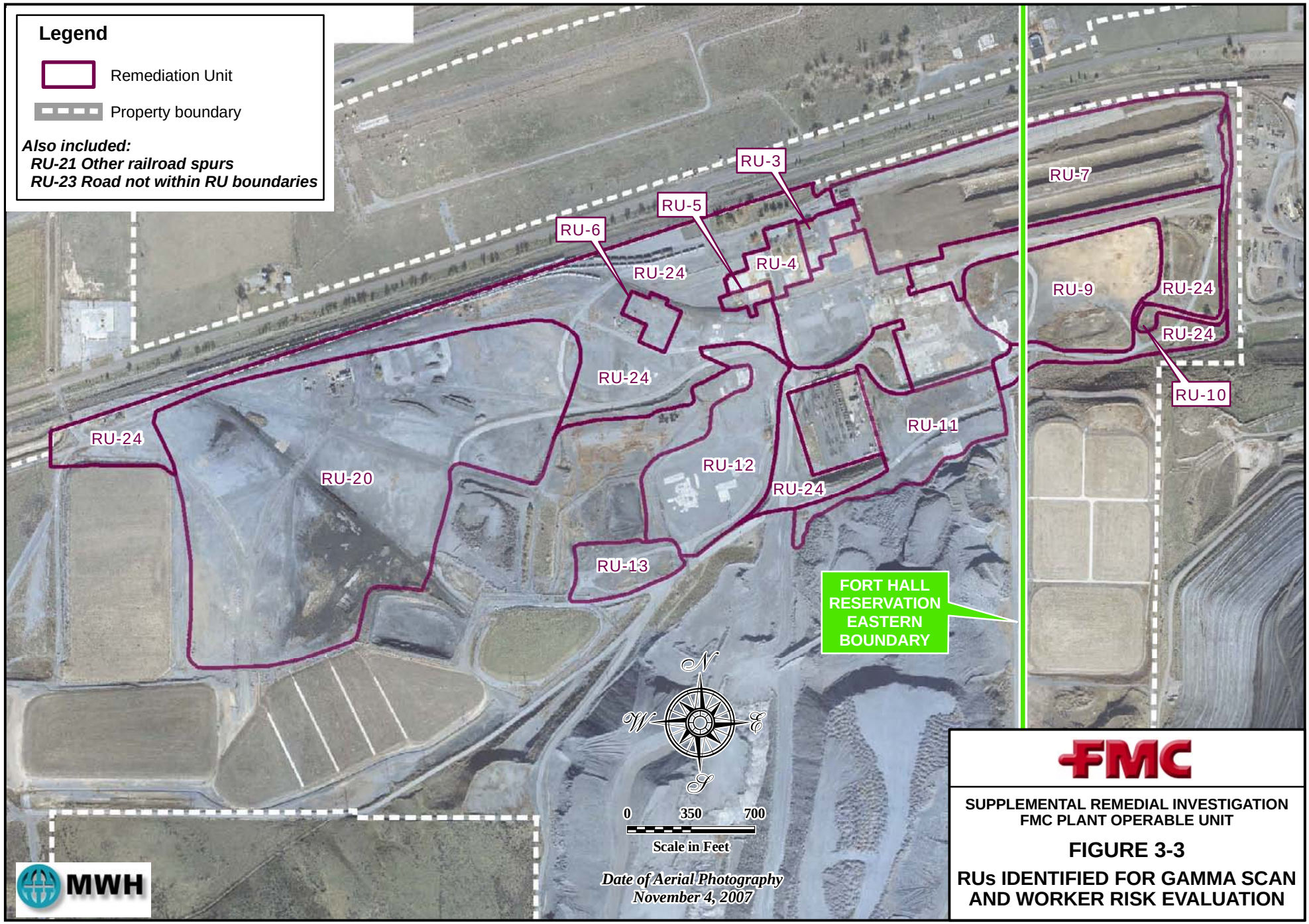

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FIGURE 3-3

RUs IDENTIFIED FOR GAMMA SCAN AND WORKER RISK EVALUATION

FILE *Fig 3-04 RUs for further Delin_308.mx 3/27/08*

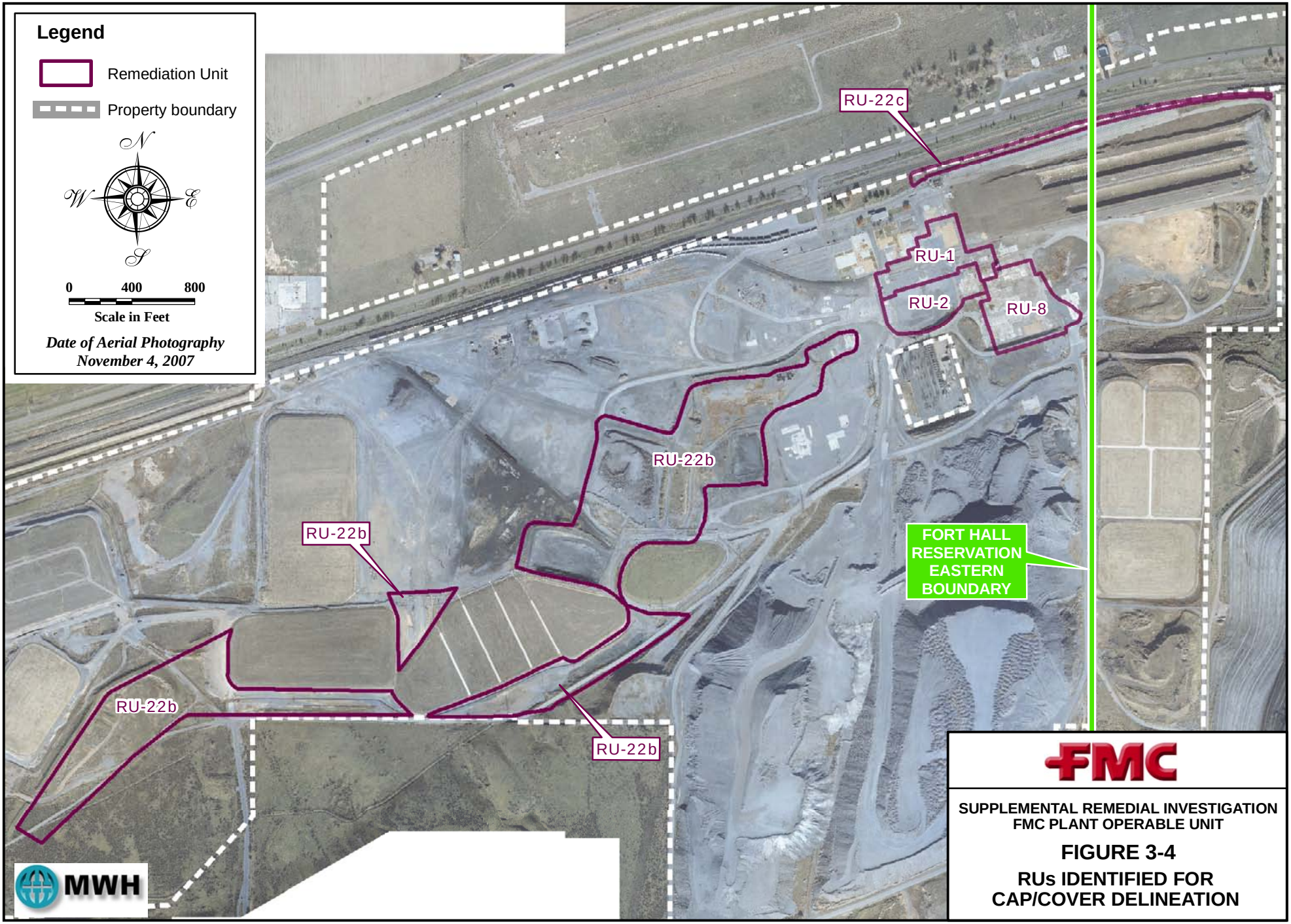

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FIGURE 3-4

RUs IDENTIFIED FOR CAP/COVER DELINEATION

FILE *Fig 3-05 Solvent areas_508.mxd 05/16/08*

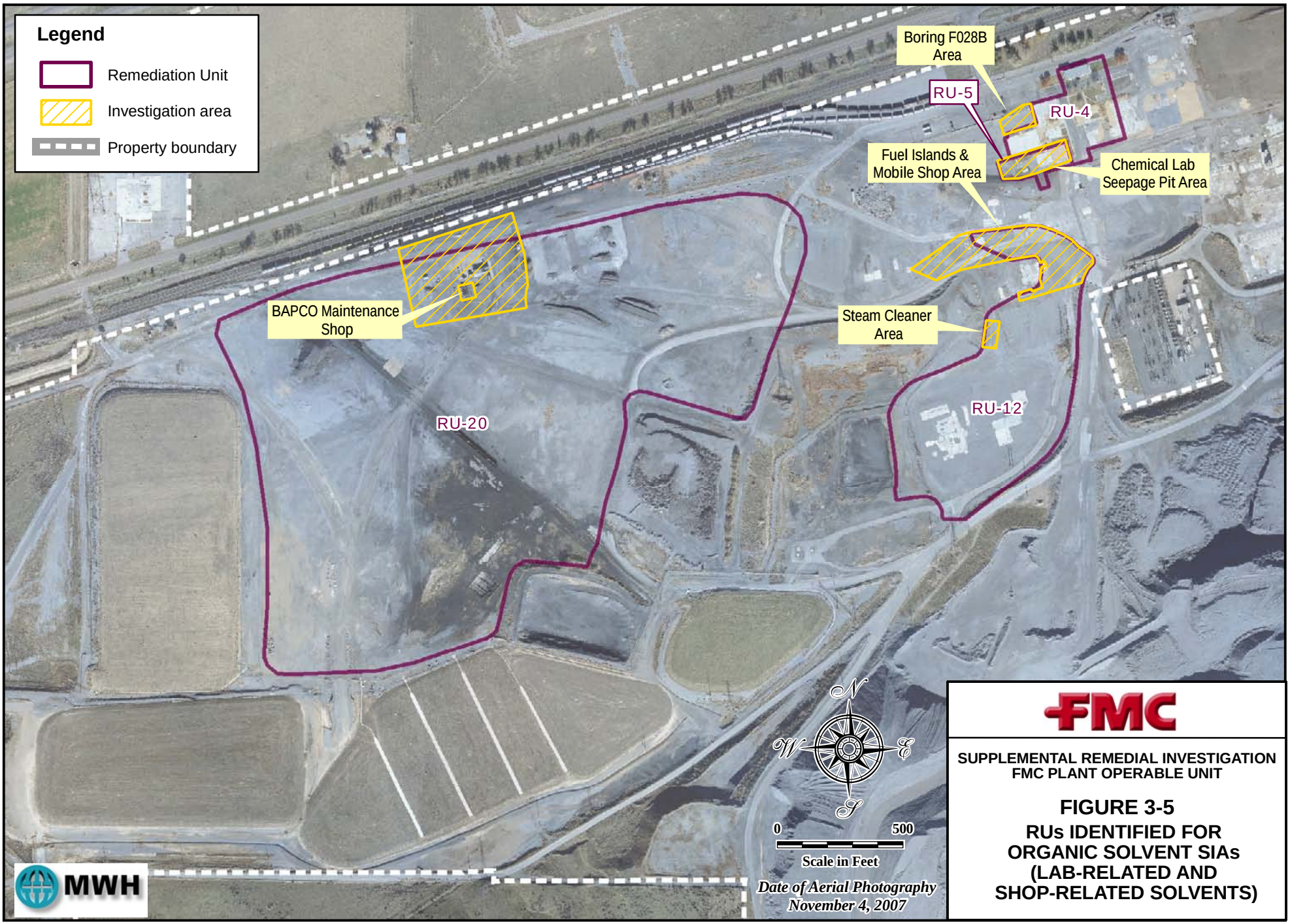

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FIGURE 3-5

RUs IDENTIFIED FOR ORGANIC SOLVENT SIAs (LAB-RELATED AND SHOP-RELATED SOLVENTS)

FILE *Fig 3-06 Liquid pet fuels_308.mxd* *04/04/08*

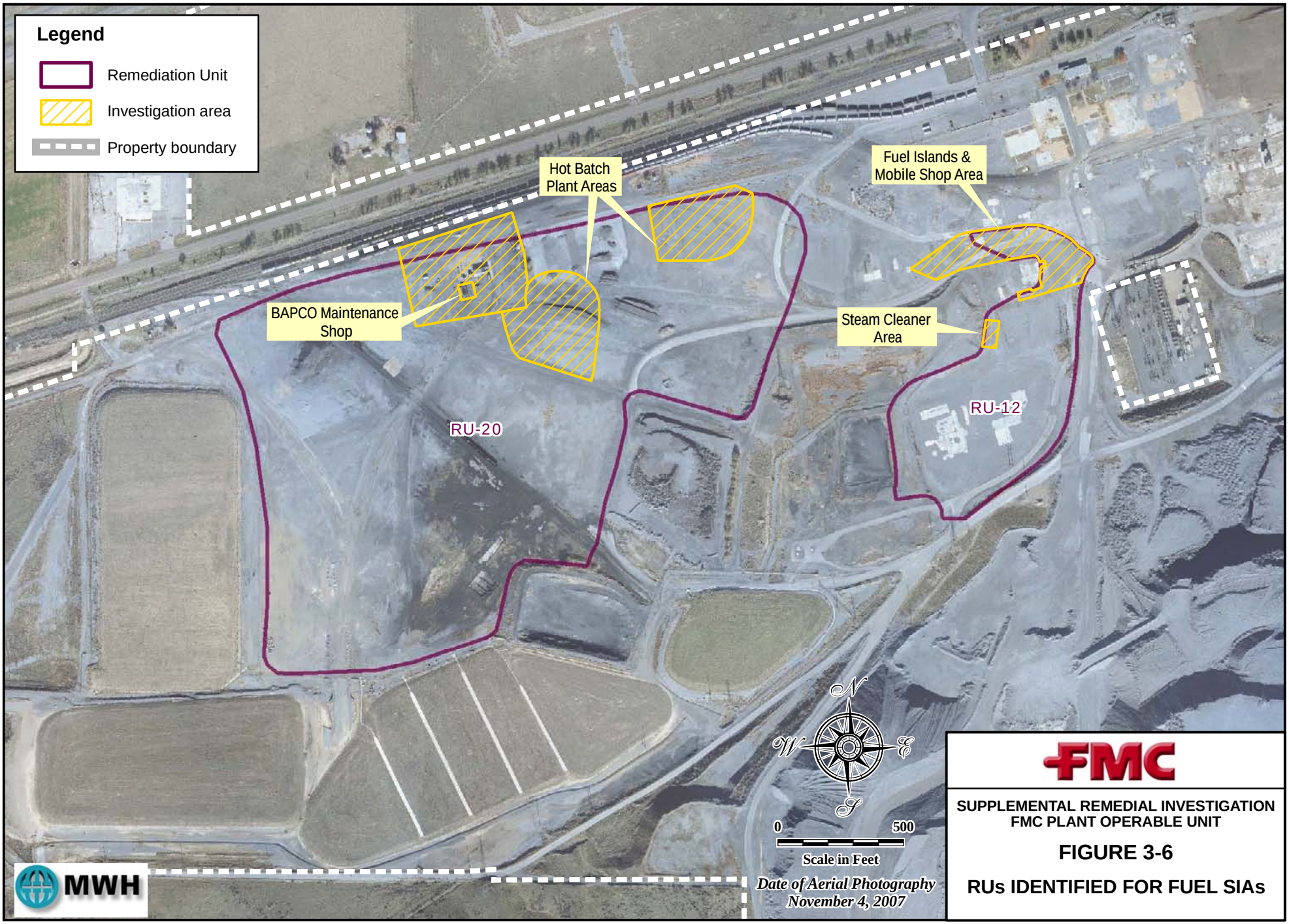

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FIGURE 3-6

RUs IDENTIFIED FOR FUEL SIAs

FILE *Fig 3-07 Coke PAH_308.mxd 04/04/08*

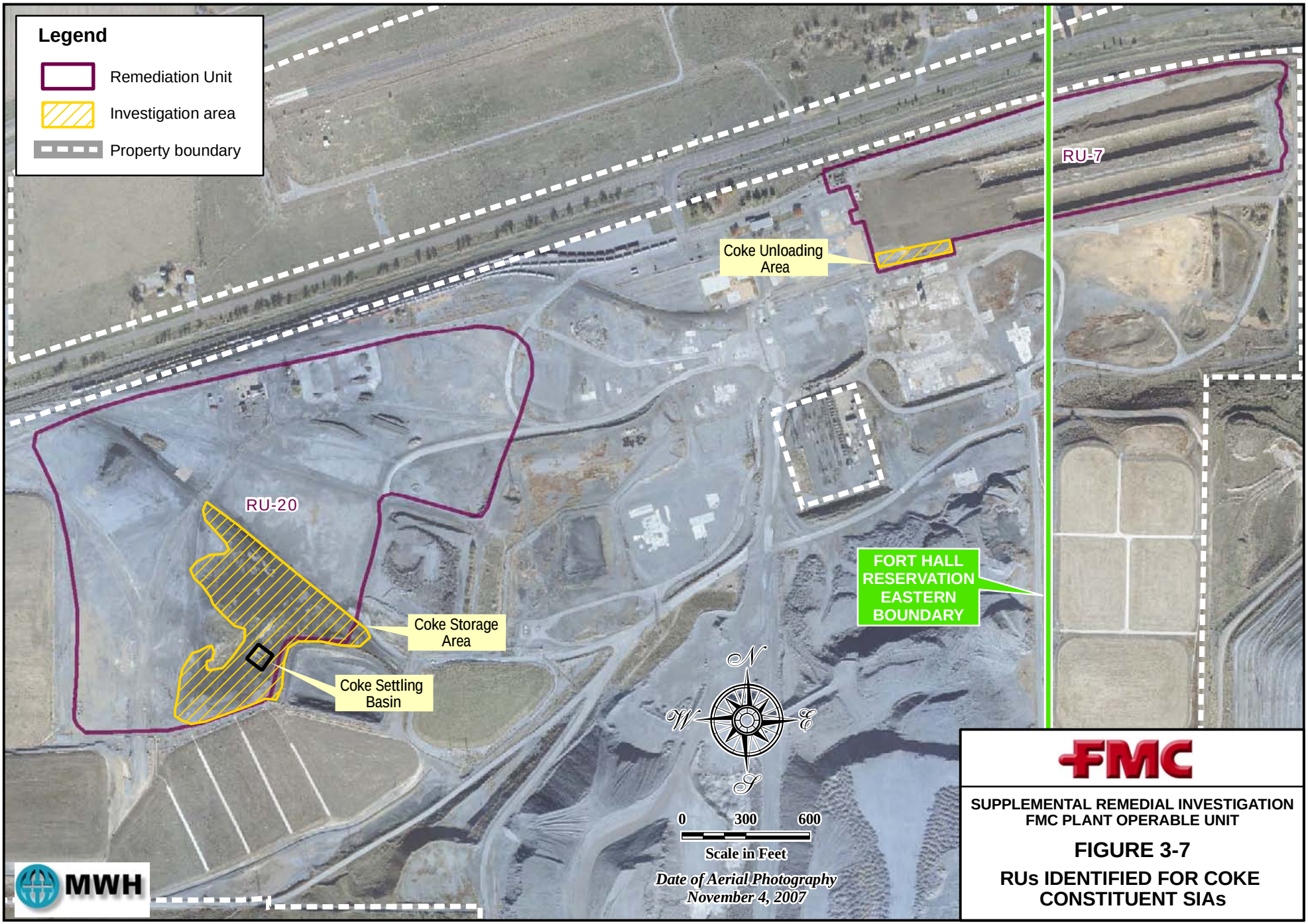

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FIGURE 3-7

RUs IDENTIFIED FOR COKE CONSTITUENT SIAs

FILE *Fig 3-08 PCB_308.mxd* *3/27/08*

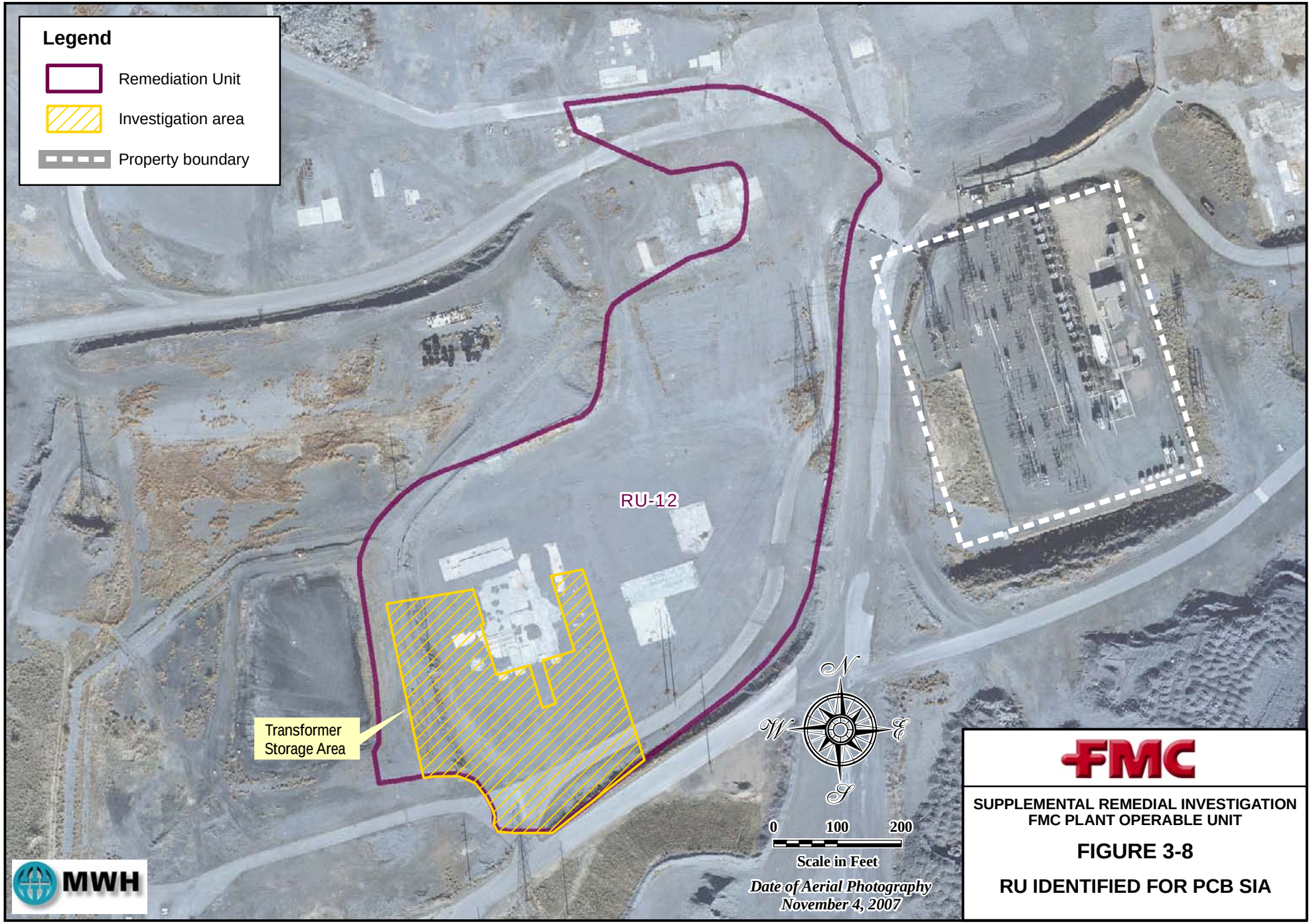

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FIGURE 3-8

RU IDENTIFIED FOR PCB SIA

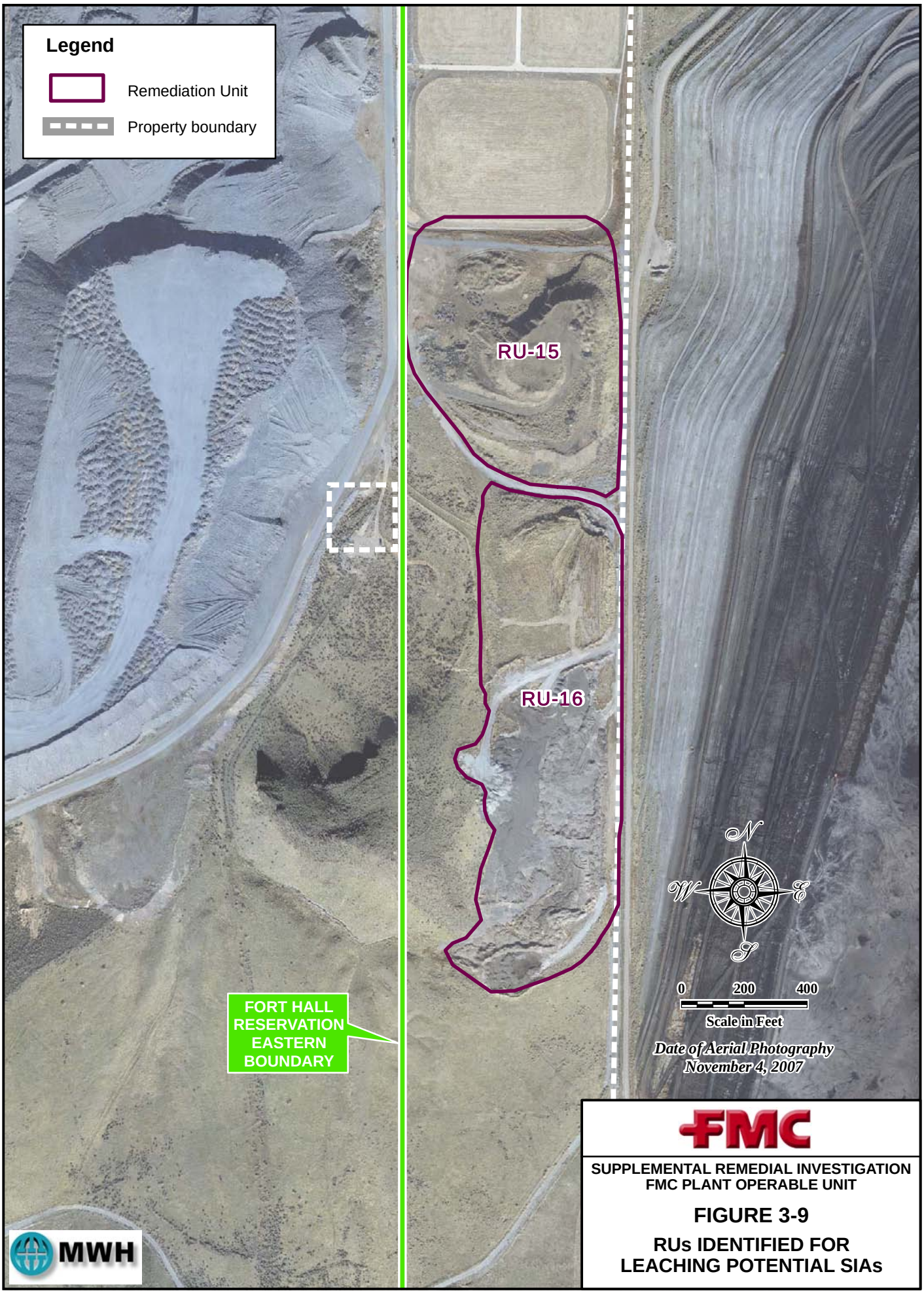

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FIGURE 3-9

RUs IDENTIFIED FOR LEACHING POTENTIAL SIAs

FILE Fig 3-09 Leaching_308.mxd 04/04/08

FILE *Fig 3-10 P4 soil_509.mxd* *05/12/09*

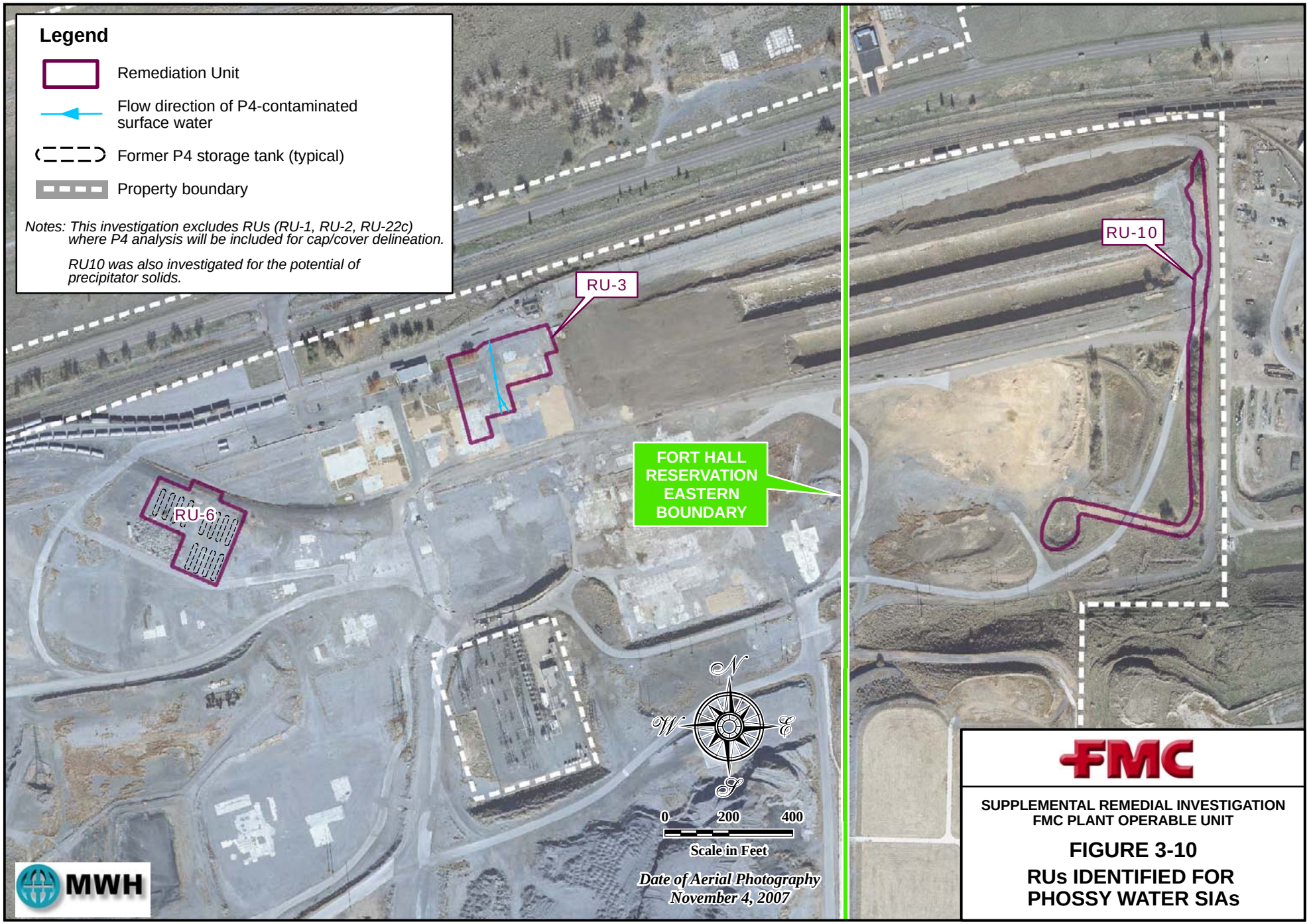

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FIGURE 3-10

RUs IDENTIFIED FOR PHOSSY WATER SIAs

FILE *Fig 3-11 Underground piping_508.mxd* *04/15/08*

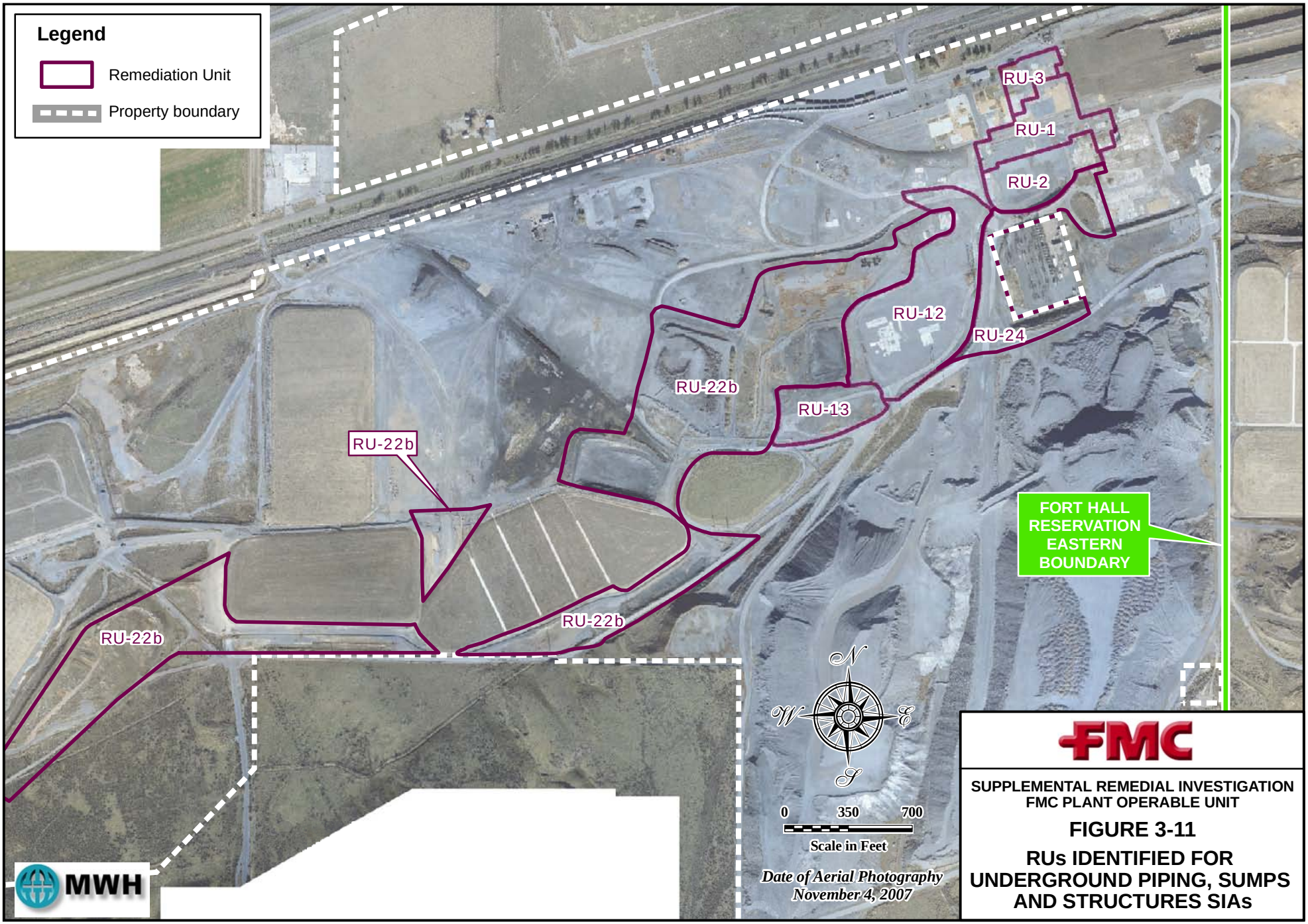

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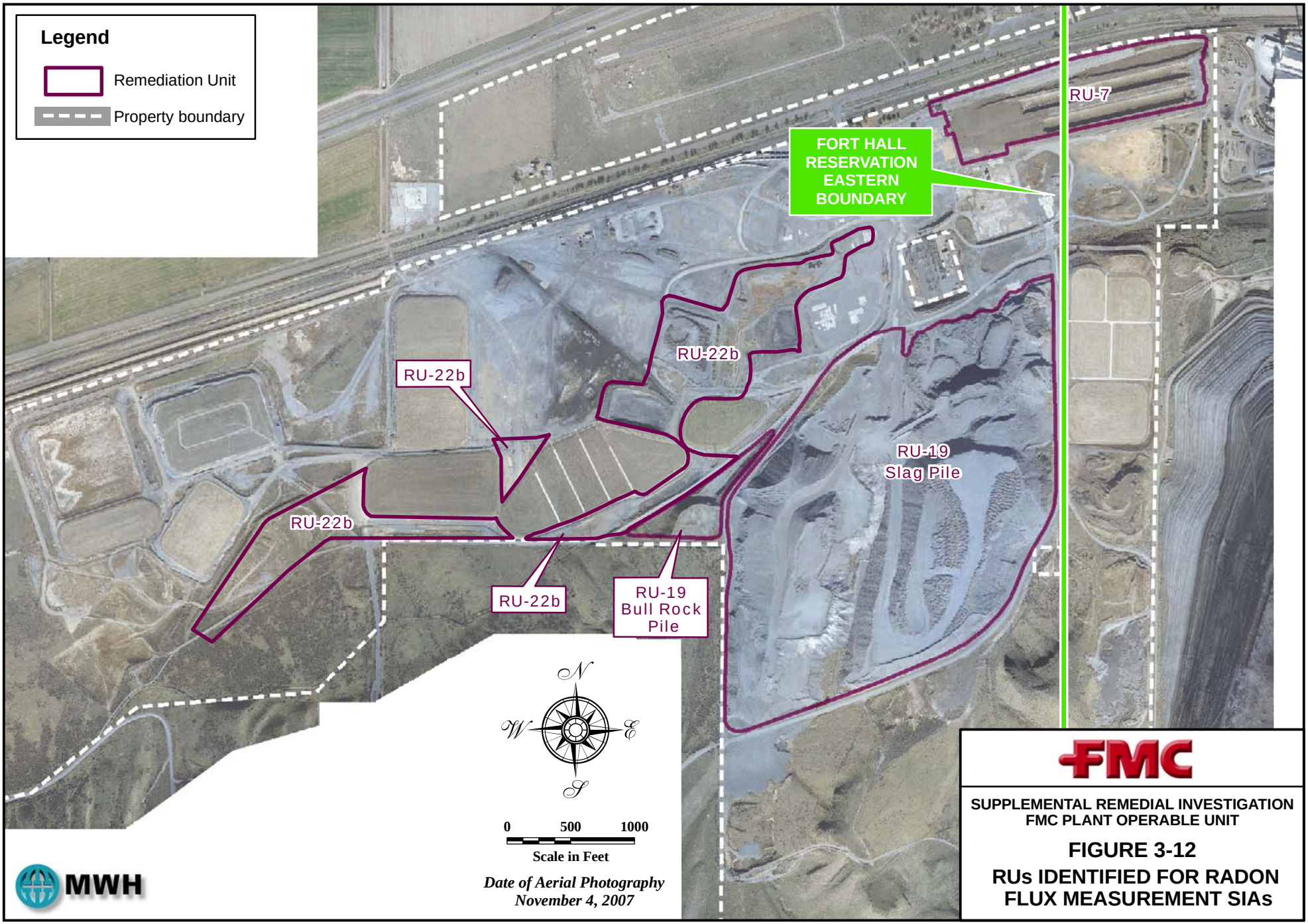
FIGURE 3-11

RUs IDENTIFIED FOR UNDERGROUND PIPING, SUMPS AND STRUCTURES SIAs

FILE *Fig 3-12 Radon Flux_508.mxd* *05/15/08*



SUPPLEMENTAL REMEDIAL INVESTIGATION
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FIGURE 3-12

RUs IDENTIFIED FOR RADON FLUX MEASUREMENT SIAs

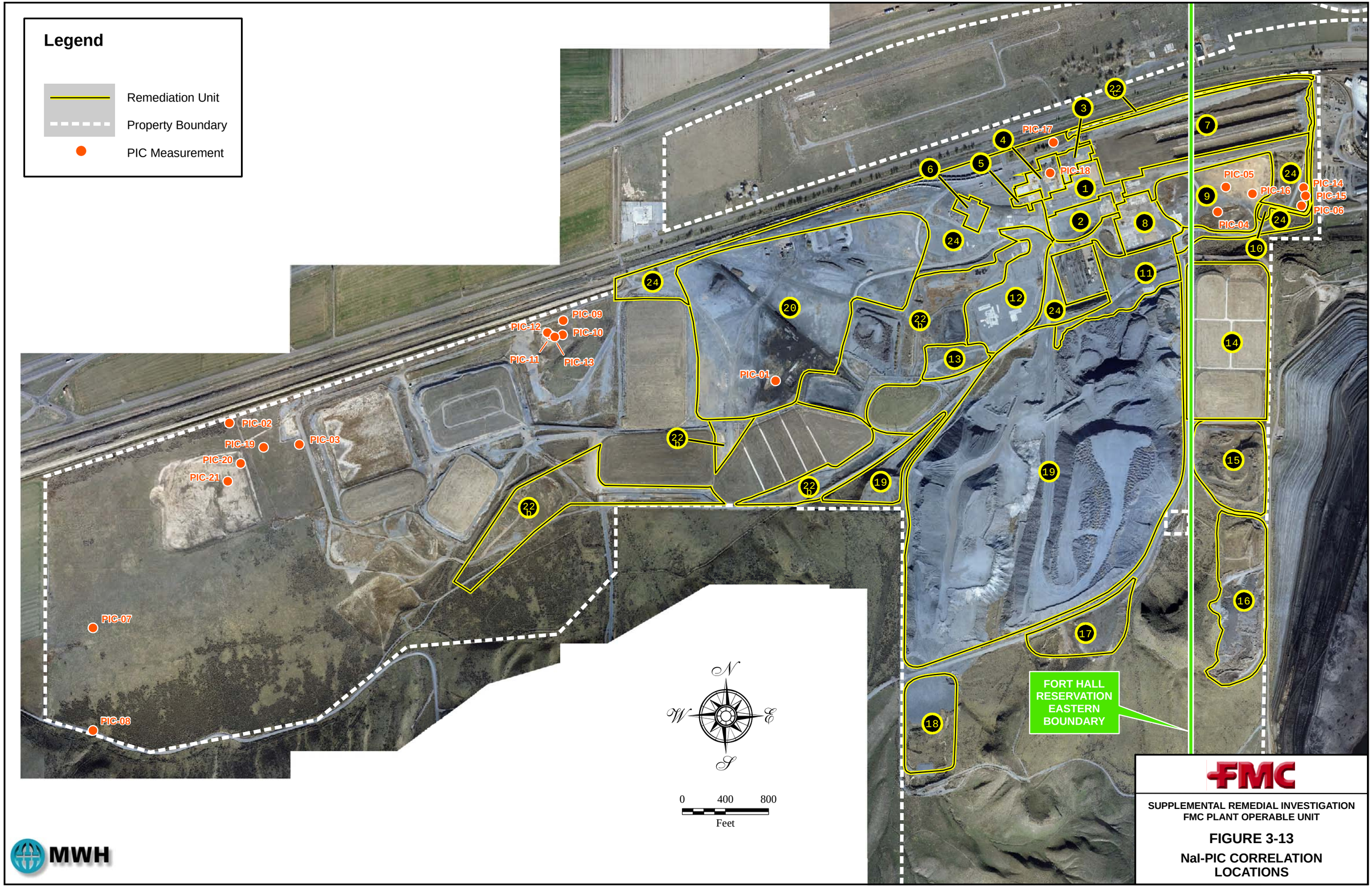

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FIGURE 3-13

NaI-PIC CORRELATION LOCATIONS

FILE Fig 3-13_NaI-PIC Correlation_508.mxd 5/16/08

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 20)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit	Risk Assessment	Due to the documented presence of P4 beneath the former working areas of RUs 1 and 2, which has the potential to spontaneously ignite upon contact with air, and presents an unacceptable acute hazard to potential receptors, including SRI field sampling staff, data to evaluate future worker risks were not specifically collected from RUs 1 and 2.	Qualitatively define the potential P4 risks at the RU. Quantitatively define the potential risks from other fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	Cap/Cover Delineation – P4	Define the horizontal extent and concentration of P4 in soils to: 1) define the boundary of the proposed cap and 2) evaluate the future worker risk for P4 outside of the proposed cap boundary.	Define the nature and extent of P4 in soils above the groundwater capillary fringe (i.e., above approximately 75 to 90 feet below ground surface (bgs) at a level of acute health concern (as evidenced by visual observation of smoking or burning in the subsurface) for the purpose of defining the proposed cap boundaries.	Drilled 14 auger borings to groundwater around the perimeter of RU 1 and 7 auger borings to groundwater around the perimeter of RU 2. Visually evaluated cuttings for the presence of P4. Stepped-out as required.	Visual P4	SC, RA, SA
			Determine whether the shallow soils (0-10' bgs) outside of the proposed cap perimeter contain an increased chronic health risk to future workers from exposure to P4.	Collected samples for laboratory analysis from 0-2' bgs and 0-10' bgs from outermost step-out locations.	P4	SC, RA, SA
	SIA1 - P4 Capillary Fringe Investigation downgradient of RU 1 (SRI Field Mod #12)	Define the lateral (horizontal) extent of P4 within the capillary fringe associated with the shallow groundwater.	Define the horizontal extent of P4 in subsurface soils at the capillary fringe associated with groundwater (i.e., approximately 75' to 90' bgs) at a level of acute health concern, as evidenced by visual observation of smoking or burning in drill cuttings from that depth.	Drilled 6 percussion hammer borings downgradient of RU 1. Visually evaluated cuttings for the presence of P4. Stepped-in for one boring. Collected samples for laboratory analysis from the two-foot interval above the water table (i.e., the capillary fringe).	P4	SC, RA, SA
			Collect geotechnical soil samples to evaluate bulk density, grain size, and vertical permeability of aquifer materials.		Geotechnical Analyses	SC, SA
	SIA2 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4 waste streams and could contain residual P4 deposits. Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning that may contain P4 deposits in order to evaluate remedial alternatives during the SFS.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	SC, SA

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 20)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 3: Receiving Stores, Paint Shop and P4 Decon	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk.	Gamma radiation	SC, RA, SA
			If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 3.**	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
				Collected Fill Characterization data (see "Other Studies" section below)		
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' below native surface (bns). Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 - Phossy Water in drainage area	Characterize the potential impacts associated with phossy water P4 contamination in soils to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate nature and extent of P4 distribution in shallow soils associated with surface phossy water flow in the drainage from RU 1 to RU 22c.	Drilled 15 sample locations in the area of the phossy water surface flow path. Collected one sample from each boring for laboratory analysis from 0-2' bns.	P4 Metals Fluoride	SC, RA, SA
	SIA2 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps, and structures that may have carried P4 waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning in order to evaluate alternatives during the SFS.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	SC, SA
			Evaluate SRI data for RU 3, if necessary, design an investigation program to collect samples in and adjacent to piping, sumps, etc. in Phase 2.	**A PHASE 2 INVESTIGATION WAS NOT REQUIRED DURING THIS STAGE OF THE SRI/SFS PROCESS.**		

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 20)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 4: Office Buildings and Training Center	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk.	Gamma radiation	SC, RA, SA
			If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 4.**	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
				Collected Fill Characterization data (see "Other Studies" section below)		
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Organic Solvent – Lab-Related Solvents around soil boring F028B	Characterize the lateral and vertical extent of solvents to evaluate whether to remediate the solvent specific investigation area or to take no further action.	Investigate nature and extent of lab-related solvent releases in shallow soils around boring F028B during Phase 1.	Phase 1: Drilled 14 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Lab-related organic solvents	SC, RA, SA
			Evaluate Phase 1 data for RU 4, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Phase 2: Evaluated phase 1 data, presented to Agency. If necessary, design sampling program and collect additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 4.**		

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 5: Lab and Old Drainfield	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk.	Gamma radiation	SC, RA, SA
			If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 5.**	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
				Collected Fill Characterization data (see "Other Studies" section below)		
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Organic Solvent – Lab-Related Solvents near SWMU 61 and Chemical Lab	Characterize the lateral and vertical extent of solvents to evaluate whether to remediate the solvent specific investigation area or to take no further action.	Investigate the nature and extent of lab-related solvent releases in shallow soils in the vicinity of SWMU 61 and the Chemical lab seepage pit during Phase 1.	Phase 1: Drilled 24 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Lab-related organic solvents	SC, RA, SA
			Evaluate Phase 1 data for RU 5, if necessary; design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Phase 2: Evaluated Phase 1 data, presented to Agency. If necessary, designed sampling program and collected additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLEING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 5.**		

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 6: Former Long-Term Phos Storage Tanks	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 6.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Phossy Water impacts under former storage tanks	Characterize the potential impacts associated with phossy water P4 contamination in soils to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate nature and extent of P4 distribution in shallow soils around and underlying the long-term phos storage tanks.	Drilled 20 borings on a random grid around former tanks and railspurs, and drilled 12 borings beneath the center of the former tanks. Visually evaluated cuttings for the presence of P4. Collected one sample from each boring for laboratory analysis from 0-2' bns.	P4 Metals Fluoride	SC, RA, SA

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 7: Shale Unloading, Crushing and Stockpile	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 7.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	Ore Reference Area Investigation	Characterize the soils beneath the shale (ore) stockpile in order to evaluate whether fill constituents have leached from the ore in underlying soils.	Characterize native soil to define geostatistical distribution of ore-related COCs/ COPCs. Statistically compare data to SFS data from other RUs that contain ore in order to determine whether ore constituents in other RUs have leached into underlying soils.	Drilled 20 borings on random grid. Collected a sample in each boring from 0-2' bns for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Coke Constituents	Characterize the potential impacts associated with coke constituents in native soils to evaluate whether to remediate the specific investigation area or to take no further action.	Evaluate whether characterization of the native soils beneath the coke handling area is needed to support the remediation vision based on the results of the RU 20 coke investigations. If necessary, determine if an investigation program for RU 7 is warranted during the SFS.	Evaluated data from RU 20 Coke Reference Area Investigation	NA	SC, SA
	SIA – Radon Flux - Ore Fill Material	Characterize radon flux to evaluate radon emanation from ore fill material.	Evaluate whether the level of radon flux emanating from ore requires RU 7 to be forwarded to the SFS. Evaluate the potential for radon flux to be an issue of concern at other RUs that contain residual ore fill material.	Collected 100 radon flux measurements on a random grid using electret ion chamber	Radon Flux	SC, RA, SA

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 8: Former Kiln Scrubber Ponds and Calciners	Risk Assessment	Due to the fact that kiln pond solids were not located during the fill characterization study, beneath the former working areas of RU 8, data to evaluate future worker risks were not specifically collected from RU 8	Quantitatively define the potential risks from other fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	Cap/Cover Delineation – Kiln Pond Sediments	Define the horizontal extent of kiln pond sediments to: 1) define the boundary of the proposed cap and 2) evaluate the future worker risk outside of the proposed cap boundary.	Confirm that the area covered by the proposed cap/cover encompasses the lateral extent of residual kiln scrubber solids around the boundary of RU 8 and into RU 9.	Visually evaluated cuttings for the presence of pond sediments down to native soil. Drilled 14 initial borings. Stepped-out 10' as required and collected a sample from 0-2' bns in final step-out borings for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, RA, SA
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 9.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA

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RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond **(continued)**	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
RU 10: IWW Pond and Ditch	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 10.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Phossy Water and Precipitator Solids - IWW Ditch and Pond Area	Characterize the potential impacts associated with phossy water P4 and precipitator solids in soils and sediments to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of phossy water P4 and precipitator solids distribution in shallow soils and sediments in the IWW ditch and pond.	Drilled 20 borings/excavated test pits. Visually evaluated cuttings for evidence of P4. Collected one sample from each location for laboratory analysis from 0-2' bns for the ditch and 0-2' bgs for the pond.	P4 Metals Fluoride Po-210 Pb-210	SC, RA, SA

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FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 11: Equipment Area South of Calciners	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 11.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
RU 12: Former RP&S Area and Mobile Shop	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 12.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA

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RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Liquid Petroleum Fuels and Organic Solvents – Mobile Shop and Fuel Islands	Characterize the lateral and vertical extent of fuels and solvents to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of fuels and shop-related solvent releases in shallow soils around the Mobile Shop and Fuel Islands during Phase 1. Evaluate Phase 1 data for RU 12, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Phase 1: Drilled 42 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis. Phase 2: Evaluated Phase1 data, presented to Agency, if necessary collect additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 12.**	Shop-related organic solvents and liquid petroleum fuels	SC, RA, SA
	SIA 2 - Fuels – Steam Cleaning Area	Characterize the lateral and vertical extent of fuels to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of possible fuel releases in shallow soils around the Steam Cleaning Area during Phase 1. Evaluate Phase 1 data for RU 12, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Phase 1: Drilled 8 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis. Phase 2: Evaluated Phase 1 data, presented to Agency, if necessary collect additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 12.**	Liquid petroleum fuels	SC, RA, SA
	SIA3 – PCBs-Former Transformer Storage Area	Characterize PCBs in soil to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of potential PCB releases in shallow soils throughout the Transformer Storage Area.	Drilled 33 borings on a random grid. Collected a discrete sample at surface, every 2.5' to native soil, native soil and 2' bns for laboratory analysis.	PCBs	SC, RA, SA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SIA4 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4 waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning in order to evaluate alternatives during the SFS. Evaluate phase one data for RU 12, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases from piping, sumps, etc. to shallow soils or potential migration groundwater in Phase 2	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures). If RU 12 remained designated as NFA, a phase two study would be proposed that would further evaluate P4 deposits in the buried piping, sumps and structures. If RU 12 was forwarded to the SFS, use information compiled in the initial investigation discussed above. **A PHASE 2 INVESTIGATION WAS NOT REQUIRED DURING THIS STAGE OF THE SRI/SFS PROCESS.**	NA	SC, SA
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 13.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area **(continued)**	SIA1 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4 waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning in order to evaluate alternatives during the SFS. Evaluate phase one data for RU 13, if necessary; design an investigation program to collect additional soil samples to further delineate potential releases from piping, sumps, etc. to shallow soils or potential migration groundwater in Phase 2.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures). If RU 13 remained designated as NFA, a phase two study would be proposed that would further evaluate P4 deposits in the buried piping, sumps and structures. If RU 13 was forwarded to the SFS, use information compiled in the initial investigation discussed above. **A PHASE 2 INVESTIGATION WAS NOT REQUIRED DURING THIS STAGE OF THE SRI/SFS PROCESS.**	NA	SC, SA
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area	Risk Assessment	Due to the fact that several types of fill exist at the former working areas of RU 15, data to evaluate future worker risks were not specifically collected from RU 15.	Quantitatively define the potential risks from fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	SIA1 - Leaching Potential from Ore, Used Electrodes, and Baghouse Dust	Characterize vertical impact to native soils underlying these materials to assess potential transport of metals and fluoride in vadose zone for the purpose of designing the proposed cap/cover.	Characterize the nature and extent of potential metals and fluoride releases from these materials into the subsurface and to groundwater at RU 15.	Drilled 5 borings. Collected samples at 0-2' bns and a discrete sample every 10' bns to refusal or groundwater for laboratory analysis.	Metals Fluoride	SC, RA, SA
RU 16: Calciner Solids Stockpile	Risk Assessment	Due to the fact that calciner solids exist at RU 16, data to evaluate future worker risks were specifically collected from RU 16 during the fill characterization study.	Quantitatively define the potential risks from fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA

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SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 16: Calciner Solids Stockpile **(continued)**	SIA1 - Leaching Potential from Calciner Solids	Characterize vertical impact to native soils underlying these materials to assess potential transport of metals and fluoride in vadose zone for the purpose of designing the proposed cap/cover.	Characterize the nature and extent of potential metals and fluoride releases from these materials into the subsurface and to groundwater at RU 16.	Drilled 8 borings. Collected samples at 0-2' bns and a discrete sample every 10' bns to refusal or groundwater for laboratory analysis.	Metals Fluoride	SC, RA, SA
RU 19: Slag Pile and Bullrock Pile	Risk Assessment	Due to the fact that historical data exists for slag, data to evaluate future worker risks were not specifically collected from RU 19 during the fill characterization study.	Qualitatively define the potential P4 risks at the RU. Quantitatively define the potential risks from other fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	Soil Cover Area Radiation Survey	Evaluate whether the test soil cover over slag material reduces the risk from surface external gamma radiation to future site workers to evaluate remedial alternatives.	Evaluate the effectiveness of the test soil cover in reducing gamma radiation from slag material.	Performed surface radiation scan over soil cover area.	NA	SC, SA
	SIA1 - Radon Flux - Measurements from the slag and bullrock piles	Characterize radon flux to evaluate the design of the proposed cap/cover (e.g., appropriate thickness).	Determine radon flux from slag and bullrock piles in order to evaluate remedial alternatives for the slag pile and bull rock pile within RU 19. Evaluate radon data from RU 19, if necessary determine radon flux from the test soil cover area.	Collect 100 radon flux measurements using electret ion chamber from each: slag pile and bullrock pile. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 19.**	Radon Flux	SC, SA
	Old Landfill and Railcar Areas: Presumptive Remedy has been considered	NA	NA	NA	NA	NA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 20: Former Bannock Paving Area	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk.	Gamma radiation	SC, RA, SA
			If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 20.**	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
				Collected Fill Characterization data (see "Other Studies" section below)		
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SFS - Reference Area Investigation (Slag)	Characterize the soils beneath the slag to evaluate if fill constituents have leached in underlying soils.	Characterize native soil to define geostatistical distribution of slag-related COCs/ COPCs. Statistically compare data to SFS data from other RUs that contain ore in order to determine whether slag constituents in other RUs have leached into underlying soils.	Drilled 20 borings on a random grid throughout the slag reference area. Collected a sample from 0-2' bns in each boring for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 – Fuels near Hot Batch Plant	Characterize the lateral and vertical extent of fuels to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of potential fuel releases in shallow soils around the Hot Batch Plant areas during Phase 1.	Phase 1: Drilled 43 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid petroleum fuels	SC, RA, SA
			Evaluate Phase 1 data for RU 20, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Phase 2: Presented Phase 1 data to Agency. Designed a sampling program. Drilled 21 additional shallow soil borings on a random grid. Collected additional samples from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid petroleum fuels – PAHs only	SC, RA, SA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 20: Former Bannock Paving Area **(continued)**	SIA2 – Fuels around the Maintenance and Equipment Shop	Characterize the lateral and vertical extent of fuels and shop-related solvents to evaluate whether to remediate the specific investigation area or to take no further action.	Investigate the nature and extent of potential fuel and shop-related solvent releases in shallow soils around the Maintenance and Equipment Shop during Phase 1. Evaluate Phase 1 data for RU 20, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Drilled 30 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis. Phase 2: Evaluated Phase 1 data, presented to Agency, if necessary design sampling program and collect additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 20.**	BTEX PAH Solvents	SC, RA, SA
	SIA3 – Coke Constituents and Reference Area Investigation - Coke	Characterize the soils beneath the coke handling area to evaluate whether fill constituents have leached in underlying soils.	Investigation potential leaching of constituents associated with coke into native soils. Evaluate the data as a reference area in order to made determinations regarding the coke handling area in RU 7.	Drilled 20 borings on random grid. Collected a sample in each boring from 0-2' bns for laboratory analysis.	Coke PAHs	SC, RA, SA
	SIA4 – Coke Constituents underlying the Coke Settling Basins	Characterize the vertical extent of constituents associated with coke beneath the concrete-lined coke settling basins to evaluate the remediation vision for coke constituents.	Investigate potential releases of constituents into shallow soils from the coke settling basins. Evaluate phase one data for RU 20, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to potential migration groundwater in Phase 2.	Drilled 3 borings to 10' below the bottom of the basins. Collected a discrete sample from each boring at 0', 2' and 10' below the basin for laboratory analysis. Phase 2: Evaluated Phase 1 data, present edto Agency, if necessary design sampling program and collect additional samples to evaluate migration to groundwater. **PHASE 2 SAMPLING WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 20.**	Metals Coke PAHs	SC, RA, SA
	SIA5 – Coke Constituents	Characterize toxicity of coke for handling purposes. Information will be used during the SFS for evaluation of potential remedial alternatives.	Evaluate whether coke exhibits a RCRA hazardous waste characteristic, specifically the toxicity characteristic.	Collected 1 composite sample at the coke handling area and a composite sample from sediments in each of the three coke settling basins.	TCLP Metals Semi volatiles	SC, SA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 21: Other Onsite Railspurs	Risk Assessment	Characterize surface risk from external gamma.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
RU 22b: Old Phossy Ponds	Risk Assessment	Due to the fact that precipitator and phossy solids exist at RU 22b, data to evaluate future worker risks were specifically collected from RU 22b during the fill characterization study.	Qualitatively define the potential P4 risks at the RU. Quantitatively define the potential risks from other fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	SIA1 - Radon Flux	Characterize radon flux in the Ponds to evaluate the design of the proposed cap/cover.	Determine radon flux so that remedial alternatives for the Old Phossy Ponds can be evaluated in the SFS.	Collected 100 radon flux measurements over the east-most parcel and 100 radon flux measurements over the combined three west-most parcels of the former ponds not covered by the RCRA ponds using electret ion chamber.	Radon Flux	SC, SA
	Cap/Cover Delineation – Old Ponds	Define the horizontal extent of Old Phossy Pond sediments to 1) define the boundary of the proposed cap and 2) evaluate the future worker risk outside of the proposed cap boundary.	Confirm that the area covered by the proposed cap/cover encompasses the lateral extent of residual Old Phossy Pond solids around the boundary of RU 22b into RUs 13, 20 and 24.	Drilled 22 borings around RU 22b. Visually evaluated cuttings for the presence of pond sediments down to native soil. Collected samples for laboratory analysis from either 0-2' bgs and 0-10'bgs or 0-2' bns depending on the presence of fill material at the surface of the boring.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, RA, SA
	SIA - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4 waste streams and could contain residual P4 deposits or other COCs. Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning that may contain P4 deposits in order to evaluate remedial alternatives during the SFS.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	SA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 22c: Railroad Swale	Risk Assessment	Due to the presumed presence of P4 beneath the former working areas of RU 22c, which has the potential to spontaneously ignite upon contact with air, and presents an unacceptable acute hazard to potential receptors, including SRI field sampling staff, data to evaluate future worker risks were not specifically collected from RU 22c.	Qualitatively define the potential P4 risks at the RU. Quantitatively define the potential risks from other fill materials in the RU.	Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	Cap/Cover Delineation – P4	Define the horizontal extent and concentration of P4 in soils to: 1) define the boundary of the proposed cap and 2) evaluate the future worker risk for P4 outside of the proposed cap boundary.	Define the nature and extent of P4 in shallow soils (0-10' bgs) at a level of acute health concern (as evidenced by visual observation of smoking or burning in the subsurface) for the purpose of defining the proposed cap boundaries.	Investigated 4 locations with test pits. Visually evaluated test pits and spoils pile for the presence of P4. Stepped-out as required.	Visual P4	SC, SA
			Determine whether the shallow soils (0-10' bgs) outside of the proposed cap perimeter contain an increased chronic health risk to future workers from exposure to P4.	Collected samples for laboratory analysis from 0-2' bgs and 0-10' bgs from a boring proximate to the outermost step-out test pit location.	P4	SC, RA, SA
RU 23: Road Segments not within RU Boundaries	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk.	Gamma radiation	SC, RA, SA
			If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 23.** Collected Fill Characterization data (see "Other Studies" section below)	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[a]	Data Uses[b]
RU 24: Plant Areas not within RU Boundaries	Risk Assessment	Characterize surface and if necessary, subsurface risks from radionuclides, fluoride, and metals.	Evaluate the risk from surface external gamma radiation to future worker. If the surface external gamma radiation screening (i.e., NaI) is under the gamma benchmark, characterize the surface gamma dose rate. If the surface gamma dose rate (i.e., PIC) is below the gamma dose benchmark, then characterize shallow subsurface soil risk (0-10 feet bgs) associated with radionuclides, fluoride and metals samples collected to assess the redistributed fill scenarios of the SFS (i.e., those remedial alternatives that address worker risks from exposure pathways other than external gamma radiation).	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. PIC measurements and soil borings established based on acreage of RU. Collect surface PIC measurements. Drill 24 soil borings and collect subsurface samples from 0-2' bgs and 2-10' bgs. Composite samples into increments of 6. Submit 8 samples for laboratory analysis. **THIS SCENARIO DID NOT OCCUR DURING THE SRI FIELD WORK AT RU 24.** Collected Fill Characterization data (see "Other Studies" section below)	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	SC, RA, SA SC, RA, SA
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils.	If, the surface external gamma radiation data, surface gamma dose rate, or subsurface data exceeds the comparative values, then drill to determine the depth of fill and sample the initial 2 feet for characterization of the native surface (below the site fill) to support the SFS.	Drilled 20 borings on a random grid and collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, SA
	SIA1 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4 waste streams and could contain residual P4 deposits or other COCs. Use this information for an SFS evaluation.	Collect sufficient information regarding underground piping, sumps, and other structures left behind in this RU after decommissioning in order to evaluate alternatives during the SFS. Evaluate phase one data for RU 24, if necessary, design an investigation program to collect additional soil samples to further delineate potential releases to shallow soils or potential migration groundwater in Phase 2.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures). If RU 24 remained designated as NFA, a phase two study would be proposed that would further evaluate P4 deposits in the buried piping, sumps and structures. If RU 24 was forwarded to the SFS, use information compiled in the initial investigation discussed above. **A PHASE 2 INVESTIGATION WAS NOT REQUIRED DURING THE SRI FIELD WORK AT RU 24.**	NA	SC, SA

TABLE 3-1

RU-SPECIFIC FIELD PROGRAM DESCRIPTION AND RATIONALE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Data Quality Objectives (RU Specific)	Field Program Data Collection Description	Data Collection Analytes[(a)]	Data Uses[(b)]
Other Studies	SIA - Southern and Western Undeveloped Area – PIC Measurements	Characterize surface external gamma dose. Forward RU to the SFS data collection pathway if surface gamma dose rate exceeds the gamma benchmark.	Characterize the gamma dose rate associated with the southern and western undeveloped regions of the FMC Plant OU.	Collected 100 PIC measurements from each area.	PIC Measurements	SC, RA, SA
	SIA – Precipitator Solids Roadway Investigation	Evaluate whether precipitator dust/phossy solids were applied on roads.	Investigate the potential application of precipitator dust/phossy solids presence on roadways. Compare the roadway segments where precipitator dust/phossy solids could *have been applied* against the southern reference area where traction material *would not have been applied*.	Investigated 6 roadway locations and a reference roadway location. Collected 10 soil samples from the roadway material (approximately 0-0.5' bgs) at each location for laboratory analysis.	Pb-210	SC, RA, SA
	SIA – PCDT Roadway Investigation	Evaluate the potential impact of PCDT water application along roads within the FMC Plant OU.	Investigate the potential affects of PCDT water application to roadways. Compare a roadway segment where PCDT *was applied* to a reference roadway segment where PCDT water *was not applied*.	Investigated worst-case segment and reference road segment. Collected 10 soils samples along each road segment from 0-0.5' bgs for laboratory analysis	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, RA, SA
	Fill Characterization	Collect additional chemical information on specific source materials (e.g., phosphate ore) and waste streams (e.g., precipitator solids) historically managed at the plant for the SRI Risk Assessment.	The objective of the proposed fill characterization sampling is to collect samples of the following specific source materials: • Precipitator solids • Phossy solids • Calciner solids • Kiln solids • Phosphate ore	Collect up to 7 samples of precipitator solids from EMF RI locations in RU 22b. Collect two sample of phossy solids form EMF RI location F025B. Collect 2 samples of calciner solids; one from southern area and one from northern area of RU 16. Collect 2 samples of kiln solids in RU 8. Collect 1 composite sample of ore material in RU 7.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	SC, RA, SA

Notes:

(a) Acronym defined and method of analysis. Also listed in Table 3-3.
Gamma radiation by sodium iodide detector (NaI) or Pressurized ionization chamber (PIC)
P4 – elemental phosphorus analyzed by EPA Method 7580
Metals (antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, and vanadium) by EPA Method 6020
Fluoride by EPA Method 9214
Ra-226 – radium-226 by Radon emanation
U-238 – uranium-238 by Alpha spectroscopy
K-40 – potassium-40 by Gamma spectroscopy
Po-210 – polonium-210 by Alpha spectroscopy
Pb-210 – lead-210 by Scintillation counting
Laboratory-related organic solvents (benzene, carbon disulfide, chloroform, methylene chloride, PCE, toluene, TCE, 1,1,1-trichloroethane and 2-butanone) by EPA Method 5035A/8260B
Shop-related organic solvents (chloroform, methylene chloride, PCE, TCE, 1,1,1-trichloroethane, and 2-butanone) by Method 5035A/8260B
Liquid petroleum fuels VOCs (benzene, ethylbenzene, toluene, m-xylenes, o-xylenes, and p-xylenes) EPA Method 5035A/8260B

Liquid petroleum fuels PAHs (semi-volatile organics) (acenapthene, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, fluorine, fluoranthene, naphthalene, phenanthrene, pyrene) by EPA Method 8270C
PCBs - Polychlorinated Biphenyls analyzed by EPA Method 1668A
Coke-related PAHs (acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene , benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorine, indeno(1,2,3-cd)pyrene, naphthalene, pyrene) by EPA Method 8270C
TCLP coke-related metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) by EPA Method 1311 and EPA Method 6020
TCLP coke-related SVOCs (o-cresol, m-cresol, p-cresol, cresol, 1,4-dichlorobenzene, 2,4-dinitrotoluene, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, nitrobenzene, pentachlorophenol, pyridine, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol) by EPA Method 1311 and 8270C.

(b) Data Uses include SC (site characterization), RA (risk assessment), and SA (screening of alternatives)

bns – below native surface
bgs – below ground surface

TABLE 3-2

RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit	Risk Assessment	Decision rules (DRs) were not developed for the risk assessment at remediation units (RUs) 1 and 2 because no investigations were conducted in these specific areas. A qualitative evaluation of risks to current and potential future receptors from exposure to P4 was performed. Data characterizing the fill materials present in RUs 1 and 2 were used to quantitatively bound risks.	Not Applicable (NA)
	Cap/Cover Delineation – P4	The decision rules associated with the visual determination of P4 sampling at RUs 1 and 2 are as follows: • If P4 in soils above the capillary fringe associated with groundwater (i.e., 75 to 90 feet below ground surface(bgs)) at a level of acute health concern is present in the boring, as evidenced by smoking or burning, then additional step-out borings down to groundwater are needed. Investigations of P4 at or below the capillary fringe (i.e,. approximately 75 to 90 feet bgs) will be performed according to SRI field modification #12 – Capillary Fringe P4 Delineation. • If P4 in soils down to the capillary fringe associated with groundwater at a level of acute health concern is not present in the boring, as evidenced by a lack of smoking or burning, then no further action regarding P4 cap delineation is needed. The decision rules associated with the evaluation of chronic worker exposure are as follows: • If P4 is above the applicable soil screening level (SSL), then additional step-out borings to 10 feet bgs are needed. • If P4 is less than all applicable SSLs then no further action with regards to P4 will be required in this area.	Yes - implemented Field Mod #12 to handle capillary fringe P4 delineation (that was not anticipated in the original SRI Work Plan decision rules (DRs)
	SIA1 - P4 Capillary Fringe Investigation downgradient of RU 1 (SRI Field Mod #12)	The decision rules associated with the visual determination of P4 sampling at RU 1 are as follows: • If P4 <u>is</u> present in any of the proposed borings at the capillary fringe, as evidenced by smoking or burning soils, then the data quality objectives (DQOs) will not have been met and subsequent activities will be discussed with the agencies. • If P4 is <u>no</u>t present in the borings at the capillary fringe, as evidenced by a lack of smoking or burning, then a single step-in boring is needed. Soil samples will be collected at the capillary fringe for P4 and geotechnical analyses in each boring when smoking or burning soils are not encountered in the capillary fringe.	Yes - P4 was not encountered so collected samples according to DRs
	SIA2 - Underground Piping, Sumps, and Other Structures	The decision whether to remove, decontaminate, or abandon underground piping will be an supplemental feasibility study (SFS) decision based on the detailed analysis of alternatives.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.

TABLE 3-2

RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 3: Receiving Stores, Paint Shop and P4 Decon	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate comparative value (CV) for the site worker, then the remediation vision of at the RU of no remedial action necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface photoionization chamber (PIC) measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
	SIA1 - Phossy Water in drainage area	The decision rules associated with sampling at RU 3 for the constituents associated with phossy water are as follows: • If the constituent concentrations are above the applicable SSLs or background levels in the underlying soil, the data will be forwarded to the SFS. • If the constituent concentrations are below the applicable SSLs or background levels then no further action is required in regards to constituents associated with phossy water.	Yes – soil borings were drilled and sampled in the area associated with Phossy Water as defined in the DRs.
	SIA2 - Underground Piping, Sumps, and Other Structures	The decision rules associated with phase one at RU 3 for the underground piping investigation are as follows: • If after evaluating the risk to future site workers for all other data collected in RU 3, except for the underground piping, it is determined that RU 3 will be NFA, then phase two will be designed to incorporate all new relevant data to evaluate the potential risk associated with the underground piping. • If after evaluating the risk to future site workers for all other data collected in RU 3, except for the underground piping, it is determined that RU 3 will be forwarded to the SFS, then no additional sampling will be required in the SRI with regards to the underground piping in RU 3.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.
RU 4: Office Buildings and Training Center	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.

TABLE 3-2

RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
SUPPLEMENTAL REMEDIAL INVESTIGATION
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 4: Office Buildings and Training Center **(continued)**	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
	SIA1 – Organic Solvent – Lab-Related Solvents around soil boring F028B	The decision rules associated with confirmation sampling at RU 4 for the solvent specific investigation area study are as follows: • If the concentration of solvent constituents of concern (COCs) or constituents of potential concern (COPCs) associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has solvent COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the solvent specific investigation area will be addressed in phase two. • If the concentrations of solvent COCs and COPCs are less than the applicable SSLs, then the vertical and lateral extent of the solvent contamination has been delineated.	Yes - soil borings were drilled and sampled in the area associated with laboratory-related solvents. Phase 2 borings were not necessary to delineate horizontal and vertical extent of contaminants as defined in the DRs.
RU 5: Lab and Old Drainfield	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.

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RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
SUPPLEMENTAL REMEDIAL INVESTIGATION
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 5: Lab and Old Drainfield **(continued)**	SIA1 – Organic Solvent – Lab-Related Solvents near SWMU 61 and Chemical Lab	The decision rules associated with RU 5 for the solvent specific investigation area study are as follows: • If the concentration of solvent COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet below native surface (bns)) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has solvent COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the solvent specific investigation area will be addressed in phase two. • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the solvent contamination has been delineated.	Yes - soil borings were drilled and sampled in the area associated with laboratory-related solvents. Phase 2 borings were not necessary to delineate horizontal and vertical extent of contaminants as defined in the DRs.
RU 6: Former Long-Term Phos Storage Tanks	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
	SIA1 – Phossy Water impacts under former storage tanks	The decision rules associated with sampling at RU 6 for the constituents associated with phossy water are as follows: • If the constituent concentrations are above the applicable SSLs or background levels in the underlying soil, the data will be forwarded to the SFS. • If the constituent concentrations are below the applicable SSLs or background levels then no further action is required in regards to constituents associated with phossy water.	Yes – soil borings were drilled and sampled as defined in the DRs.

TABLE 3-2

RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 7: Shale Unloading, Crushing and Stockpile	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface.. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
	Ore Reference Area Investigation	There were no decision rules associated with this investigation. The purpose of the investigation was to evaluate potential leaching of constituents from ore to underlying soils.	NA
	SIA1 – Coke Constituents	The decision rules associated with confirmation sampling at RU 7 for the PAH specific investigation area study are as follows: • If the PAH constituent concentrations, as indicated by the RU 20 reference study are greater than the applicable SSLs, then the specific investigation area will be forwarded to the SFS. The need for additional vertical and/or lateral sampling will be determined as a part of the SFS activities. • If the PAH constituent concentrations, as indicated by the RU 20 reference study are less than the applicable SSL value, then additional characterization of potential polyaromatic hydrocarbons (PAH) migration into soil will not be required for RU 7.	Yes – RU 20 Coke Area reference soil samples were collected and investigations in RU 7 were not required as defined in the DRs.
	SIA – Radon Flux - Ore Fill Material	The decision rules for radon flux measurements for RU 7 are as follows: • If the average radon flux from RU 7 is above the Uranium Mill Tailings Radiation Control Act (UMTRCA) guideline, then RU 7 will be forwarded to the SFS. • If the average radon flux from RU 7 is below the UMTRCA guideline, then RU 7 will continue down the appropriate risk or SFS data collection pathway, with no further consideration of the need for radon mitigation measures anticipated to be necessary.	Yes – collected radon flux measurements as defined in the DRs.
RU 8: Former Kiln Scrubber Ponds and Calciners	Risk Assessment	Decision rules were not developed for the risk assessment at RU 8 because no kiln pond solids were encountered during the fill characterization investigations were conducted in this area. A qualitative evaluation of risks to current and potential future receptors from exposure to kiln pond solids was performed. Data characterizing the fill materials present in RU 8 were used to quantitatively bound risks.	NA

TABLE 3-2

RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 8: Former Kiln Scrubber Ponds and Calciners **(continued)**	Cap/Cover Delineation – Kiln Pond Sediments	The decision rules associated with confirmation sampling at RU 8 are as follows: • If the concentration of selected COCs and COPCs in the confirmation sample is greater than the applicable SSL or background, then additional step-out borings/test pits will have to be performed. • If the concentration of selected COCs and COPCs in the confirmation sample is less than the applicable SSL or background, the lateral extent of the cap has been defined.	No – the DRs were not met because several metals SSLs were exceeded. Additional step-out borings may be necessary to define the extent of elevated metals in the RU 8 area.
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
RU 10: IWW Pond and Ditch	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.

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RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
SUPPLEMENTAL REMEDIAL INVESTIGATION
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 10: IWW Pond and Ditch **(continued)**	SIA1 – Phossy Water and Precipitator Solids - IWW Ditch and Pond Area	The decision rules associated with sampling at RU 10 for the constituents associated with phossy water, sediments and phossy solids are as follows: • If the constituent concentrations are above the applicable SSLs or background level in the underlying material (soils and sediments), then the data will be forwarded to the SFS. • If the constituent concentrations are below the applicable SSLs or background level, then no further action is required for constituents associated with phossy water.	Yes – soil borings were drilled and sampled as defined in the DRs.
RU 11: Equipment Area South of Calciners	Risk Assessment SFS	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate. The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes - additional SFS sampling was required as defined in the DRs. Yes – SFS soil borings were drilled and sampled as defined in the DRs.
RU 12: Former RP&S Area and Mobile Shop	Risk Assessment SFS	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate. The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes - additional SFS sampling was required as defined in the DRs. Yes – SFS soil borings were drilled and sampled as defined in the DRs.

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RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SIA1 – Liquid Petroleum Fuels and Organic Solvents – Mobile Shop and Fuel Islands	The decision rules associated with RU 12 for the solvent specific investigation area study are as follows: • If the concentration of solvent COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has solvent COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the solvent specific investigation area will be addressed in phase two. • If the concentrations of solvent COCs and COPCs are less than the applicable SSLs, then the lateral and vertical extent of the solvent contamination has been delineated. The decision rules associated with sampling at RU 12 for the liquid petroleum specific investigation area study are as follows: • If the concentration of liquid petroleum fuel COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has liquid petroleum fuel COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the liquid petroleum fuel specific investigation area will be addressed in phase two. • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the liquid petroleum fuel contamination has been delineated.	Yes – soil borings were drilled and sampled for liquid petroleum fuels and shop-related organic solvents. Phase 2 borings were not necessary to delineate horizontal and vertical extent of contaminants as defined in the DRs.
	SIA 2 - Fuels – Steam Cleaning Area	The decision rules associated with sampling at RU 12 for the liquid petroleum specific investigation area study are as follows: • If the concentration of liquid petroleum fuel COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has liquid petroleum fuel COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the liquid petroleum fuel specific investigation area will be addressed in phase two. • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the liquid petroleum fuel contamination has been delineated.	Yes – soil borings were drilled and sampled for liquid petroleum fuels and shop-related organic solvents. Phase 2 borings were not necessary to delineate horizontal and vertical extent of contaminants as defined in the DRs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SIA3 – PCBs- Former Transformer Storage Area	For the RU 12 PCB specific investigation area study, the decisions associated with determining the extent of PCBs in soil are: • If the PCB concentrations in the soil/fill material are detected at levels above the applicable SSL in the outer most borings, then additional definition of the lateral extent is required. • If the PCB concentrations in the soil are detected at levels above the applicable SSL at 2 feet bns, then the additional vertical sampling is required. • If the PCB concentrations in the soil are less than the applicable SSL, then the extent of the PCB contamination has been defined.	Yes - soil borings were drilled and sampled for PCBs Phase 2 borings were not necessary to delineate horizontal and vertical extent of contaminants as defined in the DRs.
	SIA4 - Underground Piping, Sumps, and Other Structures	For the RU 12 underground piping investigation, the decisions associated with determining need for remediation are: • If an RU, with the exception of underground piping, meets the criteria for an NFA designation then the risk associated the underground piping will be addressed in phase two. • If it is determined that an RU is not a candidate for NFA, regardless of the risk associated with underground piping, then the RU will be forwarded to the SFS.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
	SIA1 - Underground Piping, Sumps, and Other Structures	For the RU 13 underground piping investigation, the decisions associated with determining need for remediation are: • If an RU, with the exception of underground piping, meets the criteria for an NFA designation then the risk associated the underground piping will be addressed in phase two. • If it is determined that an RU is not a candidate for NFA, regardless of the risk associated with underground piping, then the RU will be forwarded to the SFS.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.

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RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area	Risk Assessment	Decision rules were not developed for the risk assessment at RU 15. A quantitative evaluation of risks to current and potential future receptors from exposure to stockpiled material was performed. Data characterizing the fill materials present in RU 15 were used to bound risks.	NA
	SIA1 - Leaching Potential from Ore, Used Electrodes, and Baghouse Dust	For RU 15, leaching potential investigation, the decisions associated with determining the extent of metals and fluoride migration in the soil are based on having collected sufficient information to allow for the design of the cap/cover. Therefore: • If sufficient information exists to adequately characterize the soils in the vadose zone for purposes of cap/cover design, then additional sampling is not required. • If sufficient information does not exist to adequately characterize the soils in the vadose zone for purposes of supporting cap/cover design, then additional SFS sampling may be required.	Yes – adequate data has been collected at RU 15 to allow evaluation of alternatives during the SFS as defined in the DRs.
RU 16: Calciner Solids Stockpile	Risk Assessment	Decision rules were not developed for the risk assessment at RU 16. A quantitative evaluation of risks to current and potential future receptors from exposure to calciner solids was performed. Data characterizing the fill materials present in RU 16 were used to bound risks.	NA
	SIA1 - Leaching Potential from Calciner Solids	For RU 16 leaching potential investigation, the decisions associated with determining the extent of metals and fluoride migration in the soil are based on having collected sufficient information to allow for the design of the cap/cover. Therefore: • If sufficient information exists to adequately characterize the soils in the vadose zone for purposes of cap/cover design, then additional sampling is not required. • If sufficient information does not exist to adequately characterize the soils in the vadose zone for purposes of supporting cap/cover design, then additional SFS sampling may be required.	Yes – adequate data has been collected at RU 16 to allow evaluation of alternatives during the SFS as defined in the DRs.
RU 19: Slag Pile and Bull Rock Pile	Risk Assessment	Decision rules were not developed for the risk assessment at RU 19. A quantitative evaluation of risks to current and potential future receptors from exposure to slag was performed. Data characterizing the fill materials present in RU 19 were used to bound risks.	NA
	Soil Cover Area Radiation Survey	Decision rules were not developed for the soil cover area radiation survey at RU 19.	NA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 19: Slag Pile and Bull Rock Pile **(continued)**	SIA1 - Radon Flux - Measurements from the slag and bullrock piles	The decision rules for radon flux measurements for the RU 19 slag pile are as follows: • If the average radon flux from the slag pile is above the UMTRCA guideline, then the results from the soil test cover will be evaluated. • If the average radon flux from the slag pile is below the UMTRCA guideline, then the control of radon flux is not a relevant cap/cover design criterion for the slag pile. The decision rules for radon flux measurements in the RU 19 soil test cover are as follows: • If the average radon flux from the soil test cover is above the UMTRCA guideline, then the soil cover may need to be further evaluated in the SFS with respect to controlling radon flux. • If the average radon flux from the soil test cover is below the UMTRCA guideline, then radon flux control does not need to be further evaluated in the SFS. The decision rules for radon flux measurements in the RU 19 the bull rock pile are as follows: • If the average radon flux from the pile is above the UMTRCA guideline, then radon flux control may be a cover/cap design criterion in the SFS. • If the average radon flux from the pile is below the UMTRCA guideline, then radon flux control does not need to be further evaluated in the SFS.	Yes – all radon flux measurements were below the UMTRCA guide-line for the slag and bull rock piles and as a result, radon flux measurements were not collected from the soil test cover as defined in the DRs.
	Old Landfill and Railcar Areas: Presumptive Remedy has been considered	NA	NA
RU 20: Former Bannock Paving Area	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 20: Former Bannock Paving Area **(continued)**	SFS - Reference Area Investigation (Slag)	There were no decision rules associated with this investigation. The purpose of the investigation was to evaluate potential leaching of constituents from slag to underlying soils.	NA
	SIA1 – Fuels near Former Hot Batch Plant	For the RU 20 liquid petroleum fuel specific investigation area study, the decisions associated with determining the extent of the fuel contaminated soil are: • If the concentration of liquid petroleum fuel COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet below native surface (bns)) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has liquid petroleum fuel COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the liquid petroleum fuel specific investigation area will be addressed in phase two. • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the liquid petroleum fuel contamination has been delineated.	Yes – soil borings were drilled and samples as defined in the DRs. Fuel-related VOCs were below the SSLs; however, PAHs were above the SSLs. As a result, additional Phase 2 borings were installed to investigate the lateral extent PAHs as defined in the DRs. PAHs were below the SSLs in these borings and the DRs for step-out borings were met.
	SIA2 – Fuels around the BAPCO Maintenance and Equipment Shop	The decision rules associated with RU 20 for the solvent specific investigation area study are as follows: • If the concentration of solvent COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If the concentration of liquid petroleum fuel COCs or COPCs associated with the potential migration to groundwater (i.e., 10 feet bns) is greater than the applicable SSLs, then the additional vertical sampling needed to address the migration from 10 feet below native soil to groundwater will be performed in phase two. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has liquid petroleum fuel COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the liquid petroleum fuel specific investigation area will be addressed in phase two. For the RU 20 liquid petroleum fuel specific investigation area study, the decisions associated with determining the extent of the fuel contaminated soil are: • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the liquid petroleum fuel contamination has been delineated. • If a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has solvent COC and COPC concentrations above the applicable SSLs, then additional lateral delineation of the solvent specific investigation area will be addressed in phase two. • If the concentration of solvent COCs and COPCs is less than the applicable SSLs, then the lateral and vertical extent of the solvent contamination has been delineated.	Yes - soil borings were drilled and sampled for liquid petroleum fuels and shop-related organic solvents. Phase 2 borings were not necessary to delineate horizontal and vertical extent of these contaminants as defined in the DRs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 20: Former Bannock Paving Area **(continued)**	SIA3 – Coke Constituents and Reference Area Investigation - Coke	The decision rules associated with sampling at RU 20 for the PAH specific investigation areas, except the concrete lined coke settling basins are as follows: • If the PAH concentrations are greater than the applicable SSLs, then the area will be forwarded to the SFS. • If one or ore of the outermost borings have PAH concentrations above the SSL, then additional lateral delineation of the specific investigation area will be required. • If the PAH concentrations are less than the applicable SSL value, then the lateral and vertical extent of coke PAH constituents have been delineated.	Yes - soil borings were drilled and sampled for coke-related PAHs. Phase 2 borings were not necessary to delineate horizontal and vertical extent of these contaminants as defined in the DRs.
	SIA4 – Coke Constituents underlying the Coke Settling Basins	The decision rules associated with sampling at RU 20 for the PAH specific investigation areas, the concrete lined coke settling basins are as follows: • If the PAH or metals concentrations are greater than the applicable SSLs in the soil samples below the coke settling basins, then RU 20 will be forwarded to the SFS. • If the PAH and metals concentrations are less than the applicable SSLs, then the lateral and vertical extent of coke PAH constituents have been delineated. • If the PAH or metals concentrations are greater than the applicable SSLs in the 10-foot below coke settling basin samples, then the area will be forwarded to the SFS and the need for a second phase investigation regarding soil concentrations of PAHs and metals down to groundwater will be evaluated with EPA input.	Yes - soil borings were drilled and sampled for metals and coke-related PAHs. Phase 2 borings were not necessary to delineate horizontal and vertical extent of these contaminants as defined in the DRs.
	SIA5 – Coke Constituents	The decision rules associated with coke characterization are as follows: • If the final ROD selects excavation and removal of coke in RU 7 and/or RU 20 as part of the FMC Plant OU remedial action, then the TCLP results and process knowledge will be used to determine the appropriate waste management for that material.	Yes – Coke was sampled as defined in the DRs. TCLP metals and SVOCs results indicated that coke found at the FMC plant site is not a hazardous waste.
RU 21: Other Onsite Railspurs	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was not required for this RU as defined in the DRs and the SRI Work Plan.
RU 22b: Old Phossy Ponds	Risk Assessment	Decision rules were not developed for the risk assessment at RU 22b. A quantitative evaluation of risks to current and potential future receptors from exposure to precipitator and phossy solids was performed. Data characterizing the fill materials present in RU 22b were used to bound risks.	NA

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 22b: Old Phossy Ponds **(continued)**	SIA1 - Radon Flux	The decision rules for radon flux measurements in RU 22b are as follows: • If the average radon flux from the pile is above the UMTRCA guideline, then radon flux control may be a cover/cap design criterion in the SFS. • If the average radon flux from the pile is below the UMTRCA guideline, then radon flux control does not need to be further evaluated in the SFS.	Yes – collected radon flux measurements as defined in the DRs.
	Cap/Cover Delineation – Old Ponds	The decision rules associated with confirmation sampling at RU 22b are as follows: • If the concentrations of COCs and COPCs associated with the boring/test pit from RU 22b in the 0-to-2-foot bgs or 0-to-10 foot bgs interval is greater than the applicable SSLs or background values, then the data will be forwarded to the SFS. • If the concentrations of COCs and COPCs associated with the boring/test pit from RU 22b in the 0-to-2-foot bgs and 0-to-10 foot bg interval are less than the applicable SSLs or background values, then no further data are required. • If the concentrations of COCs and COPCs associated with the step-out boring/test pit from RU22b in the 0-to-2 foot bns interval are greater than the applicable SSLs or background values, then additional step-out sampling will be performed. • Conversely, if the concentrations of COCs and COPCs associated with the boring/test pit from RU 22b in the 0-to-2 foot bns interval are less than the applicable SSLs or background values, then the lateral extent of the cap has been delineated.	No – the decision rules were not met because several metals and radionuclide SSLs were exceeded. Additional step-out borings may be necessary to define the extent of elevated metals in the RU 22b area.
	SIA 1 - Underground Piping, Sumps, and Other Structures	The decision whether to remove, decontaminate, or abandon underground piping will be an SFS decision based on the detailed analysis of alternatives.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.
RU 22c: Railroad Swale	Risk Assessment	Decision rules were not developed for the risk assessment at RU 22c. A qualitative evaluation of risks to current and potential future receptors from exposure to P4 was performed. Data characterizing the fill materials present in RU 22c were used to quantitatively bound risks.	NA

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RU-SPECIFIC FIELD PROGRAM DECISION RULES AND FIELD PROGRAM COMPLIANCE
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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 22c: Railroad Swale **(continued)**	Cap/Cover Delineation – P4	The decision rules associated with the visual determination of P4 at a level of acute health concern at RU 22c are as follows: • If P4 is present in the boring as evidenced by smoking or burning, then additional step-out borings to 10 feet bgs are needed. • If P4 is not present in the boring as evidenced by a lack smoking or burning, then no further action regarding P4 cap delineation is needed. The decision rules associated with the evaluation of potential chronic worker exposure are as follows: • If P4 is above the applicable worker SSL, then additional step-out borings to 10 feet bgs are needed. • If P4 is less than all applicable SSLs then no further action with regards to P4 will be required in this area.	Yes – P4 was encountered in a single test pit (i.e., smoking soil). A step-out test pit was installed as defined in the DRs. A single soil boring was installed as defined in the DRs.
RU 23: Road Segments not within RU Boundaries	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface.. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.
RU 24: Plant Areas not within RU Boundaries	Risk Assessment	The decisions associated with the radiation surface survey are: • If an RU (or sub-area) exceeds the gamma dose rate CV for the site worker, then the remediation vision of no action anticipated to be necessary will require revision and the predefined sampling activities to support the SFS will be performed. Data characterizing fill materials in the RU will be used to evaluate risks. • If the radiation surface survey is below the gamma dose rate CV for the site worker, then surface PIC measurements will be made to quantify the rate.	Yes - additional SFS sampling was required as defined in the DRs.
	SFS	The decision rules for SFS Data Collection scheme are as follows: • If native soil is detected at 10 feet bgs or less, then collect a 0-to-2 foot sample below the native soil surface.. • If native soil is not detected in the first 10 feet bgs, then no other sampling is required at that sampling point.	Yes – SFS soil borings were drilled and sampled as defined in the DRs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
RU 24: Plant Areas not within RU Boundaries **(continued)**	SIA1 - Underground Piping, Sumps, and Other Structures	For the RU 24 underground piping investigation, the decisions associated with determining need for remediation are: • If an RU, with the exception of underground piping, meets the criteria for an NFA designation then the risk associated the underground piping will be addressed in phase two. • If it is determined that an RU is not a candidate for NFA, regardless of the risk associated with underground piping, then the RU will be forwarded to the SFS.	Yes – the UG piping throughout the former FMC plant site, including this RU, has been accounted for in drawings included as an appendix to the SRI Report and will be considered in the SFS as defined in the DRs. Phase 2 investigations were not necessary to evaluate potential risks as defined in the DRs.
Other Studies	SIA - Southern and Western Undeveloped Area – PIC Measurements	The decision rules for the Southern Undeveloped Area (SUA) are as follows: • If the surface radiation levels in the southern undeveloped area, as measured by the PIC, are above the midpoint of the "D" range (15.75 uR/hr), site-specific exceedances associated with natural geological features (e.g., rock outcroppings) will be considered and then areas that have been impacted will be forwarded to the SFS. • If the surface radiation levels in the southern undeveloped area, as measured by the PIC, are below the midpoint of the "D" range (15.75 uR/hr), then the area will not have been impacted. The decision rules for the Western Undeveloped Area (WUA) are as follows: • If the surface radiation levels in the western undeveloped area, as measured by the PIC, are above the established background (13 µR/hr), then the area will have been impacted and will be forwarded to the SFS. • If the surface radiation levels in the western undeveloped area, as measured by the PIC, are below the established background, then the area will not have been impacted.	Yes – PIC measurements were collected and these areas will not be forwared to the SFS as defined in the DRs.
	SIA – Precipitator Solids Roadway Investigation	The decision rules for the worst case scenario location(s) are as follows: • If the statistical distribution of Pb-210 exceeds that of the southern low traffic road location in central tendency and/or extremes, then forward this information to the risk assessment (if the RU is still an NFA candidate) or the SFS (if the RU is no longer an NFA candidate). • If the statistical distribution of Pb-210 does not exceed that of the southern low traffic road location in central tendency and/or extremes, then the area has not been impacted by precipitator dust/phossy solids.	Yes – soil borings were drilled and sampled and these road segments will not be forwarded to the SFS as defined in the DRs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Decision Rules (RU Specific)	Decision Rule Compliance (Yes/No/NA)
	SIA – PCDT Roadway Investigation	The decision rules for the PCDT water study are as follows: • If the statistical distribution exceeds that of the reference road location in central tendency and/or extremes, and the roadway is located in an RU that is still NFA, then that road segment and other road segments that received PCDT water as dust suppressant will be forwarded to the risk assessment along with the results of the PCDT water application study. • If the statistical distribution exceeds that of the reference road location in central tendency and/or extremes and the roadway is located in an RU that has been forwarded to the SFS, then the results of the PCDT water application study will be forwarded to the SFS. • If the statistical distribution does not exceed that of the reference road location in central tendency and/or extremes, then no further consideration of PCDT water application is required.	Yes – soil borings were drilled and sampled and these road segments will be forwarded to the SFS as defined in the DRs.
	Fill Characterization	There were no decision rules associated with the fill characterization investigation.	NA

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
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Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 1	Cap/Cover Delineation - P4	RU1-CAP-SB001 (0-2)	0 - 2	10/18/07	Solid	Primary	P4
		RU1-CAP-SB001 (2-4)	2 - 4	10/18/07	solid	Primary	P4
		RU1-CAP-SB001 (4-6)	4 - 6	10/18/07	solid	Primary	P4
		RU1-CAP-SB001 (6-8)	6 - 8	10/18/07	solid	Primary	P4
		RU1-CAP-SB001 (8-10)	8 - 10	10/18/07	solid	Primary	P4
		RU1-CAP-SB002 (0-2)	0 - 2	10/17/07	solid	Primary	P4
		RU1-CAP-SB002 (2-4)	2 - 4	10/17/07	solid	Primary	P4
		RU1-CAP-SB002 (4-6)	4 - 6	10/17/07	solid	Primary	P4
		RU1-CAP-SB002 (6-8)	6 - 8	10/17/07	solid	Primary	P4
		RU1-CAP-SB002 (8-10)	8 - 10	10/17/07	solid	Primary	P4
		RU1-CAP-SB003 (0-2)	0 - 2	10/18/07	solid	Primary	P4
		RU1-CAP-SB003 (2-4)	2 - 4	10/18/07	solid	Primary	P4
		RU1-CAP-SB003 (4-6)	4 - 6	10/18/07	solid	Primary	P4
		RU1-CAP-SB003 (6-8)	6 - 8	10/18/07	solid	Primary	P4
		RU1-CAP-SB003 (8-10)	8 - 10	10/18/07	solid	Primary	P4
		RU1-CAP-SB003a (0-2)	0 - 2	11/14/07	solid	Primary	P4
		RU1-CAP-SB003a (2-4)	2 - 4	11/14/07	solid	Primary	P4
		RU1-CAP-SB003a (4-6)	4 - 6	11/14/07	solid	Primary	P4
		RU1-CAP-SB003a (6-8)	6 - 8	11/14/07	solid	Primary	P4
		RU1-CAP-SB003a (8-10)	8 - 10	11/14/07	solid	Primary	P4
		RU1-CAP-SB004 (0-2)	0 - 2	11/29/07	solid	Primary	P4
		RU1-CAP-SB004 (2-4)	2 - 4	11/29/07	solid	Primary	P4
		RU1-CAP-SB004 (4-6)	4 - 6	11/29/07	solid	Primary	P4
		RU1-CAP-SB004 (6-8)	6 - 8	11/29/07	solid	Primary	P4
		RU1-CAP-SB004 (8-10)	8 - 10	11/29/07	solid	Primary	P4
		RU1-CAP-SB005 (0-2)	0 - 2	11/29/07	solid	Primary	P4
		RU1-CAP-SB005 (2-4)	2 - 4	11/29/07	solid	Primary	P4
		RU1-CAP-SB005 (4-6)	4 - 6	11/29/07	solid	Primary	P4
		RU1-CAP-SB005 (6-8)	6 - 8	11/29/07	solid	Primary	P4
		RU1-CAP-SB005 (8-10)	8 - 10	11/29/07	solid	Primary	P4
		RU1-CAP-SB006 (0-2)	0 - 2	10/25/07	solid	Primary	P4
		RU1-CAP-SB006 (2-4)	2 - 4	10/25/07	solid	Primary	P4
		RU1-CAP-SB006 (4-6)	4 - 6	10/25/07	solid	Primary	P4
		RU1-CAP-SB006 (6-8)	6 - 8	10/25/07	solid	Primary	P4
		RU1-CAP-SB006 (8-10)	8 - 10	10/25/07	solid	Primary	P4
		RU1-CAP-SB007 (0-2)	0 - 2	10/26/07	solid	Primary	P4
		RU1-CAP-SB207 (0-2)	0 - 2	10/29/07	solid	Colocated	P4
		RU1-CAP-SB007 (2-4)	2 - 4	10/26/07	solid	Primary	P4
		RU1-CAP-SB207 (2-4)	2 - 4	10/29/07	solid	Colocated	P4
		RU1-CAP-SB007 (4-6)	4 - 6	10/26/07	solid	Primary	P4
		RU1-CAP-SB207 (4-6)	4 - 6	10/29/07	solid	Colocated	P4
		RU1-CAP-SB007 (6-8)	6 - 8	10/26/07	solid	Primary	P4
		RU1-CAP-SB207 (6-8)	6 - 8	10/29/07	solid	Colocated	P4
		RU1-CAP-SB007 (8-10)	8 - 10	10/26/07	solid	Primary	P4
		RU1-CAP-SB207 (8-10)	8 - 10	10/29/07	solid	Colocated	P4
RU 1	SIA1 - P4 Capillary Fringe	RU1-SIA1-SB001 (80-81)	80 - 81	12/5/07	solid	Primary	P4
		RU1-SIA1-SB002 (77-78)	77-78	11/30/07	solid	Primary	P4
		RU1-SIA1-SB003 (77.5-78)	77.5 - 78	11/30/07	solid	Primary	P4
		RU1-SIA1-SB004 (75-76)	75 - 76	11/29/07	solid	Primary	P4
		RU1-SIA1-SB005 (77.5-78)	77.5 - 78	11/30/07	solid	Primary	P4
		RU1-SIA1-SB006 (83-84)	83 - 84	12/4/07	solid	Primary	P4
		RU1-SIA1-SB007 (86-86.5)	86 - 86.5	12/5/07	solid	Primary	P4
RU 2	Cap/Cover Delineation - P4	RU2-CAP-SB001 (0-2)	0 - 2	10/31/07	solid	Primary	P4
		RU2-CAP-SB001 (2-4)	2 - 4	10/31/07	solid	Primary	P4
		RU2-CAP-SB001 (4-6)	4 - 6	10/31/07	solid	Primary	P4
		RU2-CAP-SB001 (6-8)	6 - 8	10/31/07	solid	Primary	P4
		RU2-CAP-SB001 (8-10)	8 - 10	10/31/07	solid	Primary	P4
		RU2-CAP-SB002 (0-2)	0 - 2	11/13/07	solid	Primary	P4
		RU2-CAP-SB002 (2-4)	2 - 4	11/13/07	solid	Primary	P4
		RU2-CAP-SB002 (4-6)	4 - 6	11/13/07	solid	Primary	P4
		RU2-CAP-SB002 (6-8)	6 - 8	11/13/07	solid	Primary	P4
		RU2-CAP-SB002 (8-10)	8 - 10	11/13/07	solid	Primary	P4
		RU2-SIA1-SB003 (0-2)	0 - 2	11/16/07	solid	Primary	P4
		RU2-SIA1-SB003 (2-4)	2 - 4	11/16/07	solid	Primary	P4
		RU2-SIA1-SB003 (4-6)	4 - 6	11/16/07	solid	Primary	P4
		RU2-SIA1-SB003 (6-8)	6 - 8	11/16/07	solid	Primary	P4
		RU2-SIA1-SB003 (8-10)	8 - 10	11/16/07	solid	Primary	P4

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 2 continued	Cap/Cover Delineation - P4	RU2-CAP-SB004 (0-2)	0 - 2	11/2/07	solid	Primary	P4
		RU2-CAP-SB004 (2-4)	2 - 4	11/2/07	solid	Primary	P4
		RU2-CAP-SB004 (4-6)	4 - 6	11/2/07	solid	Primary	P4
		RU2-CAP-SB004 (6-8)	6 - 8	11/2/07	solid	Primary	P4
		RU2-CAP-SB004 (8-10)	8 - 10	11/2/07	solid	Primary	P4
		RU2-CAP-SB005 (0-2)	0 - 2	11/6/07	solid	Primary	P4
		RU2-CAP-SB005 (2-4)	2 - 4	11/6/07	solid	Primary	P4
		RU2-CAP-SB005 (4-6)	4 - 6	11/6/07	solid	Primary	P4
		RU2-CAP-SB005 (6-8)	6 - 8	11/6/07	solid	Primary	P4
		RU2-CAP-SB005 (8-10)	8 - 10	11/6/07	solid	Primary	P4
		RU2-CAP-SB006 (0-2)	0 - 2	11/8/07	solid	Primary	P4
		RU2-CAP-SB006 (2-4)	2 - 4	11/8/07	solid	Primary	P4
		RU2-CAP-SB006 (4-6)	4 - 6	11/8/07	solid	Primary	P4
		RU2-CAP-SB006 (6-8)	6 - 8	11/8/07	solid	Primary	P4
		RU2-CAP-SB006 (8-10)	8 - 10	11/8/07	solid	Primary	P4
		RU2-CAP-SB007 (0-2)	0 - 2	11/9/07	solid	Primary	P4
		RU2-CAP-SB207 (0-2)	0 - 2	11/9/07	solid	Colocated	P4
		RU2-CAP-SB007 (2-4)	2 - 4	11/9/07	solid	Primary	P4
		RU2-CAP-SB207 (2-4)	2 - 4	11/9/07	solid	Colocated	P4
		RU2-CAP-SB007 (4-6)	4 - 6	11/9/07	solid	Primary	P4
		RU2-CAP-SB207 (4-6)	4 - 6	11/9/07	solid	Colocated	P4
		RU2-CAP-SB007 (6-8)	6 - 8	11/9/07	solid	Primary	P4
		RU2-CAP-SB207 (6-8)	6 - 8	11/9/07	solid	Colocated	P4
		RU2-CAP-SB007 (8-10)	8 - 10	11/9/07	solid	Primary	P4
		RU2-CAP-SB207 (8-10)	8 - 10	11/9/07	solid	Colocated	P4
RU 3	SIA1 - Phossy Water	RU3-SIA1-SB001 (3-5)	3 - 5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB002 (3-5)	3 - 5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB003 (4-6)	4 - 6	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB004 (2-4)	2 - 4	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB005 (3-5)	3 - 5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB006 (4-6)	4 - 6	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB007 (3-5)	3 - 5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB008 (3-5)	3 - 5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB009 (5.5-7.5)	5.5 - 7.5	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB010 (5-7)	5 - 7	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB210 (5-7)	5 - 7	10/9/07	solid	Colocated	P4, Metals, Fluoride
		RU3-SIA1-SB011 (7-9)	7 - 9	10/9/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB012 (4-6)	4 - 6	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB013 (4-6)	4 - 6	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB014 (7-9)	7 - 9	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU3-SIA1-SB015 (9-11)	9 - 11	10/10/07	solid	Primary	P4, Metals, Fluoride
RU 3	SFS	RU3-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/21/07	solid	Primary	Metals, Fluoride, Rads
		RU3-SFS-SBC201 (0-2 BNS)	0 - 2 BNS	9/21/07	solid	Colocated	Metals, Fluoride, Rads
		RU3-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/21/07	solid	Primary	Metals, Fluoride, Rads
		RU3-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/24/07	solid	Primary	Metals, Fluoride, Rads
		RU3-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/25/07	solid	Primary	Metals, Fluoride, Rads
RU 4	SIA1 - Organic Solvents	RU4-SIA1-SB001(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB001(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB001(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB002(2)	2	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB002(4)	4	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB002(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB003(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB003(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB003(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB004(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB204(1.5)	1.5	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB004(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB204(3.5)	3.5	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB004(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB204(10)	10	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB005(2)	2	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB005(4)	4	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB005(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 4 continued	SIA1 - Organic Solvents	RU4-SIA1-SB006(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB006(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB006(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB007(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB007(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB007(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB008(14)	14	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB008(16)	16	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB008(24)	24	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB009(2)	2	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB009(4)	4	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB009(10)	10	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB010(2)	2	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB210(2.0)	2	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB010(4)	4	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB210(4.0)	4	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB010(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB210(10)	10	7/12/07	solid	Colocated	Lab Solvent VOCs
		RU4-SIA1-SB011(2)	2	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB011(4)	4	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB011(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB012(2)	2	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB012(4)	4	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB012(10)	10	7/13/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB013(1.5)	1.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB013(3.5)	3.5	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB013(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB014(2)	2	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB014(4)	4	7/12/07	solid	Primary	Lab Solvent VOCs
		RU4-SIA1-SB014(10)	10	7/12/07	solid	Primary	Lab Solvent VOCs
RU 4	SFS	RU4-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/23/07	solid	Primary	Metals, Fluoride, Rads
		RU4-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	8/28/07	solid	Primary	Metals, Fluoride, Rads
		RU4-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	8/29/07	solid	Primary	Metals, Fluoride, Rads
		RU4-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	8/29/07	solid	Colocated	Metals, Fluoride, Rads
		RU4-SFS-SBC005 (0-2 BNS)	0 - 2 BNS	8/29/07	solid	Primary	Metals, Fluoride, Rads
RU 5	SIA1 - Organic Solvents	RU5-SIA1-SB001(2)	2	7/13/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB001(4)	4	7/13/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB001(10)	10	7/13/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB002(1.5)	1.5	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB002(3.5)	3.5	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB002(10.0)	10	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB003(2)	2	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB003(4)	4	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB003(10)	10	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB004 (5)	5	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB004 (7)	7	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB004 (10)	10	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB004 (15)	15	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB005(2.0)	2	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB005(4.0)	4	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB005(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB006(5)	5	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB006(7)	7	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB006(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB006(15.0)	15	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB007(1.5)	1.5	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB007(3.5)	3.5	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB007(10.0)	10	7/16/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB008 (6)	6	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB008 (8)	8	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB008 (10)	10	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB008 (16)	16	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB009(1.5)	1.5	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB009(3.5)	3.5	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB009(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB010(12.0)	12	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB010(14.0)	14	7/17/07	solid	Primary	Lab Solvent VOCs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 5 continued	SIA1 - Organic Solvents	RU5-SIA1-SB010(22)	22	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB011(1.5)	1.5	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB211(1.5)	1.5	7/17/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB011(3.5)	3.5	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB211(3.5)	3.5	7/17/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB011(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB211(10.0)	10	7/17/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB012 (6)	6	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB012 (8)	8	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB012 (10)	10	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB012 (16)	16	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB013(2.0)	2	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB013(4.0)	4	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB013(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB014(2.0)	2	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB014(4.0)	4	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB014(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB015(1.0)	1	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB015(3.0)	3	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB015(10.0)	10	7/17/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB016 (6)	6	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB016 (8)	8	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB016 (10)	10	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB016 (16)	16	7/19/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB017(5)	5	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB017(7)	7	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB017(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB017(15)	15	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB018(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB018(6)	6	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB018(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB018(14)	14	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB019(2)	2	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB019(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB019(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB020(1.5)	1.5	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB220(1.5)	1.5	7/18/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB020(3.5)	3.5	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB220(3.5)	3.5	7/18/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB020(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB220(10)	10	7/18/07	solid	Colocated	Lab Solvent VOCs
		RU5-SIA1-SB021(2)	2	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB021(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB021(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB022(2)	2	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB022(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB022(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB023(2)	2	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB023(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB023(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB024(2)	2	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB024(4)	4	7/18/07	solid	Primary	Lab Solvent VOCs
		RU5-SIA1-SB024(10)	10	7/18/07	solid	Primary	Lab Solvent VOCs
RU 5	SFS	RU5-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/13/07	solid	Primary	Metals, Fluoride, Rads
		RU5-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	8/14/07	solid	Primary	Metals, Fluoride, Rads
		RU5-SFS-SBC202 (0-2 BNS)	0 - 2 BNS	8/14/07	solid	Colocated	Metals, Fluoride, Rads
		RU5-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	8/14/07	solid	Primary	Metals, Fluoride, Rads
		RU5-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	8/14/07	solid	Primary	Metals, Fluoride, Rads

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 6	SIA1- Phossy Water	RU6-SIA1-SB001 (8-10)	8 - 10	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB002 (10-12)	10 - 12	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB003 (7-9)	7 - 9	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB004 (9-11)	9 - 11	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB005 (14-16)	14 - 16	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB006 (6-8)	6 - 8	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB007 (9-11)	9 - 11	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB008 (8-10)	8 - 10	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB009 (9-11)	9 - 11	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB010 (13-15)	13 - 15	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB210 (13-15)	13 - 15	10/12/07	solid	Colocated	P4, Metals, Fluoride
		RU6-SIA1-SB011 (14-16)	14 - 16	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB012 (9-11)	9 - 11	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB013 (14-16)	14 - 16	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB014 (15-17)	15 - 17	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB015 (14-16)	14 - 16	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB016 (15-17)	15 - 17	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB017 (10-12)	10 - 12	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB018 (12-14)	12 - 14	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB019 (8-10)	8 - 10	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB020 (11.5-13.5)	11.5 - 13.5	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB220 (11.5-13.5)	11.5 - 13.5	10/11/07	solid	Colocated	P4, Metals, Fluoride
		RU6-SIA1-SB021 (15-17)	15 - 17	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB022 (15-17)	15 - 17	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB023 (15-17)	15 - 17	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB024 (14-16)	14 - 16	10/12/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB025 (14-16)	14 - 16	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB026 (14-16)	14 - 16	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB027 (14-16)	14 - 16	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB028 (15-17)	15 - 17	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB029 (14-16)	14 - 16	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB030 (10-12)	10 - 12	10/11/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB230 (10-12)	10 - 12	10/11/07	solid	Colocated	P4, Metals, Fluoride
		RU6-SIA1-SB031 (10-12)	10 - 12	10/10/07	solid	Primary	P4, Metals, Fluoride
		RU6-SIA1-SB032 (12-14)	12 - 14	10/11/07	solid	Primary	P4, Metals, Fluoride
RU 6	SFS	RU6-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/26/07	solid	Primary	Metals, Fluoride, Rads
		RU6-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/26/07	solid	Primary	Metals, Fluoride, Rads
		RU6-SFS-SBC202 (0-2 BNS)	0 - 2 BNS	9/26/07	solid	Colocated	Metals, Fluoride, Rads
		RU6-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/27/07	solid	Primary	Metals, Fluoride, Rads
		RU6-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/27/07	solid	Primary	Metals, Fluoride, Rads
RU 7	Reference Area - Ore	RU7-REF-SB001 (8-10)	8 - 10	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB002 (5-7)	5 - 7	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB003 (25-27)	25 - 27	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB004 (15-17)	15 - 17	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB005 (5-7)	5 - 7	9/5/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB006 (16.5-18.5)	16.5 - 18.5	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB007 (2-4)	2 - 4	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB008 (13-15)	13 - 15	9/20/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB208 (13-15)	13 - 15	9/20/07	solid	Colocated	Metals, Fluoride, Rads
		RU7-REF-SB009 (15-17)	15 - 17	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB010 (1-3)	1 - 3	9/19/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB011 (5-7)	5 - 7	9/5/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB012 (4-6)	4 - 6	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB013 (1.5-3.5)	1.5 - 3.5	9/19/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB014 (8-10)	8 - 10	9/5/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB015 (15-17)	15 - 17	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB016 (12-14)	12 - 14	9/19/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB017 (6-8)	6 - 8	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB018 (15-17)	15 - 17	9/10/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB019 (15-17)	15 - 17	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB020 (12-14)	12 - 14	9/20/07	solid	Primary	Metals, Fluoride, Rads
		RU7-REF-SB220 (12-14)	12 - 14	9/20/07	solid	Colocated	Metals, Fluoride, Rads

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 7	SFS	RU7-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU7-SFS-SBC201 (0-2 BNS)	0 - 2 BNS	9/6/07	solid	Colocated	Metals, Fluoride, Rads
		RU7-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/20/07	solid	Primary	Metals, Fluoride, Rads
		RU7-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/7/07	solid	Primary	Metals, Fluoride, Rads
		RU7-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/10/07	solid	Primary	Metals, Fluoride, Rads
RU 8	Cap/Cover Delineation - Kiln Pond Sediments	RU8-CAP-SB001 (8-10)	8 - 10	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB002 (12-14)	12 - 14	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB003 (15-17)	15 - 17	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB004 (7-9)	7 - 9	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB005 (4-6)	4 - 6	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB006 (3-5)	3 - 5	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB007 (3-5)	3 - 5	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB008 (7-9)	7 - 9	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB009 (5-7)	5 - 7	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB010 (5.5-7.5)	5.5 - 7.5	10/3/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB210 (5.5-7.5)	5.5 - 7.5	10/4/07	solid	Colocated	Metals, Fluoride, Rads
		RU8-CAP-SB011 (4-6)	4 - 6	10/4/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB012 (4-6)	4 - 6	10/4/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB013 (5-7)	5 - 7	10/4/07	solid	Primary	Metals, Fluoride, Rads
		RU8-CAP-SB014 (8-10)	8 - 10	10/4/07	solid	Primary	Metals, Fluoride, Rads
RU 9	SFS	RU9-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/30/07	solid	Primary	Metals, Fluoride, Rads
		RU9-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	8/30/07	solid	Primary	Metals, Fluoride, Rads
		RU9-SFS-SBC202 (0-2 BNS)	0 - 2 BNS	8/30/07	solid	Colocated	Metals, Fluoride, Rads
		RU9-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/5/07	solid	Primary	Metals, Fluoride, Rads
		RU9-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/5/07	solid	Primary	Metals, Fluoride, Rads
RU 10	SIA1 - Phossy Water and Precipitator Solids	RU10-SIA1-SB001 (0-2)	0 - 2	10/18/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB002 (0-2)	0 - 2	10/18/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB003 (0-2)	0 - 2	10/18/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB004 (0-2)	0 - 2	10/18/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB005 (8-10)	8 - 10	11/7/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB006 (6-8)	6 - 8	10/15/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB007 (4-6)	4 - 6	10/17/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB008 (6-8)	6 - 8	10/17/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB009 (7-9)	7 - 9	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB010 (8-10)	8 - 10	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB210 (8-10)	8 - 10	10/16/07	solid	Colocated	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB011 (8-10)	8 - 10	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB012 (7-9)	7 - 9	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB013 (8-10)	8 - 10	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB014 (5-7)	5 - 7	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB015 (5-7)	5 - 7	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB016 (5-7)	5 - 7	10/16/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB017 (6-8)	6 - 8	10/15/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB018 (5-7)	5 - 7	10/15/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB019 (5-7)	5 - 7	10/15/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB020 (7-9)	7 - 9	10/15/07	solid	Primary	P4, Metals, Fluoride, Pb-210, Po-210
		RU10-SIA1-SB220 (7-9)	7 - 9	10/15/07	solid	Colocated	P4, Metals, Fluoride, Pb-210, Po-210
RU 10	SFS	RU10-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	10/16/07	solid	Primary	Metals, Fluoride, Rads
		RU10-SFS-SBC201 (0-2 BNS)	0 - 2 BNS	10/16/07	solid	Colocated	Metals, Fluoride, Rads
		RU10-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	10/16/07	solid	Primary	Metals, Fluoride, Rads
		RU10-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	10/17/07	solid	Primary	Metals, Fluoride, Rads
		RU10-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	11/7/07	solid	Primary	Metals, Fluoride, Rads

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 11	SFS	RU11-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/21/07	solid	Primary	Metals, Fluoride, Rads
		RU11-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	8/21/07	solid	Primary	Metals, Fluoride, Rads
		RU11-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	8/22/07	solid	Primary	Metals, Fluoride, Rads
		RU11-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	8/22/07	solid	Colocated	Metals, Fluoride, Rads
		RU11-SFS-SBC005 (0-2 BNS)	0 - 2 BNS	8/23/07	solid	Primary	Metals, Fluoride, Rads
RU12	SIA1 - Fuels and Orgranic Sovents	RU12-SIA1-SB001 (2)	2	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB001 (4)	4	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB001 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB002 (2)	2	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB002 (4)	4	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB002 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB003 (1.5)	1.5	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB003 (3.5)	3.5	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB003 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB004 (2)	2	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB004 (4)	4	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB004 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB005 (2)	2	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB005 (4)	4	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB005 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB006 (1)	1	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB006 (3)	3	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB006 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB007 (2)	2	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB007 (4)	4	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB007 (10)	10	7/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB008(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB008(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB008(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB009(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB009(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB009(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB010(5)	5	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB010(7)	7	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB010(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB010(15)	15	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB011(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB011(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB011(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB012(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB212(4)	4	7/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB012(6)	6	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB212(6)	6	7/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB012(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB212(10)	10	7/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB012(14)	14	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB013(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB013(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB013(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB014(1.5)	1.5	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB014(3.5)	3.5	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB014(10.0)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB015(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB015(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB015(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB016 (2)	2	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB016 (4)	4	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB016 (10)	10	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB017 (2)	2	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB017 (4)	4	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB017 (10)	10	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB018(2)	2	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB018(4)	4	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB018(10)	10	7/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB019 (2)	2	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB019 (4)	4	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB019 (10)	10	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU12	SIA1 - Fuels and Orgranic	RU12-SIA1-SB020 (2)	2	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
	Sovents	RU12-SIA1-SB220 (2)	2	7/24/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
continued		RU12-SIA1-SB220 (4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB020 (10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB220 (10)	10	7/24/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB021 (2)	2	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB021 (4)	4	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB021 (10)	10	7/23/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB022 (2)	2	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB022 (4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB022 (10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB023 (4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB023 (6)	6	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB023 (10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB023 (14)	14	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB024 (3.5)	3.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB024 (5.5)	5.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB024 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB024 (13.5)	13.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB025 (4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB025 (6)	6	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB025 (10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB025 (14)	14	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB026(1.5)	1.5	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB026(3.5)	3.5	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB026(10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB027(2)	2	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB027(4)	4	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB027(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB028 (2)	2	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB028 (4)	4	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB028 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB029(2)	2	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB029(4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB029(10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB030(6)	6	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB230(6)	6	8/1/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB030(8)	8	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB230(8)	8	8/1/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB030(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB230(10)	10	8/1/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB030(16)	16	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB031(2)	2	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB031(4)	4	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB031(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB032 (11)	11	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB032 (13)	13	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB032 (21)	21	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB033 (5.5)	5.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB033 (7.5)	7.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB033 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB033 (15.5)	15.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB034(4)	4	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB034(6)	6	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB034(10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB034(14)	14	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB035(8)	8	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB035(10)	10	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB035(18)	18	7/24/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB036 (3)	3	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB036 (5)	5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB036 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB036 (13)	13	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB037 (5.5)	5.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB037 (7.5)	7.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB037 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB037 (15.5)	15.5	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU12-SIA1-SB038(2)	2	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB038(4)	4	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB038(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB039 (3)	3	7/26/07	solid	Primary	Fuel VOCs, Fuel PAHs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU12	SIA1 - Fuels and Orgranic	RU12-SIA1-SB039 (5)	5	7/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
	Sovents	RU12-SIA1-SB039 (10)	10	7/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
continued		RU12-SIA1-SB039 (13)	13	7/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB040 (2)	2	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB240 (2)	2	7/25/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB040 (4)	4	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB240 (4)	4	7/25/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB040 (10)	10	7/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB240 (10)	10	7/25/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB041(3.5)	3.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB041(5.5)	5.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB041(10.0)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB041(13.5)	13.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB042(3.5)	3.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB042(5.5)	5.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB042(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA1-SB042(13.5)	13.5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
RU12	SIA2 - Fuels	RU12-SIA2-SB001(5)	5	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB001(7)	7	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB001(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB001(15)	15	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB002(3)	3	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB002(5)	5	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB002(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB002(13)	13	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB003(2)	2	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB003(4)	4	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB003(10)	10	8/1/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB004(5)	5	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB204(5)	5	8/7/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB004(7)	7	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB204(7)	7	8/7/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB004(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB204(10)	10	8/7/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB004(15)	15	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB005(4)	4	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB005(6)	6	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB005(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB005(14)	14	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB006(3)	3	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB006(5)	5	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB006(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB006(13)	13	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB007(4)	4	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB007(6)	6	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB007(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB007(14)	14	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB008(5)	5	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB008(7)	7	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB008(10)	10	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU12-SIA2-SB008(15)	15	8/7/07	solid	Primary	Fuel VOCs, Fuel PAHs
RU12	SIA3 - PCBs	RU12-SIA3-SB001(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB001(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB001(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB001(7.0)	7	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB001(9.0)	9	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(5)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(7.5)	7.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(10)	10	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(11.5)	11.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB002(13.5)	13.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(7.5)	7.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(10)	10	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB003(11)	11	8/8/07	solid	Primary	PCBs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU12 continued	SIA3 - PCBs	RU12-SIA3-SB003(13)	13	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(7.5)	7.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(8)	8	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB004(10)	10	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB005(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB005(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB005(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB005(7.0)	7	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB005(9.0)	9	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(7.5)	7.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(9.0)	9	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB006(11.0)	11	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(5.0)	5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(7.5)	7.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(10)	10	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB007(12)	12	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB008(0)	0	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB008(2.5)	2.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB008(4.5)	4.5	8/8/07	solid	Primary	PCBs
		RU12-SIA3-SB009(0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB009(2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB009(5.0)	5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB009(7.5)	7.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB009(9)	9	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB009(11)	11	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB010(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB210(0)	0	7/31/07	solid	Colocated	PCBs
		RU12-SIA3-SB010(2.5)	2.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB210(2.5)	2.5	7/31/07	solid	Colocated	PCBs
		RU12-SIA3-SB010(5)	5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB210(5)	5	7/31/07	solid	Colocated	PCBs
		RU12-SIA3-SB010(7.5)	7.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB210(7.5)	7.5	7/31/07	solid	Colocated	PCBs
		RU12-SIA3-SB010(10)	10	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB210(10.0)	10	7/31/07	solid	Colocated	PCBs
		RU12-SIA3-SB010(12)	12	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(2.5)	2.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(5)	5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(7.5)	7.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(10.0)	10	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB011(12)	12	7/31/07	solid	Primary	PCBs
		RU12-SIA-SB012(0)	0	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB012(2.5)	2.5	8/7/07	solid	Primary	PCBs
		RU12-SIA-SB012(5)	5	8/7/07	solid	Primary	PCBs
		RU12-SIA-SB012(7.5)	7.5	8/7/07	solid	Primary	PCBs
		RU12-SIA-SB012(8)	8	8/7/07	solid	Primary	PCBs
		RU12-SIA-SB012(10)	10	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB013(0)	0	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB013(2.5)	2.5	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB013(5)	5	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB013(7.0)	7	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB013(9)	9	8/7/07	solid	Primary	PCBs
		RU12-SIA3-SB014(0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB014(2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB014(5.0)	5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB014(7.5)	7.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB014(9.5)	9.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB014(11.5)	11.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB015(2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB015(5.0)	5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB015(7.5)	7.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB015(8.0)	8	7/30/07	solid	Primary	PCBs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU12 continued	SIA3 - PCBs	RU12-SIA3-SB015(10.0)	10	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB015(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB016(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB016(2.5)	2.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB016(5.0)	5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB016(7.5)	7.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB016(9.5)	9.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB017(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB017(2.5)	2.5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB017(5.0)	5	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB017(7.0)	7	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB018(0)	0	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB018(2)	2	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB018(4)	4	7/31/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (5)	5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (7.5)	7.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (8)	8	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB019 (10)	10	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB020 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB220 (0)	0	7/30/07	solid	Colocated	PCBs
		RU12-SIA3-SB020 (2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB220 (2.5)	2.5	7/30/07	solid	Colocated	PCBs
		RU12-SIA3-SB020 (5)	5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB220 (5)	5	7/30/07	solid	Colocated	PCBs
		RU12-SIA3-SB020 (6.5)	6.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB220 (6.5)	6.5	7/30/07	solid	Colocated	PCBs
		RU12-SIA3-SB020 (8.5)	8.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB220 (8.5)	8.5	7/30/07	solid	Colocated	PCBs
		RU12-SIA3-SB021 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB021 (2.5)	2.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB021 (5)	5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB021 (7.5)	7.5	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB021 (9)	9	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB021 (11)	11	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB022 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB022 (2)	2	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB022 (4)	4	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB023 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB023 (2)	2	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB023 (4)	4	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (7.5)	7.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (10)	10	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (11)	11	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB024 (13)	13	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB025 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB025 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB025 (4)	4	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB025 (8)	8	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (7.5)	7.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (10)	10	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB026 (12)	12	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (7.5)	7.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (8)	8	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB027 (10)	10	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (7.5)	7.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (9)	9	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB028 (11)	11	7/27/07	solid	Primary	PCBs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU12 continued	SIA3 - PCBs	RU12-SIA3-SB029 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB029 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB029 (3.5)	3.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB029 (5.5)	5.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB030 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB230 (0)	0	7/27/07	solid	Colocated	PCBs
		RU12-SIA3-SB030 (2)	2	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB230 (2)	2	7/27/07	solid	Colocated	PCBs
		RU12-SIA3-SB030 (4)	4	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB230 (4)	4	7/27/07	solid	Colocated	PCBs
		RU12-SIA3-SB031 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB031 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB031 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB031 (7.5)	7.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB031 (8.5)	8.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB031 (10.5)	10.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB032 (0)	0	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB032 (2.5)	2.5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB032 (3)	3	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB032 (5)	5	7/27/07	solid	Primary	PCBs
		RU12-SIA3-SB033 (0)	0	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB033 (2)	2	7/30/07	solid	Primary	PCBs
		RU12-SIA3-SB033 (4)	4	7/30/07	solid	Primary	PCBs
RU 12	SFS	RU12-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/15/07	solid	Primary	Metals, Fluoride, Rads
		RU12-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	8/16/07	solid	Primary	Metals, Fluoride, Rads
		RU12-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	8/16/07	solid	Primary	Metals, Fluoride, Rads
		RU12-SFS-SBC203 (0-2 BNS)	0 - 2 BNS	8/16/07	solid	Colocated	Metals, Fluoride, Rads
		RU12-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	8/17/07	solid	Primary	Metals, Fluoride, Rads
RU 13	SFS	RU13-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/14/07	solid	Primary	Metals, Fluoride, Rads
		RU13-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/18/07	solid	Primary	Metals, Fluoride, Rads
		RU13-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/18/07	solid	Primary	Metals, Fluoride, Rads
		RU13-SFS-SBC203 (0-2 BNS)	0 - 2 BNS	9/18/07	solid	Colocated	Metals, Fluoride, Rads
		RU13-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/19/07	solid	Primary	Metals, Fluoride, Rads
RU 15	SIA1 - Leaching Potential	RU15-SIA1-SB001 (5)	5	11/28/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB001 (10)	10	11/28/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB001 (20)	20	11/28/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB001 (30)	30	11/28/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB001 (40)	40	11/28/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB002 (20.5)	20.5	11/16/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB002 (30)	30	11/16/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (10)	10	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (20)	20	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (30)	30	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (40)	40	11/20/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (50)	50	11/20/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (60)	60	11/20/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (70)	70	11/20/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB003 (80)	80	11/20/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB004 (39)	39	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (39)	39	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB004 (50)	50	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (50)	50	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB004 (60)	60	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (60)	60	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB004 (70)	70	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (70)	70	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB004 (80)	80	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (80)	80	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB004 (90)	90	11/15/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB204 (90)	90	11/16/07	solid	Colocated	Metals, Fluoride
		RU15-SIA1-SB005 (27)	27	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB005 (40)	40	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB005 (50)	50	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB005 (60)	60	11/19/07	solid	Primary	Metals, Fluoride

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 15 continued	SIA1 - Leaching Potential	RU15-SIA1-SB005 (70)	70	11/19/07	solid	Primary	Metals, Fluoride
		RU15-SIA1-SB005 (80)	80	11/19/07	solid	Primary	Metals, Fluoride
RU 16	SIA1 - Leaching Potential	RU16-SIA1-SB001 (25)	25	11/9/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB004 (9)	9	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB005 (14)	14	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB005 (20)	20	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB006 (1.5)	1.5	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB006 (10)	10	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (14)	14	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (20)	20	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (20)	20	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (30)	30	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (30)	30	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (40)	40	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (40)	40	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (50)	50	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (50)	50	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (60)	60	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (60)	60	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (70)	70	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (70)	70	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (80)	80	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (80)	80	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (90)	90	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (90)	90	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (100)	100	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (100)	100	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (110)	110	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (110)	110	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (120)	120	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (120)	120	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (130)	130	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (130)	130	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (140)	140	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (140)	140	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (150)	150	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (150)	150	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB006 (157)	157	11/13/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB206 (156)	156	11/27/07	solid	Colocated	Metals, Fluoride
		RU16-SIA1-SB007 (14)	14	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (20)	20	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (30)	30	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (40)	40	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (50)	50	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (60)	60	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (70)	70	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (80)	80	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (90)	90	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (100)	100	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (110)	110	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (120)	120	11/14/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (130)	130	11/15/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (140)	140	11/15/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (150)	150	11/15/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB007 (156)	156	11/15/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (10)	10	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (20)	20	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (30)	30	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (40)	40	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (50)	50	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (60)	60	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (70)	70	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (80)	80	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (90)	90	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (100)	100	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (110)	110	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (120)	120	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (130)	130	11/8/07	solid	Primary	Metals, Fluoride

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 16 continued	SIA1 - Leaching Potential	RU16-SIA1-SB008 (140)	140	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (150)	150	11/8/07	solid	Primary	Metals, Fluoride
		RU16-SIA1-SB008 (157)	157	11/8/07	solid	Primary	Metals, Fluoride
RU 20	SIA1 - Fuels Phase 1	RU20-SIA1-SB001 (2.5)	2.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB001 (4.5)	4.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB001 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB001 (12.5)	12.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB002 (1.5)	1.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB002 (3.5)	3.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB002 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB003 (1.5)	1.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB003 (3.5)	3.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB003 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB004 (3.5)	3.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB004 (5.5)	5.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB004 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB004 (13.5)	13.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB005 (2)	2	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB005 (4)	4	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB005 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB006 (2)	2	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB006 (4)	4	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB006 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB007 (3.5)	3.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB007 (5.5)	5.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB007 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB007 (13.5)	13.5	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB008 (4)	4	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB008 (6)	6	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB008 (10)	10	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB008 (14)	14	6/19/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB009 (3.5)	3.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB009 (5.5)	5.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB009 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB009 (13.5)	13.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB010 (4)	4	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB010 (6)	6	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB010 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB010 (14)	14	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB011 (4)	4	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB011 (6)	6	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB011 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB011 (14)	14	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB012 (6)	6	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB012 (8)	8	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB012 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB012 (16)	16	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB013 (2.5)	2.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB213 (2.5)	2.5	6/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB013 (4.5)	4.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB213 (4.5)	4.5	6/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB013 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB213 (10)	10	6/20/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB013 (12.5)	12.5	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB014 (2)	2	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB014 (4)	4	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB014 (10)	10	6/20/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB015(3)	3	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB015(5)	5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB015(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB015(13)	13	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB016(5)	5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB016(7)	7	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB016(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB016(15)	15	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB017(4.5)	4.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB017(6.5)	6.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB017(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	SIA1 - Fuels	RU20-SIA1-SB017(14.5)	14.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
	Phase 1	RU20-SIA1-SB018(2)	2	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
continued		RU20-SIA1-SB018(4)	4	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB018(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB019(4)	4	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB019(6)	6	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB019(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB019(14)	14	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB020(4)	4	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB0220(4)	4	6/22/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB020(6)	6	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB0220(6)	6	6/22/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB020(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB220(10)	10	6/22/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB020(14)	14	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB021(3)	3	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB021(5)	5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB021(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB021(13)	13	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB022(3)	3	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB022(5)	5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB022(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB022(13)	13	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB023(4.5)	4.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB023(6.5)	6.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB023(10)	10	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB023(14.5)	14.5	6/22/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB024(2)	2	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB024(4)	4	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB024(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB025(6)	6	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB025(8)	8	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB025(10)	10	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB025(16)	16	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB026(5)	5	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB026(7)	7	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB026(10)	10	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB026(15)	15	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB027(4.5)	4.5	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB027(6.5)	6.5	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB027(10)	10	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB027(14.5)	14.5	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB028(6)	6	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB028(8)	8	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB028(10)	10	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB028(16)	16	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB029(2)	2	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB029(4)	4	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB029(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB030(5.5)	5.5	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB230(5.5)	5.5	6/28/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB030(7.5)	7.5	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB230(7.5)	7.5	6/28/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB030(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB230(10.0)	10	6/28/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB030(15.5)	15.5	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB031 (5.0)	5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB031 (7.0)	7	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB031 (10)	10	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB031 (15)	15	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB032 (5.5)	5.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB032 (7.5)	7.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB032 (10)	10	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB032 (15.5)	15.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB033 (5.5)	5.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB033 (7.5)	7.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB033 (10.0)	10	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB033 (15.5)	15.5	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB034(6)	6	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB034(8)	8	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB034(10)	10	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	SIA1 - Fuels	RU20-SIA1-SB034(16)	16	6/25/07	solid	Primary	Fuel VOCs, Fuel PAHs
	Phase 1	RU20-SIA1-SB035(2)	2	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
continued		RU20-SIA1-SB035(4)	4	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB035(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB036(3.5)	3.5	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB036(5.5)	5.5	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB036(10)	10	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB036(13.5)	13.5	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB037 (8)	8	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB037 (10)	10	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB037 (18)	18	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB038 (11)	11	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB038 (13)	13	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB038 (18)	18	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB039 (6)	6	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB039 (8)	8	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB039 (10)	10	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB039 (16)	16	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB040(4)	4	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB240(4)	4	6/27/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB040(6)	6	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB240(6)	6	6/27/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB040(10)	10	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB240(10)	10	6/27/07	solid	Colocated	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB040(14)	14	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB041(6)	6	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB041(8)	8	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB041(10)	10	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB041(16)	16	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB042 (7)	7	6/26/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB042(9)	9	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB042(10)	10	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB042(17)	17	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB043(3)	3	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB043(5)	5	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB043(10)	10	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB043(13)	13	6/27/07	solid	Primary	Fuel VOCs, Fuel PAHs
		RU20-SIA1-SB044(4)	4	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB044(6)	6	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB044(10)	10	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB044(14)	14	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB045(6)	6	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB045(8)	8	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB045(10)	10	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB045(16)	16	11/29/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB046(5)	5	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB046(7)	7	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB046(10)	10	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB046(15)	15	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB047(6)	6	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB047(8)	8	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB047(10)	10	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB047(16)	16	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB048(6)	6	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB048(8)	8	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB048(10)	10	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB048(16)	16	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB049(5)	5	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB049(7)	7	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB049(10)	10	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB049(15)	15	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB050(5.5)	5.5	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB250(5.5)	5.5	11/30/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB050(7.5)	7.5	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB250(7.5)	7.5	11/30/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB050(10)	10	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB250(10)	10	11/30/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB050(15.5)	15.5	11/30/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB051(5)	5	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB051(7)	7	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB051(10)	10	12/3/07	solid	Primary	Fuel SVOCs

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	SIA1 - Fuels	RU20-SIA1-SB051(15)	15	12/3/07	solid	Primary	Fuel SVOCs
	Phase 2	RU20-SIA1-SB052(6.5)	6.5	12/3/07	solid	Primary	Fuel SVOCs
continued		RU20-SIA1-SB052(8.5)	8.5	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB052(10)	10	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB052(16.5)	16.5	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB053(6)	6	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB053(8)	8	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB053(10)	10	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB053(16)	16	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB054(4)	4	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB054(6)	6	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB054(10)	10	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB054(14)	14	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB055(4)	4	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB055(6)	6	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB055(10)	10	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB055(14)	14	12/3/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB056(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB056(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB056(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB057(3)	3	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB057(5)	5	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB057(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB057(13)	13	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB058(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB058(6)	6	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB058(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB058(14)	14	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB059(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB059(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB059(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB060(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB260(2)	2	12/4/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB060(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB260(4)	4	12/4/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB060(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB260(10)	10	12/4/07	solid	Colocated	Fuel SVOCs
		RU20-SIA1-SB061(3)	3	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB061(5)	5	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB061(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB061(13)	13	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB062(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB062(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB062(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB063(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB063(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB063(10)	10	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB064(2)	2	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB064(4)	4	12/4/07	solid	Primary	Fuel SVOCs
		RU20-SIA1-SB064(10)	10	12/4/07	solid	Primary	Fuel SVOCs
RU 20	SIA2 - Fuels and Organic Solvents	RU20-SIA2-SB001(2)	2	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB001(4)	4	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB001(10)	10	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB002(3.5)	3.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB002(5.5)	5.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB002(10.0)	10	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB002(13.5)	13.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB003(4)	4	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB003(6)	6	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB003(10)	10	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB003(14)	14	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB004(2)	2	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB004(4)	4	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB004(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB005(3)	3	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB005(5)	5	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB005(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB005(13)	13	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB006(3)	3	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB006(5)	5	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	SIA2 - Fuels and Organic	RU20-SIA2-SB006(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
	Solvents	RU20-SIA2-SB006(13)	13	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
continued		RU20-SIA2-SB007(3)	3	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB007(5)	5	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB007(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB007(13)	13	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB08(2)	2	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB08(4)	4	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB08(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB09(2)	2	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB09(4)	4	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB09(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB10(3)	3	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB210(3)	3	7/10/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB10(5)	5	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB210(5)	5	7/10/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB10(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB210(10)	10	7/10/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB10(13)	13	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB011(3)	3	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB011(5)	5	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB011(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB011(13)	13	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB012(4)	4	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB012(6)	6	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB012(10)	10	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB012(14)	14	7/10/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB013(2)	2	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB013(4)	4	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB013(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB014(2)	2	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB014(4)	4	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB014(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB015(3.5)	3.5	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB015(5.5)	5.5	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB015(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB015(15.5)	15.5	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB016(3.5)	3.5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB016(5.5)	5.5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB016(10.0)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB016(13.5)	13.5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB017(2)	2	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB017(4)	4	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB017(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB018(3)	3	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB018(5)	5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB018(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB018(13)	13	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB019(3)	3	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB019(5)	5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB019(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB019(13)	13	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(3.5)	3.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(3.5)	3.5	7/11/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(5.5)	5.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(5.5)	5.5	7/11/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(10)	10	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(10)	10	7/11/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(13.5)	13.5	7/11/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(3.5)	3.5	8/21/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(3.5)	3.5	8/21/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(5.5)	5.5	8/21/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(5.5)	5.5	8/21/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(10)	10	8/21/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB220(10)	10	8/21/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB020(13.5)	13.5	8/21/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB021(3)	3	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB021(5)	5	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB021(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB021(13)	13	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB022(3)	3	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	SIA2 - Fuels and Organic	RU20SIA2SB022(5)	5	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
	Solvents	RU20SIA2SB022(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
continued		RU20SIA2SB022(13)	13	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB023(2)	2	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB023(4)	4	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB023(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB024(2)	2	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB024(4)	4	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB024(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB025(2)	2	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB025(4)	4	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB025(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB026(2)	2	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB026(4)	4	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20SIA2SB026(10)	10	6/29/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB027(2)	2	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB027(4)	4	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB027(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB028(2)	2	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB028(4)	4	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB028(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB029(3)	3	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB029(5)	5	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB029(10)	10	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB029(13)	13	6/28/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB030(3)	3	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB230(3)	3	7/2/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB030(5)	5	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB230(5)	5	7/2/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB030(10)	10	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB230(10)	10	7/2/07	solid	Colocated	Fuel VOCs, Fuel PAHs, Shop Solvents
		RU20-SIA2-SB030(13)	13	7/2/07	solid	Primary	Fuel VOCs, Fuel PAHs, Shop Solvents
RU 20	SIA3 - Coke Constituents	RU20-SIA3-SB001 (10-12)	10 - 12	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB002 (10-12)	10 - 12	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB003 (9-11)	9 - 11	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB004 (12-14)	12 - 14	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB005 (9-11)	9 - 11	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB006 (10-12)	10 - 12	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB007 (10-12)	10 - 12	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB008 (5-7)	5 - 7	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB009 (5-7)	5 - 7	8/17/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB010(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB210(5-7)	5 - 7	8/20/07	solid	Colocated	Coke PAHs
		RU20-SIA3-SB011(9-11)	9 - 11	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB012(9-11)	9 - 11	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB013(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB014(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB015(10-12)	10 - 12	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB016(10-12)	10 - 12	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB017(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB018(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB019(7-9)	7 - 9	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB020(5-7)	5 - 7	8/20/07	solid	Primary	Coke PAHs
		RU20-SIA3-SB220(5-7)	5 - 7	8/20/07	solid	Colocated	Coke PAHs
RU 20	SIA4 - Coke Constituents	RU20-SIA4-SB001 (4)	4	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB001 (6)	6	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB001 (14)	14	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB002 (3)	3	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB002 (5)	5	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB002 (13)	13	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB003 (3)	3	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB003 (5)	5	9/13/07	solid	Primary	Coke PAHs, Coke Metals
		RU20-SIA4-SB003 (13)	13	9/13/07	solid	Primary	Coke PAHs, Coke Metals
RU20	SIA5 - Coke Constituents	RU20-SIA5-SS001	0	8/21/07	solid	Primary	TCLP Coke PAHs, Coke Metals
		RU20-SIA5-SS002	0	8/21/07	solid	Primary	TCLP Coke PAHs, Coke Metals
		RU20-SIA5-SS003	0	8/21/07	solid	Primary	TCLP Coke PAHs, Coke Metals
		RU20-SIA5-SS004	0	8/21/07	solid	Primary	TCLP Coke PAHs, Coke Metals

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 20	Reference Area - Slag	RU20-REF-SB001 (5.5-7.5)	5.5 - 7.5	8/8/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB002 (4-6)	4 - 6	8/8/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB003 (4.5-6.5)	4.5 - 6.5	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB004 (6-8)	6 - 8	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB005 (6-8)	6 - 8	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB006 (4-6)	4 - 6	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB007 (4-6)	4 - 6	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-RREF-SB008 (4-6)	4 - 6	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB009 (6.5-8.5)	6.5 - 8.5	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB010 (6-8)	6 - 8	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB210 (6-8)	6 - 8	8/9/07	solid	Colocated	Metals, Fluoride, Rads
		RU20-REF-SB011 (5-7)	5 - 7	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB012 (5-7)	5 - 7	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB013 (7-9)	7 - 9	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB014 (2.5-4.5)	2.5 - 4.5	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB015 (5-7)	5 - 7	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB016 (5-7)	5 - 7	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB017 (7-9)	7 - 9	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB018 (3-5)	3 - 5	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB019 (2-4)	2 - 4	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB020 (2.5-4.5)	2.5 - 4.5	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-REF-SB220 (2.5-4.5)	2.5 - 4.5	8/10/07	solid	Primary	Metals, Fluoride, Rads
RU 20	SFS	RU20-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	8/9/07	solid	Primary	Metals, Fluoride, Rads
		RU20-SFC-SBC002 (0-2 BNS))	0 - 2 BNS	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-SFC-SBC003 (0-2 BNS)	0 - 2 BNS	8/10/07	solid	Primary	Metals, Fluoride, Rads
		RU20-SFC-SBC004 (0-2 BNS)	0 - 2 BNS	8/10/07	solid	Colocated	Metals, Fluoride, Rads
		RU20-SFS-SBC005 (0-2 BNS)	0 - 2 BNS	8/13/07	solid	Primary	Metals, Fluoride, Rads
RU 22b	Cap/Cover Delineation - Old Ponds	RU22B-CAP-SB001 (0-2)	0 - 2	9/28/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB001 (2-10)	2 - 10	9/28/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB002 (4-6)	4 - 6	9/28/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB003 (7-9)	7 - 9	9/28/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB004 (9-11)	9 - 11	9/28/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB005 (13-15)	13 - 15	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB006 (5-7)	5 - 7	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB007 (5-7)	5 - 7	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB008 (4-6)	4 - 6	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB009 (3-5)	3 - 5	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB010 (12-14)	12 - 14	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB210 (12-14)	12 - 14	10/1/07	solid	Colocated	Metals, Fluoride, Rads
		RU22B-CAP-SB011 (5-7)	5 - 7	10/1/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB012 (3-5)	3 - 5	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB013 (5-7)	5 - 7	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB014 (10-12)	10 - 12	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB015 (8-10)	8 - 10	10/2/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB215 (8-10)	8 - 10	10/2/07	solid	Colocated	Metals, Fluoride, Rads
		RU22B-CAP-SB016 (0-2)	0 - 2	10/5/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-CAP-SB016 (2-10)	2 - 10	10/5/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB017 (4-6)	4 - 6	11/29/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB018 (5-7)	5 - 7	11/29/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB019 (4-6)	4 - 6	11/29/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB020 (4-6)	4 - 6	11/29/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB220 (4-6)	4 - 6	11/29/07	solid	Colocated	Metals, Fluoride, Rads
		RU22b-CAP-SB021 (8-10)	8 - 10	11/29/07	solid	Primary	Metals, Fluoride, Rads
		RU22b-CAP-SB022 (9-11)	9 - 11	11/29/07	solid	Primary	Metals, Fluoride, Rads
RU 22c	Cap/Cover Delineation - P4	RU22C-CAP-SB001 (0-2)	0 - 2	11/8/07	solid	Primary	P4
		RU22C-CAP-SB001 (2-4)	2 - 4	11/8/07	solid	Primary	P4
		RU22C-CAP-SB001 (4-6)	4 - 6	11/8/07	solid	Primary	P4
		RU22C-CAP-SB001 (6-8)	6 - 8	11/8/07	solid	Primary	P4
		RU22C-CAP-SB001 (8-10)	8 - 10	11/8/07	solid	Primary	P4

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
RU 23	SFS	RU23-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/11/07	solid	Primary	Metals, Fluoride, Rads
		RU23-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/12/07	solid	Primary	Metals, Fluoride, Rads
		RU23-SFS-SBC202 (0-2 BNS)	0 - 2 BNS	9/12/07	solid	Colocated	Metals, Fluoride, Rads
		RU23-SFS-SBC003 (0-2 BNS)	0 - 2 BNS	9/12/07	solid	Primary	Metals, Fluoride, Rads
		RU23-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/13/07	solid	Primary	Metals, Fluoride, Rads
RU 24	SFS	RU24-SFS-SBC001 (0-2 BNS)	0 - 2 BNS	9/6/07	solid	Primary	Metals, Fluoride, Rads
		RU24-SFS-SBC201 (0-2 BNS)	0 - 2 BNS	9/6/07	solid	Colocated	Metals, Fluoride, Rads
		RU24-SFS-SBC002 (0-2 BNS)	0 - 2 BNS	9/10/07	solid	Primary	Metals, Fluoride, Rads
		RU24-SBC-SBC003 (0-2 BNS)	0 - 2 BNS	9/11/07	solid	Primary	Metals, Fluoride, Rads
		RU24-SFS-SBC004 (0-2 BNS)	0 - 2 BNS	9/11/07	solid	Primary	Metals, Fluoride, Rads
Roadway	SIA1 - Precipitator Dust/Phossy Solids	PRECIP1-SIA1-SB001 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB002 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB003 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB004 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB005 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB006 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB007 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB008 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB009 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB010 (0-0.5)	0 - 0.5	10/5/07	solid	Primary	Pb-210
		PRECIP1-SIA1-SB210 (0-0.5)	0 - 0.5	10/5/07	solid	Colocated	Pb-210
		PRECIP2-SIA1-SB001 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB002 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB003 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB004 (0-0.25)	0 - 0.25	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB005 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB006 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB007 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB008 (0-0.25)	0 - 0.25	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB009 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB010 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP2-SIA1-SB210 (0-0.5)	0 - 0.5	10/4/07	solid	Colocated	Pb-210
		PRECIP3-SIA1-SB001 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB002 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB003 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB004 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB005 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB006 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB007 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB008 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB009 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB010 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP3-SIA1-SB210 (0-0.5)	0 - 0.5	10/4/07	solid	Colocated	Pb-210
		PRECIP4-SIA1-SB001 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB002 (0-0.3)	0 - 0.3	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB003 (0-0.3)	0 - 0.3	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB004 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB005 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB006 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB007 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB008 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB009 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB010 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP4-SIA1-SB210 (0-0.5)	0 - 0.5	10/4/07	solid	Colocated	Pb-210
		PRECIP5-SIA1-SB001 (0-1)	0 - 1	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB002 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB003 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB004 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB005 (0-1)	0 - 1	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB006 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB007 (0-0.5)	0 - 0.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB008 (0-1)	0 - 1	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB009 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB010 (0-1)	0 - 1	10/4/07	solid	Primary	Pb-210
		PRECIP5-SIA1-SB210 (0-1)	0 - 1	10/4/07	solid	Colocated	Pb-210

TABLE 3-3

SRI SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Location	Field Program	Sample Designation	Depth Interval (feet bgs)	Date Sampled	Media	Sample Type[1]	Analyte(s)[2]
Roadway	SIA1 - Precipitator Dust/Phossy Solids	PRECIP6-SIA1-SB001 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
continued		PRECIP6-SIA1-SB002 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB003 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB004 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB005 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB006 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB007 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB008 (0-1.5)	0 - 1.5	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB009 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB010 (0-2)	0 - 2	10/4/07	solid	Primary	Pb-210
		PRECIP6-SIA1-SB210 (0-2)	0 - 2	10/4/07	solid	Colocated	Pb-210
		PRECIP7-SIA1-SB001 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB002 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB003 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB004 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB005 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB006 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB007 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB008 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB009 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB010 (0-0.25)	0 - 0.25	10/8/07	solid	Primary	Pb-210
		PRECIP7-SIA1-SB210 (0-0.25)	0 - 0.25	10/8/07	solid	Colocated	Pb-210
Roadway	SIA1 - PCDT	PCDTREF-SIA1-SB001 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB002 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB003 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB004 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB005 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB006 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB007 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB008 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB009 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB010 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDTREF-SIA1-SB210 (0-0.5)	0 - 0.5	9/27/07	solid	Colocated	Metals, Fluoride, Rads
		PCDT-SIA1-SB001 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB002 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB003 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB004 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB005 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB006 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB007 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB008 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB009 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB010 (0-0.5)	0 - 0.5	9/27/07	solid	Primary	Metals, Fluoride, Rads
		PCDT-SIA1-SB210 (0-0.5)	0 - 0.5	9/27/07	solid	Colocated	Metals, Fluoride, Rads
Fill	Fill Characterization	RU7-SIA1-SB001	0-2	10/31/07	solid	Primary	Metals, Fluoride, Rads
		RU16-SIA1-SB004a	0 - 3	10/31/07	solid	Primary	Metals, Fluoride, Rads
		RU16-SIA1-SS001	0-0.5	10/31/07	solid	Primary	Metals, Fluoride, Rads
		RU16-SIA1-SS002	0-0.5	10/31/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-SB001	10 - 14	10/31/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-SS001 (0-1)	0 - 1	11/01/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-SS002 (0-1)	0 - 1	11/01/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-SS003 (0-1)	0 - 1	11/01/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-TP002 (8)	8	11/01/07	solid	Primary	Metals, Fluoride, Rads
		RU22B-SIA1-TP002 (10)	10	11/01/07	solid	Primary	Metals, Fluoride, Rads

Notes:
1. Colocated sample was the blind replicate of the primarily and was identifed by a "200-series" label
2. P4 - EPA Method 7580
Metals - EPA Method 6020
Mercury - EPA Method 7471
Fluoride - EPA Method 9214
Rads - gamma and alpha spectrometry
Shop and Lab Solvents - EPA Method 8260B
Fuel VOCs - EPA Method 8260B
Fuel PAHs - EPA Method 8270C
PCB - EPA Method 1668A
Coke PAHs - EPA Method 8270C
Coke Metals - EPA Method 6020
TCLP - EPA Method 1311

TABLE 3-4

SUMMARY OF SAMPLE CONTAINER, PRESERVATION, HOLDING TIME REQUIREMENTS, AND ANALYTICAL METHODS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Compounds	Sample Container	Preservation	Holding Time	Analytical Method	Field/ Laboratory
Organics – Soil					
Volatile organics	Two 40-mL glass vials with screw caps, septum seals and stir bars One 40-mL glass vials with screw caps, septum seals and stir bars 2 oz sample jar for percent solids determination	5-mL water Cool to 4 °C 10 mL methanol Cool to 4 °C Cool to 4 °C	7 days to analysis 7 days	EPA Method 5035A/8260B	Laboratory
PAHs	Two 40-mL glass vials with screw caps and septum seals	Cool to 4 °C	14 days to extraction, 40 days after extraction to analysis	EPA Method 8270C	Laboratory
Polychlorinated Biphenyls	4-ounce amber glass jar with screw cap	Cool to 4 °C	14 days to extraction, 40 days after extraction to analysis	EPA Method 1668A	Laboratory
Inorganics -Soil					
Elemental phosphorus	One 4-ounce amber glass jar with screw cap	Purge with N_2 gas. Cool to 4 °C, store in the dark, keep tightly sealed to prevent loss of moisture. Collect sample as close to zero headspace as possible.	Soil samples do not have an extraction Holding time. When extracted in Isooctane analyze within 30 days of extraction	EPA Method 7580	Laboratory

TABLE 3-4

SUMMARY OF SAMPLE CONTAINER, PRESERVATION, HOLDING TIME REQUIREMENTS, AND ANALYTICAL METHODS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Compounds	Sample Container	Preservation	Holding Time	Analytical Method	Field/ Laboratory
Fluoride	Two 8-ounce plastic jar with screw cap	Ambient temperature	28 days	ASTM Method D3987/EPA Method 9214	Laboratory
Metals	Two 8-ounce plastic jar with screw cap	Ambient temperature Cool to 4 °C for mercury	6-months 28 days for mercury	EPA Method 6020	Laboratory
Radionuclides - Soil					
Polonium-210	Two 8-ounce plastic jar with screw cap	Ambient temperature	6-months	Alpha spectroscopy	Laboratory
Uranium-238	Two 8-ounce plastic jar with screw cap	Ambient temperature	6-months	Alpha spectroscopy	Laboratory
Radium-226	Two 8-ounce plastic jar with screw cap	Ambient temperature	6-months	Radon emanation	Laboratory
Radon Flux	NA	Ambient temperature	NA	Electret Ion Chamber	Field
Lead-210	Two 8-ounce plastic jar with screw cap	Ambient temperature	6-months	Scintillation counting	Laboratory
Potassium-40, uranium-238 daughters	Two 8-ounce plastic jar with screw cap	Ambient temperature	6-months	Gamma spectroscopy	Laboratory
Total gamma-ray dose	NA	NA	NA	Pressurized ionization chamber FMC SOP	Field

TABLE 3-4

SUMMARY OF SAMPLE CONTAINER, PRESERVATION, HOLDING TIME REQUIREMENTS, AND ANALYTICAL METHODS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

Compounds	Sample Container	Preservation	Holding Time	Analytical Method	Field/ Laboratory
Organics - Water					
Volatile organics	Three 40-mL amber glass vials with Teflon septa	4 °C, HCL, no head space	7 days[3]	EPA Method 8260B	Laboratory
PAHs	Two 1-L amber glass bottles	Cool to 4 °C	7 days to extraction, 40 days after extraction to analysis	EPA Method 8270C	Laboratory
Polychlorinated Biphenyls	Two 1-L amber glass bottles	Cool to 4 °C	7 days to extraction, 40 days after extraction to analysis	EPA Method 1668A	Laboratory
Inorganics - Water					
Elemental phosphorus	One 250-mL amber glass bottle	Cool to 4 °C, no head space	5 days to analysis	EPA Method 7580	Laboratory
Fluoride	One 500-mL Poly bottle	No Preservative	28 Days	ASTM Method D3987/EPA Method 9214	Laboratory
Metals	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months 28 days for Mercury	EPA Method 6020	Laboratory
Radionuclides - Water					
Polonium-210	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months	Alpha spectroscopy	Laboratory
Uranium-238	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months	Alpha spectroscopy	Laboratory

TABLE 3-4

SUMMARY OF SAMPLE CONTAINER, PRESERVATION, HOLDING TIME REQUIREMENTS, AND ANALYTICAL METHODS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

Compounds	Sample Container	Preservation	Holding Time	Analytical Method	Field/ Laboratory
Radium-226	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months	Radon emanation	Laboratory
Lead-210	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months	Scintillation counting	Laboratory
Potassium-40, uranium-238 daughters	One 1-L poly bottle	Cool to 4 °C; HNO_3 to pH <2	6-months	Gamma spectroscopy	Laboratory

See List of Acronyms and Abbreviations for definitions

TCLP for PAHs and metals in surface coke will be performed according to EPA Method 1311

[1] This project requires the analysis of boron. Therefore, sample collection and laboratory analysis must performed using non-borosilicate lab ware.
[2] Appendix B: CLP Sample Collection Guidelines for Volatile Organic Analytes (VOAs) in Soil by SW-846 Method 5035A, Option 2, Contract Laboratory Program Guidance for Field Samplers, OSWER 9240.0-35, EPA540-R-00-003, FINAL AUGUST 2004
[3] 40 CFR Part 136.3 Table II

TABLE 3-5

SUMMARY OF FIELD MODIFICATIONS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Field Modification #	Field Modification Title	Description
1	PIC/NaI Correlation	For the correlation study methods outlined in SOP-21, this modification increased the number of correlation from 10 to 21 locations. Also, two of the five detectors were correlated against the PIC instrument since the correlation plots between the two NaI detectors and the PIC instrument proved to be nearly identical.
2	Field Custody Seals	Modified Section 3.3.1 of SRI Work Plan (MWH, 2007) and Section 5.3 of the SRI Field Sampling Plan (MWH, 2007) such that a custody seal was placed on a Ziploc bag that contained several containers from one sample or on the sample containers themselves.
3	RU 19 Radon Measurement Locations	Modified SOP-22 to allow for moving the location of some of the radon sampling points (if random grid point was located on a slag slope that was not safe to access) to the nearest area that could be safely accessed. Also, allowed for the use of long-term and short-term electrets.
4	Data Validation	Added additional data flags to Table 3-15 of the SRI Work Plan (MWH, 2007). In addition, proposed that three more tables be added to the SRI Work Plan. The tables (3-21, 3-22, and 3-23) guided the independent, third party firm, LDC, as to how to qualify the data.
5	SRI Work Plan Addendum – Fill Characterization	Proposed additional fill samples to be collected of specific source materials (e.g., phosphate ore) and waste streams (e.g., calciner solids, kiln solids, precipitator solids, and phossy solids) historically managed at the plant in order to bound potential risks to future workers from exposure to residual fill materials at the FMC Plant OU.
6	Precipitator Dust/Phossy Solids Distribution along Roadways Study	Modified Section 2.1.22 of SRI Work Plan (May 2007) and Section 4.1.8.22 of the SRI Field Sampling Plan (May 2007) such that the road segment samples were collected from the surface to the base of the road bed material instead of the 0-to-2 foot bgs interval.
7	Elemental Phosphorus Analytical Method	Modified Table 3-3 of the SRI Work Plan (MWH, 2007) in order to analyze all P4 samples utilizing EPA Method 7580. The SRI Work Plan Section 3.4.2.1 and 3.4.2.2 specified the use of both EPA Method 7580 as well as FMC's Method Q-15 depending on the type of investigation.
8	Laboratory-related Modifications	Modified Tables 3-7, 3-9, 3-21 and Sections 3.6.1 and 3.6.2 of the SRI Work Plan (MWH, 2007) in order to change laboratory criteria for volumetric glassware, reagent water, performance criteria for chemical separation, and data validation of equipment rinseate blanks.
9	Table 1-6 of the SRI Work Plan	Modified Table 1-6 of the SRI Work Plan (MWH, 2007) in order to correct a transcription error that was noted during a subsequent review the table. The SSL protective of groundwater for manganese (390 mg/kg) in Table 1-6 should have defaulted to background since background (482 mg/kg) is greater than this SSL.
10	RU 16 Calciner Solids Stockpile Investigation Boring Locations	The field modification proposed that three boring locations on Figure 2-37 from the SRI Work Plan (MWH, 2007) be moved due to access problems and the need to better target specific materials such as calciner solids for sampling. Figure-37 was amended to show the revised boring locations.
11	RU 13 and 22b Cap Delineation	Proposed the removal of trenches from the cap delineation investigation and in their place, proposed six confirmation borings east of the approximate boundary at which pond sediments were encountered. The original trench locations were clearly within areas already identified as containing pond sediments (during the SFS investigation).
12	SRI Capillary-Fringe P4 Delineation at RU 1 and RU 2	Proposed six new borings and a potential seventh step-in boring for the capillary fringe P4 migration delineation addendum downgradient of RU 1. New borings represented the presumed maximum downgradient extent of P4 in the subsurface at any depth down to groundwater and targeted the shallow groundwater capillary fringe for sampling of P4.

Section 4
EVALUATION OF RU-SPECIFIC FINDINGS

4.1 INTRODUCTION

In the *RI Update Memo*, each RU was evaluated using EPA's Data Quality Objectives process (EPA, 2000) to determine: 1) if there was the necessary site characterization data to perform a Supplemental HHRA, and 2) to support the SFS to evaluate/select remedial alternatives for each RU and the FMC Plant OU as a whole. Twenty-four RUs were forwarded for further study during the SRI.

The SRI was conducted using four primary field programs as discussed in Section 3.0 including: 1) Risk Assessment, 2) SFS, 3) Pond Solids/P4 Delineation, and 4) Specific Investigation Areas (SIAs) evaluating impacts of specific constituents (e.g., solvents or P4) in specific areas (e.g., lab waste disposal pit or storm water ditches). In addition to these primary field programs, "reference studies" were conducted to further assess the potential leaching of site-related materials (i.e., slag, ore, and coke). Additional fill characterization studies were also performed to assist development of the Supplemental HHRA.

The results from these field programs are presented and discussed below as they apply to each RU. Each RU is addressed through the following sub-sections:

1) Site Description that discusses the RU characteristics (e.g., the historic activities conducted) that may have led to potential contamination;

2) Problem Statements from the approved *SRI Work Plan* that present the rationale for each field program conducted at the RU;

3) Investigation Results for each field program conducted at the RU. Summary tables present the SRI analytical results. These results are compared to CVs, such as SSLs, developed in the approved *SRI Work Plan*. Where the results exceed CVs, such as SSLs, in surface and subsurface fill materials this subsection identifies the COCs and ROCs that are carried forward into the Supplemental HHRA. Similarly, results exceeding CVs in native soils underlying fill materials are also identified, and figures are provided to depict the lateral extent of exceedances in native soils; and

4) Contamination Assessment where the implications of the results from each of the investigations conducted for the RU are evaluated, and human health risks associated with potential exposures to COCs/ROCs within surface and subsurface materials present in each RU are summarized.

Table 4-1 summarizes these topics for each RU. The text in Section 4 supports and expands on the information presented in this table. Section 4 concludes with a discussion of studies that are not linked to specific RUs, but were necessary to fill additional data gaps identified during implementation of the SRI (e.g., underground piping studies and fill characterization studies).

Table 4-2 summarizes information concerning fill and source materials in each RU and includes:

- The predominant surface and subsurface fill materials;
- Other potential source materials incidental to the fill materials;
- Depth to native soil from the current surface as determined by RI and SRI borings;
- Fill and source materials considered for HHRA exposure scenarios;
- The estimated total volume of fill; and
- The estimated volume of P4, where applicable.

4.1.1 Fill Volume Determination

EPA requested that the SRI report include estimates of the total volume of fill in each RU. While the SRI field program was not designed with determination of fill volumes as a specific data quality objective, FMC agrees that an estimate of fill volumes is needed for the Supplemental Feasibility Study (SFS) to evaluate the feasibility of various remedial alternatives and develop cost estimates for material handling and/or treatment of fill. The total fill volume and P4 volume estimates presented here are sufficiently accurate to allow for evaluation of remedial alternatives; however, the estimates should not taken as definitive or accurate to a quantifiable precision.

The total volume of fill for each RU was determined by developing a fill model across the fill-impacted portion of the FMC Plant OU. Although nearly 1,000 RI and SRI borings were advanced within the operational area of the FMC Plant OU, the areal density of borings is variable over the site and the low density or lack of borings in some RUs (e.g., RU 19) required that a modeling approach be used. Modeling is a common technique at large mining and land development sites to determine cut and fill across a site. The cut and fill isopach model used for the site utilized both the Civil 3D® and Land Development Desktop® software. Typically, cut and fill models such as these are considered to be accurate within ± 15 %. The model requires establishment of baseline site topography. The baseline site topography represents the current native soil interface lying underneath the fill. Then the current topography of the existing surface can be compared to the baseline site topography to determine the volume of fill lying above the native soil interface.

The baseline site topography was developed by using the 1937 USGS topographical map (the topography prior to FMC activities on the site) as a starting point. However, the 1937 USGS topographic map had to be “calibrated” to provide a more accurate representation of the baseline native soil interface for the following reasons:

- The 1937 topographic map has 50-foot contours for the area of the FMC Plant Site;
- The 1937 topographic map is available only in a hardcopy form, which had to be digitized; and

- Throughout the plant history, there were many cases where the original surface topography was modified (beyond adding fill to the surface) by cutting into the original surface (e.g., by digging into the surface to lower the elevation needed for plant operations such as in RUs 2, 7, 8, 16, 19, 22b, and 22c).

To calibrate the baseline site topography, the following information was used:

- Nearly 1,000 RI and SRI boring logs were used to determine the depth (and elevation) from the existing surface to the native soil interface. At approximately half of these boring locations, it was necessary to adjust the baseline site topography to match the observed boring data due to one of the reasons listed above.

- In some cases, the cut and fill isopach model shows that the current surface is lower than the original 1937 surface, indicating that the area had been excavated to meet plant needs. However, in some instances, observation on the site clearly indicates that the "cut" area contains fill material even though the current surface is below the original surface (such as in RUs 2, 7, 8, 16, and 19). In these cases, the "cut" area was assumed to contain 1 to 2 feet of fill material to determine total fill across the RU.

- In some cases, where adequate density of boring data does not exist to determine the site baseline topography, historical information such as aerial photos and plant documents were used to determine the site baseline topography. For example, in RU 22b, the current surface elevation is well above the original elevation, but known "cuts" exist that were used for historical ponds. Further details on the assumptions used within RU 22b for fill volume determinations is presented in Section 4.18.

Using the calibrated site baseline topography and the November 2007 topographical map developed by FMC as the current site topography, the cut and fill isopach model was then used to determine volumes of fill within each RU. Table 4-2 shows the minimum, maximum, and average fill depth within the cut and fill isopach model and the total fill volume estimated by the cut and fill isopach model. The cut and fill isopachs for the site are shown on Figure 5-0. More specific information on the cut and fill isopach model assumptions is presented below in the discussion of each RU. It should be noted that for the fill volume calculations, the reported estimated total fill includes fill materials (e.g., slag, ore, bullrock, silica, precipitator solids, phossy solids, ferrophos, calciner/kiln pond solids, and coke) as well as P4, and reworked native soils (i.e., soil that has been mixed with other fill materials during earthmoving activities). The total fill volume estimates do not include native soils that have been impacted by site contaminants as a result of migration of site-related constituents into native soils in the subsurface (e.g., old phossy pond solute migration to groundwater).

Table 4-2 also presents an estimated volume range of P4 in RUs 1, 2, 13, 19, 22b, and 22c. The assumptions used for determining the estimated volume range of P4 are also presented below in the discussion of these RUs.

4.2 RUs 1 AND 2: FURNACE BUILDING, PHOS DOC, AND SECONDARY CONDENSER AND SLAG PIT

4.2.1 Site Description

RU 1 is 4.1 acres in size and encompasses the site of the former furnace building, secondary condenser, and phos dock as shown in Figure 4-1. These were the primary P4 product production, storage, and handling areas within the FMC Plant Site. The furnace building contained electric arc furnaces, primary condensers, P4 sumps, and various tanks. The secondary condenser was downstream of the furnaces and provided a final recovery of P4 product that was collected in a single sump. P4 from the furnace sumps and the secondary condenser sump was pumped to the phos dock for storage and loading onto rail cars for shipment.

RU 2 is 3.7 acres in size and encompasses the former slag pit located immediately south of the furnace building (RU 1) as shown in Figure 4-1. It is an area where molten slag from the furnaces was poured, cooled, broken, and loaded onto slag haul trucks to be placed on the slag pile (RU 19). In 1999-2000, FMC converted to slag ladling, where the molten slag was poured from the furnaces into ladles. The ladles were truck mounted, allowing for the molten slag to be transported to the slag pile where it was poured down the face of the slag pile and allowed to cool and solidify.

Elemental phosphorus (P4) was produced within the four electric arc furnaces in the furnace building, which is included in RU 1. As result of the furnace reaction, carbon monoxide and P4 gases were generated within the furnace (known as the furnace offgas). Upon exiting the furnace, the furnace offgas passed through an electrostatic precipitator in which particulate was removed to clean the offgas stream. The dust collected in the electrostatic precipitator (known as precipitator dust) was then slurried with recycled water and pumped via underground and aboveground piping to ponds in RU 22b. After the electrostatic precipitator, the furnace offgas passed through a primary condenser where the P4 was condensed from the furnace offgas, collected in subsurface, brick-lined concrete sumps, and maintained above the melting point of 44°C. The P4 was pumped by displacement with water through above-ground piping to the phos dock (also within RU 1), located directly north of the furnace building. Offgas from the furnace proceeded to the secondary condenser area where an additional condenser was used to remove remaining P4 from the furnace offgas. At both the phos dock and secondary condenser, the P4 was stored in concrete subgrade tanks or sumps. P4 was ultimately displaced with water in above-ground piping to railcars for shipment. Releases of P4 from the process were captured in secondary containment tanks or sumps. The Conceptual Site Model (CSM) takes into account the difference between releases of P4 within the 44°C isotherm in RUs 1 and 2 and those releases of P4 outside the 44°C isotherm (see Figures 4-1 and 4-2). Releases of elemental phosphorus from the phos dock and secondary condenser (outside the 44°C isotherm) are expected to have resulted in contamination of shallow surface soils only (approximately less than 10 feet below grade), whereas releases of P4 from tanks or sumps within the furnace building (RU 1) or from the furnace washwater catch basins in the slag pit (RU 2) were within the 44°C isotherm and have resulted in vertical contaminant migration throughout the vadose zone and lateral migration through the capillary fringe. As such, P4 remained a liquid and did migrate downward until it encountered groundwater. Section 4.2.4 Contamination Assessment and Section 5.3.2 Potential

Release Mechanisms in this SRI Report describe this conceptual model in detail. Section 5.2.2.1 of the *Groundwater Current Conditions Report* (GWCCR) (MWH, 2008) also discusses this conceptual model as it pertains to groundwater impacts. Releases from leaking tanks or sumps remained immediately under the tanks or sumps once the P4 cooled to below the P4 melting temperature. Because of the pyrophoric nature of the P4, the P4 product was contained within a closed system, i.e., piping, pumps, tanks, etc. and covered with water to prevent the P4 from contacting air.

Nonetheless, until 1991 phossy water (any water that had come into contact with P4 and therefore contained some P4) sometimes overflowed from the furnace building and the phos dock to the railroad swale (RU 22c). The phossy water reached the railroad swale through underground storm drain piping or across the surface along a paved roadway. These overflows ceased in 1991 as result of modified operational procedures.

The slag pit was located directly south of the furnace building and is included within RU 2. Molten slag was tapped from the four furnaces into the slag pit where the slag pooled on the ground and cooled. Phossy water and precipitator slurry from the furnace building, generated from process leaks, washwater, and other sources flowed out the back of the furnace building into the slag pit. This water was collected in the slag pit sump and pumped to the phossy waste ponds. FMC used underground piping to carry the slag pit sump water to the phossy water ponds until new above-ground piping was installed in 1999. However, the underground piping remained in place. The slag pit sump was closed and capped as a RCRA waste management unit in 2005. Although the above-ground buildings and equipment have been removed as part of the decommissioning of the FMC plant, historic aerial photos show the location of the furnace building, phos dock, slag pit, capped slag pit sump, and secondary condenser. The outlines of these areas also are clearly visible on the surface as building foundations remain in place.

Throughout the FMC facility operational history, the furnace building, phos dock, and secondary condenser remained in their original locations, although expansions did occur. Therefore, investigation in other areas of the FMC Plant Site for past activities similar to those that took place at RUs 1 and 2 was not necessary.

During plant decommissioning, all above-ground tanks, equipment, and piping were removed from the site including at RUs 1 and 2. The plant decommissioning was completed in 2006 and most buildings, including the furnace building, have been dismantled and removed. The furnace building foundation currently is primarily a level concrete slab with below-grade sumps and launders. The sumps and below-grade features have been backfilled with slag and/or silica and the fill material was graded to manage run-on/run-off and prevent water accumulation in these areas.

Underground piping in RU 1 and RU 2 that carried process streams was primarily mild steel pipe, with diameters of four to six inches. In addition to this piping, RU 1 and RU 2 also contained underground electrical conduit, water lines, natural gas, and transformer oil drain lines, The underground process piping carrying phossy water and precipitator slurry from the furnace building and phos dock traversed RUs 1 and 2 to and through the pond area, RU 22b.

4.2.2 Problem Statement

The following field programs were performed at RUs 1 and 2. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment – Due to the documented presence of P4 beneath the former working areas of RUs 1 and 2, which has the potential to spontaneously combust upon contact with air, it was known in advance of the SRI that exposure to subsurface materials in these areas would present an unacceptable acute hazard to potential receptors, including SRI field sampling staff. Consequently, data to evaluate risks to potential future workers were not specifically collected from RUs 1 and 2. However, a quantitative evaluation of chronic and sub-chronic risks to potential future receptors from exposure to P4 and additional COCs/ROCs in fill materials at RUs 1 and 2 was performed. In addition, a qualitative evaluation of acute risks to potential future receptors from exposure to P4 was also performed.

- P4 Delineation - Liquid phosphorus was managed at RU 1 and RU 2. A study to verify that significant concentrations of phosphorus have not migrated into soils outside the RU 1 and RU 2 boundaries was needed to define the extent of the RCRA cap that FMC believes is the likely remedial action for these RUs. Specifically, the P4 delineation study was performed to identify the boundary around RUs 1 and 2 at which P4 concentrations in subsurface soils are below levels of potential chronic and acute health concern to future workers.

- Underground Piping, Sumps, and Structures SIA - The portion of the piping and sump system within RU 1 and RU 2 was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (e.g., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

- P4 Capillary Fringe SIA - During the SRI, P4 was encountered in soil collected at the capillary fringe above shallow groundwater (at approximately 80 feet bgs) in three (3) of the 14 borings that were drilled to define the future cap boundaries proposed for RU 1. Additional borings were necessary to define the approximate horizontal extent of P4 in the soils at the capillary fringe.

The specific field activities for RUs 1 and 2 associated with each of these field programs are summarized in Table 4-1.

4.2.3 Investigation Results

4.2.3.1 Risk Assessment

As discussed in the Problem Statement pursuant to the EPA-approved *SRI Work Plan*, samples were not specifically collected from RUs 1 and 2 to evaluate risks to potential future workers due to the documented presence of residual quantities of P4 in the subsurface beneath these RUs that

could spontaneously combust upon contact with air. While data were not collected, there is sufficient evidence to conclude that P4 is present in the subsurface of RUs 1 and 2 at levels that exceed the worker SSLs defined for this COPC in the *SRI Work Plan*.

In addition to P4, potential future receptors could be exposed to COPCs/ROPCs in fill materials observed or known to potentially be present at the surface or shallow subsurface of these RUs. As shown in Table 4-2, RU 1 fill materials consist predominantly of slag, concrete foundations, asphalt with slag, and silica, while the predominant fill materials at RU 2 include slag and concrete foundations. Precipitator solids and phossy solids are also identified in Table 4-2 as potential source materials incidental to the predominant fill materials in RUs 1 and 2. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RUs. While not collected in RUs 1 and 2, data associated with SRI and historical samples of these fill materials were used to characterize COPC/ROPC concentrations. COPCs/ROPCs with maximum concentrations in a fill material that exceed both regional background and any of the worker SSLs shown in Table 4-3 were defined as the COCs/ROCs for that specific fill material, and were carried forward into the risk characterization.

Table 4-4 identifies the 95% upper confidence limit (UCL) on the mean concentration for the COCs/ROCs identified in the fill materials associated with RUs 1 and 2 (antimony, arsenic, cadmium, lead, uranium-238, radium-226, lead-210, polonium-210 and potassium-40). As shown in this table, the highest UCL calculated for a COC/ROC within each of the fill materials identified in an RU was used to characterize the exposure point concentration (EPC) for that COC/ROC in the Supplemental HHRA. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at an EPC of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC. The findings of the Supplemental HHRA are summarized in the Contamination Assessment set forth in Section 4.2.4.

In addition to the fill materials, Table 4-2 also references the underground piping located in RUs 1 and 2 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.2.3.2 P4 Delineation (RU 1 CAP and RU 2 CAP)

A total of 14 primary borings were drilled around RUs 1 and 2, consisting of 7 borings at each RU. Each soil boring was drilled to the groundwater surface. Colocated borings were drilled at a rate of 1 per 10 primary borings. At RUs 1 and 2, the two colocated borings were drilled down to 10 feet bgs.

Borings were visually evaluated to identify fill type and for presence of P4 in the vadose zone and down to groundwater. Step-out borings were drilled as necessary when P4 was visually identified in the primary borings (i.e., smoking or burning). In the final step-out boring, where P4 was not visually identified, confirmation samples were collected. In each boring, soil samples were collected for P4 analysis at 2 foot intervals from 0 to 10 feet bgs for a total of 5 samples per boring and a total of 80 samples (with colocated samples included).

***Fill Materials*.** As summarized on Table 4-2, the surface of RU 1 and RU 2 is made of up of slag, concrete foundations, asphalt with slag aggregate, and silica. The subsurface fill materials around the perimeters of RUs 1 and 2 consist primarily of slag, concrete foundations, and reworked native soils and slag. Although not visually observed, P4, precipitator solids, and phossy solids were identified as incidental fill materials in RUs 1 and 2 based on process knowledge. The native soil interface around the perimeters of the RUs ranges between 1.5 and 20 feet bgs.

During the SRI, P4 was visually detected in soils at the capillary fringe of the groundwater just north of RUs 1 and 2 (within the boundaries of RUs 3 and 7) at approximately 80 feet bgs. P4 was observed in soil collected at the capillary fringe just above the groundwater at approximately 83 feet bgs as evidenced by smoking in borings RU1-CAP-SB004, RU1-CAP-SB005, and step-out boring RU1-CAP-SB004A. Refer to Figure 4-1 for the location of these soil borings.

The geology in these borings was consistent based on visual logging of soil cuttings and split-spoon samples collected every 10 feet. Gravelly silts and sands characterized the upper three to nine feet of each of these borings, followed by 20 to 30 feet of silt to sandy silt. Below approximately 30 feet bgs, coarse sands, gravels, and cobbles were reported to depths of 70 to 80 feet bgs. Silts and sandy silts were logged in the 70 to 72 and the 80 to 82 foot bgs split-spoon samples collected in each boring.

RU1-CAP-SB004, a split-spoon sample collected from 80 to 82 feet bgs, contained a whitish gray to light brown silty material that smoked. Per the *SRI Work Plan*, this boring was abandoned and a step-out boring, RU1-CAP-SB004A, was drilled and sampled 40 feet north of the original RU1-CAP-SB004 as shown on Figure 4-1. During collection of the 80-foot split-spoon sample, the inner center plug drill bit revealed similar smoking material. A split-spoon sample was not collected in this boring and it was abandoned.

Soil boring RU1-CAP-SB005 was drilled and sampled east of the RU 1 boundary. Split-spoon samples collected from 80 to 82 feet bgs and 90 to 92 feet bgs reported moist to wet silt and sandy silts, but no evidence of smoking was observed even after allowing these materials to dry. When the augers were extracted, following completion of this boring, whitish gray to light brown silty material that smoked was observed on the augers. It is believed that this material was located at a depth of approximately 82 to 85 feet bgs.

Groundwater was not encountered in RU1-CAP-SB004 and RU1-CAP-SB004A prior to encountering P4 and completion of these borings. However, groundwater was encountered at a depth of 85.5 feet bgs in RU1-CAP-SB005, and P4 was apparently deposited in the capillary fringe just above shallow groundwater table. No other cap delineation borings in RUs 1 and 2 visually identified P4 down to groundwater and no step-out borings were required. It should be noted that RU1-CAP-SB003 could not be completed to groundwater because of refusal, so this boring was moved 40 feet to the north where RU1-CAP-SB003A was completed to groundwater. P4 was not detected through visual means during the drilling of these two SB003 borings.

Confirmation samples collected in the upper 10 feet of shallow fill and soil materials only reported one detection of P4 out of a total of 80 samples as reported in Table 4-5. This one detection of 0.348 mg/kg was located in the 2-to-4-feet bgs interval in RU2-CAP-SB007 and was

estimated since the concentration was between the reporting limit and method detection limit. The colocated sample for this same interval (RU2-CAP-SB207) reported non-detect. This detection is substantially below the most conservative SSL of 23 mg/kg.

Field Modification #12: As a result of the P4 detected at the capillary fringe, a field modification (Field Modification #12) was prepared to further investigate shallow groundwater capillary fringe for P4. This field modification resulted in seven (7) additional borings as discussed in Section 4.2.3.3 below.

4.2.3.3 Underground Piping, Sumps, and Structures SIA

The decision whether to remove, treat, or otherwise manage underground piping will be an SFS decision based on the detailed analysis of alternatives. To provide the SFS process with sufficient information to evaluate the remedial alternatives for underground piping, an SRI task was performed to identify available information regarding remaining subsurface piping, sumps and structures, including their size, material of construction and any process knowledge regarding residual constituents that may remain in the pipes. This task was carried out based upon existing drawings, construction records, operational logs, and plant personnel knowledge. These data will be forwarded to the SFS to be evaluated as part of the evaluation of remedial alternatives for RUs 1 and 2. Further information regarding the compilation of underground piping, sumps, and structures is provided in Section 4.26 and Appendix I.

4.2.3.4 P4 Capillary Fringe SIA (RU 1 SIA1)

Seven (7) new borings were drilled as shown in Figure 4-1 in accordance with EPA-approved Field Modification #12. These additional borings established the maximum downgradient extent of P4 in the subsurface at any depth down to groundwater. At each of the borings, the drill cuttings from ground surface to approximately 74 feet bgs were visually inspected to determine if P4 was present.

P4 was not visually encountered in any of the borings down to groundwater. As a result, the borings were continuously sampled at 2-foot intervals for approximately 10 feet beginning at 74 feet bgs and extending to a depth of approximately 88 feet bgs. Six-inch long brass sleeves (four per 2-foot interval) were inserted into the split-spoon sampler so that necessary geotechnical and P4 samples could be collected. Samples collected from the two-foot interval immediately above the water table (the capillary fringe interval) were retained for analysis of P4, bulk density (ASTM D2937), grain size analysis (sieve and hydrometer; ASTM D442), and vertical permeability analysis (ASTM D2434).

As listed in Table 4-6, none of the seven (7) borings reported analytical detections of P4. The sampled material ranged from silty sands to lean clays and exhibited very low hydraulic conductivity values, ranging from 2.3×10^{-6} to 1.2×10^{-8} cm/sec. The bulk dry density of the materials ranged from 80 to 96 pounds per cubic foot (pcf). The P4 analytical data and geotechnical data laboratory results are provided in Appendix D.

Groundwater in the area of the capillary fringe investigation was not analyzed for P4 during the SRI. However, the initial groundwater sampling and analysis for elemental phosphorus was directed by EPA at the FMC site in 1998, and has continued to be monitored at the slag pit sump

(within RU 2) wells, specifically wells 121, 108, 122 and 123 under the EPA-approved RCRA post-closure plan for the slag pit sump. Elemental phosphorus has been detected in two wells, 108 and 122, downgradient of RUs 1 and 2 in the area of the P4 capillary fringe investigation. Details regarding the results of elemental phosphorus sampling are described in the GWCCR.

4.2.4 Contamination Assessment

As shown in Table 4-7 and 4-8, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RUs 1 and 2 are primarily driven by the soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are driven by lead-210 and polonium-210 levels in precipitator solids (an incidental fill material), exceed the 1E-04 RAO specified in the 1998 ROD for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material) and potassium-40 levels in precipitator solids, also exceed the 1E-04 ROD RAO for future outdoor and indoor commercial/industrial worker receptors.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for all worker receptors evaluated. Incremental non-cancer risks for cadmium also exceed a hazard index of 1.0 for the soil ingestion, dermal absorption and fugitive dust inhalation pathways for several receptors. Finally, incremental non-cancer soil ingestion risks to construction workers exceed a hazard index of 1.0 for arsenic in phossy solids.

Lead concentrations associated with precipitator solids exceed the EPA's Adult Lead Methodology (ALM) Workgroup screening level for soil lead at commercial/industrial sites of 800 mg/kg. Thus, the potential exists for there to be adverse health affects as a result of chronic exposures.

While not quantified, the presence of residual P4 beneath RUs 1 and 2 represents an unacceptable acute hazard to potential future receptors exposed to subsurface materials in these areas. Receptors located downwind of RUs 1 and 2 could also potentially be exposed to phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern.

While not quantified in the Supplemental HHRA, the presence of residual P4 beneath RUs 1 and 2 represents an unacceptable acute burning hazard to potential future receptors exposed to subsurface materials in these areas. Also, in the event of exposure of P4 at sufficient concentrations in soil to ambient air (such as during excavation activities), receptors located downwind of RUs 1 and 2 could be exposed to aerosols associated with P4 combustion. In addition to the principal combustion product P_4O_{10}, and its hydrolysis product (orthophosphoric acid), the vapor cloud may also contain trace quantities of unreacted P4 (Van Voris et al., 1987) and/or a complex mixture of suboxides of P4 including phosphorus trioxide (P_4O_6), which reacts with water to form phosphine (PH3) at low oxygen levels (Spanggord, 1985). Downwind receptors could potentially be exposed to these P4 combustion products at concentrations of acute health concern.

No other COCs/ROCs carried forward into the Supplemental HHRA for RUs 1 and 2 were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

The findings of the P4 Delineation investigation bound the area around RUs 1 and 2 that has the potential to contain P4 above levels of health concern, as defined by the chronic P4 SSLs derived in the *SRI Work Plan*.

While the observation of P4 in the subsurface at a depth of approximately 80 feet bgs outside of RUs 1 and 2 was unexpected and the mode of migration was not previously evaluated, it is not inconsistent with the CSM. This is further discussed in Section 5. The melting point of P4 is 44°C, so it will typically solidify and thus not flow in soil at ambient temperatures. (It is noted that P4 can supercool and remain a liquid under quiescent conditions. However, it would be expected that all P4 in soil at temperatures below 44°C will solidify over time. Given that the slag pit heat source ceased 10 years ago, at the time slag ladling was implemented, it is reasonable to assume that the all the P4 in the soils at these RUs has solidified). P4 was typically handled in the phosphorus production areas (RUs 1 and 2) as a liquid at temperatures between 60°C and 66°C. Molten slag was tapped almost continuously into the slag pit for 50 years. As a result, heat from these operations transferred via convection into the underlying strata. With the ground being heated above the melting point of P4, there is a potential that any P4 released into the subsurface in the areas of RUs 1 and 2 could remain liquid and mobile (i.e., moving downward through the vadose zone to groundwater) while within this thermal plume area.

Because P4 was not encountered at boring locations RU1-CAP-SB004, RU1-CAP-SB004a, and RU1-CAP-SB005 until a depth of approximately 80 feet bgs, vertical migration from the surface (or near surface) at these boring locations is highly unlikely. Rather, it is more likely that the P4 originated from upgradient sources in RUs 1 and 2 that are within the 44ºC isotherm area. As P4 was released from these sources within the 44ºC isotherm, it was maintained above its melting temperature of 44ºC and moved downward through the vadose zone along the path of least resistance. The actual path through the vadose zone would be determined by the structure of the underlying soil layers and the soil temperature (i.e., higher soil temperatures would facilitate higher flow rates). As described in the RI Update Memo and the GWCCR, the groundwater temperature at well 108 exceeded 28°C at its peak temperature, suggesting that groundwater with temperatures of greater than 44°C could have underlain the furnace building and slag pit, the latter being the most intense heat source. This would have allowed horizontal migration of liquid and/or semi-solid particles of P4 at the groundwater interface (capillary fringe). Upon reaching areas where the vadose groundwater interface and groundwater was below 44ºC, the P4 may have been further transported downgradient with the capillary fringe as a suspended solid (colloidal, particle, or particle-sorbed state). As the suspended and dissolved P4 migrated downgradient in the groundwater, P4 collected in the capillary fringe soils immediately above the groundwater. The soil borings identified above, which did not have P4 present, define the maximum downgradient extent of P4 collection in the capillary fringe soils.

Estimation of Total Fill Volume in RUs 1 and 2:

The cut and fill isopach model was used to determine total fill volume for RUs 1 and 2 as presented in Table 4-2. However, for RU 2, an adjustment was made based upon site knowledge. The cut and fill isopach model indicated that RU 2 (slag pit) was cut into the original surface by about 13 feet. For purposes of the total fill volume calculation, it was assumed that the cut surface is covered with 1 foot of fill (primarily slag). This is consistent with site knowledge that the surface in the slag pit is not native soil but is covered with slag.

Estimated Lateral and Vertical Extent of P4 Contamination in the Soil Column and Capillary Fringe Underlying RUs 1 and 2:

Four electric arc furnaces were located within the furnace building. Each furnace included electrostatic precipitators, a product condenser and a product storage sump or tank. During furnace production, furnace offgas first passed through the electrostatic precipitators and then through a primary condenser where the P4 was condensed from the furnace offgas, collected in subsurface, brick-lined concrete sumps, and maintained above the melting point of 44°C prior to transfer to the phosphorus (phos) dock. In addition, at both the phos dock and secondary condenser, P4 product was stored in subgrade concrete tanks or sumps. These sumps and storage areas were located within RU 1 as shown on Figure 4-2. Historically, furnace building washout water (phossy water) was collected in temporary catch basins located between the slag cooling pits that eventually drained into the slag pit sump. These catch basins, slag cooling pits and slag pit sump were/are located within the RU 2.

The furnace building sumps in RU 1 and the temporary catch basins in RU 2 were located within a predicted 44°C soil column isotherm and present the most likely locations for migration of P4 to the capillary fringe. The isotherm was predicted as an area of soil heated to greater than 44°C extending downward to the groundwater interface that was caused by the historic thermal loading from hot slag tapping into the slag pit. The isotherm was predicted based on the observed historic groundwater thermal plume (BEI, 1996). The phos dock and secondary condenser are positioned well outside of the 44°C isotherm; thus, there is a limited potential for migration of P4 to the capillary fringe. The slag pit sump is located relatively near the 44°C isotherm; however, the slag pit sump did not contain a significant or sustained volume of P4 (i.e., the slag pit sump contained waste phossy water from the furnace building not P4 product); therefore, the slag pit sump is not indicated as a significant source of liquid P4 that would have migrated as P4 product to the capillary fringe. The RCRA closure (capping) of the slag pit sump was completed in 2005.

Several factors were considered in developing this estimate of P4 contained in the pore space of underlying soils including:1) the footprint of the source areas that contributed to P4 in subsoils, 2) the amount of P4 present in the soil pore space, expressed as a percentage of available pore space (effective porosity), 3) the thickness (or depth) of P4 contamination in areas with sustained head above the 44°C (molten P4) and in other adjacent areas, and 4) the thickness and areal extent of P4 at the groundwater capillary fringe beneath RUs 1 and 2 and the concentration of P4 in this “smear” zone.

Thus to develop a reasonable range of the quantity of P4 that could possibly underlie the former processing facilities at RUs 1 and 2, two scenarios were developed to represent a minimum case and a maximum case. For each scenario, estimates were developed for three modes of contaminant migration: 1) Shallow subsoils (beneath process source areas within and outside of the 44°C isotherm), 2) the soil column to the capillary fringe beneath specific process units within the 44°C isotherm, and 3) the capillary fringe horizontally and downgradient from the specific process units within the 44°C isotherm.

Shallow Subsoil P4. Shallow subsoil (ranging from 2-10 feet bgs) was assumed to be contaminated with liquid P4 from various process related spills, leaks, and discharges. Note that for the purpose of this estimate, bgs refers to the elevation of the bottom of the sump/tank source rather than the surrounding surface or top of (concrete) foundation. The lateral extent of impacted shallow soils was assumed to encompass the entire area identified within the predicted 44°C isotherm. This area encompasses most of the furnace building and slag pit footprints. In addition, shallow subsoil (ranging from 2-10 feet bgs) was assumed within the footprint of the phos dock and the secondary condenser sump. The minimum case assumes the shallow subsoil is impacted to a depth of 2 feet bgs over this entire footprint, and remains at a saturation point of 10 percent of effective porosity. The maximum case assumes that the shallow fill is impacted to a depth of 10 feet bgs over the entire footprint and remains at a saturation point of 30 percent of effective porosity.

In addition, RUs 1 and 2 were initially delineated based on knowledge of the operations within these areas and an acknowledgement that 1) surface spills and overfilling product railcars occurred in the loading area between the phos dock and the furnace building; 2) surface spills and releases of product and phossy water occurred around the furnace building, phos dock and secondary condenser; and 3) leaks from product and phossy water pipelines occurred between the furnace building, phos dock and secondary condenser over the operational life of the facility. In order to estimate these largely undocumented but known events, the potential that P4 in shallow subsoils throughout the entire footprint of RUs 1 and 2 has been included in the minimum and maximum case by assuming a probability that 10 percent of the entire RUs 1 and 2 area was impacted. Consistent with the process unit specific assumptions, the minimum case assumes the shallow subsoil is impacted to a depth of 2 feet bgs and remains at a saturation point of 10 percent of effective porosity and the maximum case assumes that the shallow subsoil is impacted to a depth of 10 feet bgs and remains at a saturation point of 30 percent of effective porosity.

Soil Column P4 to Groundwater. For the specific process units where P4 was maintained above its melting point within the 44°C isotherm (e.g, liquid P4 was assumed to have leaked from the four furnace sumps in the furnace building and two furnace catch basins within the slag pit), P4 was assumed to have migrated through the soil column below the shallow subsoil to the capillary fringe (at approximately 85 feet bgs). The minimum case assumes a residual saturation of 10 percent of the effective porosity and the maximum case assuming 30 percent residual saturation of the effective porosity. The minimum case assumes no lateral dispersion of the liquid P4 as it migrates to the water table; the maximum case assumes deflection due to dispersion/advection of liquid P4 beneath facility components known to contain liquid P4. Thus the maximum case assumes dispersion within the soil column to a lateral area twice the size of each source area at the water table.

Capillary Fringe P4 Area. Upon reaching the capillary fringe, where the soil temperature decreased due to contact with groundwater and the temperature of the capillary fringe was near or below the freezing point of 44°C, liquid P4 from the specific process units within the predicted 44°C isotherm began to solidify and migrate horizontally down-gradient as a semi-solid or solid. The semi-solid to solid particles of P4 were dispersed in a "smear zone" along the top of groundwater downgradient and were frozen within and/or adsorbed onto soil particles in the capillary fringe. Soil borings collected down gradient of RU1 (SB004 and SB004A within RU 3 and SB005 within RU 7) were observed to smoke during the SRI investigation. Smoking is generally assumed to occur in soil with P4 concentrations of 1,000 ppm or greater. Both the minimum and maximum scenarios assume P4 at 1,000 ppm in a 2 foot zone just above the static groundwater level (i.e., water table). The lateral extent of the capillary fringe impacted area was developed based on the *RI Report* findings (no P4 was reported in the soil column, including the capillary fringe, based on the soil boring logs for wells 107, 108 and 122) and the SRI borings including the SRI step out borings done as part of Field Modification #12. The extent of the capillary fringe P4 area also respects the fact that elemental phosphorus has been detected in groundwater at wells 108 and 122 (maximum concentration detected was 0.179 mg/l in well 108 as of 3rd quarter 2007 results). The maximum detected concentration in groundwater is well below the maximum solubility of elemental phosphorus in water (3 mg/l at 20° C in distilled water); therefore, elemental phosphorus detected in groundwater at wells 108 and 122 likely indicates low concentration dissolved P4 in groundwater outside the extent of the capillary fringe P4 area rather than dispersed solid-phase P4 within the "smear zone". The area of the capillary fringe impact area for both the minimum and maximum scenarios is the area bound by those RI borings/wells and SRI borings (4.22 acres).

Figure 4-2 depicts the locations and areas of the 1) Shallow subsoils (beneath process source areas well outside the 44°C isotherm), 2) the soil column to the capillary fringe beneath specific process units within the 44°C isotherm, and 3) the capillary fringe area.

For the minimum estimate of residual P4 in soils underlying RUs 1 and 2 (including the capillary fringe P4 in RUs 3 and 7), the following assumptions were made:

1) Subsoil Areal Extent = 2.68 acres (refer to Figure 4-2).

2) RU 1 and 2 Footprint = 7.80 acres (refer to Figure 4-2).

3) Soil Column to Groundwater Areal Extent = 0.07 acres (refer to Figure 4-2).

4) P4 = 10% of available (effective) pore space. The effective pore space was assumed to be 20%.

5) Thickness of Potential Subsurface P4 = 81 feet directly beneath these facilities within the 44°C isotherm and 2 feet thick beneath the adjoining areas. Also no deflection or dispersion of the liquid P4 was assumed in the minimum case beneath the areas known to contain liquid P4.

6) Thickness of the smear zone is 2 feet, the areal extent is 4.22 acres (as depicted on Figure 4-2) and the concentration of P4 in soil at the capillary fringe was assumed to be 1,000 ppm.

The total minimum estimate quantity is 580 tons based on these assumptions. The minimum estimated quantity of soil (including P4 mass) impacted by P4 is 43,870 tons.

For the likely high-end quantity estimate of residual P4 in soils underlying RUs 1 and 2 (including the capillary fringe P4 in RUs 3 and 7) the following assumptions were made:

1) Subsoil Areal Extent = 2.68 acres (refer to Figure 4-2).

2) RU 1 and 2 Footprint = 7.80 acres (refer to Figure 4-2).

3) Soil Column to Groundwater Areal Extent = 0.07 acres (refer to Figure 4-2).

4) P4 = 30% of available (effective) pore space. The effective pore space was assumed to be 20%.

5) Thickness of Potential Subsurface P4 = 73 feet directly beneath these facilities components within the 44°C isotherm and 10 feet thick beneath the adjoining areas. Deflection due to dispersion/advection of liquid P4 beneath facility components known to contain liquid P4 of two times the surficial area at the groundwater table.

6) Thickness of the smear zone is assumed at 2 feet, the areal extent is 4.22 acres (as depicted on Figure 4-2) and the concentration of P4 in soil at the capillary fringe was assumed to be 1,000 ppm.

The total maximum estimate quantity is 5,465 tons based on these assumptions. The maximum estimated quantity of soil (including P4 mass) impacted by P4 is 137,300 tons.

In order to evaluate the reasonableness of the estimated range of P4 in the subsurface at RUs 1 and 2, the estimated minimum and likely high-end quantities in the subsurface (i.e., lost from the process into the subsurface) were compared to an estimate of the historic P4 production from the plant during its operation. Both the minimum and maximum estimated quantities are less than 0.1 percent of the estimated total amount of P4 produced by the FMC Plant during its operation. Although not definitive, a loss of several percent or greater from the process would likely have been discernable by plant operating personnel and would have motivated action to identify and correct the loss of production (i.e., product recovery and thus profit). Therefore, the estimated maximum quantity appears to be reasonable and not excessive. However, in order to provide an upper bound maximum quantity of P4 in RUs 1 and 2, an assumption was made that 1 percent of P4 production was lost through spills and leaks within RUs 1 and 2, and that this amount of P4 then migrated into the subsurface. Total plant lifetime production was determined to be 5.24 million tons based upon available historical plant information. Thus, the upper-bound maximum estimate of P4 within the soils under RUs 1 and 2 (including the capillary fringe P4 in RUs 3 and 7) would be 52,400 tons of P4.

4.3 RU 3: RECEIVING STORES, PAINT SHOP AND P4 DECON

4.3.1 Site Description

RU 3 is a relatively flat area 1.4 acres in size and was the site of several buildings and paved areas in the northern part of the FMC Plant Site. RU 3 is north of the phos dock and furnace building (RU 1) and south of the railroad swale (RU 22c) as shown on Figure 1-2.

Maintenance shops, receiving and stores, and office buildings were located in RU 3. There were no P4 production activities within this RU. However, the phos dock (located in adjacent RU 1) was used to store, process, and load P4 into railcars. Prior to 1991, phossy water (in its use to blanket and transfer P4 product) sometimes overflowed from the phos dock along a roadway through RU 3 to the railroad swale (RU 22c). Most of this overland flow was over an asphalt-paved surface. However, given that P4 could have been in the phossy water and the fact that the road surface was not impermeable, there is a potential for P4 to have migrated to the subsurface soils in that area.

In addition, there are approximately 1,000 feet of underground storm drain piping running from RU 1 through RU 3. The pipe carried stormwater from the plant operating areas to the railroad swale (RU 22c). However, the storm drain piping also carried spilled phossy water from the furnace building and phos dock to the railroad swale. The phossy water was generated as result of process leaks, washwater, and other RU sources. The underground piping reportedly was constructed of concrete drain pipes. As such, the piping has joints that are not sealed and can leak.

Although the buildings in RU 3 have been removed as part of the plant decommissioning, roadways and building foundations remain. These were helpful during the SRI to identify the location of underground piping, sumps and other structures and the path of overland phossy water flow.

4.3.2 Problem Statements

The following field programs were performed at RU 3. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Phossy Water SIA - The impact to underlying native soils due to drainage of phossy water across RU 3 had not been determined, and thus data were needed to be collected to support a decision either to remediate the specific investigation area or take no further action.

- Underground, Piping, Sumps, and Structures SIA - The portion of the piping within RU 3 was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (i.e., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

The specific field activities for RU 3 associated with each of these field programs are summarized in Table 4-1 by RU.

4.3.3 Investigation Results

4.3.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 3 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA (EPA, 1996)*. The gamma scan measurements averaged 51,368 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 3 consist of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 3.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 3 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 2 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.3.3.2 SFS (RU 3 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in

previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 3 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 3 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 3 is made up of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag. The subsurface fill materials consisted of the same materials found at the surface. The native soil interface ranges between 2 feet and 20 feet bgs.

4.3.3.3 Phossy Water SIA (RU 3 SIA1)

A total of 15 primary soil borings were drilled in locations where phossy water overflowed across the surface, as shown on Figure 4-4. Soil samples were collected from 0-to-2 feet bns at each boring for chemical analysis. A single colocated boring was paired with one of the primary borings. As a result, 16 soil samples were submitted and analyzed for P4, metals, and fluoride to determine whether phossy water draining across RU 3 has impacted underlying native soils.

Fill Materials. The surface material in the Phossy Water area is composed of asphalt with slag aggregate, concrete foundations, reworked native soil with slag, and silica. The subsurface fill materials consist primarily of slag and reworked native soils with slag. The native soil interface ranges between 2 and 9 feet bgs.

Metals and fluoride were detected in the soil samples collected from RU 3 SIA1, as reported in Table 4-11. All the concentrations of metals and fluoride were significantly below any future worker SSL or soil to groundwater SSL. In addition, no P4 was visually observed (smoking or burning) at any location, and all of the P4 samples were reported as nondetect. Finally, because no SSLs were exceeded, potential risks associated with exposure to phossy water-related constituents in this SIA were not evaluated in the Supplemental HHRA.

4.3.3.4 Underground Piping, Sumps and Structures SIA

The decision whether to remove, treat, or otherwise manage underground piping in RU 3 will be an SFS decision based on the detailed analysis of alternatives. In order to provide the SFS process with the appropriate information to evaluate the alternatives for underground piping, sumps, and structures in RU 3, the SRI anticipated a phased approach. During the SRI, the phase one task in RU 3 for the underground piping investigation was to identify available information regarding remaining piping, sumps and structures, including the piping, sump, and structure size, material of construction, and any process knowledge regarding the residuals expected to be remaining in them. The phase one task was based upon review of existing drawings, construction records, operational logs, and plant personnel knowledge. The need to collect additional data concerning remaining pipes/sumps/structures was based on the outcome of all other data collection activities in RU 3 conducted during the SRI, i.e., whether RU 3 would proceed to the SFS. Since the surface gamma data exceeded the CV as discussed above, RU 3 was forwarded to the SFS and only a phase one task was required for the piping, sumps, and structures. Additional information regarding this study is provided in Section 4.26 and Appendix I.

4.3.4 Contamination Assessment

As shown in Table 4-12, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 3 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

As discussed for the SFS and phossy water SIA programs, metals, fluoride, and radionuclide levels in native soils underlying fill materials in RU 3 were not elevated above any future worker SSL or soil to groundwater SSL. Therefore, migration of these constituents to groundwater is not a concern. In addition, P4 was not detected or visually observed in any shallow soil borings in RU 3. However, P4 was visually observed at a depth of approximately 80 feet bgs within the capillary fringe in RU 1 cap delineation borings that are located within the RU 3 boundary. Information regarding the P4 visually observed at the capillary fringe is described in Section 4.2.

As described in the GWCCR, Monitoring Well 122 located in RU 3 has reported elemental phosphorus in groundwater during historic groundwater sampling events. A more detailed discussion of elemental phosphorus detected in well 108 and well 122 that has also reported elemental phosphorus downgradient of RUs 1 and 2 is provided in the GWCCR Section 4.2.1.2, 5.1.2, 5.2.2.1, and 6.1.

Also, as discussed later in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials (i.e., asphalt with slag aggregate) in RU 3, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 3 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 3 have not leached into underlying native soils above levels of concern.

RU 3 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objectives of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection and Phossy Water SIA investigations will be considered during evaluation of remedial alternatives. Underground piping also will be a consideration in the SFS alternatives development for RU 3.

Estimation of Fill Volume in RU 3:

The cut and fill isopach model was used to determine total fill volume for RU 3 as presented in Table 4-2. Note that the P4 identified in the capillary fringe within the boundaries of RU 3 during the SRI has been accounted for and is reported as P4 in RU 1.

4.4 RU 4: OFFICE BUILDINGS AND TRAINING CENTER

4.4.1 Site Description

RU 4 is immediately west of RU 3 and north of RU 5 as shown on Figure 1-2. Several buildings were located within RU 4, including the change house, office buildings, and training center. The ground surface is relatively flat with a gentle slope to the north.

There were no P4 production processes within RU 4. During the EMF RI, toluene was detected at low concentrations in all samples collected from boring F028B to a depth of 70 feet bgs. F028B is located in the parking lot immediately in front of the former administration building. Although the EMF RI concluded that there was no indication of a VOC source to groundwater, there is some uncertainty as to the source, and thus additional characterization was needed during the SRI.

Although all the buildings in RU 4, other than the training center, have been removed as part of the plant decommissioning, roadways and building foundations remain and helped to orient the field crew during the SRI.

4.4.2 Problem Statement

The following field programs were performed at RU 4. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Organic Solvent SIA - Based on knowledge of analytical results associated with RI boring F028B, the determination of the presence or absence of solvents in the vicinity of this boring was needed to support a decision to either remediate the solvent specific investigation area or take no further action.

The specific field activities for RU 4 associated with each of these field programs are summarized in Table 4-1 by RU.

4.4.3 Investigation Results

4.4.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 4 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 38,829 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 4 consist of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 4.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 4 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.4.3.2 SFS (RU 4 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 4 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on: 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 4 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 4 is made up of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag. The subsurface fill materials consisted of the same materials found at the surface. The native soil interface ranges from between 2.5 and 10 feet bgs.

4.4.3.3 Organic Solvent SIA (RU 4 SIA1)

Fourteen (14) primary borings as shown on Figure 4-5 and two (2) colocated borings were installed and sampled during the organic solvent SIA at RU 4, for a total of 16 borings. The

boring location spacing for RU 4 was 30 feet, which was determined by the size of the area and the undetermined source and extent of the solvents detected in boring F028B. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected. During the organic solvent field program at RU 4, a total of 48 samples were collected for lab-related VOCs chemical analysis. Table 1-6 contains the list of lab-related VOC analytes. This means that 3 samples were collected from each of the 16 soil borings. Samples were collected from depths ranging from 1.5 to 24 feet bgs. In one boring, SB008, the native soil interface was encountered at 14 feet bgs, and thus samples were collected at 14, 16, and 24 feet bgs. In boring SB001, the native soil interface was encountered at 1.5 feet bgs, and thus samples were collected at 1.5, 3.5, and 10 feet bgs.

Fill Materials. The surface of RU 4 in the organic solvent area is made up of asphalt with slag aggregate, concrete foundations, reworked native soil with slag, and silica. The subsurface fill materials consist primarily of reworked native soils with slag. The native soil interface ranges between 1.5 and 14 feet bgs.

Laboratory-related solvents were not detected in the soil samples collected at RU 4. The complete data table for RU 4 is located in Appendix D. Because there were no reported detections of laboratory-related solvents in this RU, no phase two investigations were proposed or conducted in the RU 4 SIA1. Moreover, because no SSLs were exceeded, potential risks associated with exposure to laboratory-related VOCs in this SIA were not evaluated in the Supplemental HHRA.

4.4.4 Contamination Assessment

As shown in Table 4-13, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 4 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Metals, fluoride, and radionuclide levels in native soils underlying fill materials in RU 4 were not elevated above any future worker SSLs or soil to groundwater SSLs at RU4. As discussed later in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials in RU 4 (i.e., asphalt with slag aggregate), showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 4 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 4 have not leached into underlying native soils above levels of concern. In addition, lab-related VOCs were not detected

in any boring in RU 4. Therefore, migration of organic and inorganic constituents to groundwater is not a concern.

Although, P4 was not detected or visually observed in any shallow soil borings in RU 4, P4 was visually observed at a depth of approximately 80 feet bgs within the capillary fringe in RU 1 cap delineation borings that are located within the RU 4 boundary. Information regarding the P4 visually observed at the capillary fringe is described in Section 4.2. As described in the GWCCR, Monitoring Well 108 has reported elemental phosphorus during historic and current groundwater sampling events. A more detailed discussion of elemental phosphorus detected in Well 108, and in Well 122 that has also reported elemental phosphorus downgradient of RUs 1 and 2, is provided in the GWCCR Section 4.2.1.2, 5.1.2, 5.2.2.1, and 6.1.

RU 4 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection and Lab-Related Organic Solvents SIA investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 4:

The cut and fill isopach model was used to determine total fill volume for RU 4 as presented in Table 4-2.

4.5 RU 5: LAB AND OLD DRAINFIELD

4.5.1 Site Description

RU 5 as shown on Figure 4-5 is 0.6 acres in size and contains the site of the former FMC laboratory and its associated drainfield, also referred to as the seepage pit. The laboratory analyzed ore and product samples. The laboratory disposed of various solutions and organic solvents in the seepage pit until 1980, when that practice ceased. In 1995, the seepage pit was grouted, and a report on that was submitted to EPA in 2002.

Although there were no P4 production process operations within RU 5, the process control laboratory did analyze small quantities of process materials for quality control. The laboratory chemical disposal area (SWMU # 61) to the west of the laboratory was investigated for solvents based on prior practices at the plant process control laboratory. During the EMF RI, sampling at the seepage pit detected toluene at two of the depth horizons sampled (1 and 20 feet bgs) and, in boring F029B, xylenes and ethylbenzene were detected at a depth of 70 feet bgs.

Although the buildings in RU 5 have been removed as part of the plant decommissioning, roadways and building foundations remain and helped to orient the field crew during the SRI.

4.5.2 Problem Statement

The following field programs were performed at RU 5. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Organic Solvent SIA - Based on knowledge of past plant practices and analytical results associated with boring F029, the presence or absence of solvents at SWMU 61 and the chemical lab seepage pit needed to be determined to support a decision to either remediate the organic solvent specific investigation area or take no further action.

The specific field activities for RU 5 associated with each of these field programs are summarized in Table 4-1 by RU.

4.5.3 Investigation Results

4.5.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 5 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 48,859 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 5 consist of slag, concrete foundations, asphalt with slag aggregate, and silica.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, only these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 5.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 5 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.5.3.2 SFS (RU 5 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 5 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 5 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 5 is made of up of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag. The subsurface fill materials consist primarily of surface materials as well as drain field material (rounded quartzite cobbles). The native soil interface ranges between 2.5 and 10 feet bgs.

4.5.3.3 Organic Solvent SIA (RU 5 SIA1)

Twenty-four (24) primary borings as shown on Figure 4-6 and two (2) colocated borings were installed and sampled during the organic solvent SIA at RU 5, for a total of 26 borings. The boring location spacing for RU 5 was 30 feet, which was determined by the size of the area and the undetermined source and extent of the solvents detected in boring F029B. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also

collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected. During the organic solvent field program at RU 5, a total of 85 soil samples were collected for lab-related VOCs chemical analysis. Table 1-6 contains the list of lab-related VOC analytes. Samples were collected from depths ranging from 1 to 22 feet bgs.

Fill Materials. The surface of RU 5 in the SIA area is comprised of slag, concrete foundations, asphalt with slag aggregate, silica, and reworked native soil with slag. The subsurface fill materials consist primarily of reworked native soil with slag, slag gravel, and cobbles. The native soil interface for the SIA borings ranged between 1.0 and 14 feet bgs. SB010 appeared to be drilled into the laboratory drain field. This boring encountered 11 feet of 4-inch rounded cobbles mixed with sand and silt. The native soil interface was encountered at 12 feet bgs and samples were collected starting at this depth. Both SFS borings SB001 and SB003 also encountered this drainage field material. No other SFS or SIA borings appeared to intersect the laboratory drain field.

Low level detections of PCE, chloroform, 2-butanone (MEK), and toluene, were reported in six of the 24 borings as listed in Table 4-14, the detection summary table, and discussed below. The detections were flagged as estimates because the concentrations were above the method detection limit (MDL) but below the reporting limit (RL). Moreover, all of the detections were significantly below the SSLs as shown in Table 4-14. Both PCE (1.8 µg/kg) and chloroform (2.9 µg/kg) were reported in the 1.5-foot sample interval in SB002. No detections are reported in the 3.5 and 10-foot sample intervals at this location. This is the only boring to report detectable concentrations of PCE and chloroform. The soil to groundwater SSLs for PCE and chloroform were 50 and 500 µg/kg, respectively.

Detections of MEK were reported in six individual soil samples collected from five borings (SB002, SB013, SB015, SB220, SB021, and SB024). The detectable concentrations of MEK range from 5.9 µg/kg to 7.7 µg/kg and were only observed in the shallow and/or the intermediate sampling intervals. The deepest sample interval in each of these five borings reported non-detect levels of MEK. The soil to groundwater SSL for MEK is 91,000 µg/kg.

Toluene is reported in the shallow sampling interval of one boring (SB015) at a concentration of 1.2 µg/kg. The soil to groundwater SSLs for toluene is 12,000 µg/kg. Toluene was not detected in the deeper samples collected from this soil boring.

Because there were no reported detections of laboratory-related solvents greater than SSLs in RU 5, no phase two investigations were proposed or conducted in RU 5 SIA1. Moreover, because no SSLs were exceeded, potential risks associated with exposure to volatile organic solvents in this SIA were not evaluated in the Supplemental HHRA.

4.5.4 Contamination Assessment

As shown in Table 4-15, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 5 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated

with radium-226 in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Metals, fluoride, and radionuclide levels in native soils underlying fill materials were not elevated above any future worker SSL or soil to groundwater SSL. As discussed later in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials (i.e., asphalt with slag aggregate) in RU 5, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 5 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 5 have not leached into underlying native soils above levels of concern. In addition, lab-related solvents detected during the organic solvent SIA at RU 5 were significantly lower than SSLs, and were not detected in the deepest sample intervals. Therefore, migration of organic and inorganic constituents to groundwater is not a concern.

RU 5 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection and Organic Solvents SIA investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 5:

The cut and fill isopach model was used to determine total fill volume for RU 5 as presented in Table 4-2.

4.6 RU 6: FORMER LONG-TERM PHOS STORAGE TANKS

4.6.1 Site Description

RU 6 is 1.4 acres in size and is located in the northern part of the FMC Plant Site as shown in Figure 1-2. RU 6 is the location of the former long-term phosphorus storage tanks and loading/unloading railspur. It is a relatively flat area, slag-covered, with no remaining surface features except a railroad spur that passes through the northern portion of the RU. RU 6 is west of RUs 4 and 5.

Over a period of years in the late 1970s and early 1980s, FMC installed 12 underground steel storage tanks for long-term storage of P4 and each tank had a capacity of 104,000 gallons. The tanks (which were approximately 14 feet in diameter) were only half buried, i.e., the tanks were placed about 7 feet below the original grade with fill material piled up around the exposed top of each tank. Phossy water spills occurred during transfer operations. FMC removed the P4 from the tanks in the early 1990s and the tanks were then removed. Tank removal occurred in two phases with eight tanks removed in 1994 and four tanks removed in 1998. During both phases of

tank removal, FMC personnel noted the presence of P4 in surface materials near the tanks. Phossy water spills were located near the tank fill ports, indicating potential P4 in the nearby subsurface soil due to spilling of phossy water, rather than P4 product. The tanks were visually inspected after removal and no tank failures were found. The 7-foot-deep depressions left after the removal of the tanks were backfilled with a silty sand fill material and the area was graded level.

During the SRI, coke and ferrophos were observed in the fill material at RU 6. Because RU 6 is not known to have been a storage or staging area for coke or ferrophos, these materials are presumed to have been part of the fill material placed in RU 6 during tank removal.

4.6.2 Problem Statement

The following field programs were performed at RU 6. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Phossy Water SIA - There was a potential that phossy water spills occurred during loading and unloading of railcars and filling tanks with phossy water. Shallow samples of native soils were collected near the spur line and in the area of the former storage tanks to evaluate whether phossy water-related constituents have migrated into underlying soils. In addition, soil samples were collected beneath the former tanks to evaluate whether phossy water-related constituents have migrated into soils immediately beneath the tank.

The specific field activities for RU 6 associated with each of these field programs are summarized in Table 4-1 by RU.

4.6.3 Investigation Results

4.6.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 6 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 81,643 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data

collection concept map described in Section 3. Instead, data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the predominant fill material present within RU 6 is slag. However, Table 4-2 also identifies coke and ferrophos as potential source materials incidental to this predominant fill material in RU 6. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 6.

As shown in Table 4-4, nickel, vanadium, radium-226, uranium-238, lead-210, and six coke-related PAHs comprise the COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 6.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 6 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.6.3.2 SFS (RU 6 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 6 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 6 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 6 is made of up of slag. The subsurface fill materials consist primarily of slag and reworked native soil with slag. In addition, coke and ferrophos were also noted in the shallow subsurface at a few borings. The native soil interface ranges between 4 and 15 feet bgs.

4.6.3.3 Phossy Water SIA (RU 6 SIA1)

As shown on Figure 4-7, soil samples from 0-to-2 feet bns were collected for chemical analysis from 32 borings and three (3) colocated borings, for a total of 35 samples. All samples were analyzed for P4, metals, and fluoride.

Fill Materials. The surface and subsurface materials in the Phossy Water SIA area were the same as those observed in the SFS borings discussed above. The native soil interface ranged between 6 and 15 feet bgs. Reworked native soil consisting of silty sandy fill material and a gravelly silt fill material are the predominant fill types beneath the former long-term storage phossy tanks.

Metals and fluoride were detected in the soil samples collected from RU 6 SIA1, as reported in Table 4-11. All the concentrations of metals or fluoride were significantly below any future worker SSL or soil to groundwater SSL. In addition, no P4 was visually observed (smoking or burning) at any location, and all soil samples collected for P4 analysis were reported as non-detect. Finally, because no SSLs were exceeded, potential risks associated with exposure to phossy water related constituents in this SIA were not evaluated in the Supplemental HHRA.

4.6.4 Contamination Assessment

As shown in Table 4-16, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 6 are driven by the external exposure to gamma radiation and soil ingestion pathways. Incremental cancer risks via the external exposure to gamma radiation pathway, which were primarily associated with radium-226 in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Incremental cancer risks via the soil ingestion pathway, which are driven by PAHs associated with coke (an incidental fill material) and lead-210 and radium-226 levels in slag, also exceed the 1E-04 ROD RAO for potential future outdoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by vanadium levels in ferrophos (an incidental fill material), exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for nickel (associated with ferrophos) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Metals and fluoride levels in native soils underlying fill materials were not elevated above any future worker SSL or soil to groundwater SSL based on the SFS or phossy water investigations. In addition, P4 was not visually observed or detected in any soil samples collected at RU 6. As discussed later in Section 4.16, evaluations at the reference area for slag, which is the primary fill material in RU 6, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data and verified with the RU 6 SFS composite sample results discussed above, it can be concluded that the constituents associated with fill materials in RU 6 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

RU 6 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection and Phossy Water SIA investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 6:

The cut and fill isopach model was used to determine total fill volume for RU 6 as presented in Table 4-2.

4.7 RU 7: SHALE UNLOAD, CRUSHING AND STOCKPILE

4.7.1 Site Description

RU 7 is about 25 acres is size and is located in the northeastern portion of the FMC Plant Site, adjacent to the J.R. Simplot facility as shown on Figure 4-8. Historic aerial photos and plant records show this area was used for ore handling since the plant began operation in 1949. Coke, another raw material used in the P4 production process, was also handled within RU 7. Coke was unloaded from railcars, screened, and carried by conveyors to the furnace building. Coke that needed to be dried was carried by rail to RU 20 where it was unloaded, screened, dried, and brought back to RU 7 to be conveyed to the furnace building.

Phosphate ore was brought into the plant via railcar and unloaded to an ore stockpile/reclaim system. When reclaimed from the stockpile, the ore was crushed and screened and then conveyed to the briquetting process (all within RU 7). In addition to phosphate minerals, phosphate ore typically contained metals and uranium-238 in secular equilibrium with its decay daughters. The ore typically contained 19 to 30 pCi/g of radium-226 (a decay daughter of uranium-238), which decays to radon-222.

RU 7 has been built up from its original grade, likely because of ore stockpiling and material handling requirements at the plant. A portion of the ore stockpile was sold and shipped off-site after the plant shutdown in 2001. The remaining ore has been leveled to grade and remains within RU 7. The only remaining equipment is the railcar dumper.

The coke handling area in RU 7 consists of a former building (approximately 80 feet long, 19 feet wide, and 27 feet high) in which coke was unloaded from single railcars. Coke was bottom dropped from cars onto a hopper and conveyor belt within the building. This coke unloading building was constructed and placed into service circa 1996. Operation ended in December 2001 with the cessation of phosphate ore processing at the FMC facility. The building and coke handling systems were dismantled and removed after plant shutdown.

4.7.2 Problem Statement

The following field programs were performed at RU 7. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Ore Reference Area Investigation - A reference area study was performed in RU 7 with the overall purpose of determining the leaching potential of ore and ore-related materials (such as nodule fines) into underlying native soils. This investigation was performed by examining ore-related constituent concentrations in the underlying native soils.

- Coke Constituent SIA - Dry coke was unloaded from railcars in RU 7 for use in the P4 production process. Coke unloading and handling activities resulted in incidental spills of coke to the ground surface in RU 7 at the coke unloading building. Although coke is no longer visible at the surface, an evaluation of the coke handling area was needed to determine whether coke-related constituents could possibly have migrated to underlying native soils.

- Ore Radon Flux Measurement SIA - Radon emission rates from the shale ore handling area had not been quantified during the RI. Evaluation of the radon flux from this area was performed to determine if the flux levels from ore were sufficiently high to warrant specific consideration in the SFS. In addition, these data were used to evaluate the potential for radon flux to be an issue of concern at other RUs that contain residual ore fill material.

The specific field activities for RU 7 associated with each of these field programs are summarized in Table 4-1 by RU.

4.7.3 Investigation Results

4.7.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 7 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 85,264 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. It should be noted that, in addition to future workers, risks to off-site residents from fugitive dust emissions were also evaluated due to the proximity of RU 7 to the plant site boundary. As listed in Table 4-2, the predominant fill materials present within RU 7 consist of raw ore, slag, concrete foundations, asphalt with slag aggregate and silica. Table 4-2 also identifies coke as a potential source material incidental to the predominant fill materials in RU 7. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 7.

As shown in Table 4-4, arsenic, cadmium, radium-226, uranium-238, lead-210 and six coke-related PAHs comprise the COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 7.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 7 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.7.3.2 SFS (RU 7 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 7 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil

borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 7 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and ore reference area data. With the exception of one slight exceedance for potassium-40, all the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10. The composite sample RU7-SFS-SBC001 contained a potassium-40 concentration of 21.1 pCi/g slightly exceeding the potassium-40 SSL of 20.5 pCi/g. However, as discussed below, none of the 20 reference area potassium-40 samples were detected above background. The soil to groundwater SSL, commercial/industrial SSL, and construction worker SSLs default to the background value of 20.5 pCi/g since these SSLs were below background. The cited EPA background values represent the 95th percentile of the background data set.

Fill Materials. As summarized on Table 4-2, the surface of RU 7 is comprised of raw ore, slag concrete foundations, asphalt with slag aggregate, and silica. The subsurface fill materials consist of the surface materials as well as reworked native soils with slag. In addition, the coke handling area contains coke in the shallow subsurface. The coke area now has a surficial layer of ore. The native soil interface ranges between 2 and 25 feet bgs.

4.7.3.3 Reference Area Investigation – Ore (RU 7 REF)

The purpose of the reference area study was to evaluate the degree to which COPCs/ROPCs have leached from ore and ore-related materials into underlying native soils. RU 7 was chosen for this investigation because it is known to have historically contained the greatest volume of ore, and therefore likely represents a worst-case scenario. The study included sampling of 20 soil borings in RU 7 on a standard square grid using a random origin. These sample locations were paired with the SFS data collection boring locations described below. Samples were collected from the 0-to-2 foot bns interval in each boring for chemical analyses. Samples were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210.

Ore reference area data were compared to the background values to evaluate potential leaching from ore to underlying native soils. For a majority of the samples, the individual concentrations

of metals, fluoride, and radionuclides were below background levels and SSLs across the RU. Single detections of cadmium, chromium, and nickel above background levels were reported in borings RU7-REF-SB009 and -SB014. For example, 19 of the 20 native soil samples from RU 7 reported concentrations of chromium and nickel below their representative background levels of 27.5 mg/kg and 15.5 mg/kg. One sample from RU7-REF-SB014 reported a chromium concentration of 117 mg/kg and a nickel concentration of 59.6 mg/kg. The chromium concentration also exceeded the soil to groundwater SSL of 38 mg/kg. The sample location appears to be anomalous and there does not appear to be the result of any leaching of chromium or nickel from ore. As reported on Table 4-17, a similar scenario was encountered for cadmium, where 19 of the 20 native soil samples did not exceed background levels for cadmium. The one exception was at RU7-REF-SB009 where cadmium was found at 2.2 mg/kg compared to a background level and soil to ground water SSL of 1.9 mg/kg and 8 mg/kg, respectively.

4.7.3.4 Coke Constituent SIA

A specific investigation area was identified for residual coke that was deposited at the surface of the coke unloading area in RU 7. Since the coke in RU 7 would have the same chemical characteristics as the coke managed in RU 20 and since the areal extent of coke within RU 7 is much smaller than its areal extent in RU 20, it was proposed to conduct a coke reference study in RU 20. The coke reference study in RU 20 was utilized to address the potential release of PAHs into the underlying soils at both RU 20 and RU 7.

4.7.3.5 Radon Flux Measurement SIA

Radon flux measurements at RU 7 were performed at 100 locations on the ore pile laid out on an evenly-spaced grid. The measurements were made for a period of approximately 48 hours per location. Radon flux measurements were collected using electrets, as described in Section 3.3.9 and Appendix F. All radon measurements from the ore pile were below the UMTRCA guideline of 20 $pCi/m^2/sec$ as reported in Table 4-18. The mean radon flux rate for the ore pile was 0.67 $pCi/m^2/sec$ and measurements ranged from -0.59 to 2.91 $pCi/m^2/sec$.

As identified in the CSM, future outdoor workers have the potential to be exposed to radon. However, since the radon flux levels associated with ore do not exceed the UMTRCA guideline, radon was not identified as a COC to be incorporated into the Supplemental HHRA for RU 7, or for any other RU containing this fill material.

4.7.4 Contamination Assessment

As shown in Table 4-19, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 7 are driven by the external exposure to gamma radiation and soil ingestion pathways. Incremental cancer risks via the external exposure to gamma radiation pathway, which were primarily associated with radium-226 in ore (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Incremental cancer risks via the soil ingestion pathway, which are driven by PAHs in coke (an incidental fill material) and lead-210 and radium-226

levels in ore, also exceed the 1E-04 ROD RAO for potential future outdoor commercial/industrial workers.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

As discussed for the SFS at RU 7 and in the ore reference area findings, metals, fluoride, and radionuclide levels in underlying native soils were not consistently elevated above background, future worker SSLs or soil to groundwater SSLs. Therefore, based on the reference area data, in conjunction with the RU 7 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 7 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

The results of the coke reference study in RU 20 are discussed later in Section 4.16. As concluded in that section, no additional studies in RU 7 or 20 were required because constituents in coke were found not to leach into underlying soils above levels of concern. Potential risks to future workers associated with direct exposure to residual surface and shallow subsurface coke within RU 7 are addressed in the Supplemental HHRA.

Although, P4 was not detected or visually observed in any shallow soil borings in RU 7, P4 was visually observed at a depth of approximately 80 feet bgs within the capillary fringe in RU 1 cap delineation borings that are located within the RU 7 boundary. Information regarding the P4 visually observed at the capillary fringe is described in Section 4.2.

As described in the GWCCR, Monitoring Well 108 located in RU 7 has reported elemental phosphorus in groundwater during historic groundwater sampling events. A more detailed discussion of elemental phosphorus detected in Well 108, and in Well 122 that has also reported elemental phosphorus downgradient of RUs 1 and 2, is provided in the GWCCR Section 4.2.1.2, 5.1.2, 5.2.2.1, and 6.1.

Radon flux measurements did not exceed the UMTRCA guideline of 20 $pCi/m^2/sec$. Therefore, radon flux control for ore does not need to be evaluated in the SFS. As further discussed later in Section 4.16, the coke investigation in RU 20 showed that coke materials do not leach into underlying soils at levels of concern. Therefore, no additional evaluation was required at RU 7.

RU 7 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS, Reference Area, Coke Constituent SIA, and Radon Flux Measurement SIA investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 7:

The cut and fill isopach model was used to determine total fill volume for RU 7 as presented in Table 4-2. However, for RU 7, an adjustment was made based upon site knowledge. The cut and fill isopach model indicated that the ore trenches in RU 7 (ore stockpile) were cut into the

original surface by about 10 feet. For purposes of the total fill volume calculation, it was assumed that the cut surface within each trench is covered with (or mixed with) 1 foot of fill (primarily ore). This is consistent with site knowledge that the surface in the ore stockpile trenches are not native soil but are covered with ore. Also, note that the P4 identified in the capillary fringe within the boundaries of RU 7 has been accounted for and is reported as P4 in RU 1.

4.8 RU 8: FORMER KILN SCRUBBER PONDS AND CALCINERS

4.8.1 Site Description

RU 8 is 6.7 acres in size and was the location of the calcining operation (consisting formerly of a rotary kiln and later of two gas-fired traveling grate calciners and associated scrubbing equipment) used to heat-harden ore briquettes. RU 8 is located south of RU 7, north of RU 11, and east of RU 2 as shown in Figure 1-2. The calciners were installed in 1968. Prior to 1968, a rotary kiln was used to heat ore. Air emissions from the rotary kiln (primarily ore dust) were controlled with a wet (water) scrubber. Three former kiln scrubber water ponds were identified on historic aerial photos and delineated on-site maps as part of the EMF RI. These ponds operated from 1949 through the late 1960's. The kiln scrubber pond solids were periodically dredged during plant operations and the dredged solids were placed in the Former Plant Landfill (located in RU 19). The ponds were reported to have been backfilled to grade in preparation for the construction of the calciners in 1968. However, three SRI borings at the location of the former kiln ponds did not locate kiln pond solids. Therefore, it is believed that that the pond kiln solids were largely removed in preparation for installation of the calciners.

The calciners occupied this location from their construction in 1968 until they were dismantled in 2006. The calciners also utilized wet (water) scrubbers for control of air emissions. Calciner scrubber water was managed in ponds (located in RU 14) that were closed under an IDEQ VCO and therefore not subject to this SRI. Calciner pond solids were periodically removed from the calciner ponds in RU 14 and were placed in RU 16. RU 16 was investigated during the SRI, as reported in Section 4.14.

Process knowledge of the kiln process (rotary kilns were used before calciners were installed to heat harden ore briquettes) indicates that residual sediments from the former kiln scrubber ponds within RU 8 contain materials with COCs/ROCs similar to those contained in calciner solids. Calciner solids, and by inference kiln pond solids, exceed SSLs for cadmium, arsenic, and lead-210 and polonium-210. Additional characterization of the kiln pond solids therefore was not warranted because:

1) The kiln scrubber ponds contain materials with COPCs/ROPCs similar to the calciner ponds. The similarity of material is due to the similarity between the kiln and calcining processes.

2) The 1998 ROD selected capping or covering for the calciner pond solids in RU 16, and the kiln scrubber solids contained in the former kiln scrubber ponds were of a similar nature.

The kiln scrubber overflow pond in RU 9 received clarified water from the kiln scrubber ponds in RU 8 via the kiln scrubber overflow ditch. Therefore, accumulation of solids may have occurred in this ditch or the overflow pond. Also, the clarified water had a low pH and thus could have transported dissolved metals to the overflow scrubber pond and into the subsurface. Upon removal from service, the kiln scrubber overflow pond was filled with silica fines.

Although all of the calcining equipment and associated buildings were removed as part of the plant decommissioning process, the building and equipment foundations remain. A 1965 aerial photo, which illustrates the former kiln scrubber ponds when they were in operation, was geo-referenced and the pond outlines were drawn to show the actual locations and extent of the three ponds in RU 8. This information was used during the SRI to define the kiln scrubber pond boundaries, the initial step-out borings for RU 8 and the extension into RU 9 (overflow pond boundary).

4.8.2 Problem Statement

The following field programs were performed at RU 8. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment – Three borings were drilled during the SRI Fill Characterization study to collect samples of kiln scrubber pond sediments for use in the Supplemental HHRA of this RU; however, none of these borings encountered sediments to a depth of over 10 feet. Instead, it was determined with EPA concurrence that the area of the former kiln scrubber ponds has been backfilled with fill materials, including slag, calcined ore and silica. Consequently, a quantitative evaluation was performed pursuant to the EPA-approved *SRI Work Plan* of potential risks from exposure to the observed fill materials.

- Kiln Pond Delineation - The *RI Update Memo* identified confirmation of the lateral extent of kiln scrubber pond sediments as a data gap. Confirmation sampling along the exterior boundary of RU 8 and in the southern portion of RU 9 (around the scrubber overflow pond) was needed to ensure that the lateral extent of residual kiln scrubber solids was identified.

The specific field activities for RU 8 associated with these field programs are summarized in Table 4-1.

4.8.3 Investigation Results

4.8.3.1 Risk Assessment

As noted in the Problem Statement, attempts were made during the SRI Fill Characterization study to collect samples of kiln scrubber pond sediments for use in the Supplemental HHRA of this RU; however, none of these sediments were encountered despite borings to depths of over 10 feet. Instead, it was determined that the area of the former kiln scrubber ponds, which appeared to have been excavated upon removal from service, had been backfilled with fill materials. As shown in Table 4-2, these fill materials predominantly consist of slag, calcined ore, silica, concrete foundations and asphalt with slag aggregate. Table 4-2 also identifies residual kiln pond solids, with characteristics of calciner pond solids, as a potential source

material incidental to the predominant fill materials in RU 8. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 8.

Analytical data characterizing the composition of the fill materials at this RU were used to bound risks to potential receptors via all viable exposure pathways. As shown in Table 4-4, arsenic, cadmium, fluoride, thallium, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 are the only COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 8.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 8 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials in RU 8, Table 4-2 also references the underground piping located in RU 8 that formerly carried CO gas and states the presumption that this piping contains residual P4 at levels above SSLs. Potential risks associated with this presumed source material are separately evaluated in Section 4.26.

4.8.3.2 Kiln Pond Delineation (RU 8 CAP)

Fourteen (14) primary soil borings (see Figure 4-9), plus one (1) colocated boring, were drilled during the Kiln Pond delineation program at RUs 8 and 9, for a total of 15 borings. One soil sample was collected per boring from 0-to-2 feet bns as described below. Nine (9) borings were drilled and sampled down to native soils around the RU 8 boundary. Five (5) additional borings were drilled to determine the extent of kiln pond solids into RU 9.

Based on visual observations, if material associated with kiln scrubber pond sediments was observed in the boring, the location was abandoned and a step-out location was drilled approximately 10 feet outward from the original location. This process was repeated until the final step-out location, whose demarcation was the point at which kiln scrubber pond sediments were no longer visually observed. At that location, a soil sample was collected from 0-to-2 feet bns. Samples were submitted to the laboratory for metals, fluoride, uranium-238, radium-226, potassium-40, polonium-210, and lead-210 analyses.

Fill Materials. As summarized on Table 4-2, the surface in and around RU 8 is comprised of calcined ore, slag, concrete foundations, asphalt with slag aggregate, and silica. The subsurface fill materials in and around RU 8 and the kiln scrubber overflow pond in RU 9 consist primarily of the surface materials as well as reworked native soil with slag. The native soil interface ranges between 3 feet and 15 feet bgs.

Four borings in native soil reported at least at least one exceedance of SSLs for arsenic, cadmium, chromium, selenium, or thallium as shown in Table 4-20. These consisted of RU8-CAP-SB006, -SB007, -SB009 and -SB013. A fifth boring, RU8-CAP-SB005, reported a minor exceedance of potassium-40. The potassium-40 concentration was 20.7 ± 3.6 pCi/g, while several of the SSLs default to the potassium-40 background value of 20.5 pCi/g. Figure 4-9 depicts the locations of these soil borings and lists the concentrations of metals detected in each.

While the location of the ponds and impacted soils has been largely defined, there is some remaining uncertainty as to lateral extent in the area of these four borings.

The 12 mg/kg concentration of arsenic in RU8-CAP-SB006 exceeded the commercial/industrial worker and soil to groundwater SSLs of 7.7 mg/kg. Both cadmium and thallium SSLs were exceeded at RU8-CAP-SB007, at detected concentrations of 100 mg/kg and 2.1 mg/kg, respectively. The soil to groundwater SSL for cadmium is 8 mg/kg and the construction worker SSLs is 81.3 mg/kg. The soil to groundwater SSL is 0.7 mg/kg for thallium. The soil to groundwater SSLs were exceeded for four of the constituents in RU8-CAP-SB009 (detected concentrations of 170 mg/kg cadmium, 42 mg/kg chromium, 8.9 mg/kg selenium, and 13 mg/kg thallium). The soil to groundwater SSL for chromium is 38 mg/kg, selenium is 5 mg/kg, and thallium is 0.7 mg/kg. The soil sample collected from RU8-CAP-SB013 had exceedances of the soil to groundwater SSL for cadmium (410 mg/kg), selenium (9.2 mg/kg), and thallium (12 mg/kg). However, all concentrations detected in these four borings were several orders of magnitude below the commercial/industrial worker, construction workers, and utility worker SSLs.

4.8.4 Contamination Assessment

As shown in Table 4-21, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 8 are driven by the external exposure to gamma radiation and incidental soil ingestion pathways. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 in ore (a predominant fill material) and potassium-40 in calciner pond solids (an incidental fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Similarly, incremental cancer risks via the soil ingestion pathway, which are driven by polonium-210 in calciner pond solids and lead-210 in ore, also exceed the 1E-04 ROD RAO for potential future outdoor and indoor commercial/ industrial workers.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by thallium levels in calciner pond solids, exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for cadmium (associated with calciner pond solids) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Exceedances of the soil to groundwater SSLs in delineation samples taken around the boundary of RU 8 could be the result of 1) not collecting a sample of clean native soil (the sampled soil could have been mechanically mixed with fill material), 2) potential cross-contamination of fill materials in the split-spoon sampler, or 3) residual pond sediments or other hotspot material in the sample interval. It is not clear which of these possibilities is most likely; however, since the confirmation samples reported exceedances, the DQOs were not met. Risk to the environment,

specifically groundwater, is due to the presence of former unlined ponds in this RU that operated with a standing hydraulic head. Under a sustained head, there is a potential of subsurface contaminant migration to groundwater. Additional step-out borings from RU8-CAP-SB005, -SB006, -SB007, -SB009, and -SB013 will be required during to determine the extent of the pond sediments or impacts in RUs 8 and 9.

RU 8 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the Kiln Pond Delineation investigation will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 8:

The cut and fill isopach model was used to determine total fill volume for RU 8 as presented in Table 4-2. However, for RU 8, an adjustment was made based upon site knowledge. The cut and fill isopach model indicated that the calciner area (including the area of the former kiln scrubber ponds) was cut into the original surface by about 8 feet. For purposes of the total fill volume calculation, it was assumed that the cut surface is covered with (or mixed with) 1 foot of fill (primarily calcined ore, kiln pond solids, and/or concrete). This is consistent with site knowledge that the surface in the calciner area are not native soil but are covered with ore materials and concrete.

4.9 RU 9: SILICA STOCKPILES AND FORMER KILN SCRUBBER OVERFLOW POND

4.9.1 Site Description

RU 9 is 12.9 acres in size and is located immediately south of RU 7 at the east end of the FMC Plant Site as shown on Figure 1-2. The silica stockpile area is at the eastern end of RU 9 and is a relatively flat area south of the ore stockpile. FMC historically used much of the area within RU 9 for silica handling, although other fill materials (e.g., coke and ore) were stockpiled there as well. Slag was also stockpiled and used as fill within the RU. The former kiln scrubber overflow pond was located in this area, and is being investigated as part of RU 8. The pond was backfilled with silica in the late 1960's after the rotary kilns were replaced with calciners.

4.9.2 Problem Statement

The following field programs were performed at RU 9. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which constituents may have migrated into the underlying native soil.

The specific field activities for RU 9 associated with each of these field programs are summarized in Table 4-1.

4.9.3 Investigation Results

4.9.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 9 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 57,676 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the fill materials present within RU 9 predominantly consist of ore, calcined ore, slag, asphalt with slag aggregate and silica. Table 4-2 also identifies coke and some residual kiln pond solids, with characteristics of calciner pond solids, as potential source materials incidental to the predominant fill materials in RU 9. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RUs 9.

As shown in Table 4-4, arsenic, cadmium, fluoride, thallium, radium-226, uranium-238, lead-210, polonium-210, potassium-40 and six coke-related PAHs comprise the COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these four constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 9.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 9 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.9.3.2 SFS (RU 9 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 9 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in

a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 9 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag and ore reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized in Table 4-2, the surface of RU 9 is comprised of calcined ore, raw ore, slag, asphalt with slag aggregate, and silica. The subsurface fill materials consist primarily of these same surface materials as well as reworked native soil with slag and coke. While not visually identified during drilling, kiln pond solids are also considered an incidental source material in RU 9. The native soil interface ranges between 4 and 15 feet bgs.

4.9.4 Contamination Assessment

As shown in Table 4-22, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 9 are driven by the external exposure to gamma radiation and incidental soil ingestion pathways. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 in ore (a predominant fill material) and potassium-40 in calciner pond solids (an incidental fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Similarly, incremental cancer risks via the soil ingestion pathway, which are driven by polonium-210 in calciner pond solids, lead-210 in ore and PAHs in coke (an incidental fill material), also exceed the 1E-04 ROD RAO for potential future outdoor and indoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by thallium levels in calciner pond solids, exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for cadmium (associated with calciner pond solids) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Metal, radionuclide, and fluoride levels in underlying native soils were not elevated above any future worker SSL or soil to groundwater SSL. As discussed in Section 4.7 and Section 4.16, evaluation at the reference area for ore and slag, which were the primary fill materials at RU 9, showed that metals, fluoride, and radionuclide constituents do not leach from these materials into the underlying soil. Therefore, based on the reference area data and verified by the RU 9 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 9 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

RU 9 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 9:

The cut and fill isopach model was used to determine total fill volume for RU 9 as presented in Table 4-2.

4.10 RU 10: IWW POND AND DITCH

4.10.1 Site Description

The Industrial Wastewater (IWW) pond and ditch (RU 10) is 1.3 acres in size and is located east of RUs 7 and 9, along the eastern boundary of the FMC Plant Site. The pond is approximately 100 feet in diameter. The ditch runs east from the pond for 350 feet, then turns and runs north for 1200 feet along FMC's eastern property boundary as shown on Figure 4-11.

The IWW pond and ditch were put into operation in 1977 for the discharge of non-contact cooling water from the calciners and furnaces to the Portneuf River. FMC operated the IWW system under an NPDES permit. In 2002, FMC requested that EPA terminate the permit because IWW was no longer being discharged.

As documented in the *EMF RI Report*, there were infrequent plant upset conditions where small volumes of phossy water were inadvertently routed to the IWW system. FMC investigated the cause of the releases, and reconfigured the plant piping to reduce the potential for such releases. In addition, precipitator solids from the furnace building may have also entered the system.

Residual P4 may be contained in the sediments that remain in the pond and possibly in the ditch. Sediments in the IWW pond and ditch and sediments that were occasionally dredged and placed at the pond and ditch edges likely no longer contain P4 due to the oxidation of P4 as these sediments dried. Any sediments would be expected to have collected in the IWW Pond rather than the IWW Ditch as the flow velocity was much higher in the ditch than in the pond. After

cessation of plant operations, the IWW Ditch was backfilled with crushed silica. The IWW Pond was not backfilled and currently consists of native soils and pond sediments.

4.10.2 Problem Statement

The following field programs were performed at RU 10. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil from the pond and the ditch.

- Phossy Water and Precipitator Solids SIA - The extent to which constituents associated with phossy water and precipitator solids have migrated into native soils underlying the IWW Ditch required further evaluation. In addition, the composition of sediments within the IWW Pond required characterization.

The specific field activities for RU 10 associated with each of these field programs are summarized in Table 4-1 by RU.

4.10.3 Investigation Results

4.10.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 10 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 50,009 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly-exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the predominant fill materials present within RU 10 consist of slag, silica, and asphalt with slag aggregate. Table 4-2 also identifies precipitator solids as a potential source material incidental to the predominant fill materials in RU 10. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 10.

As shown in Table 4-4, antimony, arsenic, cadmium, lead, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in samples of

the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 10.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 10 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.10.3.2 SFS (RU 10 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 10 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 10 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 10 is comprised of slag, silica, asphalt with slag aggregate, and pond sediments (phossy and precipitator solids). The subsurface fill materials consist primarily of these surface materials as well as reworked native soil with slag. The native soil interface ranges between 1 feet and 8 feet bgs.

4.10.3.3Phossy Water and Precipitator Solid SIA (RU 10 SIA1)

A total 22 soil borings, including 20 primary and two (2) colocated borings, were drilled during the phossy water and precipitator solid SIA as shown in Figure 4-11. Soil samples were collected for chemical analysis from 20 boring locations and two colocated borings, for a total of 22 samples. Soil samples from the ditch were collected from 0-to-2 feet bns (below silica fill material in the ditch). Samples from the pond (SB001 to SB004) were collected from 0-to-2 feet bgs. All soil samples were analyzed for P4, metals, fluoride, lead-210, and polonium-210.

P4 was not visually observed (smoking or burning) at any location, and all of the P4 samples were reported as ND in the IWW pond and ditch. Only one soil sample collected from RU10-SIA1-SB016 beneath the IWW ditch exceeded an SSL, specifically, manganese at 599 mg/kg against a soil-to-groundwater SSL of 482 mg/kg. All other samples collected from the ditch reported concentrations of metals, fluoride, lead-210, and polonium-210 below the SSLs.

However, all four borings in the IWW pond sediment reported at least one exceedance. The samples in the IWW pond were collected starting at the ground surface to capture sediment material deposited there. Figure 4-11 depicts the location of these borings and the concentration of each constituent. Only one exceedance was reported for RU10-SIA1-SB003. The cadmium concentration in this boring was 15.5 mg/kg, above the soil to groundwater SSL of 8 mg/kg, but well below the commercial/industrial worker SSL of 860 mg/kg and the construction worker SSL of 81.3 mg/kg. The other three samples in the IWW pond (RU10-SIA-SB001, -SB002, and -SB004) reported exceedances of several metals including arsenic, cadmium, chromium, lead-210, manganese, mercury, polonium-210, selenium, and thallium. These exceedances are summarized in Table 4-23 and in the bullets below.

- Arsenic ranged from 12.1 to 16.8 mg/kg, above the commercial/industrial worker and soil to groundwater SSLs of 7.7 mg/kg.
- Cadmium ranged from 107 to 311 mg/kg, above the construction worker SSL of 81.3 mg/kg and the soil to groundwater SSL of 8 mg/kg.
- Chromium ranged from 135 to 300 mg/kg, above the soil to groundwater SSL of 38 but several orders of magnitude below the worker SSLs.
- Lead-210 ranged from 11.4 to 32.8 pCi/g, above the commercial/industrial worker and soil to groundwater SSLs of 3.03 pCi/g and the construction worker SSL of 7.44 pCi/g.
- Manganese ranged from 713 to 2040 mg/kg, above the soil to groundwater SSL of 482 mg/kg, but several orders of magnitude below the worker SSLs.
- Mercury ranged from 2.2 to 8.5 mg/kg, above the soil to groundwater SSL of 2 mg/kg.
- Polonium-210 ranged from 14.3 to 37.5 pCi/g, above the soil to groundwater SSL of 3.58 pCi/g.

- Selenium ranged from 6.53 to 9.21 mg/kg, above the soil to groundwater SSL of 5 mg/kg, but several orders of magnitude below the worker SSLs.

- Thallium ranged from 0.726 to 1.37 mg/kg, above the soil to groundwater SSL of 0.7 mg/kg, but several orders of magnitude below the worker SSLs.

It should be noted that the IWW Pond sediment data were not incorporated into the Supplemental HHRA for RU 10. Instead, as described in Section 4.10.3.1, COPC/ROPC concentrations associated with each of the fill materials identified in this RU were used to conservatively bound potential risks.

4.10.4 Contamination Assessment

As shown in Table 4-24, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 10 are driven by the incidental soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are driven by lead-210 and polonium 210 levels in precipitator solids (an incidental fill material), exceed the 1E-04 RAO specified in the 1998 ROD for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material) and potassium-40 levels in precipitator solids, also exceed the 1E-04 ROD RAO for future outdoor and indoor commercial/industrial worker receptors.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by cadmium levels in precipitator solids, exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for cadmium associated with precipitator solids also exceed a hazard index of 1.0 for the dermal absorption and fugitive dust inhalation pathways for several receptors.

Lead concentrations associated with precipitator solids exceed the ALM Workgroup screening level for soil lead at commercial/industrial sites of 800 mg/kg. Thus, the potential exists for there to be adverse health affects as a result of chronic exposures.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions used to perform the Supplemental HHRA is provided in Appendix J.

As discussed for the SFS and phossy water and precipitator solid SIA programs, metals, radionuclides, and fluoride levels in native soils underlying the IWW ditch and pond were not elevated above any future worker SSL or soil to groundwater SSL. As discussed later in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials at RU 10, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 10 SFS composite sample results, it can be concluded that the constituents associated with fill materials

in RU 10 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

However, the sandy IWW Pond sediment collected from 0-to-2 feet bgs in the IWW pond exceeded the soil to groundwater SSLs for several metals, specifically lead-210, polonium-210, and zinc. Zinc, lead-210, and polonium-210 concentrations were below the high levels typically found in pure precipitator solids, but were clearly elevated compared to concentrations seen in other types of fill material. Thus, the metals detected and range of concentrations suggests that the sandy fill material in the IWW pond is a mixture of precipitator dust with other types of fill material, such as ore, silica and slag. However, as mentioned above, the native soil sample composite collected beneath the IWW pond for the SFS did not report any elevated concentrations.

RU 10 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection, and Phossy Water and Precipitator Solid SIA investigations will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 10:

The cut and fill isopach model was used to determine total fill volume for RU 10 as presented in Table 4-2. However, for RU 10, an adjustment was made based upon site knowledge. For purposes of the total fill volume calculation, it was assumed that the IWW pond surface is covered with (or mixed with) 1 feet of fill (primarily ore and/or precipitator solids). This is consistent with site knowledge and SRI sediment sampling that the surface in the IWW pond is not native soil but is covered with sediment. Also, from SRI borings and site knowledge, it was established that the IWW ditch is filled with crushed silica.

4.11 RU 11: EQUIPMENT AREA SOUTH OF CALCINERS

4.11.1 Site Description

RU 11 is 8.4 acres in size and is located north of the northeastern corner of the slag pile as shown in Figure 1-2. The ground surface slopes to the north, toward the former calciners (RU 8). This area is covered in slag and was historically used as a staging area for used equipment. There were no P4 production process operations in RU 11.

4.11.2 Problem Statement

The following field programs were performed at RU 11. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

The specific field activities for RU 11 associated with each of these field programs are summarized in Table 4-1.

4.11.3 Investigation Results

4.11.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 11 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 91,253 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 11 consist of slag, concrete foundations and asphalt with slag aggregate.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 11.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 11 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.11.3.2 SFS (RU 11 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 11 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil

borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types through which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 11 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 11 is comprised of slag, concrete foundations, and asphalt with slag aggregate. The subsurface fill materials consist primarily of these surface materials as well as reworked native soil with slag. The native soil interface ranges between 3 feet and 30 feet bgs.

4.11.4 Contamination Assessment

As shown in Table 4-25, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 11 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Metal, radionuclide, and fluoride levels in underlying native soils were not elevated above any future worker SSL or soil to groundwater SSL. As discussed later in Section 4.16, evaluation at the reference area for slag, which is the primary fill material at RU 11, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Based on the reference area data, in conjunction with the RU 11 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 11 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

RU 11 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection investigations will also be taken into consideration during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 11:

The cut and fill isopach model was used to determine total fill volume for RU 11 as presented in Table 4-2.

4.12 RU 12: FORMER RP&S AREA AND MOBILE SHOP

RU 12 is 11.6 acres in size and is located in the central portion of the FMC Plant Site as shown on Figure 4-13. The ground surface is gently sloping to the northwest. Several buildings were formerly located within the RU 12 boundaries including a mobile shop, high pressure steam cleaning station, the LDR facility, the PCB storage shed (removed in 2000), and miscellaneous storage sheds. There was also a fueling island located within RU 12, with two associated underground fuel storage tanks. These gasoline and diesel underground fuel tanks were removed from RU 12 during 2006 in accordance with the RCRA UST program. RU 12 is covered with slag fill, although some ferrophos is present from former ferrophos stockpiles. Other source materials that have been identified include phossy/precipitator solids most likely due to pond activities in the nearby RU 22b. PCDT water also was applied to some slag roadways within RU 12.

4.12.1 Site Description

Mobile Shop. The Mobile Shop formerly located in RU 12 was used for large mobile equipment maintenance activities. Degreasing was performed as necessary for mobile equipment parts using brush on/wipe off techniques. No large-scale degreasing operations were used, (i.e., no vapor degreasers). A small 20-gallon degreasing station supplied and recycled by Safety Kleen was also used. The Mobile Shop was constructed with a concrete floor, which would substantially limit migration of solvents through the floor. Although no known releases were reported, solvents may have been released to the ground surface immediately outside the shop.

Fuel Islands. There were three reported releases of diesel fuel from the fueling station in RU 12. These were above-ground releases, ranging from 40 gallons to 572 gallons. FMC personnel responded by placing sand berms around the spill areas, and cleaning up free-phase diesel pooled on the asphalt areas. Some of the diesel may have run off the paved areas and infiltrated the adjacent fill and soils. During the EMF RI, twelve samples were collected and analyzed for TPH from depths of 0 to 2 feet in six different locations (F060B, F061B, F105B, F111R, F112R, and F122R). TPH concentrations ranged from 30.1 mg/kg to 9,025.2 mg/kg.

High-Pressure Steam Cleaning Station. A high-pressure steam cleaning station was located west of the mobile equipment shop. A small metal shed on a concrete pad housed only cleaning equipment. Washing was conducted in the open outside area adjacent to the station. The station was operated from June 1981 until cessation of plant operations in 2001. Hazardous wastes were never managed at the steam cleaning station.

Transformer Storage Area. The southern portion of RU 12 was used for used equipment storage, including at times for the storage of large transformers. Prior to the mid-1980s, transformers may have contained dielectric fluid with greater than 50 ppm PCBs. During the 1980s, transformers were either treated or transfilled to reduce PCB concentrations to below regulated levels (i.e., 50 ppm). No releases of transformer oil were documented, but some leakage may have occurred in the form of drips from the equipment.

There was also a small PCB storage shed located at the western edge of RU 12. This small shed was covered, equipped with an impermeable floor and berm, and was specifically designed to meet the long-term PCB storage requirements of 40 CFR Part 761, including weekly inspection of the shed and contents. There were no reported leaks or spills in this storage shed. The shed was removed in 2000 during construction of the LDR treatment facility.

The EMF RI investigated the potential for PCB releases, and no significant PCB levels were identified (*EMF RI Report*, pages 4.2-97 through 4.2-99). Fifteen soil samples were collected during the EMF RI and analyzed for PCBs (Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260). Six of the Aroclors were not detected (at 0.65 mg/kg detection level) in any of the samples. Aroclor 1260 was detected at 0.58J mg/kg or less in 3 of the 15 samples. These samples were not directly associated with the PCB storage shed that was removed in 2000 prior to construction of the LDR Treatment System.

Fill materials were found in all three boreholes ranging from 7.5 feet to 17 feet deep. Native soils sampled beneath the fill during the EMF RI indicated little to no migration of trace metals, radionuclides, or other inorganics into the native soils. Low levels of PCBs were detected in three of 15 soil samples (in fill materials) taken in the subsurface at the former transformer salvage area. There was no evidence of movement into the native soils below the fill.

Underground Pipelines. The EMF RI investigated cleanout ports along pipelines located in RU 12. These pipelines transported phossy water and precipitator slurry to the ponds, where the solids were allowed to settle. Following settling, the water (referred to as Industrial Clarified Water [IWW]), was returned to the process via other underground lines that paralleled the waste lines to the ponds. Cleanouts were placed to access these pipes in the event they became clogged with solids. During the EMF RI, inorganics and radionuclides were analyzed from soil samples collected around the pipeline cleanouts. The typical suite of phossy water constituents was detected in the shallow soil samples (cadmium, fluoride, zinc, orthophosphate, arsenic, and several trace metals). Borings were drilled to depths ranging from 7 to 25 feet bgs. A detailed review of the results of this investigation is presented in the *EMF RI Report*, Section 4.2, pages 97-106.

After the *EMF RI Report* was completed, FMC replaced the underground piping with an above-ground pipe system. During the construction of the LDR system, P4 associated with former releases from underground piping was encountered in the shallow soils and fill.

4.12.2 Problem Statement

The following field programs were performed at RU 12. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Organic Solvent SIA - Based on knowledge of past plant practices at the Mobile Shop, the determination of the presence, absence and concentrations of solvents was needed to support a decision to either remediate the solvent specific investigation area or take no further action.

- Fuel SIA - Sufficient sampling had not been conducted to determine potential impacts from the diesel fuel releases. The determination of the presence, absence, and concentrations of liquid petroleum fuels was needed to support a decision to either remediate the specific investigation area or take no further action.

- PCB SIA - PCBs in soil needed to be adequately characterized to support a decision to either remediate PCB specific investigation areas or take no further action.

- Underground, Piping, Sumps, and Structures SIA - The portion of the underground piping, sumps or other structures within RU 12 was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (i.e., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

The specific field activities for RU 12 associated with each of these field programs are summarized in Table 4-1 by RU.

4.12.3 Investigation Results

4.12.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 12 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 89,125 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the fill materials predominantly present within RU 12 consist of slag, concrete foundations and asphalt

with slag aggregate. Table 4-2 also identifies P4, ferrophos, PCDT water residues, precipitator solids, and phossy solids as potential source materials incidental to the predominant fill materials in RU 12. PCDT water residues were applied to some of the slag roadways within RU 12. It should be noted that samples used in the PCDT Roadway Study (Section 4.24) were used to characterize COPC/ROPC concentrations in slag. Consequently, any impacts associated with PCDT application are addressed by the slag data set used in the Supplemental HHRA. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 12.

As shown in Table 4-4, antimony, arsenic, cadmium, lead, nickel, vanadium, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 12. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at a concentration of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 12 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 12 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.12.3.2 SFS (RU 12 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 12 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 12 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 12 is made of up of ferrophos, slag, concrete foundations, and asphalt with slag aggregate. The subsurface fill materials consist primarily of these same surface materials as well as reworked native soil with slag. Although, not visually encountered, P4, precipitator solids and phossy solids were also included as fill materials within this RU. The native soil interface ranges between 3 feet and 13.5 feet bgs.

4.12.3.3 Organic Solvent SIA (RU 12 SIA1)

Fourteen (14) primary borings and two (2) colocated borings were installed and sampled during the Organic Solvent SIA at the Mobile Shop, for a total of 16 borings as shown on Figure 4-14. The boring location spacing for RU 12 was 50 feet, which was determined by the size of the area and the undetermined source and extent of the shop-related solvents in RU 12. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected. During the organic solvent field program at RU 12, a total of 55 samples were collected for shop-related VOCs chemical analysis. Samples were collected from depths ranging from 1.5 to 21 feet bgs. Table 1-6 contains the list of shop-related analytes.

As mentioned above, the surface of RU 12 in the organic solvent area is comprised of slag, asphalt, and concrete foundations. However, the subsurface fill materials consist primarily of slag, reworked native soil and some minor amounts of ferrophos. The native soil interface ranges between 1.5 feet and 11 feet bgs.

Shop-related VOC Results. Low level concentrations of TCE were reported in eleven borings, and MEK is detected in one sample interval of one boring. All of the detections were significantly below the SSLs as presented on Table 4-26, and were flagged as estimated because the concentrations fall between the analytical MDL and RL. Concentrations of TCE were reported in the shallow, intermediate and deepest sample intervals. The concentrations in the deepest sample intervals were generally the same as or less than the concentrations found in the

shallow sample intervals. The concentrations of TCE ranged from 0.92 to 5.1 µg/kg, which is at least twelve times lower than the most conservative SSL (60 µg/kg).

The only detection of MEK, a common laboratory contaminant, was reported in the 10-foot bgs sample interval from SB023. It was detected at a concentration of 6.1 µg/kg, over four orders of magnitude below the most conservative SSL (91,000 µg/kg). A non-detect level of MEK was reported in the deep (14-foot bgs) sample interval at this location.

The complete data table for RU 12 is located in Appendix D. Because there were no reported detections of shop-related organic solvents above SSLs, no phase two investigations were required for the organic solvent borings in RU 12 SIA1. Moreover, because no worker-related SSLs were exceeded, potential risks associated with exposure to organic solvents in this area were not evaluated in the Supplemental HHRA.

4.12.3.3.1 Fuel SIA (RU 12 SIA1 and RU 12 SIA2)

RU 12 SIA1 (Mobile Shop and Fueling Island Areas):

Forty-two (42) primary borings and four (4) colocated borings were installed and sampled during the Fuel SIA 1 at RU 12, for a total of 46 borings as shown on Figure 4-14. These borings were installed and sampled to investigate possible fuel spills in the Mobile Shop and Fueling Island areas. The boring location spacing for RU 12 was 50 feet, which was determined by the size of the area and the undetermined source and extent of the fuels that may be present in RU 12. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected. During the fuel SIA at RU 12, a total of 150 samples were collected for fuel-related VOCs and PAH chemical analysis. Samples were collected from depths ranging from 1 to 21 feet bgs. Table 1-6 contains the list of fuel-related VOC and PAH analytes. Detection summary tables are presented as Tables 4-27 and 4-28.

The surface of RU 12 in the Mobile Shop and Fueling Islands area is comprised of slag, concrete foundations, minor amounts of ferrophos and asphalt with slag aggregate. The subsurface fill materials consist primarily of these surface materials as well as reworked native soils. The native soil interface ranges between 1 and 11 feet bgs.

Fuel-related VOCs Results. All of the VOC concentrations were significantly below the SSLs presented in Table 4-27, and were flagged as estimated because the concentrations fall between the analytical MDL and RL. Boring SB016 in SIA1 reported a toluene concentration of 0.89 µg/kg at a depth of 2 feet bgs. However, the 4 and 10-foot sample intervals in this boring reported non-detect for toluene. Toluene (1.8 µg/kg) and total xylenes (0.93 µg/kg) were reported at a depth of 13 feet bgs in SB036 in SIA1. The shallow intervals (3, 5, and 10 feet bgs) at SB036 reported non-detects for both of these constituents.

PAH Results. Eighteen of the 42 borings in SIA1 reported low level detections of fuel PAHs. All of the concentrations were significantly below the SSLs presented on Table 4-28, and were

flagged as estimated because the concentrations fall between the analytical MDL and RL. All of the PAH constituents reported at least one detection in SIA1 except for acenapthene and fluorene. The detections were reported in the shallow and intermediate sampling intervals, while the deepest sampling intervals were generally reported as non-detects.

The complete data table for RU 12 is located in Appendix D. Because there were no reported detections of fuel VOCs and PAHs above SSLs, no phase two investigations were required to further investigate fuel releases in RU 12. Moreover, because no worker-related SSLs were exceeded, potential risks associated with exposure to fuel VOCs and PAHs in this area were not evaluated in the Supplemental HHRA.

RU12 SIA2 (Steam Cleaning Area):

Eight (8) primary borings and one (1) colocated boring were installed and sampled during the fuel SIA 2 at RU 12, for a total of nine (9) borings as shown on Figure 4-14. These borings were installed and sampled to investigate the Steam Cleaning Area. The boring location spacing for RU 12 was 30 feet, which was determined by the size of the area and the undetermined location of the fuels that may be present in RU 12. Each boring was drilled and sampled as discussed in SIA1 above. During the fuel SIA at RU 12, a total of 34 samples were collected for fuel-related VOCs and PAH chemical analysis. Samples were collected from depths ranging from 2 to 15 feet bgs. Table 1-6 contains the list of fuel-related VOC and PAH analytes. Detection summary tables are presented as Tables 4-27 and 4-28.

The surface of RU 12 in the steam cleaning area is made up of slag. The subsurface fill materials consist primarily of slag. The native soil interface ranges between 2 feet and 5 feet bgs.

Fuel-related VOCs Results. Two borings in SIA2 near the steam cleaning area reported low level detections of fuel VOCs in the shallowest soil samples collected from those borings. All of the concentrations were significantly below the SSLs presented in Table 4-27, and were flagged as estimated because the concentrations fall between the analytical MDL and RL. Boring SB006 in SIA2 reported benzene (1.3 µg/kg), toluene (2.2 µg/kg) and total xylenes (0.92 µg/kg) at a depth of 3 feet bgs. The 5, 10, and 13-foot bgs sample intervals in this boring reported non-detect for these constituents. Both toluene (1.1 µg/kg) and total xylenes (1.8 µg/kg) were reported at a depth of 4 feet bgs in SB007 in SIA2. The intermediate and deeper intervals (6, 10 and 14 feet bgs) reported non-detects for both of these constituents.

Fuel-related PAH Results. Low level concentrations of fuel PAHs were reported in each of the eight borings in SIA2 as shown on Table 4-28. All of the concentrations were significantly below the SSLs and a majority of the detections were flagged as estimated because the concentrations fall between the analytical MDL and RL. All of the PAH constituents reported at least one detection in SIA2.

The complete data table for RU 12 is located in Appendix D. Because there were no reported detections of fuel VOCs and PAHs above SSLs in this RU, no phase two investigations were required for the fuel borings in RU 12 SIA2. Moreover, because no worker SSLs were exceeded, potential risks associated with exposure to fuel VOCs and PAHs in this area were not evaluated in the Supplemental HHRA.

4.12.3.4 PCB SIA (RU 12 SIA3)

As shown on Figure 4-15, a total of 33 borings and three (3) colocated borings were drilled to investigate the Transformer Storage Area. Boring locations were laid out as a 50-foot grid with a random origin. Soil samples were collected, starting at the ground surface, and every 2.5 feet to native soil. Samples then were collected at the native soil interface and at 2 feet bns for PCB analysis. A total of 183 soil samples were analyzed for the PCB congeners (monochlorinated biphenyls, dichlorinated biphenyls, trichlorinated biphenyls, tetrachlorinated biphenyls, pentachlorinated biphenyls, hexachlorinated biphenyls, heptachlorinated biphenyls, octachlorinated biphenyls, nonachlorinated biphenyls, and decachlorinated biphenyl).

The surface of RU 12 in the Transformer Storage Area is comprised of slag, concrete foundations, and asphalt with slag aggregate. The subsurface fill materials consist primarily of slag. The native soil interface ranged between 2 feet and 11.5 feet bgs. Samples were collected from depths ranging from 0 to 13.5 feet bgs. Sample intervals for detected analytes are presented in Table 4-29.

Low-level concentrations of PCB congeners were detected in soil samples collected from ten soil borings at depths ranging from the surface to 7.5 feet bgs. Concentrations of PCBs ranged from 200 picogram per gram (pg/g) to 6,800 pg/g. One or more detections of each congener type were reported except for chlorobiphenyls, nonachlorobiphenyls, and decachlorobiphenyls.

The deepest sample interval reported non-detects for all PCBs in those borings where PCBs were initially detected. In addition, all of the concentrations were significantly below the SSLs presented in Table 4-29. For comparison, the most conservative SSL was the commercial/ industrial worker SSL with a standard from several PCB congeners of 800,000 pg/g. The SSL protective of groundwater for all PCB congeners is 900,000 pg/g.

The complete data table for RU 12 is located in Appendix D. Because there were no reported detections of PCBs above the SSLs, and as a result, no phase two investigations were required for the PCB borings in RU 12 SIA3. Moreover, because no worker-related SSLs were exceeded, potential risks associated with exposure to PCBs in this area were not evaluated in the Supplemental HHRA.

4.12.3.5 Underground Piping, Sumps and Structures SIA

The decision whether to remove, treat, or otherwise manage underground piping in RU 12 will be an SFS decision based on the detailed analysis of alternatives. In order to provide the SFS process with the appropriate information to evaluate the alternatives for underground piping, sumps, and structures in RU 12, the SRI anticipated a phased approach. During the SRI, the phase one task for the underground piping investigation in RU 12 was to identify available information regarding remaining piping, sumps and structures, including the piping, sump, and structure size, material of construction, and any process knowledge regarding the residuals expected to be remaining in the pipes, sumps, and structures. The phase one task was based upon review of existing drawings, construction records, operational logs, and plant personnel knowledge. The need to collect additional data concerning remaining pipes/sumps/structures

was based on the outcome of all other data collection activities in RU 12 conducted during the SRI, i.e., whether RU 12 would proceed to the SFS. Since the surface gamma data exceeded the CV, as discussed above, RU 12 was forwarded to the SFS and only a phase one task was required for the piping, sumps, and structures. Additional information regarding this study is provided in Section 4.26 and Appendix I.

4.12.4 Contamination Assessment

As shown in Table 4-30, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 12 are driven by the incidental soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are primarily associated with lead-210 and polonium-210 levels in precipitator solids (an incidental fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker and construction worker receptors. Incremental cancer risks via the external exposure to gamma radiation pathway, which are driven by radium-226 levels in slag (a predominant fill material) and potassium-40 levels in precipitator solids, also exceed the 1E-04 ROD RAO for potential future outdoor and indoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for all worker receptors evaluated. In addition, the soil ingestion incremental non-cancer risks associated with vanadium levels in ferrophos (an incidental fill material) and cadmium levels in precipitator solids exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. In addition, the soil ingestion incremental non-cancer risks associated with Incremental non-cancer risks for cadmium (associated with precipitator solids) also exceed a hazard index of 1.0 for the dermal absorption and fugitive dust inhalation pathways for outdoor commercial/industrial and construction workers. Non-cancer risks for nickel (associated with ferrophos) also exceed a hazard index of one for the fugitive dust inhalation pathway for construction workers and, in combination with cadmium, utility workers.

Lead concentrations associated with precipitator solids exceed the ALM Workgroup screening level for soil lead at commercial/industrial sites of 800 mg/kg. Thus, the potential exists for there to be adverse health affects as a result of chronic exposures.

While not quantified, the presence of residual P4 beneath RU 12 represents an unacceptable acute burning hazard to potential future receptors exposed to subsurface materials in these areas. Receptors located downwind of RU 12 could also potentially be exposed to phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. Potential risks associated with exposure to the materials presumed present in the underground piping in RU 12, as identified in Table 4-2, are evaluated in Section 4.26. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

As discussed for the SFS, metals, fluoride, and radionuclide levels were not elevated in native soils above any future worker SSL or soil to groundwater SSL. In addition, organic constituents (i.e., shop solvents, fuels, and PCBs) were not detected above SSLs in any of the SIAs. As discussed later in Section 4.16, evaluation at the reference area for slag, which is the primary fill material at RU 12 showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Based on the reference area data, in conjunction with the RU 12 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 12 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern.

RU 12 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs primarily associated with fill materials found at RU 12. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection and Organic SIA investigations will also be considered during the evaluation of remedial alternatives. Underground piping also will be a consideration in the SFS alternatives development for RU 12.

Estimation of Fill Volume in RU 12:

The cut and fill isopach model was used to determine total fill volume for RU 12 as presented in Table 4-2.

4.13 RU 13: POND 8S RECOVERY AND METAL SCRAP PREPARATION

4.13.1 Site Description

RU 13 is 3.6 acres in size and is located in the south-central portion of the FMC Plant Site as shown on Figure 1-2. It is immediately southwest of RU 12, and is adjacent to several old ponds. RU 13 is north of a portion of RU 22b (old phossy water ponds) and they share a common boundary.

Although RU 13 was never documented to have been used directly in the P4 production process operation, in the mid-1980s a process was developed, built, and tested on the northern side of Pond 8S to recover P4 from Pond 8S. This process (which was within the RU 13 boundaries) was later shut down and removed. Spillage of phossy solids from the Pond 8S recovery process may have occurred.

EMF RI Borings F058B and F059B, located in RU 13, encountered phossy solids at depths of approximately 5 to 7 feet below current grade which may have been related to dredging of old ponds (RU 22b). These boring locations are shown in Figure 4-16.

While the exact source of the phossy solids around borings F058 and F059 is unknown, the investigation to delineate the extent of the old ponds in RU 22b into RU 13 will address these phossy solids. Confirmation sampling around borings F058B and F059B is needed to determine the extent of the RU 22b ponds into the western portion of RU 13 as discussed in Section 4.18.

There were several buried pipelines used to transport phossy water and precipitator slurry to the phossy waste ponds that passed through RU 13. Cleanouts were placed along these pipelines to

access these pipes in the event they became clogged with solids. Inorganics and radionuclides were analyzed from soil samples collected around the pipeline cleanouts. The EMF RI investigated the pipeline cleanouts located in RU 12 which also pass through RU 13. The typical suite of phossy water constituents was detected in the shallow soil samples (cadmium, fluoride, zinc, orthophosphate, arsenic, and several trace metals). Borings were drilled to depths ranging from 7 to 25 feet bgs. A detailed review of the results of this investigation is presented in the *EMF RI Report*, Section 4.2, pages 97-106.

4.13.2 Problem Statement

The following field programs were performed at RU 13. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Underground, Piping, Sumps, and Structures SIA - The portion of the piping within RU 13 was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (e.g., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

The specific field activities for RU 13 associated with each of these field programs are summarized in Table 4-1.

4.13.3 Investigation Results

4.13.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 13 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 85,119 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the fill materials present within RU 13 predominantly consist of slag, concrete foundations and asphalt with slag aggregate. In addition, P4, which was encountered in the shallow subsurface of RU 13

during the SRI field sampling, is identified as an additional, incidental source material in Table 4-2. Finally, Table 4-2 identifies precipitator slurry solids and phossy solids as potential source materials incidental to the predominant fill materials in RU 13. Within the Supplemental HHRA, all of the identified fill and source materials were conservatively assumed to be present in RU 13.

As shown in Table 4-4, antimony, arsenic, cadmium, lead, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in any sample of the fill materials at a concentration that exceeds both regional background and any worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 13. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at a concentration of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 13 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 13 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.13.3.2 SFS (RU 13 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 13 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These are referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for

the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

Pond sediments were encountered at several of the original RU 13 SFS boring locations. These sediments were visually encountered in borings SB001, SB002, SB005, SB006, and SB010 at depths ranging from 3 to 12 feet bgs. Some of the borings were relocated up to four times in order to find a location beyond the pond sediments as shown on Figure 4-16. The pond sediments were described as olive green to black, moist to wet, clayey materials. Minor smoking of sediments was visually evidenced in the original SB001 boring location in split-spoon samples of pond sediments collected from 10 feet bgs.

Due to the fact that pond sediments were encountered in these borings, the trenching locations for RU 13/RU22b cap delineation depicted in the *SRI Work Plan* were not appropriate to meet the objective of the cap delineation investigation. Field Modification #11 addressed this required change and is discussed in Section 3.4 as well as Section 4.18.

Fill Materials. As summarized on Table 4-2, the surface of RU 13 is comprised of slag, concrete foundations, and asphalt with slag aggregate. The subsurface materials consist primarily of these same surface materials as well as pond sediments containing P4, precipitator solids and phossy solids.

RU 13 SFS samples were collected between 2 feet and 17 feet bgs. The sample results were compared to the slag reference area data, background values, as well as future worker and the soil to groundwater SSLs. Concentrations of several metals and radionuclides were significantly above the soil to groundwater SSLs and some future worker SSL as listed in Table 4-10. Because slag was determined not to leach, these exceedances were not attributed to slag. These exceedances were the result of several of the SFS composite samples being collected in non-native material. During drilling of the SFS borings, a reddish-brown sandy silt was encountered at depths ranging between 4 and 23 feet bgs. It was difficult for the field geologists to determine if this material was native. However, based on the continuous nature of this material, both vertically and laterally, SFS samples were collected. The exceedances of several metals and radionuclides confirm that the reddish-brown sandy silt material is not unimpacted native material. These exceedances are further discussed below.

- Antimony - Three (3) detections were reported above the soil to groundwater SSL of 5 mg/kg; Concentrations ranged from 5.43 mg/kg at RU13-SFS-SBC002 to 14 mg/kg at RU13-SFS-SBC001.

- Arsenic – Four (4) detections and a colocated detection above the commercial/industrial worker SSL of and soil to groundwater SSL of 7.7 mg/kg. Concentrations ranged from 14 mg/kg at RU13-SFS-SBC003CL (-SBC202) to 65.8 mg/kg at RU13-SFS-SBC001.

- Cadmium – Four (4) detections and a colocated detection above the construction worker SSL of 81 mg/kg and soil to groundwater SSL of 8 mg/kg. Concentrations ranged from 36.1 mg/kg at RU13-SFS-SBC003CL to 225 mg/kg at RU13-SFS-SBC001.

- Chromium – Four (4) detections and a colocated detection above the soil to groundwater SSL of 38 mg/kg. Concentrations ranged from 80.3 mg/kg at RU13-SFS-SBC003CL to 639 mg/kg at RU13-SFS-SBC001.

- Manganese – One (1) detection of 486 mg/kg at RU13-SFS-SBC001 above the soil to groundwater SSL of 482 mg/kg.

- Nickel – Two (2) detections above the soil to groundwater SSL of 130 mg/kg. Concentration ranged were 145 mg/kg at RU13-SFS-SBC004 and 156 mg/kg at RU13-SFS-SBC001.

- Selenium – Two (2) detections were above the soil to groundwater SSL of 5 mg/kg. Concentrations were 8.5 mg/kg at RU13-SFS-SBC004 and 9.49 mg/kg at RU13-SFS-SBC001.

- Thallium – Three (3) detections above the soil to groundwater SSL of 0.7 mg/kg. Concentrations ranged from 2.64 mg/kg at SBC002 to 3.67 mg/kg at RU13-SFS-SBC001.

- Lead-210 – Four (4) detections and a colocated detection above the commercial/industrial worker SSL and soil to groundwater SSL of 3.03 pCi/g. Concentrations ranged from 4.9 pCi/g at RU13-SFS-SBC003 to 21.8 pCi/g at RU13-SFS-SBC001.

- Polonium-210 – Four (4) detections and a colocated detection above the commercial/industrial worker SSL and soil to groundwater SSL of 3.58 pCi/g. Concentrations ranged from 5.8 pCi/g at RU13-SFS-SBC003 to 28.9 pCi/g at RU13-SFS-SBC001.

- Radium-226 – Four (4) detections and a colocated detection above the commercial/industrial worker SSL and soil to groundwater SSL of 3.88 pCi/g. Concentrations ranged from 5 pCi/g at RU13-SFS-SBC003 to 15 pCi/g at RU13-SFS-SBC001.

- Uranium-238 – Four (4) detections and a colocated detection above the commercial/industrial worker SSL and soil to groundwater SSL of 3.88 pCi/g. Concentrations ranged from 5.4 pCi/g at RU13-SFS-SBC003 to 25 pCi/g at RU13-SFS-SBC001.

4.13.3.3 Underground Piping, Sumps and Structures SIA

The decision whether to remove, treat, or otherwise manage underground piping in RU 13 will be an SFS decision based on the detailed analysis of alternatives. In order to provide the SFS process with the appropriate information to evaluate the alternatives for underground piping,

sumps, and structures in RU 13, the SRI anticipated a phased approach. During the SRI, the phase one task for the underground piping investigation in RU 13 was to identify available information regarding remaining piping, sumps and structures, including the piping, sump, and structure size, material of construction, and any process knowledge regarding the residuals expected to be remaining in the pipes, sumps, and structures. The phase one task was based upon review of existing drawings, construction records, operational logs, and plant personnel knowledge. The need to collect additional data concerning remaining underground pipes/sumps/structures was based on the outcome of all other data collection activities in RU 13 conducted during the SRI, i.e., whether RU 13 would proceed to the SFS. Since the surface gamma data exceeded the CV as discussed above, RU 13 was forwarded to the SFS and only a phase one task was required for the piping, sumps, and structures. Additional information regarding this study is provided in Section 4.26 and Appendix I

4.13.4 Contamination Assessment

As shown in Table 4-31, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 13 are primarily driven by the soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are driven by lead-210 and polonium-210 levels in precipitator solids (an incidental fill material), exceed the 1E-04 RAO specified in the 1998 ROD for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material) and potassium-40 levels in precipitator solids, also exceed the 1E-04 ROD RAO for future outdoor and indoor commercial/industrial worker receptors.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for all worker receptors evaluated. In addition, the soil ingestion incremental non-cancer risks associated with cadmium levels in precipitator solids exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for cadmium also exceed a hazard index of 1.0 for the dermal absorption and fugitive dust inhalation pathways for several receptors.

While not quantified in the Supplemental HHRA, the presence of residual P4 beneath RU 13 represents an unacceptable acute burning hazard to potential future receptors exposed to subsurface materials in this area. Receptors located downwind of RU 13 could also potentially be exposed to phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern.

Lead concentrations associated with precipitator solids exceed the ALM Workgroup screening level for soil lead at commercial/industrial sites of 800 mg/kg. Thus, the potential exists for there to be adverse health affects as a result of chronic exposures.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. Potential risks associated with exposure to materials presumed present in the

underground piping in RU 13, as identified in Table 4-2, are evaluated in Section 4.26. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Below the known fill material, several metals and radionuclide levels exceed future worker SSLs and/or soil to groundwater SSLs. The reddish brown sandy silt material encountered in several borings was the source material for many of the SSL exceedances and does not appear to be unimpacted native soil. The reddish brown sandy silt that was encountered, sampled and analyzed appears to be a fill material. However, if the material were to be impacted native soils, it most likely would have been impacted by old pond liquids and sediments. The lateral and vertical extent of this material has been identified based on the SFS borings and RU 22b investigation borings. It should also be noted that a boring drilled during the EMF RI on the western portion of RU 13 (F079B) also encountered the same reddish brown material. The analytical result indicated a potential precipitator slurry or phossy water/solids impact in both soil samples from the EMF RI boring F079B. Therefore, risk to the environment, specifically migration of constituents to groundwater, is of concern.

RU 13 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection investigations will be considered during the evaluation of remedial alternatives. Underground piping also will be a consideration in the SFS alternatives development for RU 13.

Estimation of Fill Volume in RU 13:

The cut and fill isopach model was used to determine total fill volume for RU 13 as presented in Table 4-2. A P4 volume range is also presented in Table 4-2 based upon SRI observations of P4 in subsurface fill (reddish brown sandy silt material) as evidenced by smoking. The range of P4 volume is based upon the assumption that the reddish brown sandy silt material contains from 1,000 to 2,500 ppm P4. This results in an estimated P4 volume range of 25 to 60 tons of P4 within RU 13.

4.14 RU 15 AND 16: OVERSIZED ORE, USED ELECTRODES, BAGHOUSE DUST AREA AND CALCINER SOLIDS STOCKPILE

4.14.1 Site Description

RU 15 is 11.7 acres in size and is located south of the calciner ponds (RU 14). It is south of the main plant area, and east of the slag pile, against the eastern FMC property boundary as shown on Figure 1-2. RU 16 is 15.1 acres in size and is located south of RU 15. RU 16 contains dried calciner pond solids.

RU 15 was used since the 1970's for placement of oversize ore (bull rock), baghouse dust from ore handling facilities within the plant, off-spec coke, used/broken carbon electrodes from the furnaces. Portions of RU 15 were also historically used as a temporary staging area for calciner pond solids during construction of the lined ponds in RU 14. Periodically, FMC would reclaim some of the oversize ore and larger pieces of carbon electrodes for use as refractory in the

furnace operation (slag runner block). After plant shutdown, FMC sold most of the electrodes from this area.

RU 16 contains calciner pond solids, consisting of dried materials that were removed from the calciner scrubber ponds. Some slag is also present as road base material. The calciner pond solids are primarily composed of precipitates of calcium fluoride, ore dust, and potentially elevated levels of metals, polonium-210 and lead-210. Although these materials are currently dried, they contained a high moisture content (to the extent that the materials would flow) when originally placed in RU 16. A concern has been expressed about their potential impact to groundwater. The materials placed in the area after the 1996 RI were essentially the same as those materials placed before that date. Although the volume and areal extent (footprint) of materials has increased since the 1998 ROD, the materials themselves have remained consistent in terms of their chemical and physical characteristics.

4.14.2 Problem Statement

The following field program was performed at RUs 15 and 16. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment – As discussed in Section 4.27, three samples of calciner pond sediments were collected in RU 16 during the SRI Fill Characterization study. The resulting radiological and inorganic (metals, fluoride, and radionuclide) analytical data were used, in conjunction with existing data for other fill materials observed in RUs 15 and 16, to evaluate risks to potential receptors in the Supplemental HHRA.

- Leaching Potential SIA - Current soil conditions in the vadose zone beneath the stockpiles in RUs 15 and 16 had not been fully characterized. Additional data were needed to determine the potential for metals and fluoride migration into the subsurface and the potential for metals and fluoride migration to groundwater at RUs 15 and 16.

The specific field activities for RUs 15 and 16 associated with this field program are summarized in Table 4-1.

4.14.3 Investigation Results

4.14.3.1 Risk Assessment

As noted in the Problem Statement, three samples of calciner pond sediments were taken from RU 16 during the SRI Fill Characterization study for use in the Supplemental HHRA. As shown in Table 4-2, in addition to calciner pond sediments, slag is also a predominant fill material in RU 16. By contrast, the predominant fill materials present within RU 15 consist of calcined ore, slag, and bullrock. Table 4-2 also identifies coke and graphite/carbon as potential source materials incidental to the predominant fill materials in RU 15. Portions of RU 15 were also historically used as a temporary staging area for calciner pond solids during construction of the lined ponds in RU 14. Thus, although calciner pond solids are not readily apparent, this material is also considered a potential source material in RU 15. Within the Supplemental HHRA, all of the identified fill materials were conservatively assumed to be present in that RU.

As shown in Table 4-4, arsenic, cadmium, fluoride, thallium, radium-226, uranium-238, lead-210, polonium-210, potassium-40 and coke-related PAHs comprise the COPCs/ROPCs that were detected in any sample of the fill materials identified in RU 15 at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Similarly, the same suite of COPCs/ROPCs, minus coke-related PAHs, were detected in at least one sample of the fill materials identified in RU 16 at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. The constituents identified above as exceeding background and any worker SSL were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RUs 15 and 16.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 15, and separately, RU 16, was used to characterize the RU-specific EPC for that COC/ROC in the Supplemental HHRA of the RU (Table 4-4). The findings of the Supplemental HHRA are summarized in the Contamination Assessment.

4.14.3.2 Leaching Potential RU 15 SIA Result (RU 15 SIA1)

Five (5) primary soil borings and a colocated boring were drilled within RU 15, for a total of six (6) soil borings. In each boring, the first soil sample was collected at the interface between the waste and native soil. Thereafter, soil samples were collected at 10-foot intervals until refusal or groundwater is encountered, whichever came first. A total of 30 samples were collected between the waste/native soil interface at 5 feet bgs and 90 feet bgs. Samples were submitted to the laboratory for the analysis of metals and fluoride.

Fill Materials. As summarized on Table 4-2, the surface of RU 15 is made of up of calcined ore slag, bull rock, and reworked native soil. The subsurface fill materials consisted primarily of these same surface materials. In addition coke, graphite/carbon electrodes, and calciner solids are thought to exist in this RU. Subsurface native materials include silt, gravels, cobbles as well as volcanic basalt, ryholite and ash tuff. Volcanic bedrock (i.e., refusal) was encountered between 35 in RU15-SIA1-SB002 to 95 feet bgs in RU15-SIA1-SB004. No groundwater was encountered in any of the borings.

The RU 15 SIA sample results were compared to future worker SSLs and the soil to groundwater SSL. With the exception of cadmium, concentrations of metals and fluoride were significantly below the soil to groundwater SSLs and some future worker SSL as listed in Table 4-32.

Cadmium was exceeded in two borings and a colocated boring at three different sample interval depths as shown in Figure 4-17. The first sample interval in RU15-SIA1-SB001 at 5 feet bgs reported a cadmium concentration of 11 mg/kg, which is above the soil to groundwater SSL of 8 mg/kg. However, it appears that this sample may have contained some fill materials or was impacted by fill, as several other metals (e.g., chromium, copper, silver, uranium, and zinc) were elevated in the 5 feet bgs interval compared to deeper samples. However, these elevated concentrations were below SSLs.

Cadmium also was detected above the soil to groundwater SSL (8 mg/kg) at 80 feet bgs in RU15-SIA1-SB004 and 90 feet bgs interval in RU15-SIA1-SB204. The concentration of cadmium at 80 feet bgs was 13 mg/kg; however, it was 1.29 mg/kg in the colocated boring. In

the 90 feet bgs sample interval, the colocated boring, SB204, reported a concentration of 18.3 mg/kg, while the primary boring (SB004) reported a cadmium concentration of 1.19 mg/kg.

4.14.3.3 Leaching Potential RU 16 SIA (RU 16 SIA1)

Eight (8) primary soil borings and a colocated boring were drilled within RU 16 for a total of nine (9) borings. In each boring, the first soil sample was collected at the interface between the waste and native soil. Thereafter, soil samples were collected at 10-foot intervals until refusal or groundwater was encountered, whichever came first. A total of 69 samples were collected between the waste/native soil interface at 1.5 feet bgs and 157 feet bgs. These soil samples were submitted to the laboratory for the analysis of metals and fluoride analyses.

Fill Materials and Other Physical Conditions at RU 16:

The surface of RU 16 is made of up of slag and calciner solids. The subsurface fill materials consist primarily of calciner solids. Subsurface native materials included silt, gravels, and cobbles, as well as volcanic basalt, ryholite and ash tuff. Volcanic bedrock (i.e., refusal) was encountered between 13 in RU16-SIA1-SB004 to 160 feet bgs in RU16-SIA1-SB007. Groundwater was encountered at a depth of 157 to 158 feet bgs in borings SB006, SB007, and SB008. No native soil was encountered in SB002 and SB003 where fill materials were placed directly on top of bedrock; therefore, no samples were collected. Only one sample of native soil was collected from borings SB001 and SB004 prior to encountering bedrock.

The RU 16 SIA sample results were compared to future worker SSLs and the soil to groundwater SSL. Four of the six borings sampled reported one or more exceedances of cadmium, chromium, manganese, selenium, and thallium as shown on Figure 4-18. With the exception of cadmium, concentrations of metals and fluoride were significantly above the soil to groundwater SSLs and some future worker SSL as listed in Table 4-32. These exceedances are further discussed below.

Exceedances of the soil to groundwater SSL were reported at 14 feet bgs in RU16-SIA1-SB005 for cadmium (26 mg/kg), chromium (50.9 mg/kg), selenium (40.9 mg/kg), and thallium (9.59 mg/kg). It appears that the sample interval consisted of both fill materials and native soils, as this sample was collected at the fill/native interface. Concentrations decreased to approximately background levels in the 20 feet bgs sample interval, which is approximately 6 feet below the fill/native soil interface. Bedrock and refusal were encountered at 22 feet bgs.

Several sample depth intervals, specifically at 50, 80, 120, 130, and 140 feet bgs, in RU16-SIA1-SB006 and its colocated boring SB206 reported concentrations of cadmium, manganese, selenium, and thallium that exceed the soil to groundwater SSL. Cadmium concentrations were 14.6 mg/kg and 10.6 mg/kg in the 50 and 130-foot bgs sample intervals, but were significantly less in the shallower and deeper sample intervals. The soil to groundwater cadmium SSL is 8 mg/kg. Selenium and thallium exceedances were reported at the same depths as the cadmium exceedances as shown on Figure 4-18. In addition, manganese concentrations were above the soil to groundwater SSL of 482 mg/kg in 3 sample intervals collected from SB006. However, the concentrations decreased significantly prior to encountering groundwater and bedrock at approximately 157 feet bgs.

The two shallowest sample intervals in RU16-SIA1-SB007, 20 and 30 feet bgs, reported exceedances for cadmium, selenium, and thallium. Cadmium concentrations were 12.2 mg/kg and 13.7 mg/kg in the 20 and 30-foot bgs sample intervals, but were significantly less in the deeper sample intervals to groundwater. The soil to groundwater SSL for cadmium is 8 mg/kg. Selenium and thallium reported exceedances at the same depths as cadmium. Selenium concentrations were 11 and 14.6 mg/kg and thallium concentrations were 1.9 and 2.15 mg/kg for the 50 and 130-foot bgs intervals, respectively. However, the concentrations significantly decrease in the 40-foot bgs sample and stay close to background in the remainder of the samples to groundwater and bedrock.

Exceedances of these same three constituents were reported in one shallow interval (20 feet bgs) in RU16-SIA1-SB008. Concentrations of cadmium, selenium, and thallium were 12 mg/kg, 23.8 mg/kg, and 2.68 mg/kg, respectively; however, concentrations of these three constituents decreased significantly to background levels at the 10 and 30-foot bgs intervals. There was also one (1) manganese detection (586 mg/kg) above the soil to groundwater SSL at a depth of 80-feet bgs.

4.14.4 Contamination Assessment

As shown in Tables 4-33 and 4-34, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RUs 15 and 16 are driven by the external exposure to gamma radiation and soil ingestion pathways.

In RU 15, incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 in slag (a predominant fill material) and potassium-40 in calciner pond solids (an incidental fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Incremental cancer risks via the soil ingestion pathway, primarily associated with lead-210 levels in ore (a predominant fill material), polonium-210 levels in calciner pond solids and PAHs in coke (also an incidental fill material), also exceed the 1E-04 ROD RAO for potential future outdoor and indoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway in RU 15, which are driven by thallium levels in calciner pond solids, exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers. Incremental non-cancer risks for cadmium (associated with calciner pond solids) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

In RU 16, incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 in slag (a predominant fill material) and potassium-40 in calciner pond solids (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Incremental cancer risks via the soil ingestion pathway, primarily associated with lead-210 and polonium-210 levels in calciner pond solids, also exceed the 1E-04 ROD RAO for potential future outdoor and indoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway in RU 16, which are driven by thallium levels in calciner pond solids, exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers. Incremental non-cancer risks for cadmium (associated with calciner pond solids) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway in either RU 15 or 16. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Below the known fill materials, exceedances of cadmium, chromium, manganese, selenium, and thallium were detected at various depths in RUs 15 and 16. In RU 15, exceedances of the soil to groundwater SSL for cadmium at 80 and 90 feet bgs could be the result of leaching of constituents. However, since there were no elevated concentrations in the shallower intervals or deeper intervals in other borings it could also be possible that the cadmium in RU 15 is naturally elevated in the gravels and cobbles above bedrock at 94 feet bgs.

On the north side of RU 16, the trace metals were usually within representative levels. However, the exceptions, which appeared consistently at deeper horizons, were cadmium, selenium, and thallium. The fact that these three constituents reported exceedances at the same depths and for the same constituents found in the calciner material supports that some migration of metals has occurred in the subsurface and may a pose a potential risk to groundwater.

RUs 15 and 16 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the Leaching Potential SIA investigation will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RUs 15 and 16:

The cut and fill isopach model was used to determine total fill volume for RUs 15 and 16 as presented in Table 4-2. However, for several areas within these RUs, the cut and fill isopach model indicated that a cut existed, primarily due to road construction. For purposes of the total fill volume calculation, it was assumed that the cut surfaces are covered with 1 foot of fill (primarily slag). This is consistent with site knowledge that the roadway surfaces in these RUs are not native soil but are covered with slag.

4.15 RU 19: SLAG PILE AND BULL ROCK PILE

4.15.1 Site Description

RU 19, at 151.5 acres, is the largest RU within the FMC Plant Site and contains the slag pile and bull rock pile as shown in Figure 4-19. The former plant landfill (used prior to the development of the current landfill designated as RU 18) and railcars buried within an identified area of the slag pile are included within this RU. Wastes may include scrapped building materials, filter media, asbestos insulation, furnace dig-out material, and minor amounts of spent solvents and oily residuals.

RU 19 consists of the slag pile and bull rock pile. These two piles were made of different materials. The slag pile is composed primarily of slag, while the bull rock pile is made of reject ore materials (primarily oversize rock). As such, the potential for radon emanation is different between the slag pile and the bull rock pile. Although the slag contains radium-226, which decays to radon, a radioactive gas[1], slag has a vitrified matrix (i.e., glass like) and radon gas flux is significantly inhibited.

The bull rock pile primarily consists of reject oversized ore that could contain above-background levels of radium-226. As the ore has not been vitrified, the bull rock pile area of RU 19 was evaluated separately.

A test cap soil cover was constructed on the northwest corner of the RU 19 slag pile in 2001. The original purpose of the test cap was to determine the minimum depth of soil required in a soil cap on the slag pile to support plant survival and growth. The slag pile was first graded to a slope of 3:1. Soil from the southern, undisturbed portion of the FMC Plant Site was used as soil cover. The test plot area is approximately 2 acres. The 2-acre plot is divided into four relatively equal areas with differing soil cover thicknesses. One area was designed with an 8-inch thick soil layer, two areas were designed with a 12-inch thick soil layer, and one area was designed with an 18-inch thick soil layer. Plants survived similarly on all four test sections. The test plot is still in place and intact.

4.15.2 Problem Statement

The following field programs were performed at RU 19. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data associated with the surface and subsurface fill materials present in RU 19 were used to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents within these materials.

- Radon Flux Measurement SIA - Radon emission rates from the uncovered slag pile, bull rock pile and old phossy ponds had not been quantified. Determination of the radon flux was required to evaluate remedial alternatives for the slag pile and bull rock pile within RU 19 in the SFS. These flux rates may be relevant to the design of remedial alternatives for these areas to meet the UMTRCA guidelines for radon in the event these guidelines are identified as an ARAR. In addition, these data along with other radon measurements (e.g., RU 7) will be used to evaluate the potential for radon flux to be a concern at other RUs that contain residual fill material.

- Soil Cover (Test Cap) Gamma Measurements - While the test cap soil cover was not installed for use as part of a gamma radiation study, the opportunity to test the effectiveness of the soil cover at reducing gamma radiation from the slag pile was evaluated.

[1] Radon (^{222}Rn) is a noble gas derived from the radioactive decay of an isotope of radium (^{226}Ra).

The specific field activities for RU 19 associated with this field program are summarized in Table 4-1.

4.15.3 Investigation Results

4.15.3.1 Risk Assessment

As shown in Table 4-2, the predominant fill materials present within RU 19 consist of slag and bullrock (ore). In addition to these fill materials, P4 and phossy solids that could have been contained within several rail cars that were historically buried in RU 19, are identified as additional potential source materials. However, any P4 or phossy solids associated with these railcars is buried too deep (> 10 feet) for future worker exposure to these materials to occur. Consequently, P4 and phossy solids are not identified as materials to be considered in the Supplemental HHRA.

As shown in Table 4-4, arsenic, cadmium, radium-226, uranium-238 and lead-210 comprise the COPCs/ROPCs that were detected in the fill materials identified in RU 19 at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 19.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 19 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.15.3.2 Radon Flux Measurement SIA

Radon flux measurements at RU 19 were performed at 100 locations on the slag pile and 100 locations on the bull rock pile as shown on Figures 4-19 and 4-20. The measurements were laid out on an evenly-spaced grid for a period of up to 48 hours per location. Radon flux measurements were collected using electrets as described in Section 3.3.9 and Appendix F.

All measurements from the slag pile and the bullrock pile were below the UMTRCA guideline of 20 pCi/m^2/sec as reported in Table 4-18. The mean radon flux rate for the slag pile was 0.22 pCi/m^2/sec and measurements ranged from -0.21 to 1.13 pCi/m^2/sec. As would be expected, the bullrock pile radon flux measurements were slightly higher than the slag pile. The measurements ranged from -0.30 to 4.80 pCi/m^2/sec and the mean was 0.32 pCi/m^2/sec. Since the radon flux measurements from the slag pile did not exceed the guideline, radon flux measurements to test the effectiveness of the soil cap to reduce radon emissions were not required on the northwestern portion of RU 19 where FMC had installed a soil test cover to evaluate re-vegetation on the slag pile.

As identified in the CSM, future outdoor workers have the potential to be exposed to radon. However, since the radon flux levels associated with slag do not exceed the UMTRCA guideline, radon was not identified as a COC to be incorporated into the Supplemental HHRA for RU 19, or for any other RU containing this fill material.

4.15.3.3 Gamma Survey – Soil Cover

As shown on Figure 4-3, a gamma scan was performed over the entire two-acre surface of the soil cover. As described in Section 3.3.9 and Appendix F, the NaI scan was performed with a lead collimator in order to reduce the influence of gamma shine from the slag pile. As shown on the figure, the gamma exposure rates over the entire soil cover were below the CV of 18,500 cpm.

4.15.4 Contamination Assessment

As shown in Table 4-35, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 19 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated with radium-226 levels in ore (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Radon flux measurements did not exceed the UMTRCA guideline of 20 pCi/m^2/sec, therefore, radon flux control for slag does not need to be evaluated in the SFS. The gamma exposure rates in the soil cover area demonstrate that a soil cover of a minimum depth of eight inches will effectively reduce gamma exposure rates at the site. As also noted in the *RI Update Memo*, the EPA presumptive remedy for Municipal Solid Waste Landfills (EPA, 1993) will be the basis for remedy evaluation for FMC Plant Site landfills (RUs 17 and 18). At RU 19, this presumptive remedy of containment will also be evaluated in the remedy selection for the area in RU 19 where the former plan landfill is located. Additional information on the landfills is included in Section 5.2.5 and Section 5.3.

As discussed in Section 4.16 for the slag reference area evaluation, statistical evaluation of the other metals, fluoride, and radionuclides slag reference data indicate that slag constituents do not leached into underlying soils and do not pose a potential risk to groundwater.

RU 19 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the Radon Flux SIA will also be considered during evaluation of remedial alternatives. The presumptive remedy for landfills also will be a consideration in the SFS alternatives development for RU 19.

Estimation of Fill Volume in RU 19:

The cut and fill isopach model was used to determine total fill volume for RU 19 as presented in Table 4-2. However, for several areas within this RU, the cut and fill isopach model indicated that a cut existed, primarily due to road construction or borrow areas for pond construction in RU 22b. For purposes of the total fill volume calculation, it was assumed that the cut surfaces are covered with 1 foot of fill (primarily slag and/or bullrock). This is consistent with site

knowledge that the surface in these areas is not native soil but is covered with slag or bullrock. The estimated total volume of fill in RU 19 includes the slag placed on top of the former plant landfill (RU 19b) but does not include the volume of other wastes in the former plant landfill. However, these wastes constitute only 0.06 % of the total weight of slag within RU 19.

A P4 volume range is also presented in Table 4-2 based upon historical knowledge of 21 railcars buried in the slag pile (designated as RU 19c as shown on Figure 5-1). RU 19c is located near the center of the slag pile (RU 19) and was used one time in 1964 for the disposal of railcar tanks (with their trucks removed) containing phosphorus sludge. This area is approximately 2.7 acres in size and is buried under 100+ feet of slag. Section 6 of the *RI Update Memo* provides a discussion of the buried railcar tanks and indicates that an assumption was made that these railcar tanks contained 50% to 75% capacity of phosphorus sludge when buried, resulting in a range of 1,000 to 2,000 tons of P4 buried in the slag pile within the railcars. However, a July 1, 1981 memo from an FMC employee (the Phosphorus Area Supervisor) has since been identified that indicates that the sludge was "unloaded" from the railcar tanks with the intention of "cleaning" the emptied railcars for scrap metal sales. Due to safety concerns, the sludge could not be totally "cleaned" from 21 railcars, which were then taken to the south end of the slag pile (in 1964) and buried with clay and then slag. A copy of this memo is attached in Appendix L. This indicates that the previously calculated range of P4 sludge mass buried in the railcars in RU 19c (1,000 to 2,000 tons) should be considered a worst case estimate. Based upon the currently available information, as little as 200 tons could have been buried if it is assumed that the cars contained only 10% sludge, which seems reasonable if the railcars were "unloaded" prior to disposal. Therefore, Table 4-2 provides a range of P4 volume in RU 19 as 200 to 2,000 tons.

4.16 RU 20: FORMER BANNOCK PAVING AREA

4.16.1 Site Description

RU 20 is 61.6 acres in size and is located east of RU 6 and north of RU 22c along the northern plant site boundary, as shown on Figure 1-2. The RU 20 property was leased from FMC by Bannock Paving Company (BAPCO) for the crushing and sale of slag, ferrophos crushing and loading, coke loading and unloading, drying coke for FMC, production of asphalt, and equipment maintenance. RU 20 was never used for P4 production process operations.

BAPCO Operations. BAPCO had a maintenance shop within RU 20 primarily used for mobile equipment and general maintenance activities on their equipment. Degreasing is presumed to have been performed as necessary for equipment parts using brush on/wipe off techniques. No large-scale degreasing operations were used (i.e., no vapor degreasers). The maintenance shop had a concrete floor that would limit migration of solvents through the floor. Although no known releases were reported, solvents may have been released to the ground surface immediately outside the shop. In November 2006, an accidental fire destroyed the former BAPCO maintenance shop.

BAPCO also operated an asphalt batch-plant operation on-site and an equipment fueling area with above-ground storage tanks. All fuel tanks and asphalt production equipment have been removed from RU 20.

Coke Operations. Coke is a raw material used in the manufacture of P4. Although there were numerous sources for the coke used at the FMC Plant Site, 70% of the coke came from FMC's Kemmerer, Wyoming coke plant. Other types of coke included metallurgical coke and petroleum coke. Coke was typically transported to the FMC site by railcar and was unloaded near the ore stockpile (in RU 7) into an underground hopper, where it was transferred to the process via conveyors.

Kemmerer coke typically was dry enough to feed directly into the process, while coke from other sources contained enough moisture that drying was required prior to use. Wet coke was transported via railcar to the coke drying operation at the Bannock Paving area (RU 20) where it was unloaded, stockpiled, dried, and transported back to the FMC operations in RU 7. The coke drying operation was equipped with a wet scrubber, including a series of three coke settling basins. Scrubber water was recycled through these basins to allow suspended particulates to settle.

4.16.2 Problem Statement

The following field programs were performed at RU 20. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Reference Area Investigation - A reference area study was planned for RU 20 with the overall purpose of determining the leaching potential of slag into the native soils beneath the ore materials. This was done by examining certain slag constituents in the native soil beneath the slag materials on the surface.

- Organic Solvent SIA - Shop-related solvent VOCs needed to be adequately characterized to support a decision to either remediate specific investigation areas or take no further action.

- Fuel SIA - Sampling had not been conducted to determine potential impacts from the historic diesel fuel releases. The determination of the presence, absence, and concentration of liquid petroleum fuels was needed to support a decision to either remediate liquid petroleum fuel specific investigation areas or take no further action.

- Coke Constituent SIA (Coke Handling Area) - Wet and dry coke was stored in RU 20 as part of the coke drying process. This process included a coke dryer scrubber and coke settling basins that contained a sustained hydraulic head as described above. Characterization of the soils beneath the coke handling area was needed to support the evaluation of remedial alternatives.

- Coke Constituent SIA (Coke Settling Basins) - Wet and dry coke was stored in RU 20 as part of the coke drying process. This process included coke settling basins that had a sustained hydraulic head. The potential migration to groundwater for the concrete-lined coke settling basins needed to be investigated to support the evaluation of remedial alternatives.

- Coke Constituent SIA (Coke Characterization) - Waste characterization of the coke present on the FMC Plant Site required re-evaluation per 40 CFR Part 262.11.

The specific field activities for RU 20 associated with each of these field programs are summarized in Table 4-1 by RU.

4.16.3 Investigation Results

4.16.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 20 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements averaged 77,254 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. It should be noted that, in addition to future workers, risks to off-site residents from fugitive dust emissions were also evaluated due to the proximity of RU 20 to the plant site boundary. As listed in Table 4-2, the predominant fill materials present within RU 20 consist of slag, concrete foundations and asphalt with slag aggregate. Potential source materials incidental to the predominant fill materials include coke and ferrophos. PCDT water residues were also applied to some of the slag roadways within RU 20. It should be noted that samples used in the PCDT Roadway Study (Section 4.24) were used to characterize COPC/ROPC concentrations in slag. Consequently, any impacts associated with PCDT application are addressed by the slag data set used in the Supplemental HHRA. Finally, because worker-related SSLs were exceeded by several COPCs in the Fuel SIA of the Former Batch Plant area of RU 20 (Section 4.16.3.5), fuel spill residues are also identified as a potential source material to be evaluated in the Supplemental HHRA.

As shown in Table 4-4, nickel, vanadium, radium-226, uranium-238, lead-210 and six coke-related PAHs comprise the COPCs/ROPCs that were detected in any sample of the identified fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. In addition, the fuel-related PAHs that exceed worker SSLs in the Former Batch Plant Fuel SIA consist of benzo(a)anthracene, benzo(a)pyrene, benzo(f)fluoranthene and

benzo(k)fluoranthene. These constituents were all identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 20.

The highest UCL calculated for a COC/ROC within each of the fill materials identified in RU 20 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4). By contrast, the maximum concentration of each of the four fuel-related PAHs identified as COCs in the Former Batch Plant Fuel SIA, as shown in Table 4-28, was used to characterize these EPCs. The findings of the Supplemental HHRA are summarized in the Contamination Assessment.

4.16.3.2 SFS (RU 20 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 20 and the extent to which constituents associated with the fill material may have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program, five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 20 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. All the concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10.

Fill Materials. As summarized on Table 4-2, the surface of RU 20 is made of up of slag, ferrophos, coke, concrete foundations, and asphalt with slag aggregate. The subsurface fill materials consist primarily of these same surface materials as well as reworked native soil with

slag. In addition, incidental fill materials within this RU include coke and ferrophos. The native soil interface ranges between 2 feet and 7 feet bgs.

4.16.3.3 Reference Area–Slag (RU 20 REF)

The purpose of the reference area study was to evaluate the degree to which COPCs/ROPCs have leached from slag and slag-related materials into underlying native soils. RU 20 was chosen for this investigation because it is known to have historically contained the greatest volume of slag and, therefore, likely represents a worst-case case scenario. This reference area study involved sampling 20 locations in RU 20 on a standard square grid using a random origin. These sample locations were paired with the 20 SFS data collection locations described below. Samples were collected of native soils from the 0-to-2 foot bns interval and submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses. The native soil interface ranges between 2 feet and 7 feet bgs.

The slag reference area data were compared to the background values to evaluate potential leaching from slag to underlying native soils. For a majority of the samples, the individual concentrations of metals, fluoride, and radionuclides were below background levels and SSLs across the RU. Single detections of antimony, boron, cadmium, and manganese above background levels were reported in borings RU20-REF-SB002, -SB017, and SB-020. For example, 19 of the 20 native soil samples from RU 20 reported concentrations of cadmium and antimony below the background levels of 1.9 mg/kg and 2.2 mg/kg respectively. One sample from RU20-REF-SB017 reported a cadmium concentration of 32.6 mg/kg and an antimony concentration of 3.92 mg/kg. The cadmium concentration also exceeded the soil to groundwater SSL of 8 mg/kg. Results at this sample location appear to be anomalous and there does not appear to be any leaching of cadmium or antimony from slag. As reported on Table 4-17, a similar scenario was encountered for manganese, where 19 of the 20 native soil samples detected concentrations of manganese below background. The manganese concentration in RU20-REF-SB002 was 494 mg/kg and the background and soil to ground water SSL is 482 mg/kg. Since the soil to groundwater SSL for manganese is below background, the SSL defaults to the background value. Four (4) of the 16 of the native soil samples listed on Table 4-17, reported concentrations of zinc above background levels, but all 4 zinc concentrations were below worker or soil to groundwater SSLs.

4.16.3.4 Shop-Related Organic Solvent SIA (RU 20 SIA2)

Thirty (30) primary borings and three (3) colocated borings were installed and sampled during the Organic Solvent SIA around the BAPCO shop, for a total of 33 borings as shown on Figure 4-23. The boring location spacing around the BAPCO shop was 75 feet, which was determined by the size of the area and the undetermined source and extent of the shop-related solvents in former BAPCO shop area. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected. During the organic solvent field program at RU 20, a total of 116 samples were collected for shop-related VOCs chemical analysis. Samples were collected from depths ranging

from 2 to 15.5 feet bgs. Table 1-6 contains the list of shop-related VOC analytes. Sample intervals for detected data are presented in Table 4-26.

***Fill Materials*.** The surface of RU 20 around the former BAPCO shop is made of up of slag, asphalt with slag aggregate, and concrete foundations. The subsurface fill materials consist primarily of slag and reworked native soil. The native soil interface ranges between 2 feet and 4 feet bgs.

Low level concentrations of methylene chloride were reported in several borings, and MEK was detected in one sample interval. All of the detections were significantly below the SSLs as presented on Table 4-26, and were flagged as estimated because the concentrations fall between the analytical MDL and the RL. The methylene chloride detections were further flagged because it was also detected in the associated blank data. All these samples were collected on a single day of sampling. No other samples reported any detections of methylene chloride during previous or subsequent days of sampling.

The complete data table for RU 20 is located in Appendix D. As there were no reported detections of shop-related solvents above SSLs, no phase two investigations were required for the organic solvent borings in RU 20 SIA2. In addition, because no worker SSLs were exceeded, potential risks associated with exposure to shop-related solvents in this SIA were not evaluated in the Supplemental HHRA.

4.16.3.5 Fuel SIA Results (RU 20 SIA1 and RU 20 SIA2)

RU 20 SIA1 (Former Batch Plants).:

Forty-three (43) primary borings and four (4) colocated borings were installed and sampled during the Organic Solvent SIA around the Former Batch Plants for a total of 47 borings as shown on Figure 4-22. The boring location spacing in the former Batch Plant area was 75 feet, which was determined by the size of the area and the undetermined source and extent of the fuel related constituents in former Batch Plant area. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected.

During this fuels investigation, a total of 173 samples were collected for fuel-related VOCs and PAHs analyses. Samples were collected from depths ranging from 2 to 15.5 feet bgs. Table 1-6 contains the list of fuel-related VOC and PAH analytes. Soil borings and sample intervals with detected data are presented in Tables 4-27 and 4-28.

***Fill Materials*.** The surface of RU 20 in the fuel area around the former Batch Plants is made of up of slag, ferrophos, and asphalt with slag aggregate. The subsurface fill materials consist primarily of slag. The native soil interface ranges between 1.5 feet and 8 feet bgs.

Fuel-related VOCs Results. Three borings in SIA1 reported low level detections of fuel VOCs. All of the concentrations were significantly below the SSLs presented in Table 4-27, and several of the concentrations that fall between the analytical MDL and the RL were flagged as estimated.

Fuel-related PAH Results. Detections of fuel-related PAHs were reported in samples collected at various depths in several borings as listed in Table 4-28. Concentrations of several fuel-related PAHs exceed SSLs in three of these borings including RU20-SIA1-SB021, -SB023 and –SB027, which are depicted in Figure 4-22.

At the 3-foot bgs sample interval in SB021, concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene exceed one or more of the SSLs, including worker SSLs. However, as seen in Table 4-27, concentrations significantly decrease in the 5-foot bgs sample and were generally non-detect in the 10 and 13-foot bgs sample intervals. Moreover, none of the detections below the 3-foot bgs sample interval exceed SSLs. This sample location is an outermost boring located in the southeast corner of the easternmost Former Batch Plant SIA (refer to Figure 4-22).

RU20-SIA1-SB023 is an outermost boring in the central group of specific investigation area borings in RU 20. Several fuel-related PAHs were reported in the shallow sample interval from RU20-SIA1-SB023 and one exceedance of an SSL is reported in the 4.5-foot bgs interval. The concentration of benzo(a)pyrene is 700 µg/kg and the commercial/industrial worker SSL is 200 µg/kg. As seen on Table 4-28, no fuel-related PAHs were detected in deeper sample intervals collected from this boring (i.e., 6.5, 10 and 14.5 feet bgs).

Exceedances of several fuel-related PAH SSLs were also reported in the 4.5-foot bgs sample interval of RU20-SIA1-SB027, located immediately southwest of RU20-SIA1-SB023. Concentrations of benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene, exceeded one or more of the SSLs. Similar to RU20-SIA1-SB023, there were no detections reported in the 6.5 and 10-foot bgs sample intervals. Two low detections, significantly lower than SSLs (less than 1 µg/kg), of fluoranthene and phenanthrene were reported in the 14.5-foot bgs sample. Soil boring RU20-SIA1-SB027 is also considered an outermost boring.

As specified in the decision rules summarized in Table 3-2, when a sample (i.e., from native soil interface, 2 feet bns, 10 feet bgs or 10 feet bns intervals) from one or more of the outermost borings has liquid petroleum fuel constituents above the applicable SSLs, then additional lateral delineation of the solvent specific investigation area was needed to be addressed in phase two. Since exceedances of SSLs were reported for fuel PAHs in the shallowest sample intervals in SB021, SB023, and SB027, additional lateral delineation of these areas in RU 20 SIA1 was proposed and approved by the EPA in November 2007. Based on the detections in the phase one borings at the shallowest intervals, there was no need to evaluate contaminant migration to groundwater during a phase two investigation.

It was proposed that in the phase two investigation, a sample scheme similar to the phase one be performed, but specifically targeted to shallow soils. As shown on Figure 4-22, boring locations were laid out on a 75-foot square grid with a random origin. A total of 21 borings and two colocated borings for a total of 23 borings were drilled to delineate the area to the east of SB021 and SB023 and SB027. A total of 84 samples were collected as discussed above and analyzed

for fuel PAHs only. Samples were collected from depths ranging from 2 to 16.5 feet bgs. Sample intervals for detected data are presented in Tables 4-27 and 4-28.

Phase 2 Fuel-related PAH Results. Low-level concentrations of fuel-related PAHs were reported in several phase two borings. All of the concentrations were significantly below the SSLs, and a majority of the detections were flagged as estimated because the concentrations fall between the analytical MDL and the RL. The complete data table for RU 20 is located in Appendix D. As there were no reported detections of fuel-related PAHs above SSLs in phase two in the former Batch Plant area, no additional investigations were required in RU 20.

Finally, as further discussed in Section 4.16.3.1 (Risk Assessment), because worker SSLs were exceeded by four fuel-related PAHs in the Former Batch Plant SIA, these constituents were identified as COCs to be evaluated in the Supplemental HHRA for RU 20.

RU 20 SIA2 (BAPCO Shop Area):

Thirty-three (33) primary borings and three (3) colocated borings were installed and sampled during the Organic Solvent SIA around the former BAPCO Shop area, for a total of 36 borings as shown on Figure 4-23. The boring location spacing in the former BAPCO Shop area was 75 feet, which was determined by the size of the area and the undetermined source and extent of the fuel related constituents in the former BAPCO Shop area. Each boring was drilled until native soil was encountered. Soil samples then were collected from 0 feet bns and 2 feet bns in each boring. If the fill was less than 2 feet thick, then a 10 foot bgs sample was also collected. If the fill was greater than 2 feet thick, then additional samples from 10 foot bgs and 10 foot bns were collected. Thus, in any one boring, a minimum of three (3) soil samples and a maximum of four (4) soil samples were collected.

During the BAPCO Shop Area fuels investigation, a total of 116 samples were collected for fuel-related VOCs and PAHs analyses. Samples were collected from depths ranging from 2 to 15.5 feet bgs. Soil borings and sample intervals with detected data are presented in Tables 4-27 and 4-28. Table 1-6 contains the list of fuel-related VOC and PAH analytes.

Fill Materials. The surface material around the former BAPCO shop is made of up of slag, asphalt with slag aggregate, and concrete foundations. The subsurface fill materials consist primarily of slag and reworked native soil. The native soil interface ranges between 2 feet and 4 feet bgs.

Fuel-related VOCs Results. Five borings reported low level detections of fuel VOCs in RU 20 SIA2. All of the concentrations were significantly below the SSLs presented in Table 4-27, and several of the concentrations that fell between the analytical MDL and reporting limit (RL) were flagged as estimated.

Fuel-related PAH Results. Low concentrations of fuel-related PAHs were reported in 12 borings in RU 20 SIA2. All of the concentrations were significantly below the SSLs presented in Table 4-28, and were flagged as estimated because the concentrations fall between the analytical MDL and the RL. At least one detection of each fuel PAH was reported except for acenaphthene and fluorene.

The complete data table for RU 20 is located in Appendix D. Because there were no reported detections of fuel-related VOCs and PAHs above SSLs, no phase two investigations were required for the BAPCO shop area in RU 20 (RU 20 SIA2). In addition, because no worker SSLs were exceeded, potential risks associated with exposure to fuel-related COPCs in the BAPCO shop area SIA were not evaluated in the Supplemental HHRA.

4.16.3.6 Coke Constituents – Coke Handling Area (RU 20 SIA3)

As depicted on Figure 4-24 total of 22 soil borings were drilled during the investigation of the Coke Handling Area of RU 20. Twenty (20) primary borings and two colocated boring were located on a standard square grid with a random origin. Each boring was drilled through the fill and soil samples were collected from 0-to-2 feet bns. These samples were analyzed for the coke-related PAHs: acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene , benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h) anthracene, fluoranthene, fluorine, indeno(1,2,3-cd)pyrene, naphthalene, and pyrene. A total of 22 samples were collected from depths ranging from 5 to 14 feet bgs.

Fill Materials. The surface of RU 20 in the coke handling area is made of up of coke, slag, and the concrete coke settling basins. The subsurface fill materials consist primarily of coke, slag, and reworked native soil. The native soil interface ranges between 5 feet and 12 feet bgs. Soil borings and sample intervals with detected data are presented in Table 4-36.

Coke-related PAH Results. Seven borings had low-level concentrations of coke PAHs that were flagged as estimated because the concentrations fall between the MDL and the RL. One or more detections of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, naphthalene, and pyrene were reported. However, all reported concentrations of coke PAHs were below 2.1 µg/kg, which is several orders of magnitude below any of the coke-related PAH SSLs presented in Table 4-36.

The complete data table for RU 20 is located in Appendix D. Phase two investigations were not required for the coke constituent borings in the Coke Handling Area because there were no reported detections of coke PAHs above SSLs. In addition, because no worker SSLs were exceeded, potential risks associated with exposure to coke-related PAHs in the Coke Handling Area did not require evaluation in the Supplemental HHRA. However, as discussed in Section 4.16.3.1 (Risk Assessment), the Supplemental HHRA conservatively evaluated risks associated with exposure to coke potentially present at the surface and shallow subsurface in portions of RU 20.

4.16.3.7 Coke Constituents – Coke Settling Basins (RU 20 SIA4)

A single boring was drilled through the concrete in each of the three basins, for a total of three (3) soil borings during the investigation of the Coke Settling Basins at RU 20 (RU 20 SIA4). Each boring was drilled through the fill beneath the basin and soil samples were collected from the top of the native ground surface, at 2 feet bns, and at 10 feet bns for a total nine (9) soil samples to evaluate potential leaching of constituents from the Coke Settling Basins to native soil. The boring locations are shown on Figure 3-24. Samples were collected from depths

ranging from 3 to 14 feet below the bottom of the basins and analyzed for coke PAHs and metals. Soil borings and sample intervals with detected data are presented in Tables 4-36 and 4-37.

Coke-related PAH Results. One boring in during this investigation at RU 20 reported low-level concentrations of coke PAHs. This boring was located in the center basin and the concentrations were reported at a depth of 5 feet below the bottom of the basin. All of the coke PAH constituents were detected in this sample with the exception of acenapthene and fluorene. However, all of the concentrations of coke PAHs were several orders of magnitude below any of the coke PAH SSLs presented in Table 4-36. It is important to note that the shallow sample interval (3 feet below the bottom of the basin) and the deeper sample interval (13 feet below the bottom of the basin) in this same boring did not report any concentrations of coke PAHs. A possible explanation for the detections in the intermediate sample is that coke fines, which may have entered the split-spoon samplers as "sluff," contaminated this particular sample. Regardless, the concentrations of the deepest samples were less than SSLs.

Metals Results. Metals concentrations in the samples beneath the coke settling basins were consistent with depth in each of the borings as listed on Table 4-37. With the exception of selenium, all the metals were detected in one or more samples from each boring. All of the samples of the native soil collected beneath the coke settling basins reported concentrations of metals below SSLs.

The complete data table for RU 20 is located in Appendix D. Phase two investigations were not required for the coke constituent borings in the Coke Settling Basin area because there were no reported detections of coke-related PAHs or metals above SSLs. In addition, because no worker SSLs were exceeded, potential risks associated with exposure to coke-related PAHs in the Coke Settling Basins did not require evaluation in the Supplemental HHRA. However, as discussed in Section 4.16.3.1 (Risk Assessment), the Supplemental HHRA conservatively evaluated risks associated with exposure to residual coke potentially present at the surface and shallow subsurface in portions of RU 20.

4.16.3.8 Coke Constituents – Coke Characterization (RU 20 SIA5)

One composite sample was collected from each of the three basins within the coke settling pond and one sample was collected from the former unloading and storage area for a total of four (4) coke-area samples. These samples were analyzed for TCLP metals analysis (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) and SVOCs (o-cresol, m-cresol, p-cresol, cresol, 1,4-dichlorobenzene, 2,4-dinitrotoluene, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, nitrobenzene, pentachlorophenol, pyridine, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol).

Sample data are presented in Tables 4-38 and 4-39. As seen on these tables, only mercury was detected in any of the samples, at concentrations that were three orders of magnitude below the TCLP maximum contaminant levels. Based on these results, excavation of coke at the FMC Plant Site would not involve generation of RCRA hazardous waste and RCRA hazardous waste management requirements would not apply.

4.16.4 Contamination Assessment

As shown in Table 4-40a, the Supplemental HHRA determined that risks to all potential future receptors from exposure to fill materials identified within RU 20 are driven by the external exposure to gamma radiation and soil ingestion pathways. Incremental cancer risks via the external exposure to gamma radiation pathway, which were primarily associated with radium-226 in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. Incremental cancer risks via the soil ingestion pathway, which are driven by PAHs in coke (an incidental fill material) and lead-210 and radium-226 levels in slag, also exceed the 1E-04 ROD RAO for potential future outdoor commercial/industrial workers.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by vanadium levels in ferrophos (an incidental fill material), exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for nickel (associated with ferrophos) also exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for construction workers.

As shown in Table 4-40b, the Supplemental HHRA determined that potential future receptor exposures to both RU 20 fill materials and fuel spill residue within the Former Batch Plant SIA of RU 20 result in higher cancer risks than associated with exposure to RU 20 fill materials alone; however, the same receptors are associated with exceedances of the 1998 ROD RAOs.

A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

During the reference area evaluation, statistical evaluation of the other metals, fluoride, and radionuclides slag reference data show that the individual and mean metal, fluoride, and radionuclide concentrations were equal to or less than the EPA background values. Based on this data, the few exceedances of background or soil to groundwater SSLs appear to be isolated occurrences, and overall the data indicate that slag constituents have not leached into underlying soils. In addition during the SFS investigations at numerous RUs, the metals, fluoride, and radionuclide levels from the SFS borings were not elevated above any future worker SSL or soil to groundwater SSL and migration of these constituents to groundwater is not of concern. The reference borings that did report concentrations of constituents above SSLs will be considered during the SFS.

Also, organic constituents were not detected above SSLs in any of the SIAs except for the three borings in RU 20 SIA1 that exceeded those for PAHs. However, the extent of fuel PAHs above SSLs has been defined, and the risks evaluated (Table 4-40b).

RU 20 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS data collection and Organic SIAs will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 20:

The cut and fill isopach model was used to determine total fill volume for RU 20 as presented in Table 4-2.

4.17 RU 21: OTHER ON-SITE RAILSPURS

4.17.1 Site Description

Several thousand feet of rail spurs served the FMC Plant Site and it is desirable to leave the rail spurs intact for potential future site industrial use. These rail spurs are located primarily along the northern plant boundary, although individual rail spurs pass through RUs 1, 5, 6, 7, 20, 22b, and 24. The rail spurs were used to deliver coke, ore, and heavy equipment to the facility and to transport P4, slag, and ferrophos products from the plant to receiving facilities and customers. It is likely that rail spurs have investigation and remediation needs independent from the RUs in which they are located. Therefore, RU 21 investigations remained separate from the other RU investigations.

4.17.2 Problem Statement

The following field programs were performed at RU 21. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

The specific field activities for RU 21 associated with each of these field programs are summarized in Table 4-1.

4.17.3 Investigation Results

4.17.3.1 Risk Assessment

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 21 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements for both the railroad spurs and roads (RU 23) averaged 70,477 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the

composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2 the fill material present within RU 21 consists solely of slag.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs to have been detected in any sample of the identified fill material at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 21.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 21 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.17.3.2 SFS Results (RU 21 SFS)

As stated in the *RI Update Memo* (BEI, 2004b), rail spurs are significant assets for future redevelopment and are not anticipated to be removed. Therefore, no subsurface samples were collected through the rail spurs under the SFS data collection pathway.

4.17.4 Contamination Assessment

As shown in Table 4-41, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 21 are driven by the external exposure to gamma radiation pathway. However, risks via this pathway, which are primarily associated with radium-226 in slag (a predominant fill material), are lower than the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future utility worker receptors.

RU 21 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs.

4.18 RU 22b: OLD PONDS

4.18.1 Site Description

RU 22b is 37.7 acres in size and consists of four separate parcels in the western portion of the FMC Plant Site as shown on Figure 1-2. The parcels are separated by RCRA-capped ponds that are not part of the SRI investigation. While individual ponds within RU 22b vary in size, the location and extent of each pond is well-documented by plant data and historic aerial photos. The old ponds have had hydraulic head removed through solar evaporation, although their residual volume of dried material and/or P4 is not known.

Early in the FMC Plant Site history, waste streams that contained P4, (i.e., phossy water and precipitator slurry) were slurried and pumped to a series of ponds west of the furnace building. Ponds that accepted phossy water were designated with an “S” and ponds that accepted precipitator slurry were designated with an “E”. As the “S” ponds filled with settled solids, they typically contained P4 and thus were covered with slag to prevent oxidation. The E ponds were

typically allowed to dry in order to reclaim the dried solids. New ponds were dug to replace the filled ponds, such that a series of ponds expanded westward from the older ponds. In the early 1970s, an FBD dryer was installed to manage the precipitator slurry, thus temporarily eliminating the need for further "E" ponds. With the shutdown of the FBD in the mid-1980s, new lined "E" ponds were constructed to again manage precipitator slurry.

Over the history of ponds utilized in RU 22b, the phossy water and precipitator slurry were conveyed to the ponds via underground pipelines from the furnace building (RU 1) and slag pit (RU 2). FMC used underground piping to carry the slag pit water to the phossy water ponds until 1996, when new above-ground piping was installed. However, the underground piping remained in place.

RU 22b extends over areas of known historic phosphorus ("phossy") waste ponds. These areas were extensively investigated and the results reported in the *RI Report*. The 1998 ROD selected a capping remedy for the old phossy pond area (now RU 22b).

In the mid-1980s, a process was developed, built, and tested on the northern side of Pond 8S in RU 13 and adjacent to RU 22b, to recover P4 from Pond 8S. This process was later shut down. Spillage of phossy solids from the Pond 8S recovery process may have occurred. During the EMF RI phossy solids were encountered in borings F058 and F059. FMC considers it likely that the phossy solids encountered there were deposited from dredging one or more of the old phossy ponds or from excavating dried phossy solids from nearby ponds. Subsequent activities resulted in the sediments being buried under slag fill.

It is likely that the same activities that deposited phossy solids in RU 13 also accounted for the phossy solids encountered in RU 12 (borings F035, F036, and F077) and in other borings in and around RU 22b. Therefore, during the SRI samples were take in step-out borings and continued across other RUs (i.e., RUs 12, RU 20, and RU 24) to define the extent of these phossy solids.

4.18.2 Problem Statement

The following field programs were performed at RU 22b. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - As discussed in Section 4.27, five samples of precipitator solids and one sample of phossy solids were collected in RU 22b during the SRI Fill Characterization study. The resulting radiological and inorganic (metals, fluoride, and radionuclide) analytical data were used, in conjunction with data for these and other fill materials identified in RU 22b, to evaluate risks to potential receptors in the Supplemental HHRA.

- Old Phossy Ponds Delineation - More information was needed to determine the extent of phossy solids that were dredged or otherwise deposited outside the pond boundaries.

- Radon Flux Measurements SIA - Radon emission rates from the uncovered old phossy ponds had not been quantified. Determination of the radon flux was required to evaluate remedial alternatives for the former phossy waste ponds at RU 22b. .

- Underground Piping, Sumps, and Structures SIA - The portion of the piping and sump system within RU 22b was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (i.e., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

The specific field activities for RU 22b associated with each of these field programs are summarized in Table 4-1.

4.18.3 Investigation Results

4.18.3.1 Risk Assessment

As discussed in the Problem Statement, samples of precipitator solids and phossy solids were collected from RU 22b as part of the SRI Fill Characterization study. These data were combined with historical data characterizing precipitator solids and phossy solids to evaluate risks from exposure to these materials in the Supplemental HHRA. In addition, data characterizing the composition of other predominant fill materials present in the surface and shallow subsurface of RU 22b were also incorporated into the Supplemental HHRA. As listed in Table 4-2 these additional fill materials consist of slag and ferrophos. Table 4-2 also identifies the presence of P4 in the subsurface of RU 22b.

As shown in Table 4-4, antimony, arsenic, cadmium, lead, nickel, vanadium, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in any sample of the identified fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 22b. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at a concentration of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 22b was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 22b and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.18.3.2 Old Phossy Ponds Delineation (RU 22b CAP)

Around the boundary of RU 22b (the old Phossy Ponds), an investigation was required to determine the extent of pond sediments into RU 12, RU 13, RU 20, and RU 24 and beyond the western and southern boundaries of RU 22b. A total of 22 borings and three (3) colocated borings were drilled in RUs 12, 13, 20, and 24, and in locations along the western and southern boundaries of RU 22b (see Figure 4-25). Six (6) of the boring were originally proposed as trenches, but were relocated and investigated using borings based on Field Modification #11. In

each boring, a single soil sample from 0-to-2 feet bns was collected if fill material was encountered at the surface. Two (2) soil samples were collected, from 0-to-2 feet bgs and 2-to10-feet bgs, when native soil was found at the surface. The total number of soil samples collected was 27 samples, which means that only two (2) borings encountered native soil on the surface (i.e., SB001 and SB016). Samples were submitted to the laboratory for metals, fluoride, uranium-238, radium-226, potassium-40, polonium-210, and lead-210 analyses.

Fill Materials. The surface in and around RU 22b is comprised of slag, ferrophos, precipitator dust/phossy solids, and reworked native soils with slag. The subsurface fill materials consist primarily of these surface materials as well as reworked native soil with slag, and pond sediments. A reworked soil consisting of gravelly silt, and reddish brown silty sand, was observed in samples collected between 0 feet and 13 feet bgs.

Based on visual observations, no phossy pond material or pond sediments were observed in any of the boring locations. However, eight borings and two colocated borings reported exceedances of soil to groundwater SSLs for metals including cadmium, chromium, manganese, nickel, selenium, and thallium. In addition, several radionuclides exceeded worker SSLs and soil to groundwater SSLs. Antimony, arsenic, and cadmium were the only metals that exceeded a worker SSL, as described below. Almost all the exceedances were associated with borings in which fill material was inadvertently sampled, as discussed for the RU 13 SFS borings in Section 4.13.3.2. The sampled material consisted of dark reddish brown silty sand that was different from the typical yellowish brown silt that characterizes native throughout much of the FMC Plant Site. The cap delineation samples that this affects include RU22b-CAP-SB015, -SB015CL, -SB017, -SB018, -SB019, -SB020, -SB020CL, and -SB021. Two of the other eight borings (-SB011 and -SB022) appeared to be collected in native soil.

These exceedances are further discussed below. Soil borings and sample intervals with detected data are presented in Table 4-20. Figure 4-25 presents the sample locations and concentrations.

- Antimony - Six (6) detections and two (2) colocated detections above the soil to groundwater SSL of 5 mg/kg, concentrations ranged from 12.9 mg/kg at RU22b-CAP SB021 to 17 mg/kg at RU22b-CAP-SB015.

- Arsenic – Six (6) detections and two (2) colocated detections above the commercial/ industrial worker and soil to groundwater SSL of 7.7 mg/kg, concentrations ranged from 44 mg/kg at RU22b-CAP-SB015CL (-SB215) to 71.9 mg/kg at RU22b-CAP-SB019.

- Cadmium – Seven (7) detections and two (2) colocated detections above the construction worker SSL of 81 mg/kg and soil to groundwater SSL of 8 mg/kg, concentrations ranged from 158 mg/kg at RU22b-CAP SB018 to 330 mg/kg at RU22b-CAP-SB015.

- Chromium - Six (6) detections and two (2) colocated detections above the soil to groundwater SSL of 38 mg/kg, concentrations ranged from 600 mg/kg at RU22b-CAP-SB015CL (-SB215) to 729 mg/kg at RU22b-CAP-SB017.

- Lead-210 - Six (6) detections and two (2) colocated detections above the commercial/industrial worker SSL and soil to groundwater SSL of 3.03 pCi/g,

concentrations ranged from 20.3 pCi/g at RU22b-CAP-SB018 to 29.9 pCi/g at RU22b-CAP-SB015.

- Manganese – Two (2) detections of 609 and 503 mg/kg at RU22b-CAP-SB017 and RU22b-CAP-SB018 above the soil to groundwater SSL of 482 mg/kg.

- Nickel - Six (6) detections and two (2) colocated detections above the soil to groundwater SSL of 150 mg/kg, concentrations ranged from 150 mg/kg at RU22b-CAP-SB015 to 169 mg/kg at RU22b-CAP-SB017.

- Polonium-210 - Six (6) detections and two (2) colocated detections above the commercial/industrial worker SSL and soil to groundwater SSL of 3.58 pCi/g, concentrations ranged from 26.2 pCi/g at RU22b-CAP-SB018 to 34.9 pCi/g at RU22b-CAP-SB015.

- Radium-226 - Six (6) detections and two (2) colocated detections above the commercial/industrial worker SSL and soil to groundwater SSL of 3.88 pCi/g and the utility worker SSL of 12 pCi/g, concentrations ranged from 14.3 pCi/g at RU22b-CAP-SB020CL (-SB220) to 18.5 pCi/g at RU22b-CAP-SB018 and RU22b-CAP-SB015.

- Selenium – Five (5) detections and one (1) colocated detection above the soil to groundwater SSL of 5 mg/kg, concentrations ranged from 8.41 mg/kg at RU22b-CAP-SB021 to 9.75mg/kg at RU22b-CAP-SB017.

- Thallium - Six (6) detections and two (2) colocated detections above the soil to groundwater SSL of 0.7 mg/kg, concentrations ranged from 2.99 mg/kg at RU22b-CAP-SB018 to 6 mg/kg at RU22b-CAP-SB015.

- Uranium-238 - Six (6) detections and two (2) colocated detections above the commercial/industrial worker SSL and soil to groundwater SSL of 3.88 pCi/g, concentrations ranged from 23.2 pCi/g at RU22b-CAP-SB020CL (-SB220) to 25 pCi/g at RU22b-CAP-SB018.

Two other borings that appeared to collect samples from 0-to-2 feet bns reported minor exceedances. The cadmium concentration in RU22b-CAP-SB011 (8.24 mg/kg) was just above the soil to groundwater SSL of 8 mg/kg. The potassium-40 concentration (22 pCi/g) was also just above the SSLs of 20.5 pCi/g. This sample also exceeded the soil to groundwater SSL for thallium; the concentration was 2.1 mg/kg. The second boring, RU22b-CAP-SB022, reported one exceedance of cadmium at 206 mg/kg and one exceedance of arsenic at 14.1 mg/kg, and this sample appears to have been collected in native soils.

4.18.3.3 Radon Flux Measurements SIA

Radon flux measurements at RU 22b were performed at 100 measurement locations on the combined three western-most parcels and 100 measurement locations on the eastern-most parcel, laid out on an evenly-spaced grid. The measurements were made for approximately 48 hours per

location. Radon flux measurements were collected using electrets as described in Section 3.3.9 and Appendix F.

All the measurements from the two areas were below the UMTRCA guideline of 20 pCi/m^2/sec, as reported in Table 4-18 and shown on Figures 4-37a, b, and c. The mean radon flux rate for all of RU 22b was 0.56 pCi/m^2/sec and measurements ranged from -0.27 to 3.02 pCi/m^2/sec.

As identified in the CSM, future outdoor workers have the potential to be exposed to radon. However, since the radon flux levels associated with RU 22b do not exceed the UMTRCA guideline, radon was not identified as a COC to be incorporated into the Supplemental HHRA for RU 22c, or for any other RU containing precipitator solids and/or phossy solids.

4.18.3.4 Underground Piping, Sumps, and Structures SIA

The decision whether to remove, treat, or otherwise manage underground piping in RU 22b will be an SFS decision based on the detailed analysis of alternatives. To provide the SFS process with sufficient information to evaluate the alternatives for underground piping, an SRI task was performed to identify available information regarding remaining subsurface piping, sumps, structures, including their size, material of construction, and any process knowledge regarding residual constituents that may remain in the pipes. This task was based upon existing drawings, construction records, operational logs, and plant personnel knowledge. This data will be forwarded to the SFS to be evaluated as part of the cap design for RU 22b. Further information regarding the underground piping, sumps, and structures task is provided in Section 4.26 and Appendix I.

4.18.4 Contamination Assessment

As shown in Table 4-42, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 22b are primarily driven by the soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are driven by lead-210 and polonium 210 levels in precipitator solids (an incidental fill material), exceed the 1E-04 RAO specified in the 1998 ROD for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental cancer risks via the external exposure to gamma radiation pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material) and potassium-40 levels in precipitator solids, also exceed the 1E-04 ROD RAO for future outdoor and indoor commercial/industrial worker receptors.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for all worker receptors evaluated. In addition, the soil ingestion incremental non-cancer risks associated with vanadium levels in ferrophos (also an incidental fill material) and cadmium levels in precipitator solids exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer risks for cadmium (associated with precipitator solids) also exceed a hazard index of 1.0 for the dermal absorption and fugitive dust inhalation pathways for outdoor commercial/industrial and construction workers. Non-cancer risks for nickel (associated with

ferrophos) also exceed a hazard index of one for the fugitive dust inhalation pathway for construction workers and, in combination with cadmium, utility workers.

While not quantified in the Supplemental HHRA, the presence of residual P4 beneath RU 22b represents an unacceptable acute burning hazard to potential future receptors exposed to subsurface materials in this area. Receptors located downwind of RU 22b could also potentially be exposed to phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern.

Lead concentrations associated with precipitator solids exceed the ALM Workgroup screening level for soil lead at commercial/industrial sites of 800 mg/kg. Thus, the potential exists for there to be adverse health affects as a result of chronic exposures.

No other COCs/ROCs carried forward into the Supplemental HHRA for RU 22b were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

With respect to the radon emanation concern, no radon flux measurements exceeded the UMTRCA guideline of 20 $pCi/m^2/sec$. Therefore, radon flux control for slag does not need to be evaluated in the SFS. Exceedances of the soil to groundwater SSLs for several of the cap delineation borings in RU 22b likely were the result of fill being sampled instead of native soil. For the remaining two borings, the exceedances could be the result of 1) not collecting a sample of clean native soil (the soil sample had been mechanically mixed with fill material), 2) potential cross-contamination of fill materials in the split-spoon sampler or 3) residual pond sediments or other material in the sample interval. It is not clear which of these possibilities is most applicable. However, since the confirmation samples reported exceedances, the DQOs were not met. Additional sampling may need to be conducted to identify the native soil interface in RU22b-CAP-SB015 and RUB22b-CAP-SB017 to SB021. To meet the DQO, additional step-out borings from RU22b-CAP-SB0011 and RU22b-CAP-SB0022 would be required. Regardless, risk to the environment, specifically groundwater, is a potential due to presence of former unlined ponds in this RU that operated with a standing hydraulic head. Under a sustained head, there is a potential of subsurface contaminant migration to groundwater.

In addition, when alternatives are developed for RU 22b in the SFS, underground piping will be a consideration in those designs.

RU 22b will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the Old Phossy Ponds delineation, and Radon Flux SIA will all be considered during the evaluation of remedial alternatives. Underground piping also will be a consideration in the SFS alternatives development for RU 22b based on the findings described in Section 4.26.

Estimation of Fill Volume in RU 22b:

The cut and fill isopach model was used to determine total fill volume for RU 22b as presented in Table 4-2. However, unlike most other RUs, there were considerable cut and fill activities

within RU 22b (with the digging, filling, closing and covering of numerous ponds) over the life of the plant site. As there were relatively few RI and no SRI borings within RU 22b, the cut and fill isopach model was adjusted based upon historical documentation and site knowledge. Within RU 22b, there were 18 historic (or "old") unlined phossy ponds that had been used from 1954 through 1989. Ponds 00S, 0S, 3S, 6S, and 4E were used to contain phossy water and precipitator slurry. Ponds 1S, 2S, and 5S were used to contain phossy water only. Ponds 4S, 7S, 9S, and 10S were used to contain precipitator slurry only. Pond 7E was used to contain decant water from other ponds. Ponds 1E, 2E, 3E, 5E and 6E were used to contain phossy water and pond decant water.

All of these ponds were taken out of service by 1981 (except for Pond 10S, which was used until 1989) and allowed to dry. Ponds 00S, 0S, 1S, 2S, 3S, 4S, 5S, 6S, and 7S were covered with various fill materials from the plant including slag, baghouse dust, precipitator solids/prills, and/or native soil. Ponds 9S, 1E, and 4E were excavated to remove recoverable precipitator solids, which were sold as a byproduct (although some precipitator solids remain on the surface). These ponds were not covered. Ponds 2E, 3E, 5E, and 6E were excavated to remove recoverable precipitator solids (which were sold as a byproduct) and then fully or partially covered with the construction of the lined Phase IV ponds, Pond 8E and Pond 15S. Pond 7E was dried with no observable solids remaining (as this pond held decant water only). Pond 10S, a single-lined pond, remains uncovered with 2 to 5 feet of dried precipitator solids.

In order to calculate the total fill volume presented in Table 4-2 for RU 22b, it was assumed that the ponds in RU 22b were excavated into the original native surface to various depths as indicated in historical documents. The excavated material(s) were used to construct berms around the ponds. The ponds were then filled to approximately the original surface elevation. Once dried, the dried pond surface was assumed to be at or near the original surface elevation. The fill material volumes were derived from historical documents as presented in Appendix M of the *Remedial Investigation Report for the Eastern Michaud Flats Site* – August 1996. Volumes of the cover material(s) were determined using the cut and fill isopach model. Berm materials were assumed to be native soils mixed with other plant fill materials and were included in the total volume calculation. It should be noted that while fill materials and native soil mixed with fill materials have been included in the fill volume calculation, subsurface native soils impacted by pond water infiltration are not included in this calculation.

Within RU 22b, several ponds are presumed to have no remaining P4. While these ponds are included in the total fill volume calculation for RU 22b presented in Table 4-2, they do not contribute to the P4 volumes for RU 22b. These ponds and the reasons why they are presumed to contain no P4 are as follows:

- Ponds 00S and 0S received precipitator slurry and phossy water in the early years of plant operation but were reported to have been reclaimed back to the process for P4 recovery

- Pond 9S received precipitator slurry which was dried and reclaimed for precipitator dust sales. This pond remains uncovered and empty except for relatively small amounts of dried precipitator dust.

- Ponds 1E and 4E received precipitator slurry, phossy water and decant water from other ponds. These ponds were dried and reclaimed for precipitator dust sales. These ponds remain uncovered and empty except for relatively small amounts of dried precipitator dust.

- Ponds 5E, 6E and 7E received decant water from other ponds and did not accumulate appreciable solids (or P4). These ponds were dried and remain uncovered and empty except for relatively small amounts of dried precipitator dust.

- Ponds 2E and 3E received phossy water and decant water from other ponds. These ponds were dried and then partially excavated for the construction of Ponds 8E and the Phase IV Ponds (Pond 8E and the Phase IV Ponds were closed in accordance with RCRA hazardous waste management unit requirements and are included in the "RCRA Ponds" designated as RU22a).

Ponds 1S, 2S, 3S, 4S, 5S, 6S, 7S and 10S (all within RU 22b) are presumed to have significant amounts of P4 remaining in the fill. A P4 volume range is presented in Table 4-2 for these ponds using two methods. The minimum P4 volume is taken from historical documents estimating P4 remaining in ponds based upon P4 production rates and estimated losses. The maximum P4 volume is based upon an assumed percentage of P4 in the dried solids within each pond (again based upon process knowledge). The assumed percentage of P4 in the dried solids within each pond and the resulting calculated maximum P4 volumes (which are totaled to give the upper range volume of P4 of 10,800 tons for RU 22b in Table 4-2) are presented below:

- Pond 1S is assumed to have 1% P4 remaining in the pond solids resulting in an estimated 30 tons of P4 remaining. A low P4 concentration was used as this pond was reportedly reclaimed back into the process for P4 recovery;

- Pond 2S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 100 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids;

- Pond 3S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 1,070 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids;

- Pond 4S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 790 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids;

- Pond 5S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 1,000 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids;

- Pond 6S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 3,000 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids;

- Pond 7S is assumed to have 20% P4 remaining in the pond solids resulting in an estimated 4,420 tons of P4 remaining. A higher P4 concentration was estimated based upon historical records indicating a high concentration of P4 in Pond 7S.

- Pond 10S is assumed to have 10% P4 remaining in the pond solids resulting in an estimated 390 tons of P4 remaining. Process knowledge was used to estimate 10 % P4 concentration in the pond solids.

4.19 RU 22c: RAILROAD SWALE

4.19.1 Site Description

RU 22c is 2.4 acres in size and is located to the north of the P4 production areas along the northern boundary of the Plant Site, as shown on Figure 4-27. The Railroad Swale was designed as a stormwater collection pond, but also received releases of phossy water from spills within the RU 1 area. It was partially lined in 1993, during the performance of the EMF RI.

Historically, phossy water releases from the furnace building and phos dock (RU 1) resulted in probable P4 releases to the railroad swale area. Phossy water spills since the EMF RI may have introduced additional P4 above the liner in the railroad swale and/or to the unlined area east of the lined portion of the railroad swale. As with the old ponds (RU 22b), historic aerial photos were used to delineate the extent of ponded water in the railroad swale east of the lined area, which should ensure that the SRI has delineated past spills of process materials..

4.19.2 Problem Statement

The following field program was performed at RU 22c. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data characterizing the radiological and inorganic (metals, fluoride, and radionuclide) composition of surface and subsurface fill materials present in RU 22c were used to evaluate risks to potential receptors in this area.

- P4 Delineation - During the SRI, confirmation soil samples were collected along the railroad swale to delineate the extent of released P4.

The specific field activities for RU 22c associated with each of these field programs are summarized in Table 4-1.

4.19.3 Investigation Results

4.19.3.1 Risk Assessment

Samples were not specifically collected from RU 22c to evaluate risks to potential future workers, in part due to the documented presence of residual quantities of P4 in the subsurface beneath this RU that could spontaneously combust upon contact with air. While RU-specific

data were not collected, there is sufficient evidence to conclude that P4 is likely present in the subsurface of RU 22c at levels that exceed the worker SSLs defined for this COPC in the *SRI Work Plan*.

In addition to P4, potential future receptors could be exposed to COPCs/ROPCs in fill materials observed or known to potentially be present at the surface or shallow subsurface of RU 22c. As listed in Table 4-2, the predominant fill material within RU 22c is slag. Table 4-2 also identifies phossy solids as a potential source material incidental to slag and ore in RU 22c.

As shown in Table 4-4, antimony, arsenic, cadmium, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs to have been detected in any sample of the identified fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 22c. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at a concentration of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in the RU was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.19.3.2 P4 Delineation (RU 22c CAP)

Four trenches were excavated across the Railroad Swale and one soil boring was drilled to visually evaluate the shallow subsurface soil (0-to-10 feet bgs) for P4. The first step-out trench was located just to the east of the existing liner as depicted on Figure 4-27. The first two trenches, from west to east, encountered refusal in hard slag at depth of 3.5 and 4.5 feet bgs. No P4 was observed, based on the absence of any smoking or burning. The third trench encountered smoking material, presumably P4, from a depth of 9 feet bgs. The total depth of the third test pit was 10 feet bgs. There was no evidence of P4 in the fourth trench and native soil was encountered at 9 feet bgs. Figure 4-27 depicts the locations of these trenches and the soil boring installed at RU 22c.

Since the fourth trench did not encounter P4, a confirmation boring was drilled in the center of the swale, approximately 10 feet east of the fourth trench. Soil samples were collected from 0-to-2 feet bgs, 2-to-4 feet bgs, 4-to-6 feet bgs, 6-to-8 feet bgs, and 8-to-10 feet bgs and submitted to the laboratory for analyses of P4. The five samples from the confirmation boring reported non-detect for P4 as shown on Table 4-5.

4.19.4 Contamination Assessment

As shown in Table 4-43, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 22c are primarily associated with the soil ingestion and external exposure to gamma radiation pathways. Incremental cancer risks via the soil ingestion pathway, which are driven by lead-210 and polonium 210 levels in phossy solids (an incidental fill material), exceed the 1E-04 RAO specified in the 1998 ROD for potential future outdoor and indoor commercial/industrial workers. Incremental cancer risks via

the external exposure to gamma radiation pathway, which are primarily associated with radium-226 levels in ore (an incidental fill material) and potassium-40 levels in phossy solids, also exceed the 1E-04 ROD RAO for future outdoor and indoor commercial/industrial worker receptors.

Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for all worker receptors evaluated. In addition, the soil ingestion incremental non-cancer risks associated with cadmium levels in phossy solids exceed the 1.0 hazard index ROD RAO for potential future outdoor and indoor commercial/industrial workers and construction workers. Incremental non-cancer soil ingestion risks to construction workers also exceed a hazard index of 1.0 for arsenic in phossy solids. Finally, incremental non-cancer risks for cadmium exceed a hazard index of 1.0 for the fugitive dust inhalation pathway for future construction workers.

While not quantified in the Supplemental HHRA, the presence of residual P4 beneath RU 22c represents an unacceptable acute hazard to potential future receptors exposed to subsurface materials in this area. Receptors located downwind of RU 22c could also potentially be exposed to phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern.

No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Based on these results, the lateral extent of P4 in the Railroad Swale has been defined.

RU 22c will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the P4 delineation will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 22c:

The cut and fill isopach model was used to determine total fill volume for RU 22c as presented in Table 4-2. However, unlike most other RUs, there was a considerable amount of cuting and filling within RU 22c. The cut and fill isopach model was adjusted based upon site knowledge and SRI trenches/borings placed in RU 22c.

P4 was encountered in RU 22c during SRI trenching. A P4 volume range is presented in Table 4-2. The minimum P4 volume is based upon a calculated value assuming 1,000 ppm P4 in the RU 22c fill resulting in 4 tons of P4. The maximum P4 volume is based upon a calculated value assuming 2,500 ppm P4 in the RU 22c fill resulting in 10 tons of P4.

4.20 RU 23: ROAD SEGMENTS NOT WITHIN RU BOUNDARIES

4.20.1 Site Description

RU 23 includes all road segments not included within an existing RU boundary, as shown on Figure 4-28. Other roads that fall within an RU will be investigated as part of that RU. Most roads within the FMC Plant Site were constructed on a base of crushed and graded slag. Many of these roads were paved during the 1990's to reduce fugitive dust emissions.

Plant roads were constructed primarily of slag, placed upon native soils or upon fill materials existing on the surface at the time of road construction. Roads that were paved were constructed of a slag base and asphalt with a slag aggregate.

4.20.2 Problem Statement

The following field programs were performed at RU 23. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

The specific field activities for RU 23 associated with each of these field programs are summarized in Table 4-1.

4.20.3 Investigation Results

4.20.3.1 Risk Assessment Results

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 23 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements for the roads in RU 23 averaged 70,477 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 23 consist of slag and asphalt with slag aggregate. PCDT water residues are also identified as a potential source material incidental to the fill materials in Table 4-2.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the observed fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 23.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 23 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

4.20.3.2 SFS (RU 23 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 23 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types in which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 23 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. With the exception of one detection of cadmium above the soil to groundwater SSL, all other concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL as listed in Table 4-10. The cadmium concentration for the composite sample RU23-SFS-SBC004 was 8.16 mg/kg, compared to the soil to groundwater SSL of 8 mg/kg.

Fill Material. As summarized on Table 4-2, the surface of RU 23 is made up of slag and asphalt with slag aggregate. The subsurface fill materials consist primarily of slag, reworked native soil, and reworked native soil with slag. The native soil interface ranges between 2 feet and 20 feet bgs.

4.20.4 Contamination Assessment

As shown in Table 4-44, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 23 are driven by the external exposure to gamma radiation pathway. However, risks via this pathway, which are primarily associated with radium-226 in slag, are lower than the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future maintenance worker receptors using the RU 23 roads to access work locations. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Below the fill, metals, radionuclide, and fluoride results were not elevated above any future worker SSL or soil to groundwater SSL in three of the four borings. However, the exceedance of the cadmium soil to groundwater SSL in RU23-SFS-SBC004 will be considered in the SFS. Also, as discussed previously in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials (i.e., asphalt with slag aggregate) in RU 23, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 23 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 23 have not leached into underlying native soils above levels of concern and migration of these constituents to groundwater is not of concern. The cadmium exceedance appears to be an isolated exceedance and not the result of leaching of slag.

RU 23 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the findings of the SFS Data Collection will also be considered during the evaluation of remedial alternatives.

Estimation of Fill Volume in RU 23:

The cut and fill isopach model was not used to determine total fill volume for RU 23 as presented in Table 4-2. The volume of fill (primarily slag) was determined based upon an assumption that roads outside of RU boundaries were constructed of 1 foot of slag on native soil.

4.21 RU 24: PLANT AREAS NOT WITHIN RU BOUNDARIES

4.21.1 Site Description

This RU includes disturbed areas of the FMC Plant Site that are not associated with other RUs or SWMUs (see Figure 4-29). This RU excludes areas of the plant site that were not disturbed or that contain only non-impacted native soils (e.g., the southern and western undeveloped areas). Examples of areas included in RU 24 are those where slag or other fill material has been placed. Examples of areas not included in RU 24 are soil borrow areas and associated soil stockpiles.

Many areas of the plant site were not directly used for P4 production and were not included in the original RU identification. However, these areas may contain fill materials such as slag, phosphate ore, silica or other debris. Typically, these are graded level and were used for access throughout the plant site. These disturbed areas are encompassed with RU 24.

The EMF RI investigated the pipeline cleanouts located in RU 12, which also passed through RU 24. These pipelines transported phossy water and precipitator slurry to the ponds, where the solids were allowed to settle. The decant water from the ponds, referred to as Industrial Clarified Water, was returned to the process via other underground lines that paralleled the waste lines out to the ponds. Cleanouts were placed to access these pipes in the event they became clogged with solids. Inorganics and radionuclides were analyzed from soil samples collected around the pipeline cleanouts. The typical suite of phossy water constituents was detected in the shallow soil samples (cadmium, fluoride, zinc, orthophosphate, arsenic, and several trace metals). Borings were drilled to depths ranging from 7 to 25 feet bgs. A detailed review of the results of this investigation is presented in the *EMF RI Report*, Section 4.2, pages 97-106.

4.21.2 Problem Statement

The following field programs were performed at RU 24. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment - Data were collected to evaluate risks to potential receptors from exposure to radiological and inorganic (metals, fluoride, and radionuclide) constituents associated with residual surface and subsurface fill materials.

- SFS - Additional data were necessary to evaluate: 1) the depth and volume of fill, and 2) the extent to which fill constituents may have migrated into the underlying native soil.

- Underground Piping, Sumps, and Structures - The portion of the underground piping, sumps or other structures within RU 24 was identified based upon a review of drawings and diagrams during the SRI. Sufficient information regarding underground piping, sumps, and other structures (i.e., foundations) left behind in these RUs after decommissioning was needed to support the SFS.

The specific field activities for RU 24 associated with each of these field programs are summarized in Table 4-1.

4.21.3 Investigation Results

4.21.3.1 Risk Assessment Results

As shown on Figure 4-3, a gamma scan was initially performed over the entire surface of RU 24 to evaluate potential impacts associated with the external exposure to gamma radiation pathway, which was found to drive risks in the *Baseline HHRA*. The gamma scan measurements in RU 24 averaged 70,445 cpm, exceeding the calculated surface gamma radiation CV of 18,500 cpm, which is representative of EPA's upperbound potentially acceptable incremental lifetime cancer risk (3E-04) at CERCLA sites for the most highly exposed hypothetical receptor (future outdoor commercial/industrial worker).

Given that the upperbound CERCLA risk threshold was exceeded across the entire RU, no further RU-specific data were collected to evaluate risks, in accordance with the SRI data collection concept map described in Section 3. Instead, analytical data characterizing the composition of fill materials observed or known to potentially be present at this RU were used to bound risks to potential receptors via all viable exposure pathways. As listed in Table 4-2, the predominant fill materials present within RU 24 consist of slag, concrete foundations, asphalt with slag aggregate, and silica.

As shown in Table 4-4, radium-226, uranium-238 and lead-210 are the only COPCs/ROPCs that were detected in any sample of the identified fill materials at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Consequently, these three constituents were identified as COCs/ROCs to be incorporated into the Supplemental HHRA for RU 24.

The highest UCL concentration calculated for a COC/ROC within each of the fill materials identified in RU 24 was used to characterize the EPC for that COC/ROC in the Supplemental HHRA (Table 4-4), the findings of which are summarized in the Contamination Assessment.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 24 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in Section 4.26.

4.21.3.2 SFS (RU 24 SFS)

The SFS investigation was conducted because the gamma scan measurements exceeded the CV during the risk evaluation program. As the premise of the *SRI Work Plan* was that fill materials on the surface throughout the site had already been sufficiently characterized for COCs in previous investigations, the purpose of the SFS investigation was to determine the depth and volume of fill material across RU 24 and the extent to which constituents associated with the fill material have impacted underlying native soils. The spatial extent of the SFS borings in this RU and visual observations of the primary fill types also served to laterally delineate and characterize types of primary fill in this RU. Twenty (20) SFS borings were installed throughout the RU. At each of the 20 SFS boring locations, the type and depth of the fill material was visually determined and logged. Each boring was drilled until native soil was encountered, then one soil sample was collected from 0 to 2 feet bns. The 0-2 feet bns samples from five (5) soil borings were combined and composited to create one (1) composite soil sample. This resulted in a total of four (4) composite soil samples from the SFS program that were submitted for chemical analyses. The individual samples were combined into composite samples based on 1) their proximity (i.e., in the same general location) and/or 2) the similarity of fill types through which they were installed (e.g., borings installed through slag being composited together versus borings thru silica being composited together).

In addition, during the SFS field program five (5) additional borings were randomly paired with five (5) of the 20 primary borings. These were referred to as colocated borings. Using the sample compositing procedures described above, a single colocated composite sample was developed for the SFS field program at this RU. Table 4-9 correlates the individual soil borings

to the composite samples that were submitted during the SFS field program at each of the RUs where an SFS field program was conducted. The four (4) composite samples and one (1) colocated composite sample were submitted to the laboratory for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210 analyses.

The RU 24 SFS sample results were compared to future worker SSLs, the soil to groundwater SSL, and the slag reference area data. With the exception of one detection of cadmium above the soil to groundwater SSL, all other concentrations of metals, fluoride, and radionuclides were significantly below any future worker SSL or soil to groundwater SSL, as listed in Table 4-10. The cadmium concentration for the composite sample RU24-SFS-SBC003 was 11.1 mg/kg, compared to the soil to groundwater SSL of 8 mg/kg.

Fill Materials. As summarized on Table 4-2, the surface of RU 24 is made of up of slag, concrete foundations, asphalt with slag aggregate, and silica. The subsurface fill materials consist primarily of these surface materials as well as reworked native soil with slag. The native soil interface ranges between 2.5 feet and 13 feet bgs.

4.21.3.3 Underground Piping, Sumps, and Structures

The decision whether to remove, treat, or otherwise manage underground piping in RU 24 will be an SFS decision based on the detailed analysis of alternatives. In order to provide the SFS process with the appropriate information to evaluate the alternatives for underground piping, sumps, and structures in RU 24, the SRI anticipated a phased approach. During the SRI, the phase one task for the underground piping investigation in RU 24 was to identify available information regarding remaining piping, sumps and structures, including the piping, sump, and structure size, material of construction, and any process knowledge regarding the residuals expected to be remaining in the pipes, sumps, and structures. The phase one task was based upon review of existing drawings, construction records, operational logs, and plant personnel knowledge. The need to collect additional data concerning remaining pipes/sumps/structures was based on the outcome of all other data collection activities in RU 24 conducted during the SRI, i.e., whether RU 24 would proceed to the SFS. Since the surface gamma data exceeded the CV as discussed above, RU 24 was forwarded to the SFS and only a phase one task was required for the piping, sumps, and structures. Additional information regarding this study is provided in Section 4.26 and Appendix I.

4.21.4 Contamination Assessment

As shown in Table 4-45, the Supplemental HHRA determined that risks to potential future receptors from exposure to fill materials identified within RU 24 are driven by the external exposure to gamma radiation pathway. Risks via this pathway, which are primarily associated with radium-226 levels in slag (a predominant fill material), exceed the 1E-04 incremental cancer risk RAO for external gamma exposure specified in the 1998 ROD for future outdoor and indoor commercial/industrial worker receptors. No other COCs/ROCs carried forward into the Supplemental HHRA were found to be associated with incremental cancer risks or hazard indices in excess of the 1998 ROD RAOs for any exposure pathway. A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

As discussed for the SFS, metals, radionuclide, and fluoride levels were not elevated above any future worker SSL or soil to groundwater SSL in three of the four borings. The exceedance of the cadmium soil to groundwater SSL in RU24-SFS-SBC003 will be considered in the SFS. Also, as discussed previously in Section 4.16, evaluations at the reference area for slag, which is one of the primary fill materials (i.e., asphalt with slag aggregate) in RU 24, showed that metals, fluoride, and radionuclide constituents do not leach from slag into the underlying soil. Therefore, based on the reference area data, in conjunction with the RU 24 SFS composite sample results, it can be concluded that the constituents associated with fill materials in RU 24 have not leached into underlying native soils above levels of concern and migration of constituent to groundwater is not of concern. The cadmium exceedance appears to be an isolated exceedance and not the result of leaching of slag.

RU 24 will be forwarded to the SFS to evaluate remedial alternatives to address the risk management objective of reducing future worker exposures contributing to risks above RAOs. In addition to the Supplemental HHRA risk characterization, the SFS Data Collection findings will be considered during the evaluation of remedial alternatives. Underground piping also will be a consideration in the SFS alternatives development for RU 24 based on the findings described in Section 4.26.

Estimation of Fill Volume in RU 24:

The cut and fill isopach model was used to determine total fill volume for RU 24 as presented in Table 4-2.

4.22 SOUTHERN UNDEVELOPED AREA GAMMA STUDY

4.22.1 Site Description

The SUA of the FMC Plant OU is comprised of approximately 250 acres of land located to the south of the former working areas of the plant site. The surface of the SUA has not been disturbed, and was never used for operational processes or for storage of materials or waste. The SUA is situated in the northern end of the Bannock Range. Due to the differences in geological formations, this area has a higher level of background gamma radiation than those portions of the FMC Plant OU that are situated in the Michaud Flats (i.e., former working areas and the western undeveloped area) based on the 1987 EPA survey.

4.22.2 Problem Statement

The following field program was performed for the SUA investigation. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- PIC Measurement SIA - The gamma dose rate associated with the southern undeveloped region of the FMC Plant Site had not been adequately characterized.

The specific field activities conducted during the gamma investigation of the SUA are summarized in Table 4-1.

4.22.3 Investigation Results

One hundred PIC gamma dose measurement points for the SUA were identified on a standard grid cast on a random origin. Twenty (20) minute PIC measurements were made at each of the 100 measurement locations. The results of these measurements are provided in Table 4-46.

As previously discussed, the background gamma exposure rate is higher in the Bannock Range than the Michaud Flats, and ranges from 14.5 to 17 μR/h according to the 1987 EPA aerial survey. For purposes of the SRI, the mid-point of this range (15.75 uR/hr) was assigned to preliminarily screen against the background level. However, the *SRI Work Plan* stated that gamma emissions from natural geological features, such as rock outcrops, could cause locally elevated exposure rates that would warrant further consideration in interpreting the investigation findings.

In addition to rock outcroppings, several other factors have the potential to influence the PIC measurement results. Small deposits of slag were observed during implementation of the field measurements in several localized areas of the SUA. Specifically, an east-west trending slag road bisects the SUA. In addition, the slag pile (RU 19) is located directly adjacent to the northern edge of this area, and some slag was observed in the SUA near the slag pile. Finally, there is some uncertainty over the extent to which historical sloughing and/or shine from the Simplot gypstack, which is located to the east of the SUA, may have impacted nearby measurements. As discussed below, these anomalies were taken into consideration in evaluating the significance of the SUA PIC measurement results.

In the SUA data set, there were several small groups of elevated readings (i.e., greater than 15.75 uR/hr) identified on Figure 4-30. Group A lies along the northern end of the SUA. Measurements in this area appear to be influenced by gamma emissions (gamma shine) from the slag pile. Exposure rates in Group B, in the center of the SUA, appear to be influenced by a large, local rock outcrop. Measurements in Group C occur along the eastern edge of the SUA and appear to be elevated primarily due to the influence of local rock outcropping, rather than the Simplot Gypsum Stack (since the exposure rate at Measurement Location 98 is about 50% of those of the nearest readings to the north and south). The five points in Group D were located near the southeast corner of the SUA and again are likely to be influenced by local outcroppings.

4.22.4 Contamination Assessment

The PIC measurement results verify the EPA 1987 Aerial Gamma Survey. The elevated readings appear to be the result of disturbed areas, shine, slag roadways, and outcrops. The pattern of the elevated readings is not indicative of aerial deposition. Removal of these four groups of elevated readings discussed above from the SUA data set results in exposure rates ranging from 14.0 to 20.0, averaging 15.4 μR/h with a standard deviation of 1.0 μR/h. This mean value is within the background range reported for the Bannock Range. With anomalies removed from the SUA data set, the historically established (15.75 μR/h) and SRI exposure rates (15.4 μR/h) were similar.

The disturbed areas with slag (e.g., Group C), as well as the slag roadways, will be evaluated with RU 23 during the SFS. The area affected by shine from the slag pile (e.g., Group A) will be addressed with RU 19 during the SFS.

4.23 WESTERN UNDEVELOPED AREA GAMMA STUDY

4.23.1 Site Description

Background gamma exposure rates in the Pocatello area range from 11 to 17 μR/h according to the 1987 EPA aerial survey. Background levels in the flats and valley floor areas, which include the WUA, have been reported at 11 to 14.5 μR/h. Based on previous studies, as discussed in the *RI Update Memo*, a background level of 13 uR/hr was assigned to the northern and western regions of the FMC Plant Site.

4.23.2 Problem Statement

The following field program was performed for the WUA investigation. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- PIC Measurement SIA - The gamma dose rate associated with the western undeveloped region of the FMC Plant Site had not been adequately characterized.

The specific field activities for the WUA gamma investigation associated with this field program are listed in Table 4-1.

4.23.3 Investigation Results

For the WUA, 100 sampling points were identified by a standard grid cast on a random origin. Twenty (20) minute PIC measurements were made at each location. These measurements are listed in Table 4-46.

It was reported in the *SRI Work Plan* that the surfaces of the undeveloped areas on the FMC Plant Site have not been disturbed, and were never used for operational process areas, for storage of materials or waste, or as traffic ways. Several exceptions to this description were observed when conducting the SRI field measurements.

Slag was observed in localized areas of the WUA. Anomalies in the WUA data set were those measurements that appear to be influenced by gamma emissions from nearby slag associated with roads, which used slag for pond cap construction, and/or from slag at nearby proximity to the RCRA Ponds whose caps include a large slag layer. Measurement locations 8, 34, 43, 52, 59, 70, 75, 76, 80, 81, 84, 85, 88, 98, 99, and 100 in the WUA were located on or near slag roads as shown on Figure 4-31. Measurement location 61 is located among several small, isolated piles of slag remaining from road construction.

There also is an approximately 13.5 acre borrow pit in the center of the WUA. This borrow pit was created in 2004-2005 as a native soil source material for RCRA pond cap construction, and is approximately 15 feet deep at the center. Six of the PIC measurements (locations 32, 40, 41, 49, 50, and 51) as shown on Figure 4-21 in the WUA were collected within this borrow pit area.

4.23.4 Contamination Assessment

In order to evaluate gamma measurements in the WUA, it is necessary first to address anomalies in the data set. In the WUA, removing measurement locations 8, 34, 43, 52, 59, 61, 70, 75, 76, 80, 81, 84, 85, 88, 98, 99, and 100 is appropriate as these measurements were clearly impacted by slag on the surface near the measurement location. Removal of these measurements from the data set results in a data set of 83 measurements with exposure rates ranging from 13.5 to 16.3 μR/h, averaging 14.4 μR/h, and having a standard deviation of 0.6 μR/h. Although slightly above the assigned background of 13 uR/hr, this mean value is within the background range reported for valley floor areas (i.e., 11 to 14.5 μR/h).

Also, a comparison between the six measurements taken within the borrow pit area (which should be unimpacted because the surface soil was removed in 2005 after the plant operations ceased) to the remaining data set (i.e., 77 measurements) collected outside the borrow pit is appropriate. The mean of the measurements inside the borrow pit is 14.45 uR/hr and the mean of the measurements outside the borrow pit is 14.47 μR/h. This suggests that the gamma exposure rates from the surface of the borrow pit area (with 10 to 15 feet of material removed) and the undisturbed surface were very similar, indicating there has been no historical surface deposition that has increased gamma exposures in the SUA.

With anomalies removed from the WUA data set, the historically established and SRI exposure rates were similar. Observations collected during this investigation in the WUA suggests that an exposure rate of 14.4 μR/h is more realistic for the WUA than the regionally accepted background rate assumed in the *SRI Work Plan* of 13 μR/h. However, the disturbed areas with slag, as well as the slag roadway, will be evaluated with RU 23 during the SFS.

4.24 PCDT ROADWAY STUDY

4.24.1 Site Description

This investigation included plant roads within RUs. Many plant roads were built with a slag base to handle heavy equipment (slag haulers, etc.). During 2004 and 2005, treated effluent water from Ponds 8E, 15S, 16S, 18, 17 and Phase IV ponds was utilized for general dust control, primarily along roads, and for dust control in the pond closure construction area. The potential mass loading of PCDT constituents onto the roadways was evaluated in Appendix I of the *RI Update Memo*. As discussed in Appendix I, the PCDT water contained low concentrations of generally the same suite of constituents observed in slag, thus making an investigation of the impact of PCDT water on slag roadways difficult to perform.

PCDT water used for dust suppression on roads was most heavily applied on a slag road trending east-west within RU 20. Therefore, evaluation of this road segment in RU 20 is representative of a worst case scenario (i.e., road with the greatest application of PCDT water). PCDT dust suppression water was not applied to many road segments within the plant, and was never

applied to the slag haul road running north-south in the center of RU 19. Therefore, a road segment in RU 19 was selected as a reference area (i.e., a slag covered road with no PCDT water application).

4.24.2 Problem Statement

The following field program was performed for the PCDT roadway investigation. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- PCDT SIA - The potential impact of PCDT water application along roads within the FMC Plant Site had not been adequately characterized.

The specific field activities conducted during the PCDT roadway investigation are listed in Table 4-1.

4.24.3 Investigation Results

Two segments of roadway, the worst-case slag road segment in RU 20 and the slag road reference segment in RU 19, were selected for the PCDT study as shown on Figure 4-33. For each roadway segment, a total of eleven (11) surface slag samples were collected from 10 locations and one colocated location placed along the centerline of the roadway based on a random origin. A total of 22 surface slag samples were collected from 0 to 0.5 feet and were analyzed for metals, fluoride, radium-226, uranium-238, potassium-40, lead-210, and polonium-210.

Slag roadway samples from both the reference and PCDT roadways exceed the soil to groundwater SSLs for cadmium, chromium, polonium-210, selenium, and thallium as reported on Table 4-47. However, as discussed later in Section 4.16, other SRI data showed that these constituents do not leach from slag. Both road segments also reported detections of lead-210, radium-226 and uranium-238 above the commercial/industrial worker SSLs, construction worker SSL, and the soil to groundwater SSL.

Slag and PCDT water contain similar constituents, and slag is known to have metal and radionuclide constituents at levels above SSLs or background levels. Therefore, just analyzing for the presence of PCDT-related constituents (e.g., total metals) does not provide adequate data to support a decision regarding whether the application of PCDT water has impacted roadways. Therefore, statistical analyses were performed to compare the worst-case RU 20 PCDT road segment results with the RU 19 reference area data set. As shown in Table 4-48, concentrations of several constituents in the RU 20 worst-case PCDT road segment were statistically higher than the RU 19 slag reference roadway, including arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, lead-210, lithium, manganese, molybdenum, nickel, potassium-40, polonium-210, silver, thallium, vanadium, and zinc. However, concentrations of other metals and radionuclides in the RU 20 worst-case PCDT road segment dataset were less than or equal to corresponding concentrations in the RU 19 reference area roadway, including barium, fluoride, radium-226, selenium, uranium, and uranium-238.

Both the worst-case PCDT and reference area data sets were also compared to concentrations of metals and radionuclides reported in previous analyses of slag, as documented in the *RI Update Memo*. Concentrations of metals and radionuclides in slag varied somewhat over the history of the FMC Plant due to the natural variability of these constituents in the shale ore. Based on this comparison, several constituents in the RU 20 PDCT roadway appear to be within the normal observed variability of slag. The metals and radionuclides that appear to be within the normal variability of slag consist of beryllium, boron, cadmium, manganese, silver zinc, lead-210, polonium-210, and potassium-40. Constituents outside the observed normal variability of slag consisted of arsenic, chromium, cobalt, copper, lead, lithium, molybdenum, nickel, and vanadium.

4.24.4 Contamination Assessment

Due to the fact that several metals and radionuclides in the RU 20 PCDT roadway were statistically higher than the background or reference slag roadway in RU 19, the roadway that received PCDT water will be forwarded to the SFS. These PCDT roadways were included in RUs already are being forwarded to the SFS due the presence of slag and surface gamma radiation exceeding in CV of 18,500 cpm. There also is no difference between the PCDT roadways and other slag roadways in the surface exposures to future site workers.

4.25 PRECIPITATOR DUST/PHOSSY SOLIDS ROADWAY STUDY

4.25.1 Site Description

Plant roads were constructed primarily of waste slag, placed upon native soils or upon fill materials existing on the surface at the time of road construction. Paved roads were constructed using a slag base and asphalt with a slag aggregate. Until approximately 1992, precipitator dust/phossy solids may have been occasionally applied to roads during winter months for traction (as an alternative to salt) at the FMC Plant Site.

Both slag and precipitator dust/phossy solids contain constituents at levels above the applicable SSLs or background levels. However, the concentrations of these constituents in slag and precipitator dust/phossy solids were significantly different from each other (e.g., the concentration of lead-210 in precipitator dust/phossy solids is at least ten times greater than the concentration in slag). Therefore, as discussed in the *SRI Work Plan*, analyzing for the presence of constituents above the applicable CV will not provide adequate data to support a decision regarding constituents related to the presence of precipitator dust/phossy solids. However, the comparison of sample results from road segments potentially impacted by precipitator dust/phossy solids to road segments where precipitator dust/phossy solids was not utilized will provide data to support the decisions identified below.

Due the complexity of comparing the distributions of several constituents simultaneously to determine differences in two identified populations, lead-210 was selected for identifying the presence of precipitator dust/phossy solids in the roadway investigation. If precipitator dust/phossy solids were determined to be present during the SRI, based on the analysis of lead-210, then additional constituents would be analyzed.

To evaluate the potential presence of precipitator dust/phossy solids along the roadways, FMC selected six roadways segments for investigation that represent the worst case scenarios in which precipitator dust/phossy solids would have been applied for winter traction purposes. These were either high traffic areas or areas with a steeper grade where application of precipitator dust/phossy solids would have been useful to increase traction during winter conditions. A comparative roadway was identified in the remote southern region of the FMC Plant Site. This roadway is a slag based, unpaved road that was not used in the winter and had very little traffic during the remainder of the year. The section of this roadway that was evaluated is located in a relatively level area that would not have required the use of any traction materials, even if used during the winter months. Investigation areas selected for this study included four areas in RU 24, one area is in RU 3, one area is in RU 23, and the comparative road section discussed above that is located in the southern undeveloped area. Figure 4-32 depicts the locations of these areas.

4.25.2 Problem Statement

The following field program was performed for the Precipitator Solids Roadway Investigation. The problem statement that identifies the data gap for each program was defined by the *SRI Work Plan* and is set forth below.

- Precipitator Dust/Phossy Solids SIA - The purpose of this study was to determine if precipitator dust/phossy solids were applied on roads.

The specific field activities for precipitator dust/phossy solids roadway investigation associated with this field program are listed in Table 4-1.

4.25.3 Investigation Results

Ten borings were drilled in each of the six potentially impacted locations (PRECIP1 to PRECIP6) and the reference road location (PRECIP7), for a total of 70 borings. One paired colocated boring was installed in each of these investigation areas for a total of 7 colocated borings. These borings were located on a grid as shown on Figure 3-32. All of the roads surfaces were either slag, or asphalt with slag aggregate. Sample depths for the 77 samples ranged from 0.25 feet to 2 feet bgs, and all samples were submitted to the laboratory for analysis of lead-210. Sample collection depths were modified from those originally proposed in the approved *SRI Work Plan* based on knowledge gained during the SRI as described below.

Various depths of road bed materials were encountered during the SFS investigation in RU 23 (Road Segments not within RU Boundaries). Road bed materials ranged in depth from 6 inches to greater than 10 feet. Therefore, it was anticipated during this investigation that the depth of road base at the selected road precipitator dust sampling locations could range from six inches to over 2 feet. As this was a comparison study of roadbed materials in areas where precipitator dust may have been used on roadways to roadway where precipitator dust would not have been used, it was important to compare only fill materials in the comparison analyses, i.e., samples containing native soil would be biased low. The *SRI Work Plan* investigation called for sampling the 0-to-2 foot interval and thus many samples could have had up to 18 inches of native soil. These sample results could not have been legitimately compared to samples with 24 inches of fill material. Therefore, Field Modification #6 was proposed and approved by EPA, which

modified the study such that ten discrete samples were collected from each road segment, but only to a depth of 2 feet or down to the native soil interface if encountered prior to reaching the 2 foot depth in any one boring.

The concentration of lead-210 in the roadway samples ranged from 5 ± 1.2 pCi/g to 19.8 ± 4.8 pCi/g as listed in Table 4-49. As expected, all the samples were above the commercial/industrial worker SSL and soil to groundwater SSL of 3.03 pCi/g, due to the fact that the samples were comprised of slag or asphalt with slag aggregate. Several samples were above the construction worker SSL of 7.44 pCi/g.

However, the purpose of the study was not to compare the roadways to SSLs. The purpose was to compare each of the six roadways to the reference road (PRECIP7) and evaluate whether precipitator dust/phossy solids as indicated by lead-210 was applied to the roadways.

Statistical analysis was performed on each of the data sets as summarized in Table 4-50. Each of the six data sets was compared to the reference area data using the appropriate t-test or Wilcoxon Rank Sum (WRS) test. As shown in Table 4-50 the results of the six roadway areas (PRECIP1 to PRECIP 6) were found to be statistically less than or equal to similar to the reference area (PRECIP 7). In addition, the central tendency was evaluated by comparing the mean of the data sets. The mean lead-210 concentration ranged from 7.4 to16.8 pCi/g for PRECIP1 to PRECIP 6. The reference area (PRECIP 7) mean was 16.8 pCi/g.

4.25.4 Contamination Assessment

The six study areas were found to be not impacted by precipitator dust/phossy solids because these roadway areas lead-210 results were statistically less than or equal to the reference area lead-210 results. This finding is supported by data collected during the original EMF RI. During that work, several roadway samples were collected. With the exception of one boring (F101R) located on the western area of RU 22b, south of Pond 15S, no other roadway samples indicated the presence of precipitator dust or phossy solids. This boring reported that the near-surface soils in the vicinity of the boring were mixed with precipitator dust or phossy solids and slag. Based on typical site operations, precipitator dust or phossy solids would not have been used for roadway material. However, it is possible that roadways were constructed in areas where the surface material was precipitator solids/phossy solids (e.g., road on top of old phossy ponds or next to pond cleanout areas). Therefore, samples beneath roadways could contain precipitator dust/phossy solids. This is the most likely cause of the precipitator dust/phossy solids material observed at F101R.

As a result, precipitator dust application is not a driver for remediation and these road segments will not be evaluated in the SFS. However, it must be noted that the roadways within RU boundaries and within RU 23 be forwarded to the SFS and will be evaluated for remedial action based on their surface gamma radiation, which exceeds the gamma CV of 18,500 cpm.

4.26 UNDERGROUND PIPING, SUMPS, AND STRUCTURE SIA

After cessation of P4 production in December 2001, process operations were isolated and decommissioned. The decommissioning process involved decontamination of process equipment including process tanks and subgrade sumps (e.g., secondary condenser sump,

furnace building and phos dock P4 product tanks and sumps, furnace building and phos dock wastewater sumps, etc.) and removal/demolition of process areas and buildings down to the ground surface. Underground piping, electrical conduit, sumps, and other structures (e.g., building foundations, access tunnels, manholes, etc.) were left in place. In addition, there are several active underground piping and structure systems either in support of existing site activities (e.g., site water lines, sewer lines, RCRA pond cover systems) or within active right-of-ways (e.g., Chevron petroleum pipeline and El Paso Natural Gas Pipeline).

Abandoned underground piping and structures may still contain process materials, which have not been fully characterized. As a result, these abandoned underground piping/structures will need to be evaluated under the SFS process. Remedial alternatives will need to adequately address past and/or future potential releases of COCs/ROCs into subsurface soils. All such piping, etc, are found in RUs that will otherwise be evaluated in the SFS. It is envisioned that additional remedial alternatives for underground piping/structures that contained process materials (and thus presumably contain remaining COCs/ROCs) will be addressed during the SFS for affected RUs. It is currently anticipated that these alternatives will include the following:

- Removal of the piping/sumps/structures from the subsurface during remedial action, sampling of subsurface soils to delineate past releases of COCs/ROCs, removal of contaminated soils, and confirmation soil sampling to demonstrate clean removal.

- Investigation sampling of the piping/sumps/structure media and surrounding soils to demonstrate the lack of COCs/ROCs and/or past releases and leave in-place.

- Incorporate the presumed existence of COCs/ROCs within the piping/sumps/structures into the remedial design, e.g., a RCRA cover, and leave in place.

In addition to the concern of past or future releases of COCs/ROCs presumed to be present in underground piping/sumps/structures, their physical presence may impact remedial alternatives and thus must be considered during the SFS. Examples include:

- Existing foundations or sumps may impact the design of a cap/cover system

- Existing underground piping may act as a conduit under the edge of a cap/cover system

- Existing underground structures such as access tunnels must be considered for cap/cover loading

Active underground piping/conduits, e.g., site water/sewer lines, active electrical lines, gas and petroleum pipelines, and property easements must also be considered for remedial alternative evaluation, selection and design.

For these reasons, an inventory of abandoned-in-place piping, conduit, sumps, and structures as well as active piping and conduit was deemed necessary for performance of the SFS.

4.26.1 Site Description

Based upon preliminary information, RUs 1, 2, 3, 12, 13, 22b, and 24 were identified as potentially containing underground piping/sumps and structures abandoned in place. During the course of developing the inventory, piping/sumps/structures were also identified in RUs 4, 7, 8, 9, 11, and 20. Abandoned piping/sumps/structures included the following:

- Underground electrical conduit
- Plant process water (makeup water) and drinking water piping from production wells
- Plant natural gas piping
- Phossy water piping (potentially containing COCs associated with P4)
- Precipitator slurry piping (potentially containing COCs/ROCs associated with precipitator dust)
- Slag pit dewatering piping (potentially containing COCs/ROCs associated with slag, P4 and precipitator dust)
- Industrial clarified water (ICW) piping (potentially containing COCs associated with P4)
- Non-contact cooling water piping (Industrial Waste Water or IWW)
- Storm drain piping (potentially containing COCs associated with P4)
- Sanitary sewer lines
- Chemical waste drain line (COCs associated with laboratory solvents and reagents)
- Transformer oil pipelines (COCs associated with petroleum and PCBs)
- Condensate wastewater
- Building and equipment foundations
- Process sumps (potentially COCs/ROCs associated with P4 and precipitator dust)
- Open tunnels (associated with ore handling)

Active underground piping and conduit include the following:

- Underground electrical conduit in support of the RCRA pond cover systems (RU 22a) and production well No. 3 (RU 24)
- Underground drinking water piping in support of the scale house (RU 20) and the Training Center (RU 3)

- Underground Chevron petroleum pipeline
- Underground El Paso natural gas pipeline supplying J.R. Simplot (RUs 14 and 24)
- Underground storm drain lines (RUs 1, 3, 4 and 24 discharging to RU 22c)
- Underground sewer lines from the Training Center (RUs 4 and 24 to the Pocatello POTW lines)

4.26.2 Problem Statements

The problem statement that identifies the data gap for each underground piping/sump/structure investigation program was defined by the *SRI Work Plan* and is set forth below.

- Risk Assessment – Data characterizing the radiological and inorganic (metals, fluoride, and radionuclide) composition of the precipitator solids and phossy solids present within the precipitator slurry and phossy water underground piping runs were also used to quantitatively evaluate potential risks from exposure to these types of underground piping in the Supplemental HHRA. In addition, chronic and sub-chronic risks associated with P4, potentially present in precipitator slurry, phossy water and carbon monoxide underground piping, were conservatively evaluated assuming non-smoking P4 is present at a concentration of 3,000 mg/kg. Potential acute risks associated with exposure to P4 in underground piping were qualitatively evaluated.

- RUs 1 and 2 - The portion of the piping and sump system within RUs 1 and 2 was not evaluated during the remedial investigation. Sufficient information regarding underground piping, sumps, and other structures left behind in these RUs after decommissioning is needed to support the SFS.

- RU 3 - The storm drain and underlying soil may contain P4, metals and fluorides from storm water collected from the furnace and phos dock area. This portion of the piping within RU 3 was not evaluated during the remedial investigation. Sufficient information regarding underground piping, sumps, and other structures left behind in these RUs after decommissioning is needed to support the SFS.

- RUs 12, 13, and 24 - The portion of the underground piping, sumps or other structures within RU 12, RU 13, and RU 24 was not evaluated during the remedial investigation. Sufficient information regarding underground piping, sumps, and other structures left behind in these RUs after decommissioning is needed to support the SFS.

- RU 22b - The portion of the piping and sump system within RU 22b was not evaluated during the remedial investigation. Sufficient information regarding underground piping, sumps, and other structures left behind in these RUs after decommissioning is needed to support the SFS.

As mentioned above, during the course of developing the inventory, piping/structures were also identified in RUs 4, 7, 8, 9, 11, and, 20. However, problem statements and investigations were

not developed for these RUs in the *SRI Work Plan*. The specific activities for the underground piping investigation associated with this field program are listed in Table 4-1.

4.26.3 Investigation Results

4.26.3.1 Risk Assessment

Due to practical limitations, samples were not collected during the SRI to evaluate conditions adjacent to and beneath remaining underground pipelines present across the FMC Plant Site. However, it is known that residual P4, which has the potential to spontaneously combust upon contact with air, may be present within the underground piping historically used to transport precipitator slurry, phossy water and carbon monoxide across the site. Additional COCs/ROCs are also present in the precipitator slurry and phossy water piping runs (i.e., precipitator and phossy solid-related COCs/ROCs).

As shown in Table 4-4, antimony, arsenic, cadmium, lead, radium-226, uranium-238, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in any sample of precipitator solids at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. Similarly, as shown in Table 4-4, antimony, arsenic, cadmium, lead-210, polonium-210 and potassium-40 comprise the COPCs/ROPCs that were detected in any sample of phossy solids at a concentration that exceeds both regional background and any of the worker SSLs shown in Table 4-3. As also shown in Table 4-4 and discussed in Section 5 of the Supplemental HHRA, non-smoking P4 was assumed to be present at a concentration of 3,000 mg/kg to conservatively characterize potential chronic and sub-chronic hazards associated with exposure to this COC.

The highest UCL concentrations associated with the precipitator slurry underground piping and, separately, the phossy water underground piping, were used to characterize the EPC for that COC/ROC in the Supplemental HHRA of underground piping (Table 4-4). The findings of the Supplemental HHRA are summarized in the Contamination Assessment.

4.26.3.2 Underground Piping, Sumps and Structures Inventory

Although most of the operational records generated throughout the plant operation no longer exist, the underground piping/sump/structure inventory was created utilizing the following sources of information:

- Historical plant drawings
- Historical and current aerial photos and maps
- Field observations and surveys
- Interviews with personnel knowledgeable about the historical plant operations

The inventory of active and abandoned piping/sumps/structures on a site-wide and RU by RU basis is provided in Table 4-51. It is noted that pipes and conduit less than three-inches in diameter would not have carried process materials, and therefore, were not included in the

inventory. Appendix I provides additional information supporting the underground piping and structures inventory including Figures I1 through I6 showing underground piping and structures on an RU-by-RU basis and a series of drawings which plot the location of all identified piping/sumps/structures (Drawing Sheets 0 to 11). Most of the remaining underground piping consists of inert materials that do not pose a future threat of release of COCs into subsurface soils. These include:

- Well/fire/process (makeup water) water lines
- Drinking water lines
- Natural gas lines
- Condensate return lines
- LDR lines never put into service
- Electrical conduit
- Sanitary sewer lines

However, some underground piping potentially could contain materials that could pose a threat of release of COCs as result of the materials conveyed. These include:

- Phossy water lines (includes ICW lines)
- Precipitator slurry lines
- Slag pit dewatering lines
- CO lines (containing condensed P4)
- Some non-contact cooling water drain lines (IWW drain lines)

These underground piping runs are shown on Figure 4-34 with the exception of the IWW drain lines. The IWW drain and return lines are shown in the inventory and drawings included in Appendix I. Based on operational use, the IWW drain lines would not be suspected to contain process related COCs. However, based on observations of the condition of the IWW drain line manholes (accumulation of solids, potentially from surface run-in) and piping (corrosion and potential for unintended cross-contamination from other sources) within RU 1, the IWW drain lines have been included on the list for consideration during the SFS.

4.26.4 Contamination Assessment

Any leaks of residual P4 from underground pipe lines historically used to transport CO, precipitator slurry and phossy water across the FMC Plant Site would represent a potentially unacceptable acute hazard to future receptors exposed to subsurface materials adjacent to these lines. Receptors located downwind of these pipelines could also potentially be exposed to

phosphoric acid aerosols, associated with P4 combustion, at concentrations of acute health concern if the subsurface materials were to become exposed to air.

In addition to acute P4 hazards, receptors exposed to subsurface leaks from precipitator slurry lines, i.e. utility workers, could also be sub-chronically exposed to P4 and other COCs/ROCs associated with precipitator solids. As shown in Table 4-52, the Supplemental HHRA determined that risks to utility workers from exposure to precipitator solids associated with underground pipelines used to transport precipitator slurry are below the 1E-04 RAO specified in the 1998 ROD for potential future workers. Incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for utility workers. Incremental non-cancer risks for all other COCs/ROCs and exposure pathways are below the 1.0 hazard index RAO specified in the 1998 ROD.

With respect to leaks from phossy water underground lines, receptors could be exposed to phossy solids in addition to P4. As shown in Table 4-53, the Supplemental HHRA determined that incremental non-cancer risks via the soil ingestion pathway, which are driven by the assumed presence of non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index ROD RAO for utility workers. Risks to utility workers from exposure to other COCs/ROCs associated with leaks from underground phossy water pipelines are below the 1E-04 and the 1.0 hazard index RAOs specified in the 1998 ROD.

A comprehensive discussion of the methods and assumptions that were used to perform the Supplemental HHRA is provided in Appendix J.

Although specific sampling to determine releases of COCs/ROCs from piping/sumps/structures to subsurface soils was not performed as part of the SRI, the inventory created will be valuable in performing the SFS. The following presumptions will be applied during the SFS at each RU where piping/sumps/structures are identified:

- For abandoned underground piping, sumps, storm drains or structures that contained or were in contact with process streams (e.g., elemental phosphorus, phossy water, precipitator slurry), the presumption will be that the piping or sump has released the process material (and associated COCs/ROCs) into the surrounding subsurface soils and has the potential to act as a conduit of COCs/ROCs from one location to another into the surrounding subsurface soils.

- For abandoned underground piping that contained well/fire/process (makeup water), drinking water, condensate water, or natural gas, the presumption will be that the piping and pipeline corridor may act as a conduit for water to infiltrate from one location to another, but would not have been a source of historical release into the surrounding subsurface soils.

- For abandoned underground electrical conduit, the presumption will be that the piping and pipeline corridor may act as a conduit for water to infiltrate from one location to another, but would not have been a source of historical release into the surrounding subsurface soils.

- For abandoned building and equipment foundations, the presumption will be that the foundation will remain in place and will be incorporated into the remedial alternative design, as appropriate.

- For abandoned open access tunnels, the presumption will be that the access tunnel will remain in place or be filled-in depending on the remedial alternative design, as appropriate.

- For active pipelines, sewer lines, water lines, and electrical conduit, the presumption will be that these will remain in place and active.

- For active pipelines/utilities subject to easements (e.g., Chevron and El Paso Gas pipelines), these lines will remain in place pursuant to the respective easement agreements.

Estimation of P4 Volume in Underground Piping:

The underground pipe inventory presented in Appendix I was utilized to develop an estimate of the volume of residual P4 potentially present in underground pipelines at the plant site. The underground pipes that may potentially contain residual P4 are:

- Phossy water lines;

- Precipitator slurry lines;

- Phosphorus (P4) lines;

- CO line; and,

- Stormwater piping from the Phosphorus Dock Area to the Railroad Swale (RUs 1, 3, 7, 24)

Based on plant operational knowledge regarding the use of these lines and the observed conditions during historic maintenance and removal of aboveground segments of phossy water/precipitator slurry lines and CO lines, a volume estimate was developed for 1) Phossy water, precipitator slurry and P4 lines collectively, 2) CO line, and 3) Stormwater piping from the Phosphorus Dock Area to the Railroad Swale. The basis for the estimated volume is provided below:

<u>Phossy water, precipitator slurry and P4 lines</u>

The P4 volume was estimated for these pipes collectively due to general proximity of these lines within the furnace building and slag pit (RUs 1 and 2) and leading out to the phossy ponds area (RU 22b). A void volume within the pipelines was calculated using the diameter and total length of each pipe identified in Appendix I. Although some of these pipes were probably abandoned due to plugging that could not be cleared, plant experience (again, based on removal of aboveground segments of phossy water/precipitator slurry lines) that plugs typically occurred in low points and/or angles (turns) in the pipelines, not uniformly within the entire pipeline. The

plugs typically included a mixture of phossy/precipitator solids and agglomerated P4. However, to provide a conservative estimate, half the volume of the pipes was assumed full of phossy solids or precipitator slurry and the P4 concentration in the residual phossy material was assumed to range from 2 to 20 percent P4. The estimated residual P4 volume in all identified underground phossy water, precipitator slurry and P4 lines ranged between 2.8 and 28 tons. This estimate does not include the weight of the residual non-P4 solids or the weight of the pipe. The P4 volume estimate does not include potential leakage or loss at pipeline cleanouts (from maintenance) that likely occurred but are not quantifiable.

CO line

The void volume within the CO line was calculated using the diameter and total length identified in Appendix I. The use and operation of the old underground CO line would be similar to the aboveground CO line that was in operation until plant shutdown and removed during the plant decommissioning. P4 was encountered as a thin layer in the invert of the CO line and, similar to the phossy/precipitator slurry lines, tended to be encountered at low points and turns in the pipeline; however, the CO lines never plugged with P4 because of gas velocity and typical gas temperature above the freezing point of P4. Therefore, a range of 1 to 10 percent of the pipe volume is reasonable. In the CO line, any residual material would be high concentration P4 with minor particulate solids and the residual was assumed to be essentially 100% P4. The residual P4 volume in the CO line was estimated to range between 0.2 and 1.8 tons.

Stormwater piping from the Phosphorus Dock Area to the Railroad Swale (RUs 1, 3, 7, 24)

The void volume within the of the stormwater piping in the Phosphorus Dock area leading to the railroad swale was calculated using the diameter and total length identified in Appendix I. These pipes primarily conveyed stormwater, but were also know to have intercepted spilled phossy water from the phosphorus dock operations and transported that phossy water and entrained P4 to the railroad swale. There is no operational or historical knowledge that these pipes plugged, but some segments of the pipe may have accumulated dirt, and possibly phossy solids and particulate P4 from historic dock spills. Assuming that the entire length of pipe is 20 percent full with dirt / solids and the P4 concentration in the dirt ranges from 1 to 5 percent, the residual P4 volume in the stormwater piping was estimated to range between 0.13 and 0.6 tons. This estimate does not include the weight of the residual non-P4 solids or the weight of the pipe.

4.27 FILL CHARACTERIZATION

4.27.1 Site Description

Based on discussions with EPA during the SRI in August 2007, an additional investigation was undertaken to obtain data to more fully characterize the composition of the following five FMC Plant Site fill materials: precipitator solids, phossy solids, calciner solids, kiln solids and phosphate ore. The purpose of this sampling event was to obtain analytical data for these targeted fill materials for use in the bounding Supplemental HHRA. More specifically, and as discussed comprehensively in the Supplemental HHRA (Appendix J), the data from this investigation were used, in conjunction with historical data for these and other types of fill material, to bound risks to potential future receptors from exposure to the fill materials observed

to be present within each RU. For example, analytical data for phosphate ore are used to characterize EPCs in the Supplemental HHRA for RUs in which surficial or sub-surface ore was observed during the SRI field activities. In cases where two or more fill materials of concern are identified in an RU, the data for the fill material containing the highest concentration of each constituent of concern are used to provide the most conservative risk characterization.

4.27.2 Problem Statements

The problem statement that identifies the data gap for each fill characterization program was defined by the *SRI Work Plan Addendum* (submitted October 12, 2007[2]) and Field Modification #5 for fill characterization and is summarized below.

Fill Characterization - The objective of the proposed fill characterization sampling was to collect samples of the following specific source materials:

- Precipitator solids
- Phossy solids
- Calciner solids
- Kiln solids
- Phosphate ore

The fill samples collected during this program were analyzed for the following COPCs/ROPCs: gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. The samples were collected under EPA contractor oversight and the sampling team was accompanied by members of the Shoshone-Bannock Tribes, who broundt an XRF and field screened data. XRF data has not been provided to FMC.

The specific activities performed during the Fill Characterization investigation are listed in Table 4-1.

4.27.3 Investigation Results

RUs known to contain the fill materials targeted for collection were selected for sampling during the field investigation. A backhoe, drill rig, hand auger, and shovel were used to collect the targeted fill samples. The following sections discuss the specific activities that were necessary to collect representative samples of each of the targeted fill types, and present the corresponding analytical results. Figure 4-35 presents the fill characterization sample locations for each targeted fill type.

[2] Several of the specific activities described in the Fill Characterization Addendum submitted on October 12, 2007 were revised based on field conditions encountered during sampling on October 31 and November 1, 2007. The revised sampling plan was submitted to the EPA on November 28, 2007 and is documented as part of Field Modification #5 in Appendix G.

4.27.3.1 Precipitator Solids Investigation (RU 22b SIA1)

Precipitator solids are known to contain relatively high concentrations of certain metals (e.g., zinc) and alpha-emitting radionuclides compared to other source materials at the FMC Plant Site. Therefore, hand held instruments, including an XRF instrument and alpha detector, were used to locate this material in the field.

A test pit was advanced at RU22b to 10 feet bgs adjacent to the location of EMF RI boring F056. Black pond sediment material was identified at depths below approximately 8 feet bgs. Two discrete samples were collected from the backhoe bucket at depths of 8 and 10 feet bgs. These samples of precipitator solids were submitted for laboratory analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. In addition, two split samples were collected by EPA.

Samples of precipitator dust also were to be collected from locations near EMF RI borings F058B and F059B. However, at the location of F058B, a test pit was advanced down to the limit of the backhoe being used (11 feet) without hitting the target material (precipitator solids). Based upon visual evidence, only slag was encountered in this test pit, and no samples were collected. After conference with the regulatory oversight group, the EPA contractor and MWH decided to abandon the investigation at F058B and nearby F059B. Instead, samples were collected from two previously identified backup locations, as described below.

Pond 10S Sampling. After field screening with the XRF and alpha detector, it was agreed by all parties that the material in Pond 10S was consistent with the target material. One composite sample was collected, consisting of four individual samples collected using a shovel to a depth of one foot below the surface. The four individual samples were composited using SOP-16A from the *SRI Work Plan*. A composited sample from Pond 10S was submitted for laboratory analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. In addition, a split of the Pond 10S composite sample was collected by EPA.

Area of EMF RI Boring B1. After field screening using the XRF instrument only, it was agreed that the material at the surface near EMF RI Boring B1 was consistent with the target material. A sample location was selected approximately 250 feet due east of Boring B1. One discrete sample was collected at a depth of 0 to 1 foot below the surface using a stainless steel spoon. The sample was submitted for laboratory analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. In addition, a split sample was collected by EPA.

Area of EMF RI Boring B2. After field screening using the XRF instrument only, it was agreed that the surface material near Boring B2 was consistent with the target material. One discrete sample was collected using a stainless steel spoon and shovel to a depth of 0 to 1 foot below the surface. The sample was submitted for laboratory analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. A split sample was collected from this interval by EPA.

Summary:

Concentrations of antimony, arsenic, cadmium, lead, lead-210, polonium-210, potsassium-40, radium-226, thallium, and uranium-238 were reported above worker SSLs were reported in several of the precipitator solid samples collected. Table 4-54 presents a summary of the metals and radionuclides detected in the collected samples and the EPA split sample data.

Comparative values were not established for gross alpha and gross beta in the *SRI Work Plan* as these parameters were not part of the SRI suite of ROPCs. However, at EPA's request, the samples collected during the Fill Characterization study were analyzed for these parameters. The gross alpha values from the 5 samples ranged from 157 pCi/g at the 10-foot bgs sample collected near EMF RI boring F056B to 270 pCi/g at Pond 10S. The gross beta values ranged from 474 pCi/g at the 8-foot bgs sample collected near EMF RI boring F056B to 730 pCi/g at Pond 10S.

Split sample data collected by the EPA are provided in Appendix D. Metals and radionuclide data from the split data were generally consistent with the primary samples and verify the representativeness of these analytical results.

4.27.3.2 Phossy Solids Investigation (RU 22b SIA1)

The investigation near the location of F025B was performed using a drill rig and split-spoon samplers as described below. A thin band of gray material was encountered in the split-spoon sampler at depths of approximately 10 to 14 feet bgs. Field screening was performed using an XRF and alpha detector. The oversight group agreed that the material in the boring drilled near F025B was consistent with the target material (phossy solids). After conferencing, the EPA contractor decided to collect just one sample instead of two samples because there wasn't much material recovered from the thin layer of the target material in the split-spoon samplers.

Therefore, one composite soil sample was collected using the target material collected from the 10 to 12 feet bgs and 13 to 14 feet bgs sample intervals. The sample was submitted to a laboratory for analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. In addition, a split sample was collected by EPA.

The phossy solids sample reported concentrations of cadmium, lead-210, polonium-210, and potsassium-40 above worker SSLs. Table 4-54 presents a summary of the metals and radionuclides detected in the collected samples and the EPA split sample data.

Comparative values were not established for gross alpha and gross beta in the *SRI Work Plan* as these parameters were not part of the SRI suite of COCs/ROCs and COPCs/ROPCs. However, these analyses were evaluated for the Fill Characterization study. The gross alpha value from the F025B samples was 53.5 pCi/g and the gross beta value was 79 pCi/g.

The split sample data collected by the EPA are provided in Appendix D. Metals and radionuclide data from the split data were generally consistent with the primary sample and verify the representativeness of these analytical results.

4.27.3.3 Calciner Solids Investigation (RU 16 SIA1)

The fill characterization study for collection of calciner solids within RU 16 involved collecting calciner solids near locations that would be drilled during later phases of the SRI. Proposed soil boring locations SB003 (northern area) and SB004 (southern area) were targeted for this additional investigation. Field Modification #5 explained the locations and procedures that would be followed during this investigation.

Southern Area Samples. A single boring was drilled near (SB004) and encountered native soil at 3 feet bgs. Based upon visual and XRF evidence, the fill material in the 0-3 feet bgs interval appeared to be consistent with the target material (calciner solids). After conference with the oversight group, the EPA contractor and MWH decided to collect just one sample for analysis instead of two samples at this boring location due to the shallow depth of the fill material and the lack of material from this boring. A second sample location (SS001) was selected about 50 feet to the southwest of the first sample location based upon visual and XRF evidence. A surface soil sample was collected using a stainless steel spoon and submitted for analysis. The two southern area samples (RU16-SIA1-SB004A and RU16-SIA1-SS001) were submitted to a laboratory for analysis of radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, metals. Split samples were collected by EPA from each of these samples.

Northern Area Sample. After advancing the boring near the proposed northern area sample location (SB003) to 10 feet, reworked native and fill materials were encountered. The XRF results did not support that the materials were calciner solids; therefore, no sample was collected. As per the Field Modification #5, an alternate site was selected based on visual observations. A surface sample (SS002) was collected nearby aimed at collected calciner solids. The northern area sample (RU16-SIA1-SS002) was submitted to a laboratory for analysis of radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. EPA did not collect a split sample of the surface material as XRF results were not consistent with the target material.

The three calciner solid samples have concentrations of arsenic, cadmium, lead-210, polonium-210, potsassium-40, radium-226, thallium, and uranium-238 above worker SSLs. Table 4-54 presents a summary of the metals and radionuclides detected in the collected samples and the EPA split sample data.

Comparative values were not established for gross alpha and gross beta in the *SRI Work Plan* as these parameters were not part of the SRI suite of COCs/ROCs and COPCs/ROPCs. However, these analyses were evaluated for the fill characterization study. The gross alpha values ranged from 81 pCi/g at SS001 to 126 pCi/g at SB004. The gross beta values ranged from 77 pCi/g at SS002 to 114 pCi/g at SB004.

Split sample data collected by the EPA are provided in Appendix D. Metals and radionuclide data from the split data were generally consistent with the primary samples and verify the representativeness of these analytical results.

4.27.3.4 Kiln Solids Investigation (RU 8 SIA1)

The kiln solids investigation at RU 8 was attempted. Based upon visual and XRF evidence; however, kiln solids were not encountered and no samples were collected. The first boring

encountered reworked native soil to a depth of 6 feet bgs and native soil at a depth of 6 feet bgs. As kiln solids were not encountered in the first boring, a second boring location was selected approximately 2.5 feet due west of the first boring. Samples collected at 2.5 to 6 feet appeared to be reworked native soil. Field screening of this material using XRF analysis indicated only slightly elevated levels of lead (Pb-106). After conference with the oversight group, the EPA contractor decided that the sampled material was not consistent with the target material (kiln solids). Therefore, a sample was not collected at the second boring for analysis.

A third boring was drilled approximately 70 feet due east of the first boring location in an attempt to find kiln solids in the third kiln pond. Again, reworked native soils were encountered down to 6 feet bgs, at which point native soil was encountered. Based upon visual evidence, no kiln solids were encountered in the third boring and no sample was collected for analysis. It was decided that the kiln pond solids likely were removed after closure of the kiln and kiln ponds. After conference with the oversight group, the EPA contractor and MWH decided that kiln solids could not be found and the investigation was abandoned.

4.27.3.5 Ore Investigation (RU 7 SIA1)

Using a hand auger, four separate locations were sampled from a depth of one to two feet below the surface of the ore stockpile in RU 7. These four locations were at the western end of the southern ore stockpiling trench, a location known to contain raw ore. The four individual samples were composited into one sample according to SOP-16A from the *SRI Work Plan*. The sample was submitted to a laboratory for analysis of gross alpha, gross beta, radium-226, uranium-238, potassium-40, lead-210, polonium-210, fluoride, and metals. In addition, a split sample was collected by EPA.

As presented on Table 4-54, the ore sample reported concentrations of arsenic, cadmium, lead-210, radium-226, and uranium-238 above worker SSLs. Table 4-54 presents a summary of the metals and radionuclides detected in the collected samples and the EPA split sample data.

Comparative values were not established for gross alpha and gross beta in the *SRI Work Plan* as these parameters were not part of the SRI suite of COCs/ROCs and COPCs/ROPCs. However, these analyses were evaluated for the fill characterization study. The gross alpha value from the RU 7 ore sample was 194 pCi/g and the gross beta value was 116 pCi/g.

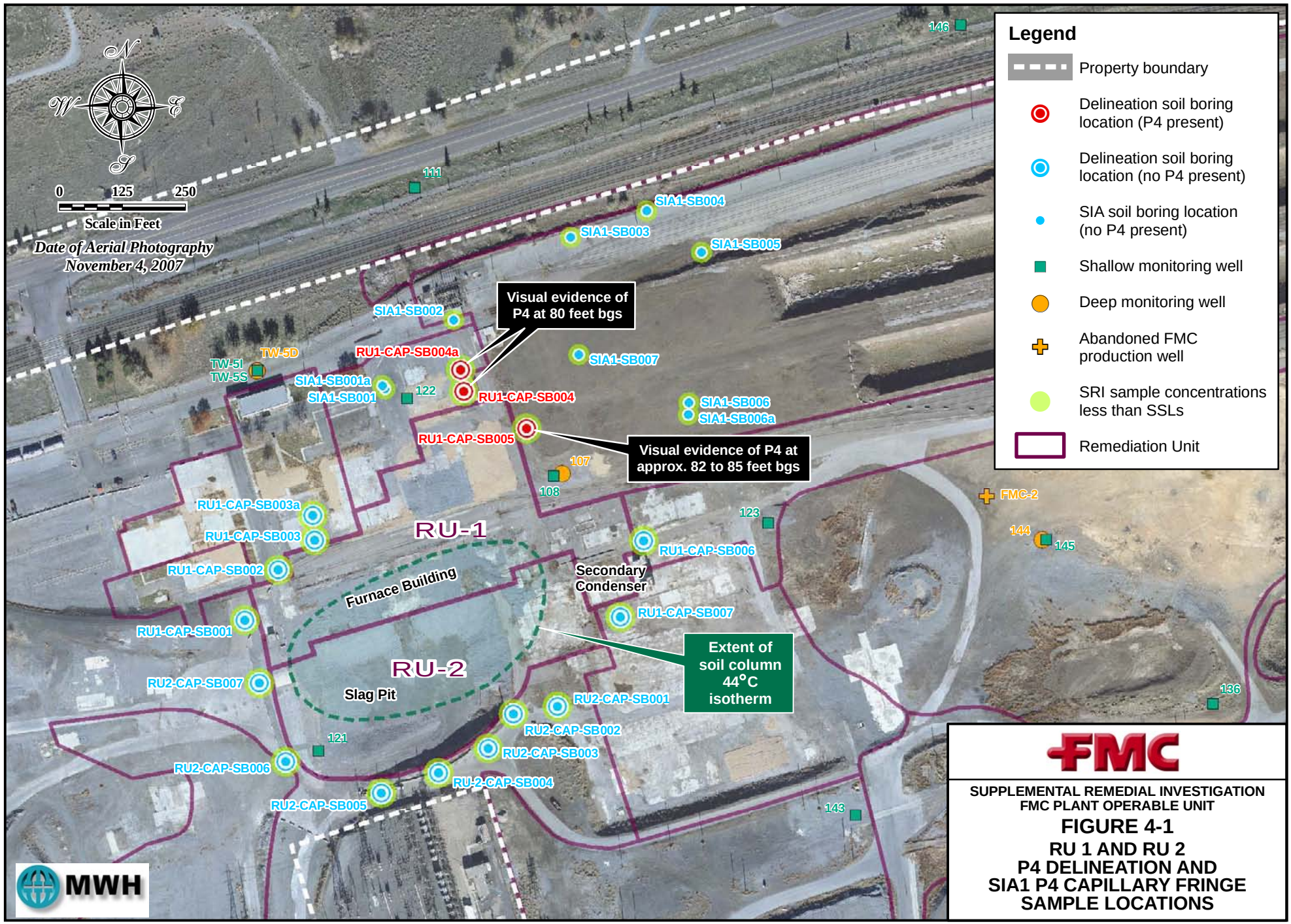
The split sample data collected by the EPA are provided in Appendix D. Metals and radionuclide data from the split data were generally consistent with the primary samples and verify the representativeness of these analytical results.

4.27.4 Contamination Assessment

Targeted samples of precipitator solids, phossy solids, calciner solids, and ore were collected during the Fill Characterization investigation. A sample of the kiln solids material was not obtained as the material could not be located in RU 8. The kiln solids appear to have been removed during the installation of the calciner. No slag samples were collected during the Fill Characterization study since the PCDT and Precipitator Dust/Phossy Solids Roadway Investigations slag samples as well as historic slag samples provided sufficient data to characterize slag and fill and to support the Supplemental HHRA.

The fill materials were found to exceed the worker and soil to groundwater SSLs for several metals and radionuclides. These findings were generally consistent with the results of historical analyses performed on these fill materials reported in the *EMF RI Report* and the *RI Update Memo* as shown on Table 4-55. The historical data generally contain elevated levels of the same metals and radionuclides, in similar concentration ranges.

FILE *Fig 4-01_RU1 and RU2 P4 Delineation_508.mxd 06/11/08*

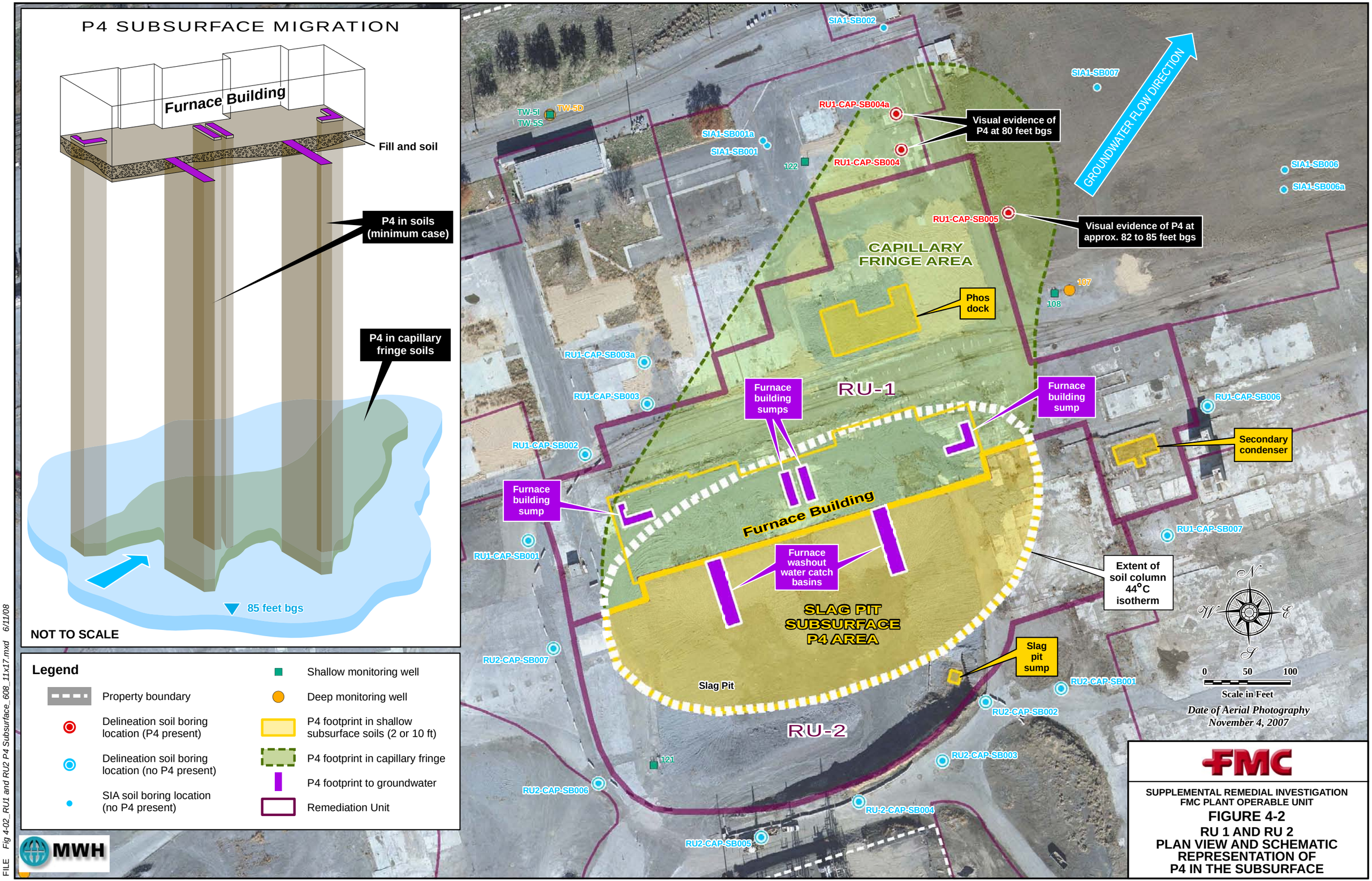


FMC

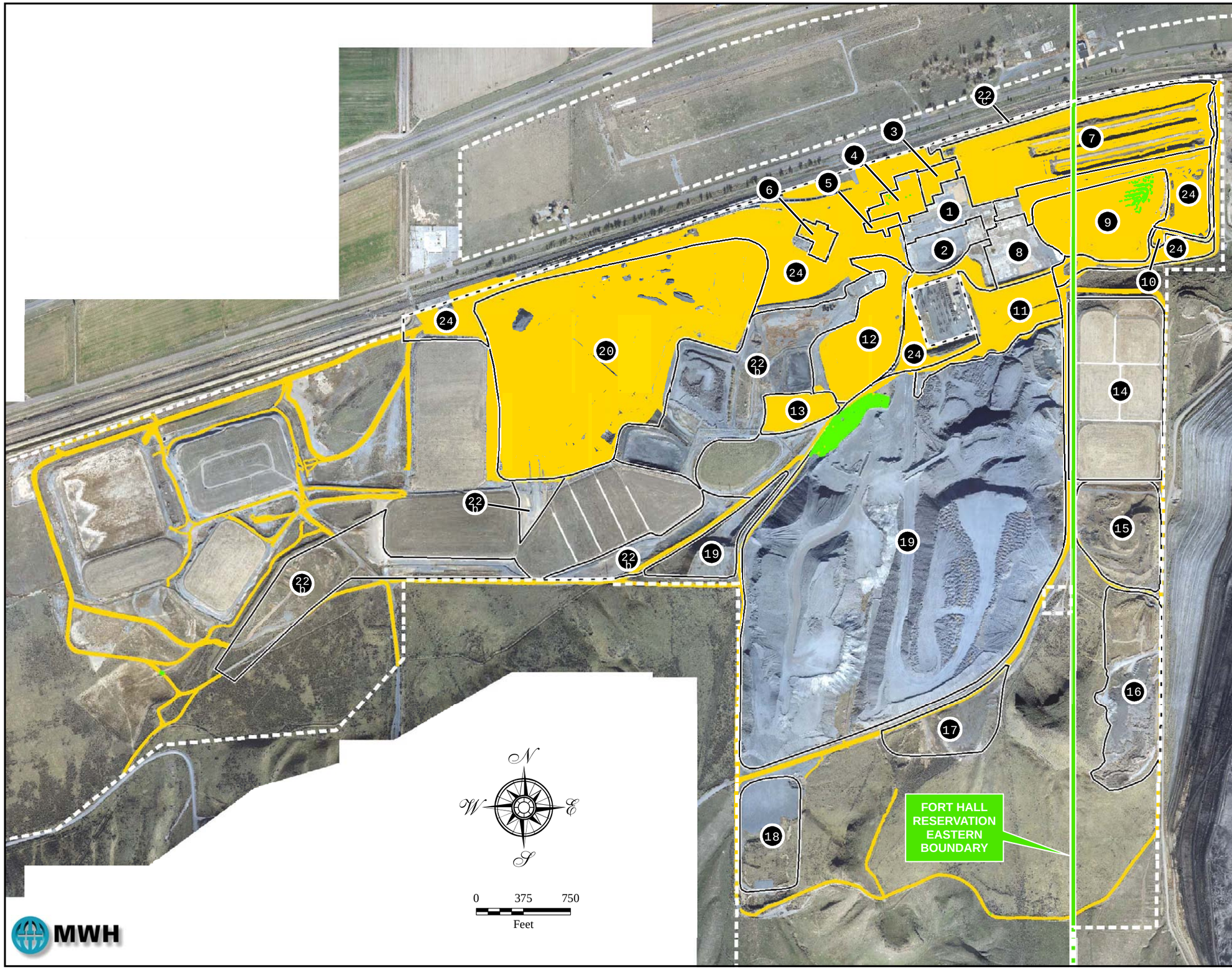
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-1

RU 1 AND RU 2 P4 DELINEATION AND SIA1 P4 CAPILLARY FRINGE SAMPLE LOCATIONS



FILE Fig 4-02_RU1 and RU2 P4 Subsurface_608_11x17.mxd 6/11/08



Legend

Remediation Unit

Property Boundary

cpm Counts per minute

GAMMA in cpm

≤ 18,500

> 18,500

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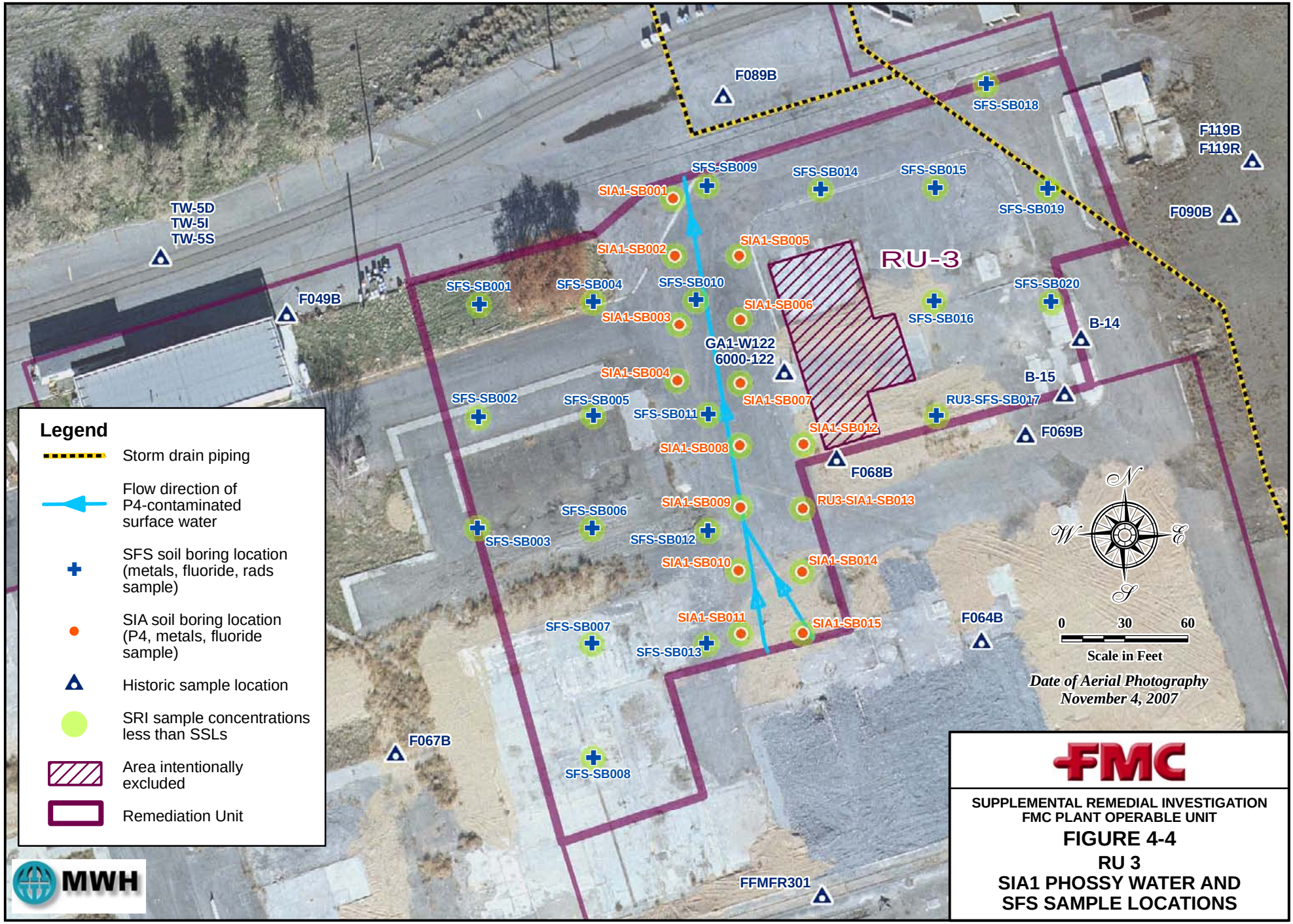
FIGURE 4-3

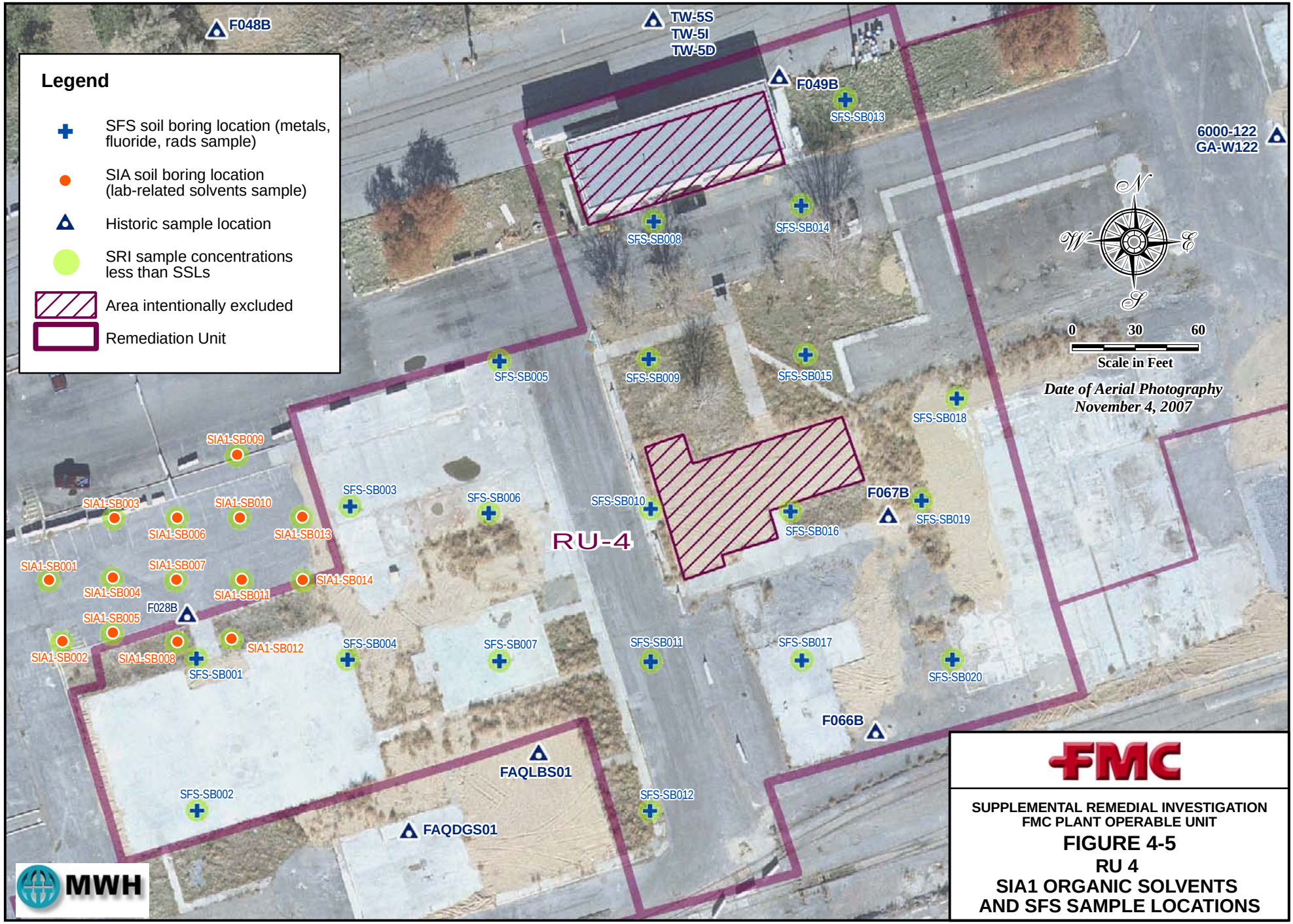
PLANT SITE GAMMA SCAN RESULTS COMPARED TO THE COMPARATIVE VALUE (CV)

FILE Fig 4-3_FMC Plant Site GAMMA compare to CV_508.mxd 6/11/08

FILE *Fig 4-04_RU3_SIA1_SFS_Samples_408.mxd 6/09/08*



FILE *Fig 4-05_RU4_SIA1_SFS_Samples_508.mxd* *6/09/08*

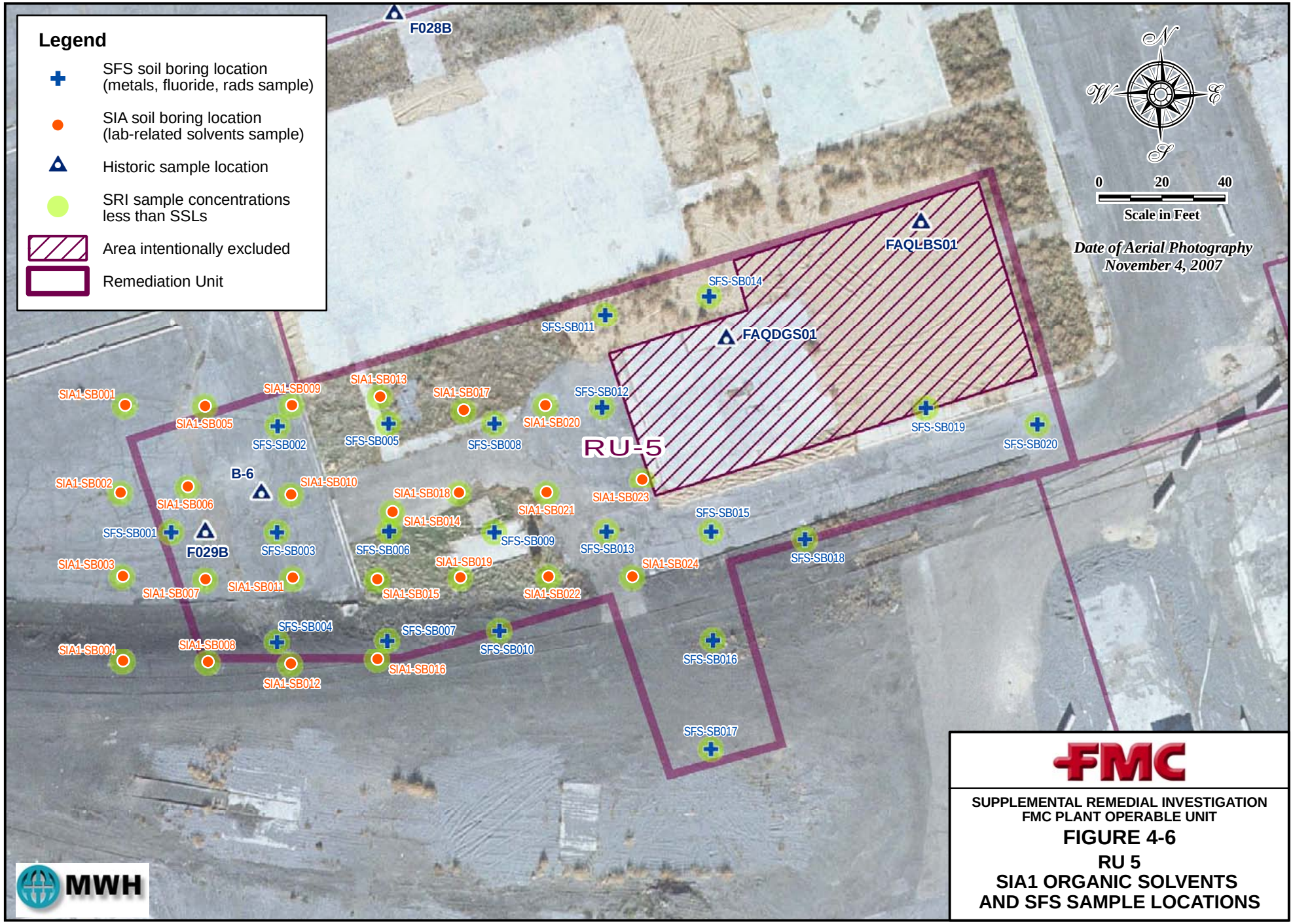


FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-5
RU 4
SIA1 ORGANIC SOLVENTS AND SFS SAMPLE LOCATIONS

FILE *Fig 4-06_RU5_SIA1_508.mxd 6/09/08*



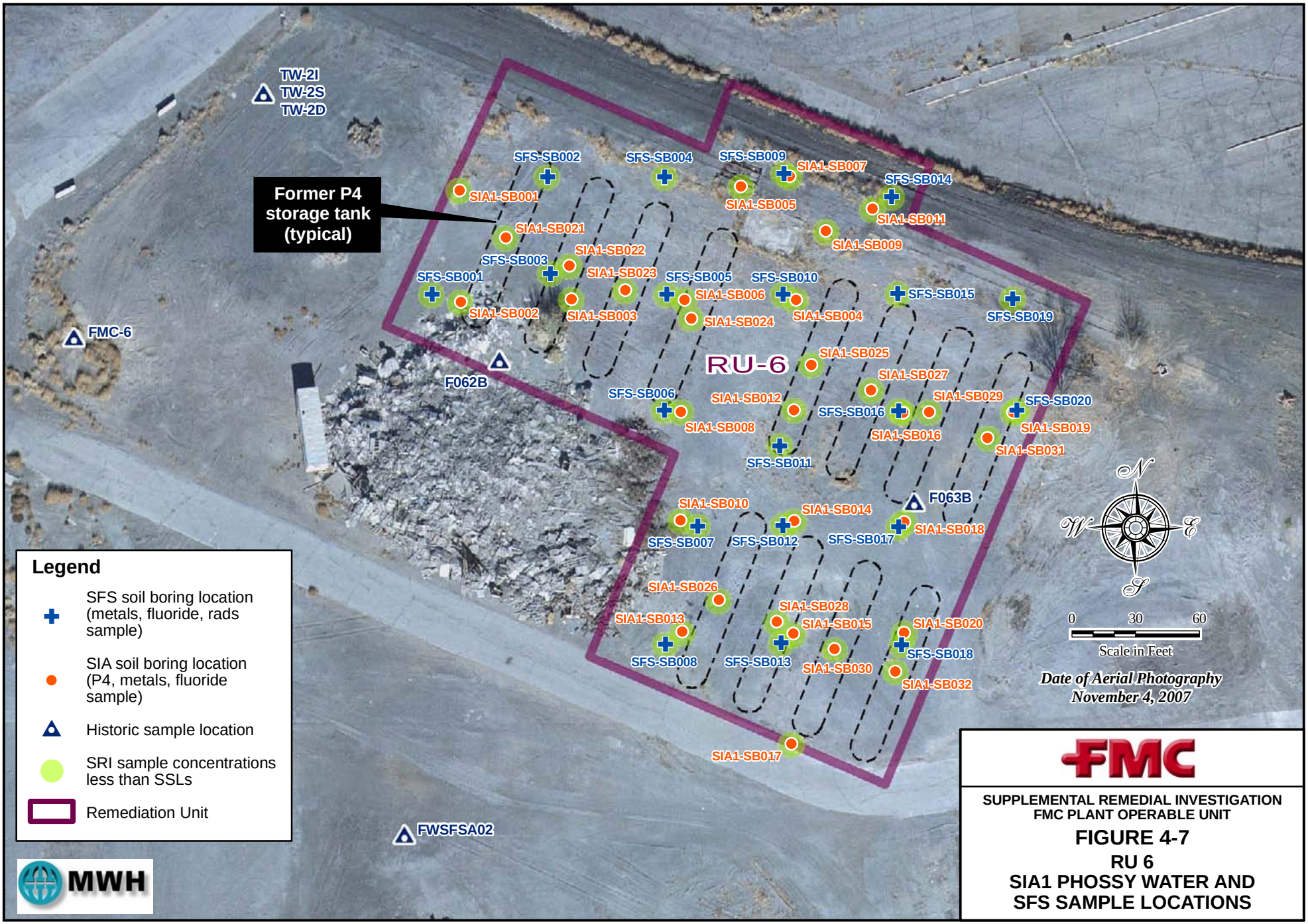
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-6

RU 5
SIA1 ORGANIC SOLVENTS AND SFS SAMPLE LOCATIONS

FILE *Fig 4-07_RU6_SIA1_508.mxd 6/09/08*



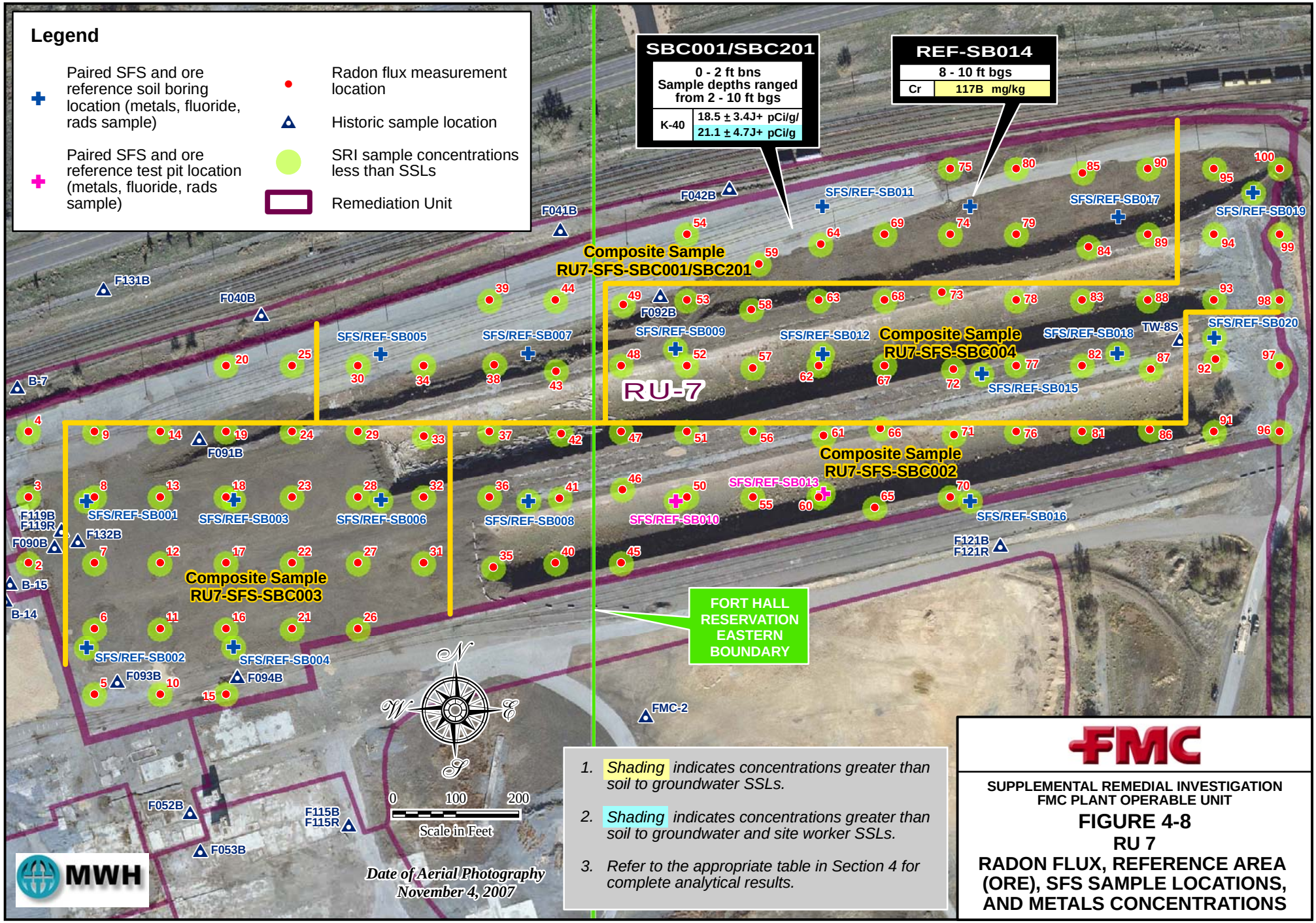
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-7

RU 6
SIA1 PHOSSY WATER AND SFS SAMPLE LOCATIONS

FILE *Fig 4-08_RU7_RAI_508.mxd* *6/10/08*



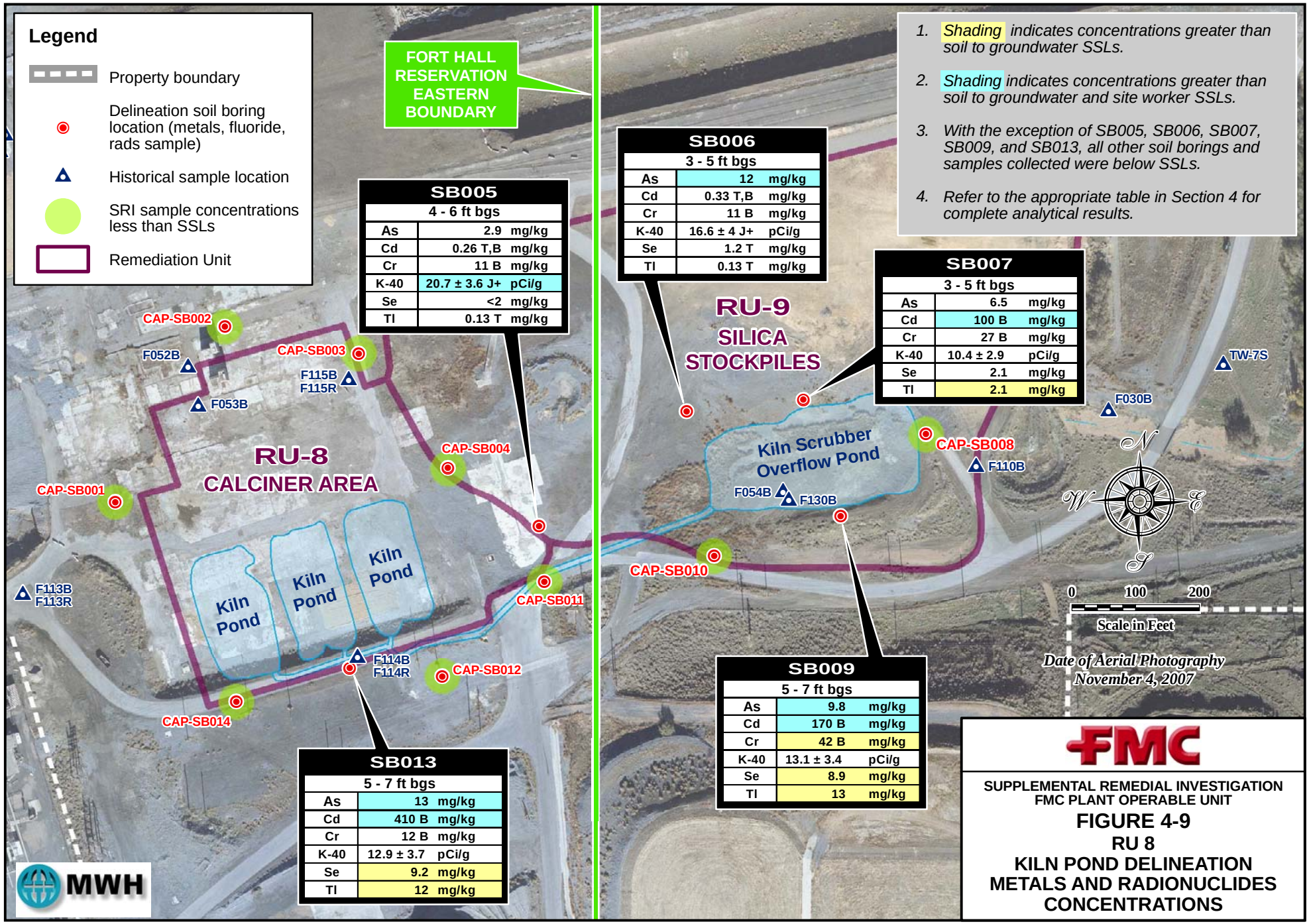
1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *Shading indicates concentrations greater than soil to groundwater and site worker SSLs.*
3. *Refer to the appropriate table in Section 4 for complete analytical results.*

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-8
RU 7
RADON FLUX, REFERENCE AREA (ORE), SFS SAMPLE LOCATIONS, AND METALS CONCENTRATIONS

FILE *Fig 4-09_Kiln Pond Delin_Samples_RU8_RESULTS_508.mxd 6/10/08*



1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *Shading indicates concentrations greater than soil to groundwater and site worker SSLs.*
3. *With the exception of SB005, SB006, SB007, SB009, and SB013, all other soil borings and samples collected were below SSLs.*
4. *Refer to the appropriate table in Section 4 for complete analytical results.*

SB005

4 - 6 ft bgs		
As	2.9	mg/kg
Cd	0.26 T,B	mg/kg
Cr	11 B	mg/kg
K-40	20.7 ± 3.6 J+	pCi/g
Se	<2	mg/kg
Tl	0.13 T	mg/kg

SB006

3 - 5 ft bgs		
As	12	mg/kg
Cd	0.33 T,B	mg/kg
Cr	11 B	mg/kg
K-40	16.6 ± 4 J+	pCi/g
Se	1.2 T	mg/kg
Tl	0.13 T	mg/kg

SB007

3 - 5 ft bgs		
As	6.5	mg/kg
Cd	100 B	mg/kg
Cr	27 B	mg/kg
K-40	10.4 ± 2.9	pCi/g
Se	2.1	mg/kg
Tl	2.1	mg/kg

SB009

5 - 7 ft bgs		
As	9.8	mg/kg
Cd	170 B	mg/kg
Cr	42 B	mg/kg
K-40	13.1 ± 3.4	pCi/g
Se	8.9	mg/kg
Tl	13	mg/kg

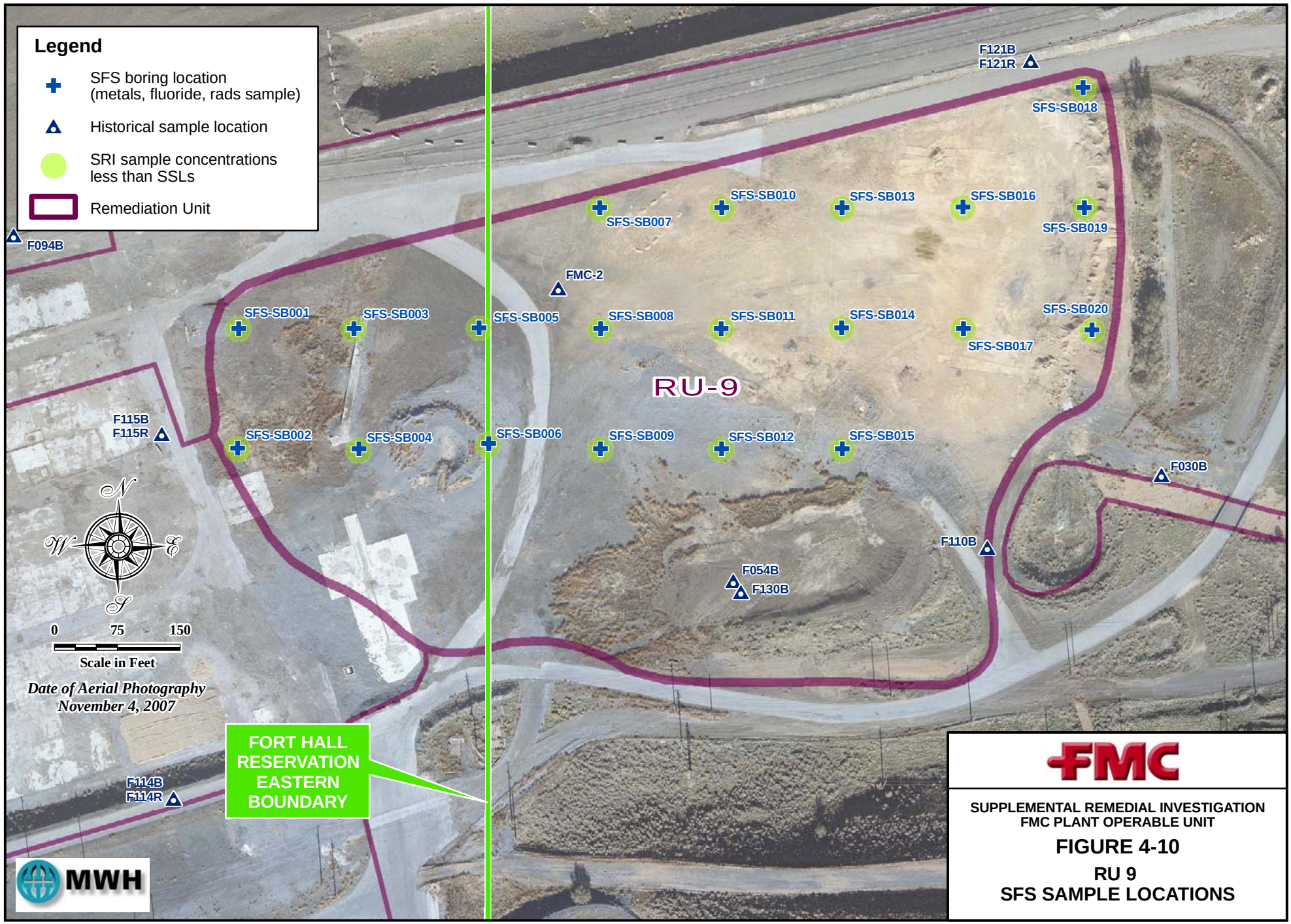
SB013

5 - 7 ft bgs		
As	13	mg/kg
Cd	410 B	mg/kg
Cr	12 B	mg/kg
K-40	12.9 ± 3.7	pCi/g
Se	9.2	mg/kg
Tl	12	mg/kg

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-9
RU 8
KILN POND DELINEATION METALS AND RADIONUCLIDES CONCENTRATIONS

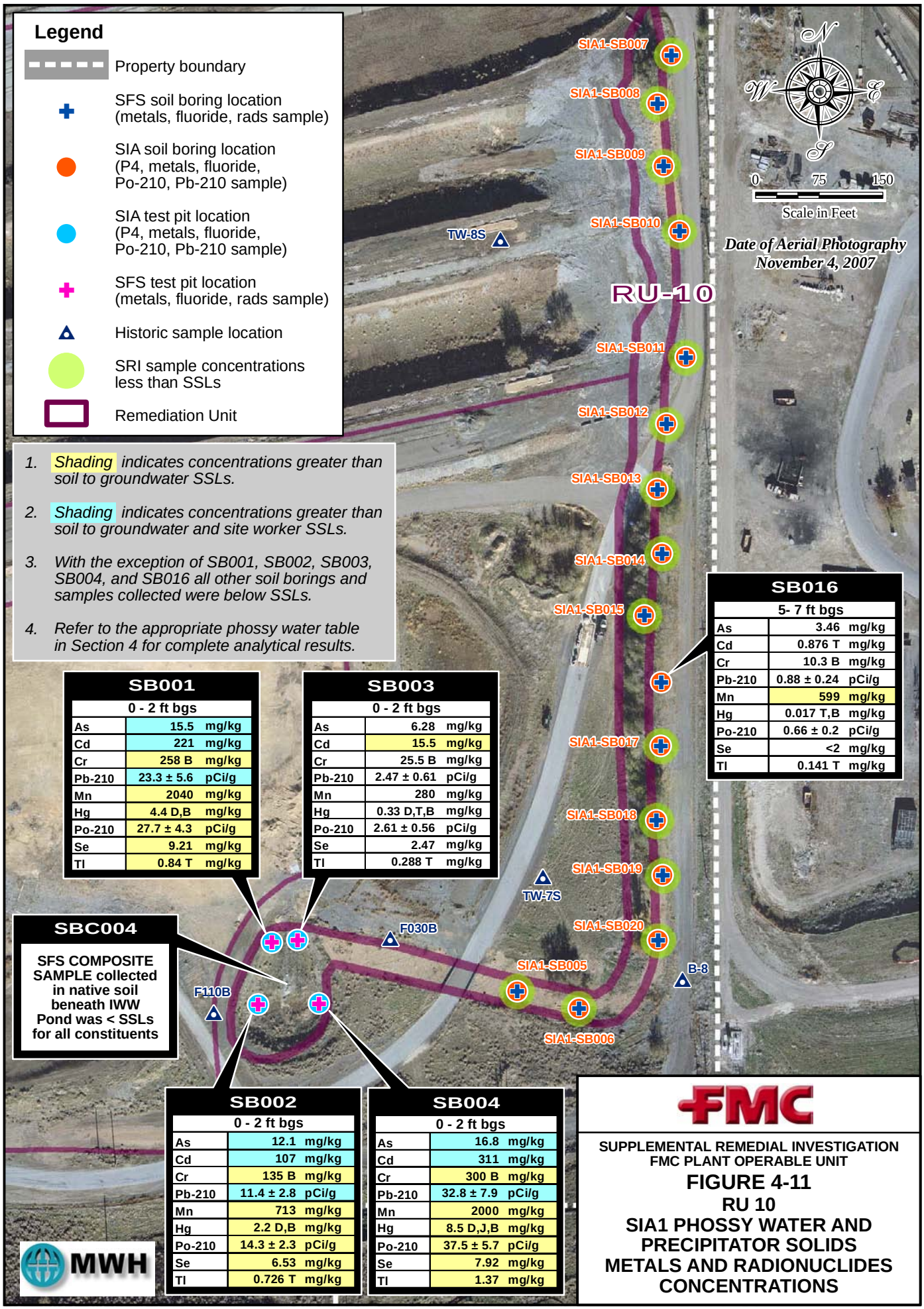
FILE *Fig 4-10_RU9_SFS_Samples_508.mxd* *6/10/08*



SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-10

RU 9
SFS SAMPLE LOCATIONS

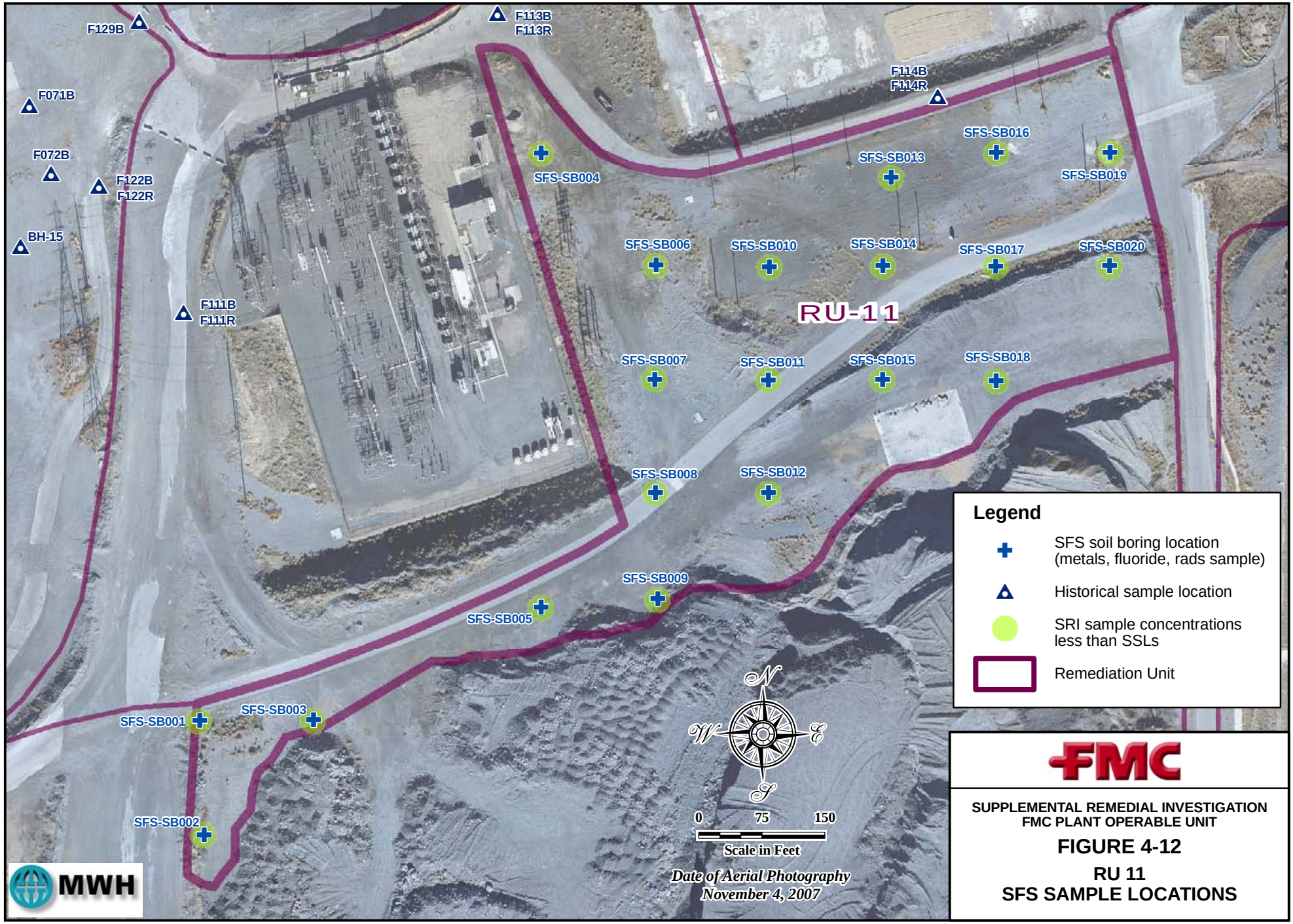


SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-11
RU 10
SIA1 PHOSSY WATER AND PRECIPITATOR SOLIDS METALS AND RADIONUCLIDES CONCENTRATIONS

FILE Fig 4-11_RU10_Phossy_SIA1_RESULTS_508.mxd 6/10/08

FILE *Fig 4-12_RU11_SFS_Samples_508.mxd* *6/10/08*

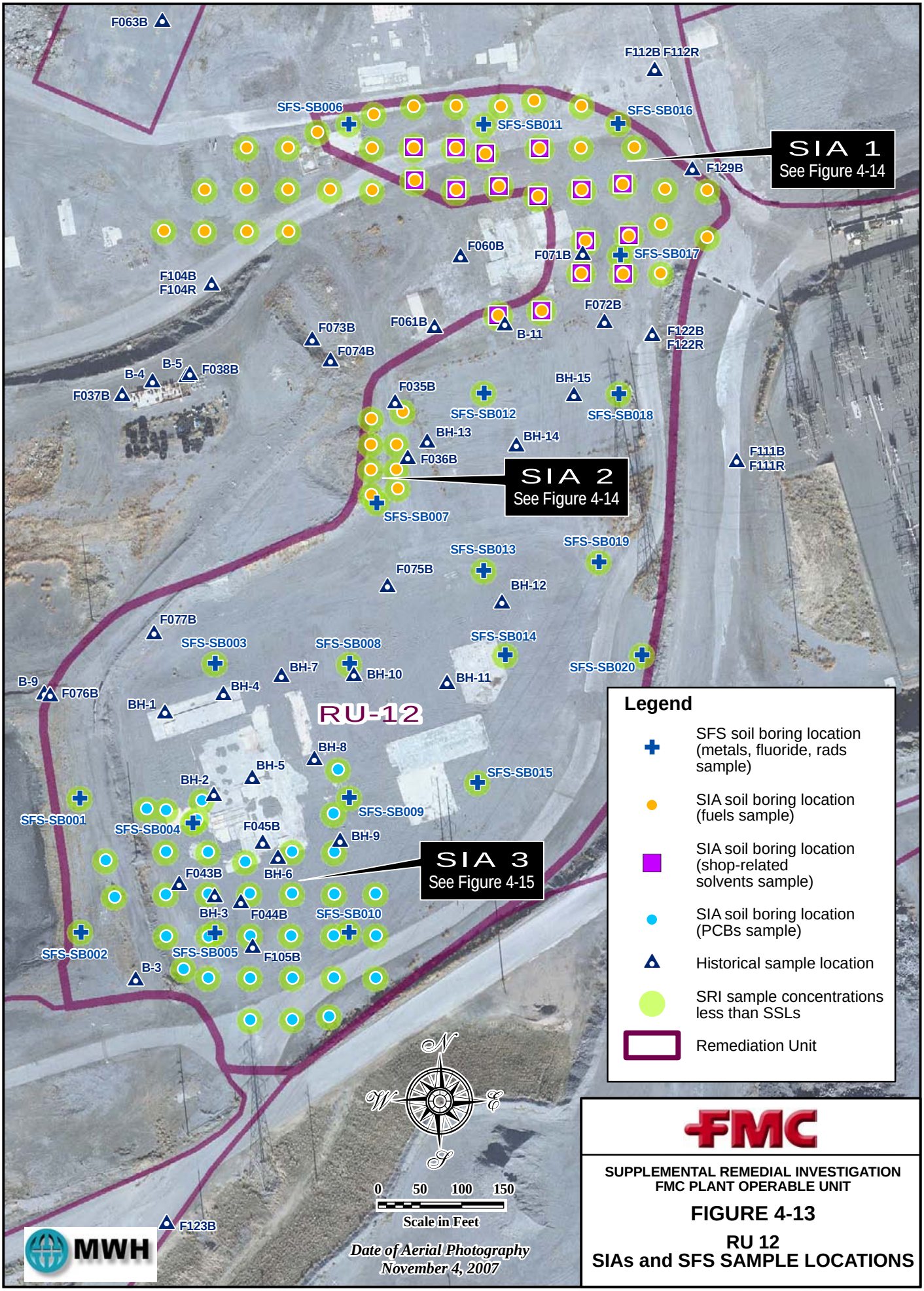


FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-12

RU 11
SFS SAMPLE LOCATIONS



FMC

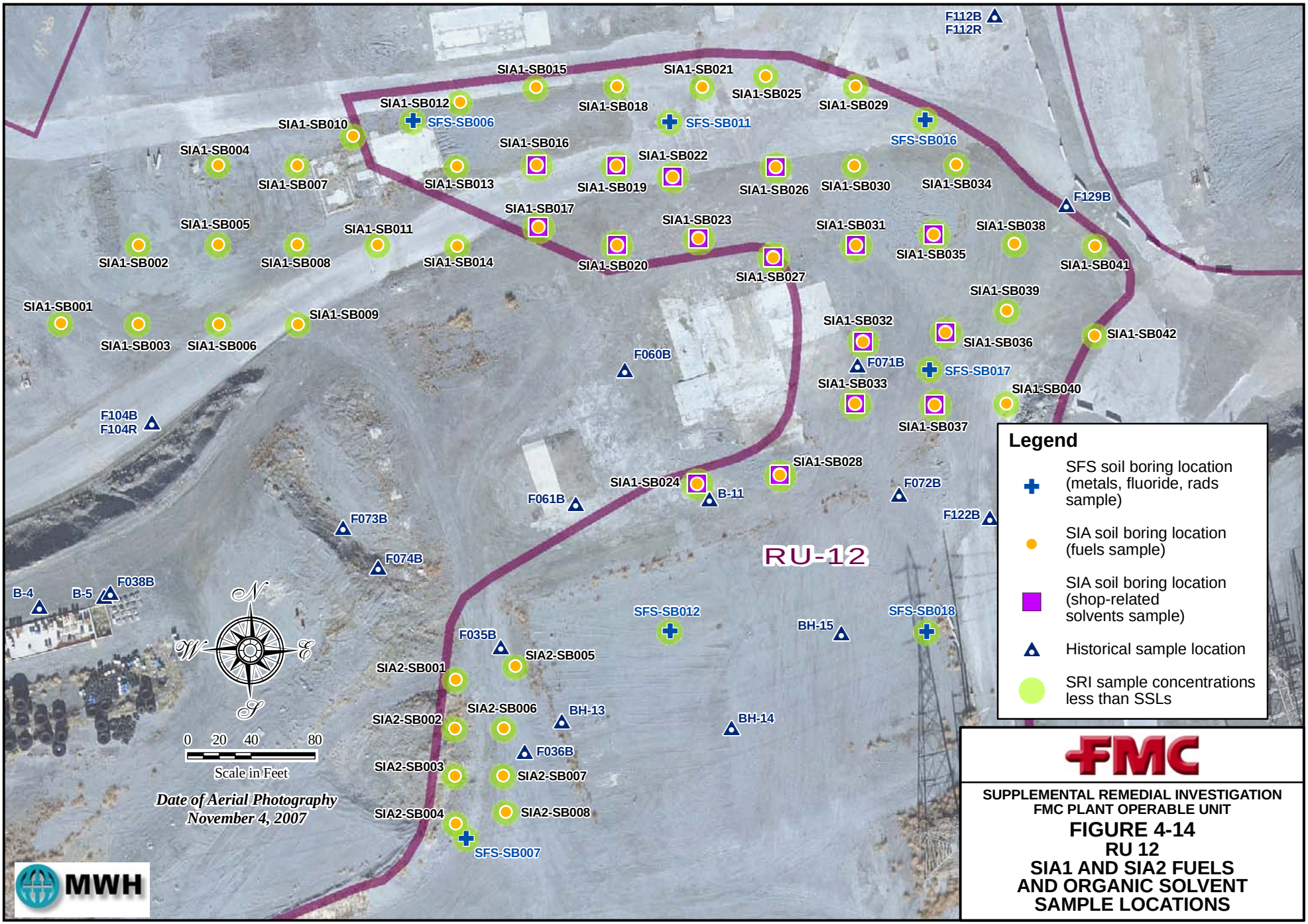
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-13

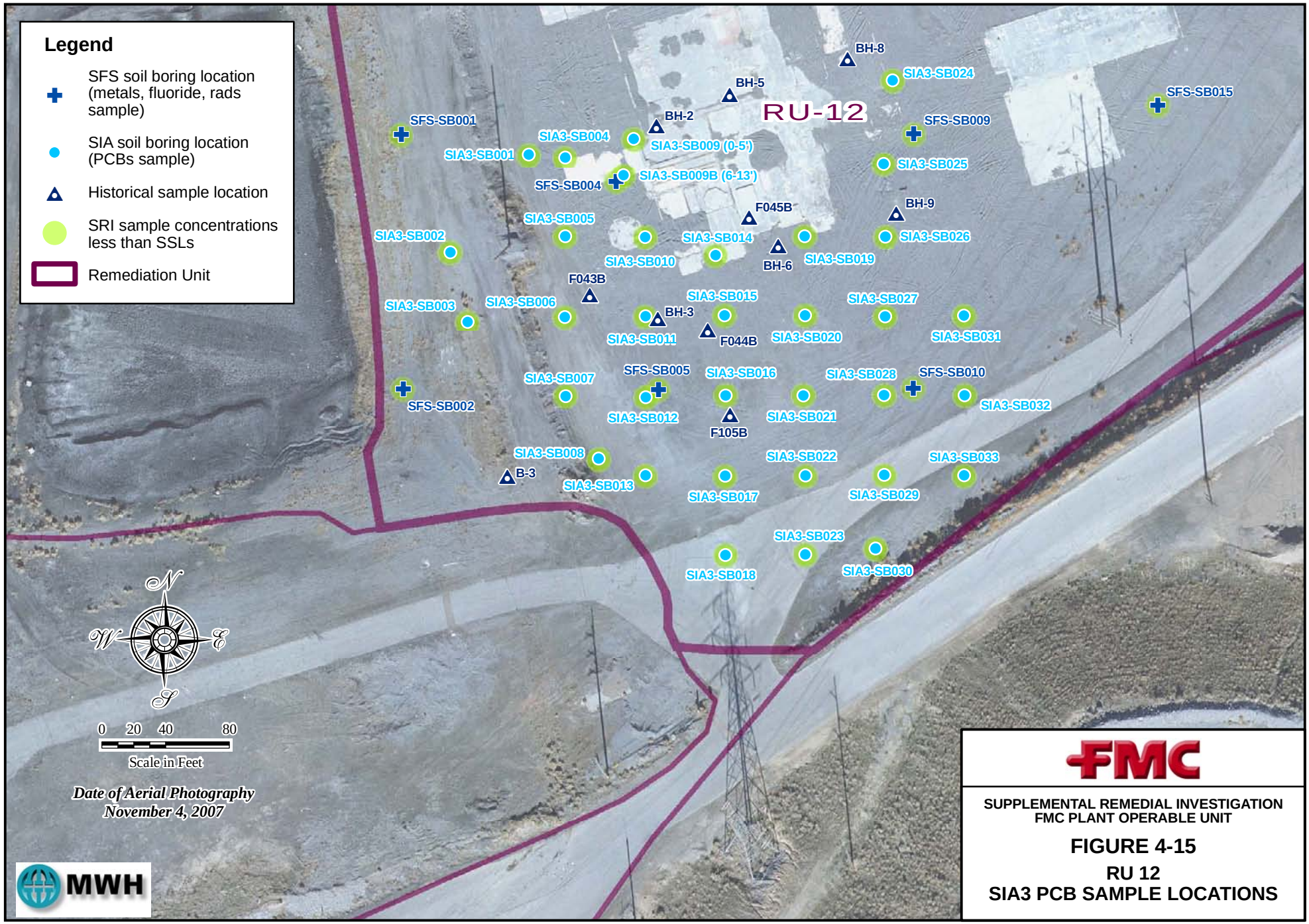
RU 12
SIAs and SFS SAMPLE LOCATIONS

FILE Fig 4-13_RU12_SFS_Samples_508.mxd 6/11/08

FILE *Fig 4-14_RU12_SIA1AND2_508.mxd* *5/30/08*



FILE *Fig 4-15_RU12_SIA3_508.mxd* *6/11/08*



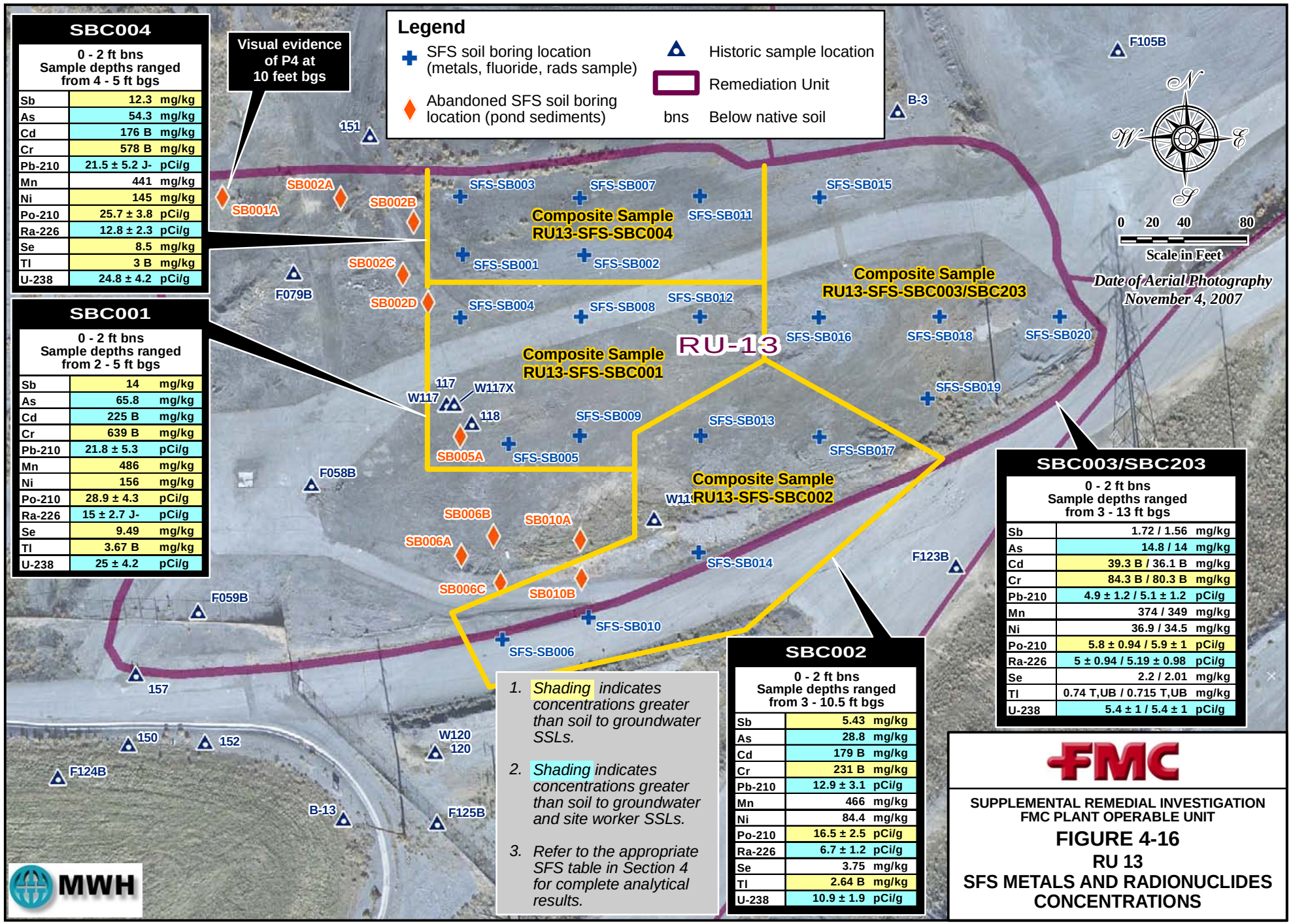
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-15

RU 12
SIA3 PCB SAMPLE LOCATIONS

FILE *Fig 4-16_RU13_SFS_RESULTS_508.mxd* 6\12/08



SBC004

0 - 2 ft bns
Sample depths ranged from 4 - 5 ft bgs

Sb	12.3	mg/kg
As	54.3	mg/kg
Cd	176 B	mg/kg
Cr	578 B	mg/kg
Pb-210	21.5 ± 5.2 J-	pCi/g
Mn	441	mg/kg
Ni	145	mg/kg
Po-210	25.7 ± 3.8	pCi/g
Ra-226	12.8 ± 2.3	pCi/g
Se	8.5	mg/kg
Tl	3 B	mg/kg
U-238	24.8 ± 4.2	pCi/g

SBC001

0 - 2 ft bns
Sample depths ranged from 2 - 5 ft bgs

Sb	14	mg/kg
As	65.8	mg/kg
Cd	225 B	mg/kg
Cr	639 B	mg/kg
Pb-210	21.8 ± 5.3	pCi/g
Mn	486	mg/kg
Ni	156	mg/kg
Po-210	28.9 ± 4.3	pCi/g
Ra-226	15 ± 2.7 J-	pCi/g
Se	9.49	mg/kg
Tl	3.67 B	mg/kg
U-238	25 ± 4.2	pCi/g

SBC003/SBC203

0 - 2 ft bns
Sample depths ranged from 3 - 13 ft bgs

Sb	1.72 / 1.56	mg/kg
As	14.8 / 14	mg/kg
Cd	39.3 B / 36.1 B	mg/kg
Cr	84.3 B / 80.3 B	mg/kg
Pb-210	4.9 ± 1.2 / 5.1 ± 1.2	pCi/g
Mn	374 / 349	mg/kg
Ni	36.9 / 34.5	mg/kg
Po-210	5.8 ± 0.94 / 5.9 ± 1	pCi/g
Ra-226	5 ± 0.94 / 5.19 ± 0.98	pCi/g
Se	2.2 / 2.01	mg/kg
Tl	0.74 T,UB / 0.715 T,UB	mg/kg
U-238	5.4 ± 1 / 5.4 ± 1	pCi/g

SBC002

0 - 2 ft bns
Sample depths ranged from 3 - 10.5 ft bgs

Sb	5.43	mg/kg
As	28.8	mg/kg
Cd	179 B	mg/kg
Cr	231 B	mg/kg
Pb-210	12.9 ± 3.1	pCi/g
Mn	466	mg/kg
Ni	84.4	mg/kg
Po-210	16.5 ± 2.5	pCi/g
Ra-226	6.7 ± 1.2	pCi/g
Se	3.75	mg/kg
Tl	2.64 B	mg/kg
U-238	10.9 ± 1.9	pCi/g

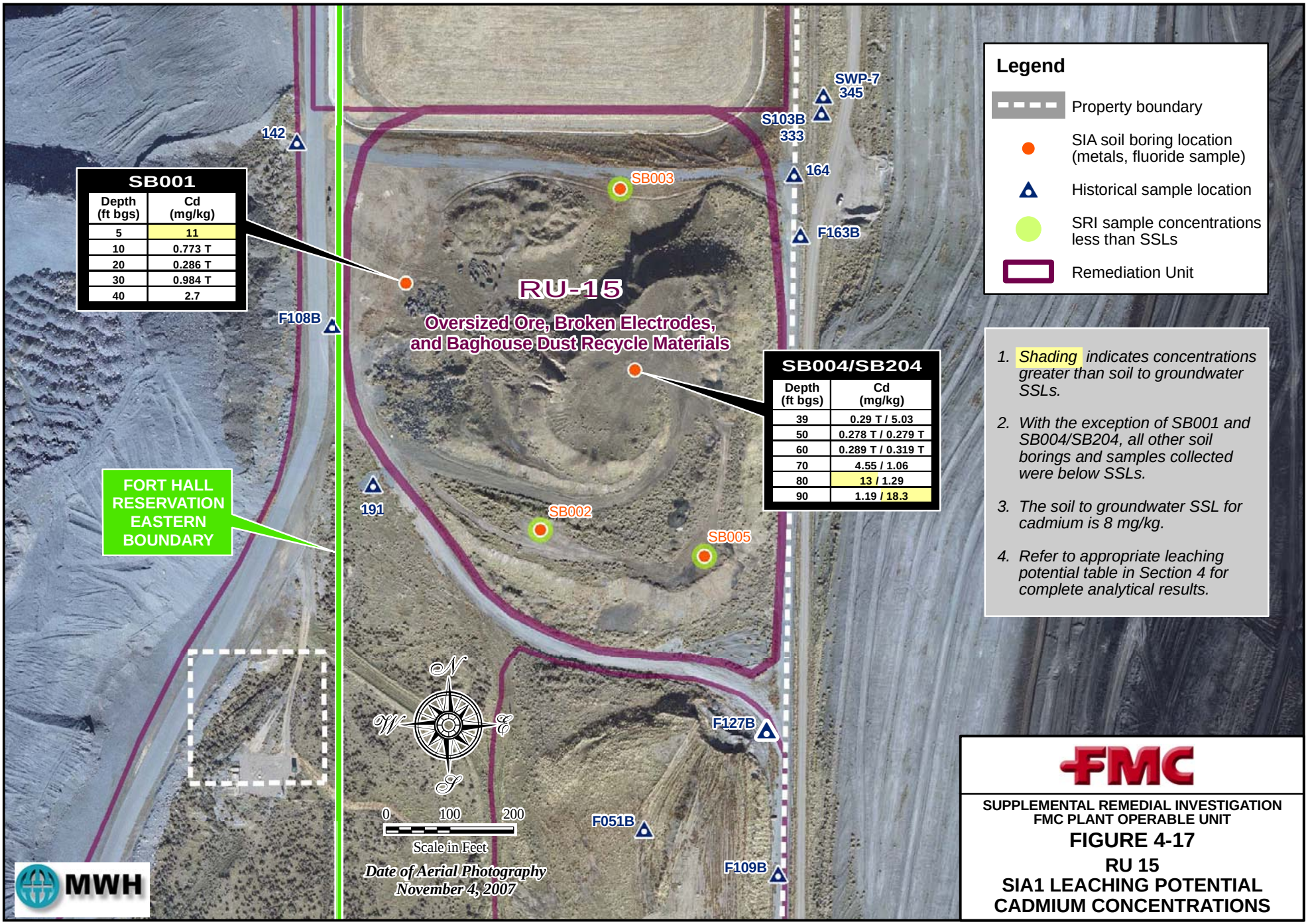
1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *Shading indicates concentrations greater than soil to groundwater and site worker SSLs.*
3. *Refer to the appropriate SFS table in Section 4 for complete analytical results.*

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-16
RU 13
SFS METALS AND RADIONUCLIDES CONCENTRATIONS

FILE *Fig 4-17_RU15_SIA1_RESULTS_508.mxd 6/11/08*



SB001

Depth (ft bgs)	Cd (mg/kg)
5	11
10	0.773 T
20	0.286 T
30	0.984 T
40	2.7

SB004/SB204

Depth (ft bgs)	Cd (mg/kg)
39	0.29 T / 5.03
50	0.278 T / 0.279 T
60	0.289 T / 0.319 T
70	4.55 / 1.06
80	13 / 1.29
90	1.19 / 18.3

1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *With the exception of SB001 and SB004/SB204, all other soil borings and samples collected were below SSLs.*
3. *The soil to groundwater SSL for cadmium is 8 mg/kg.*
4. *Refer to appropriate leaching potential table in Section 4 for complete analytical results.*

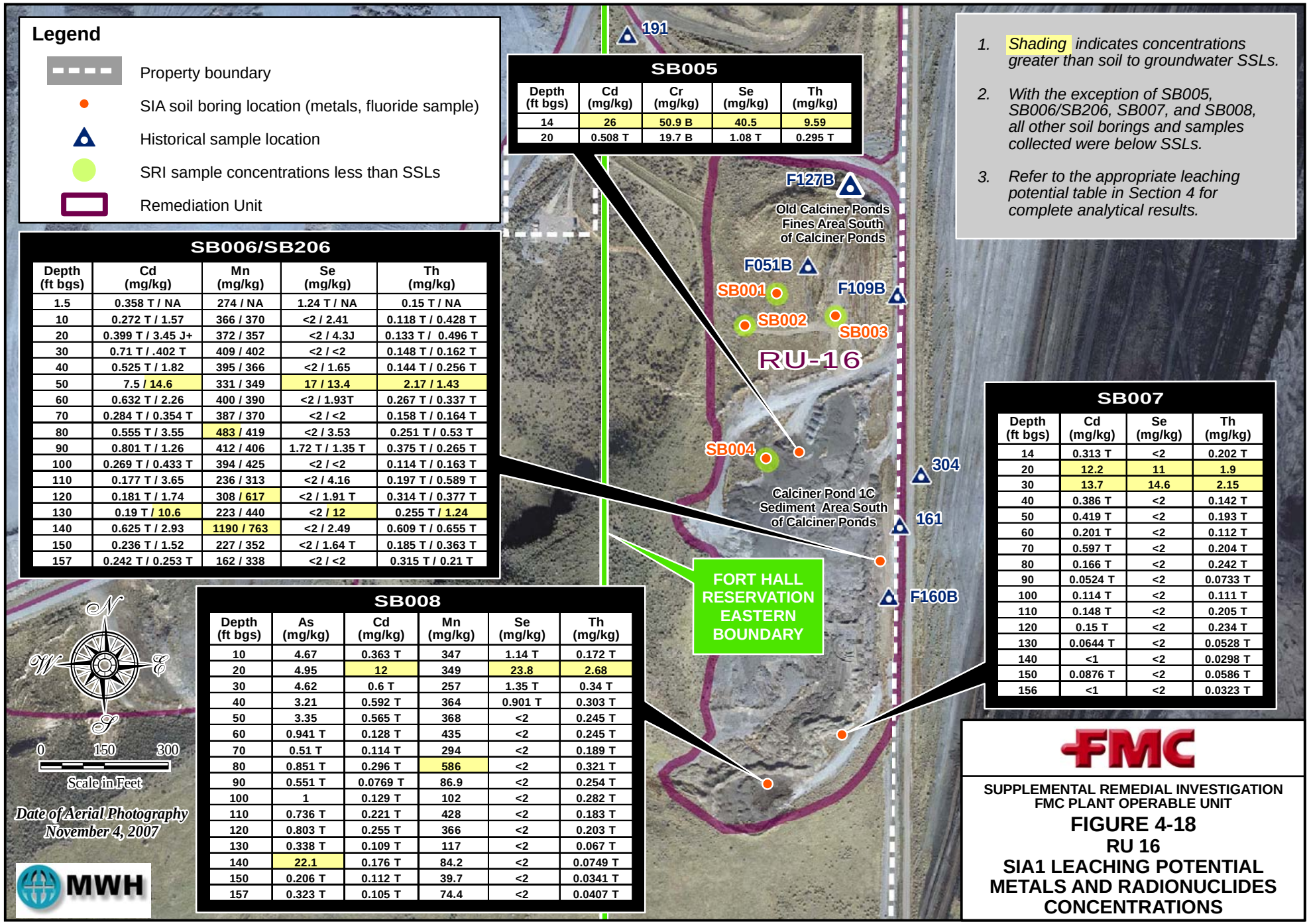
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-17

RU 15
SIA1 LEACHING POTENTIAL CADMIUM CONCENTRATIONS

FILE *Fig 4-18_RU16_SIA1_RESULTS_508.mxd* *6/12/08*



Legend

- Property boundary
- SIA soil boring location (metals, fluoride sample)
- Historical sample location
- SRI sample concentrations less than SSLs
- Remediation Unit

1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *With the exception of SB005, SB006/SB206, SB007, and SB008, all other soil borings and samples collected were below SSLs.*
3. *Refer to the appropriate leaching potential table in Section 4 for complete analytical results.*

SB005

Depth (ft bgs)	Cd (mg/kg)	Cr (mg/kg)	Se (mg/kg)	Th (mg/kg)
14	26	50.9 B	40.5	9.59
20	0.508 T	19.7 B	1.08 T	0.295 T

SB006/SB206

Depth (ft bgs)	Cd (mg/kg)	Mn (mg/kg)	Se (mg/kg)	Th (mg/kg)
1.5	0.358 T / NA	274 / NA	1.24 T / NA	0.15 T / NA
10	0.272 T / 1.57	366 / 370	<2 / 2.41	0.118 T / 0.428 T
20	0.399 T / 3.45 J+	372 / 357	<2 / 4.3J	0.133 T / 0.496 T
30	0.71 T / .402 T	409 / 402	<2 / <2	0.148 T / 0.162 T
40	0.525 T / 1.82	395 / 366	<2 / 1.65	0.144 T / 0.256 T
50	7.5 / 14.6	331 / 349	17 / 13.4	2.17 / 1.43
60	0.632 T / 2.26	400 / 390	<2 / 1.93T	0.267 T / 0.337 T
70	0.284 T / 0.354 T	387 / 370	<2 / <2	0.158 T / 0.164 T
80	0.555 T / 3.55	483 / 419	<2 / 3.53	0.251 T / 0.53 T
90	0.801 T / 1.26	412 / 406	1.72 T / 1.35 T	0.375 T / 0.265 T
100	0.269 T / 0.433 T	394 / 425	<2 / <2	0.114 T / 0.163 T
110	0.177 T / 3.65	236 / 313	<2 / 4.16	0.197 T / 0.589 T
120	0.181 T / 1.74	308 / 617	<2 / 1.91 T	0.314 T / 0.377 T
130	0.19 T / 10.6	223 / 440	<2 / 12	0.255 T / 1.24
140	0.625 T / 2.93	1190 / 763	<2 / 2.49	0.609 T / 0.655 T
150	0.236 T / 1.52	227 / 352	<2 / 1.64 T	0.185 T / 0.363 T
157	0.242 T / 0.253 T	162 / 338	<2 / <2	0.315 T / 0.21 T

SB008

Depth (ft bgs)	As (mg/kg)	Cd (mg/kg)	Mn (mg/kg)	Se (mg/kg)	Th (mg/kg)
10	4.67	0.363 T	347	1.14 T	0.172 T
20	4.95	12	349	23.8	2.68
30	4.62	0.6 T	257	1.35 T	0.34 T
40	3.21	0.592 T	364	0.901 T	0.303 T
50	3.35	0.565 T	368	<2	0.245 T
60	0.941 T	0.128 T	435	<2	0.245 T
70	0.51 T	0.114 T	294	<2	0.189 T
80	0.851 T	0.296 T	586	<2	0.321 T
90	0.551 T	0.0769 T	86.9	<2	0.254 T
100	1	0.129 T	102	<2	0.282 T
110	0.736 T	0.221 T	428	<2	0.183 T
120	0.803 T	0.255 T	366	<2	0.203 T
130	0.338 T	0.109 T	117	<2	0.067 T
140	22.1	0.176 T	84.2	<2	0.0749 T
150	0.206 T	0.112 T	39.7	<2	0.0341 T
157	0.323 T	0.105 T	74.4	<2	0.0407 T

SB007

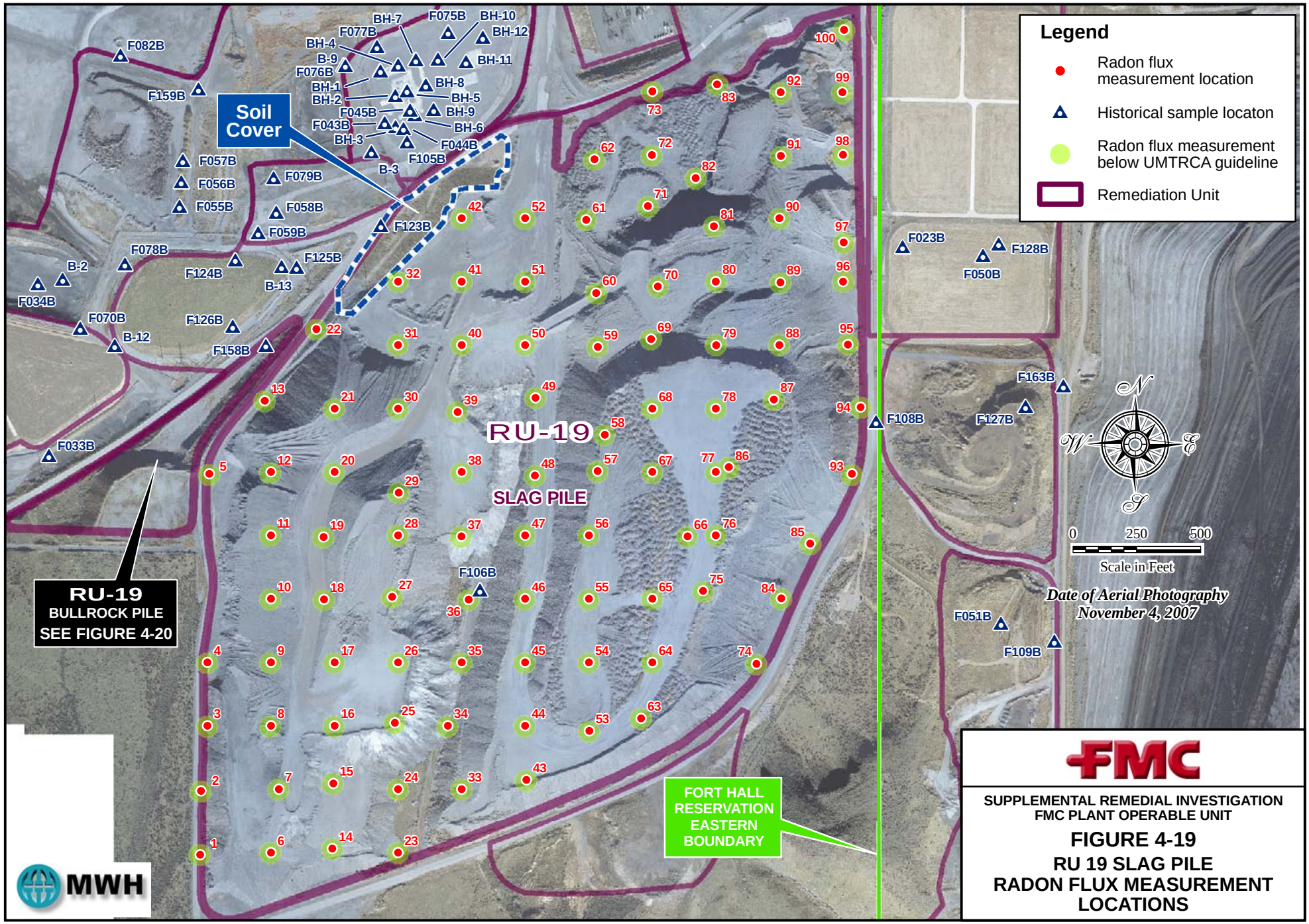
Depth (ft bgs)	Cd (mg/kg)	Se (mg/kg)	Th (mg/kg)
14	0.313 T	<2	0.202 T
20	12.2	11	1.9
30	13.7	14.6	2.15
40	0.386 T	<2	0.142 T
50	0.419 T	<2	0.193 T
60	0.201 T	<2	0.112 T
70	0.597 T	<2	0.204 T
80	0.166 T	<2	0.242 T
90	0.0524 T	<2	0.0733 T
100	0.114 T	<2	0.111 T
110	0.148 T	<2	0.205 T
120	0.15 T	<2	0.234 T
130	0.0644 T	<2	0.0528 T
140	<1	<2	0.0298 T
150	0.0876 T	<2	0.0586 T
156	<1	<2	0.0323 T

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-18
RU 16
SIA1 LEACHING POTENTIAL METALS AND RADIONUCLIDES CONCENTRATIONS

FILE *Fig 4-19_Radon FluxRU19SlagPile_509.mxd* *5/12/09*



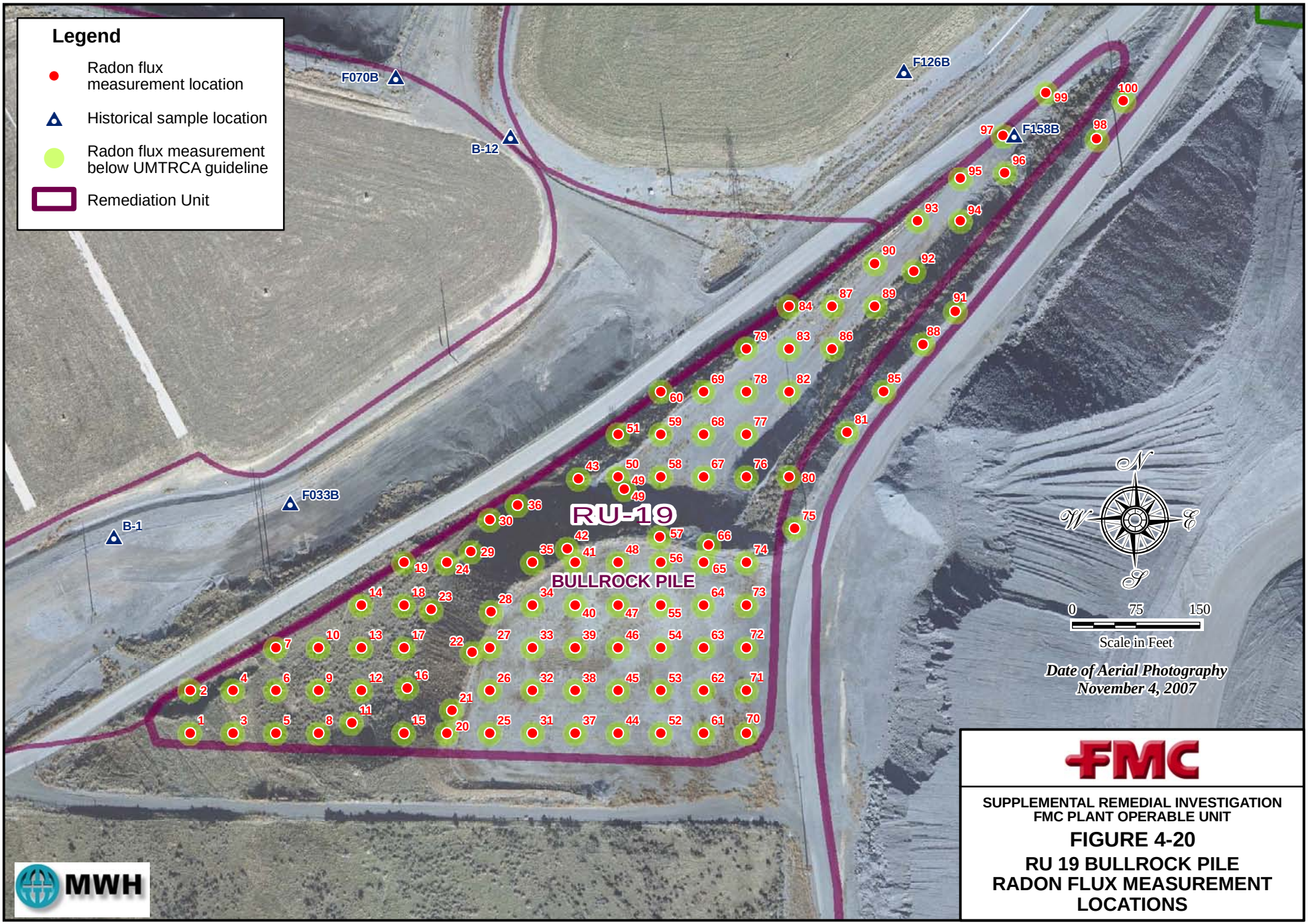
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-19

RU 19 SLAG PILE RADON FLUX MEASUREMENT LOCATIONS

FILE *Fig 4-20_Radon FluxRU19Bullrock_508.mxd* *6/11/08*



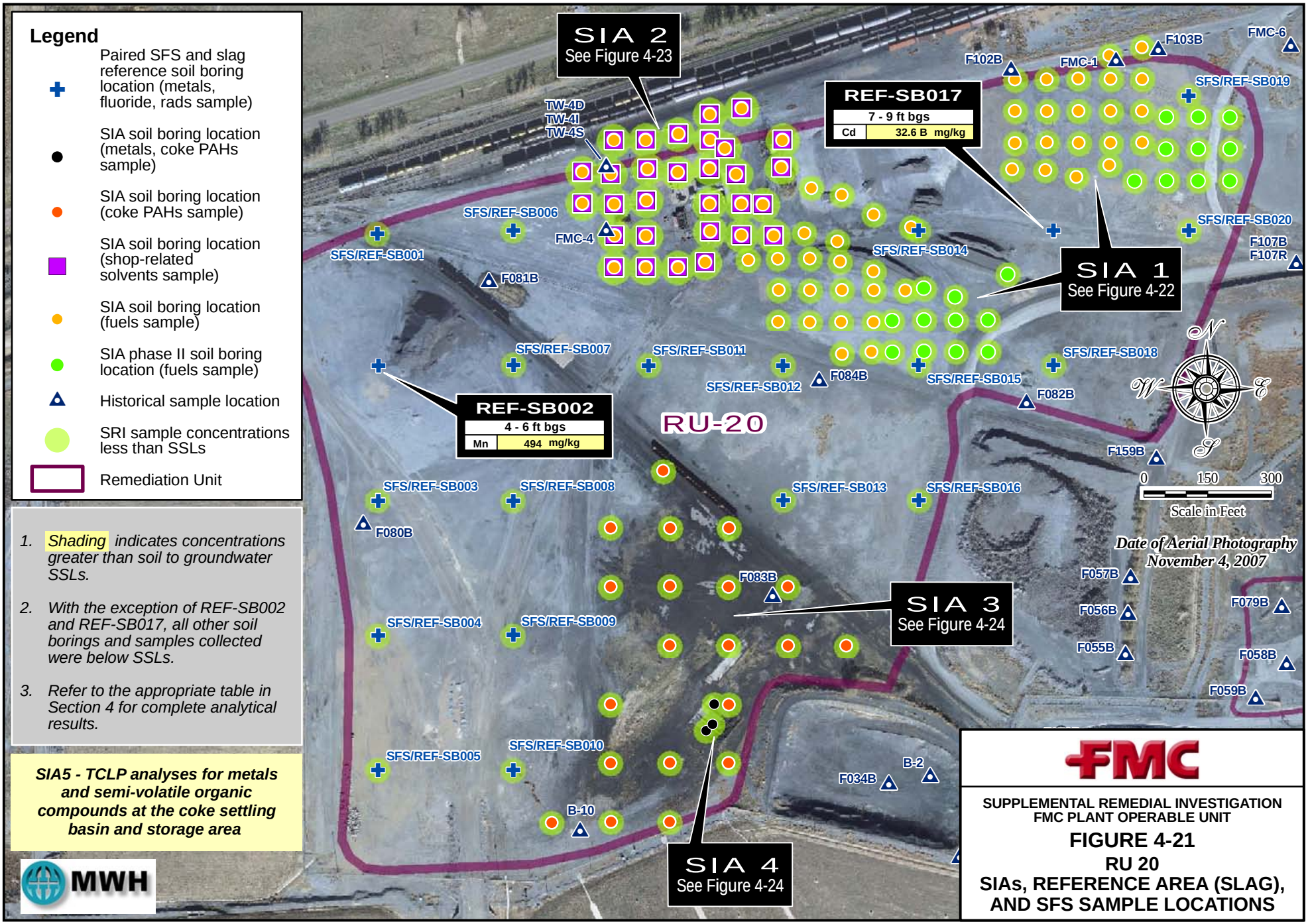
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

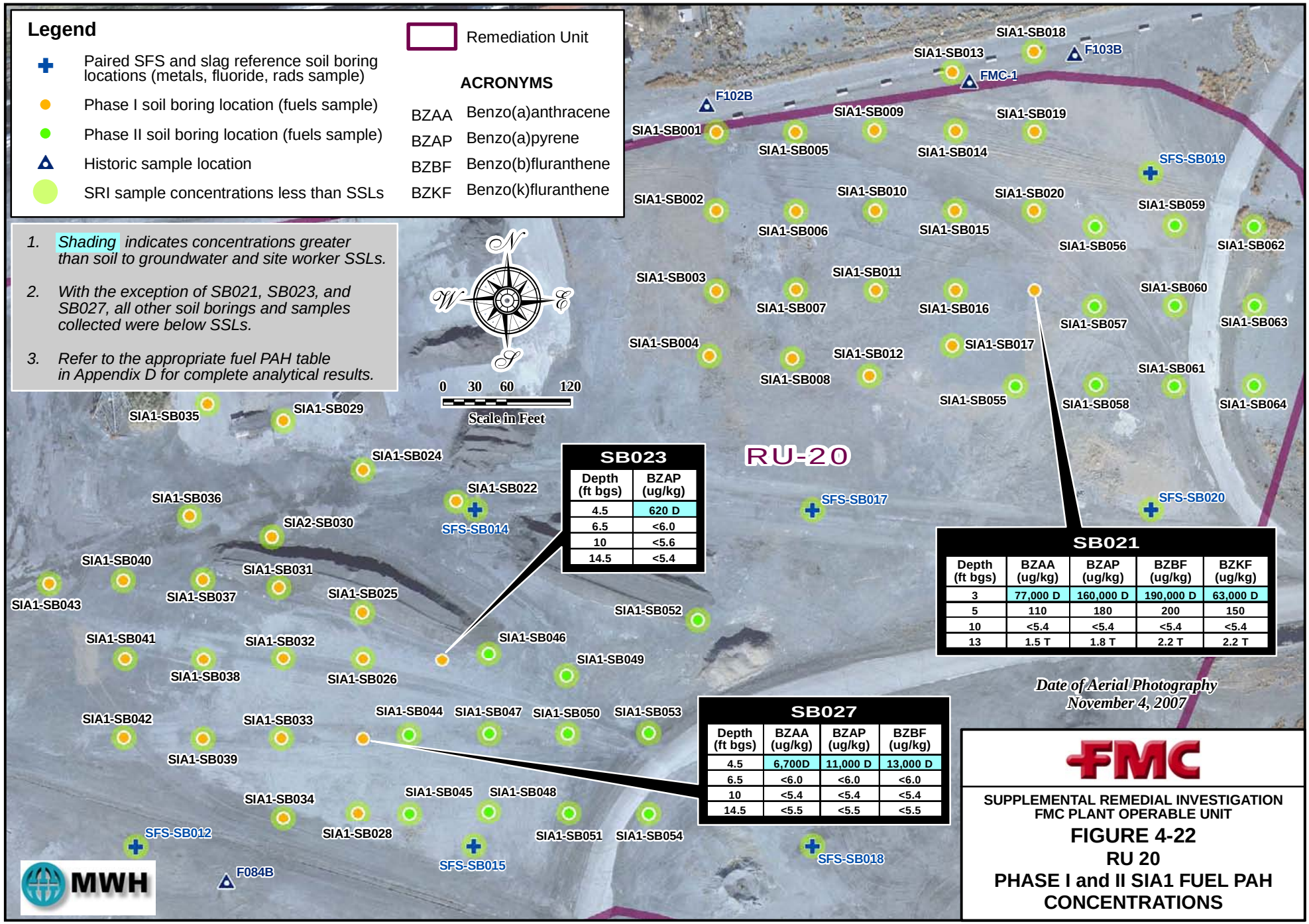
FIGURE 4-20

RU 19 BULLROCK PILE RADON FLUX MEASUREMENT LOCATIONS

FILE *Fig 4-21_RU20_RAI_SFS_Samples_508.mxd 6/11/08*



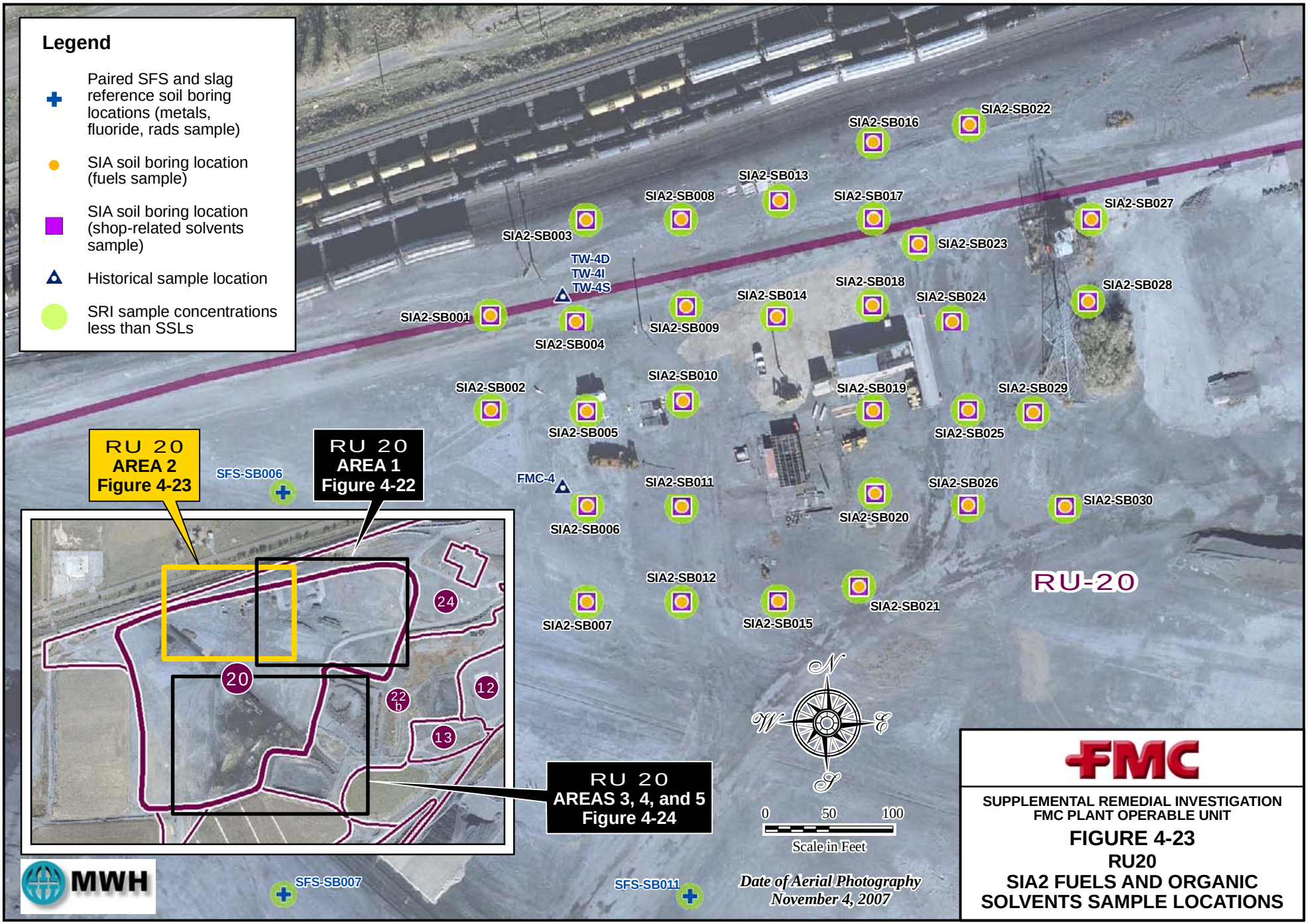
FILE *Fig 4-22_RU20_SIA1_Phase_I AND II_RESULTS_508.mxd* *6/11/08*



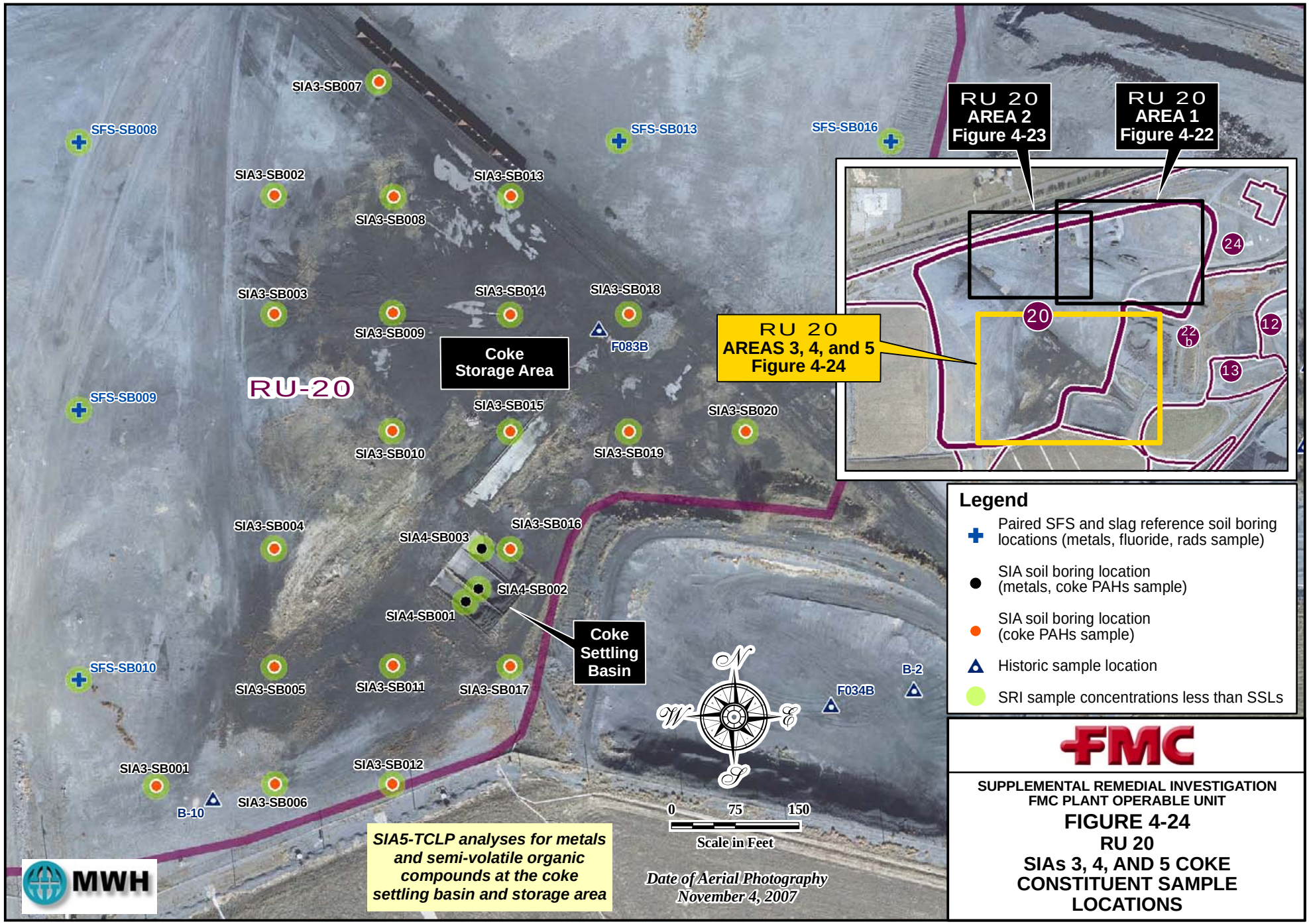
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-22
RU 20
PHASE I and II SIA1 FUEL PAH CONCENTRATIONS

FILE *Fig 4-23_RU20_SIA2_508.mxd* *6/11/08*



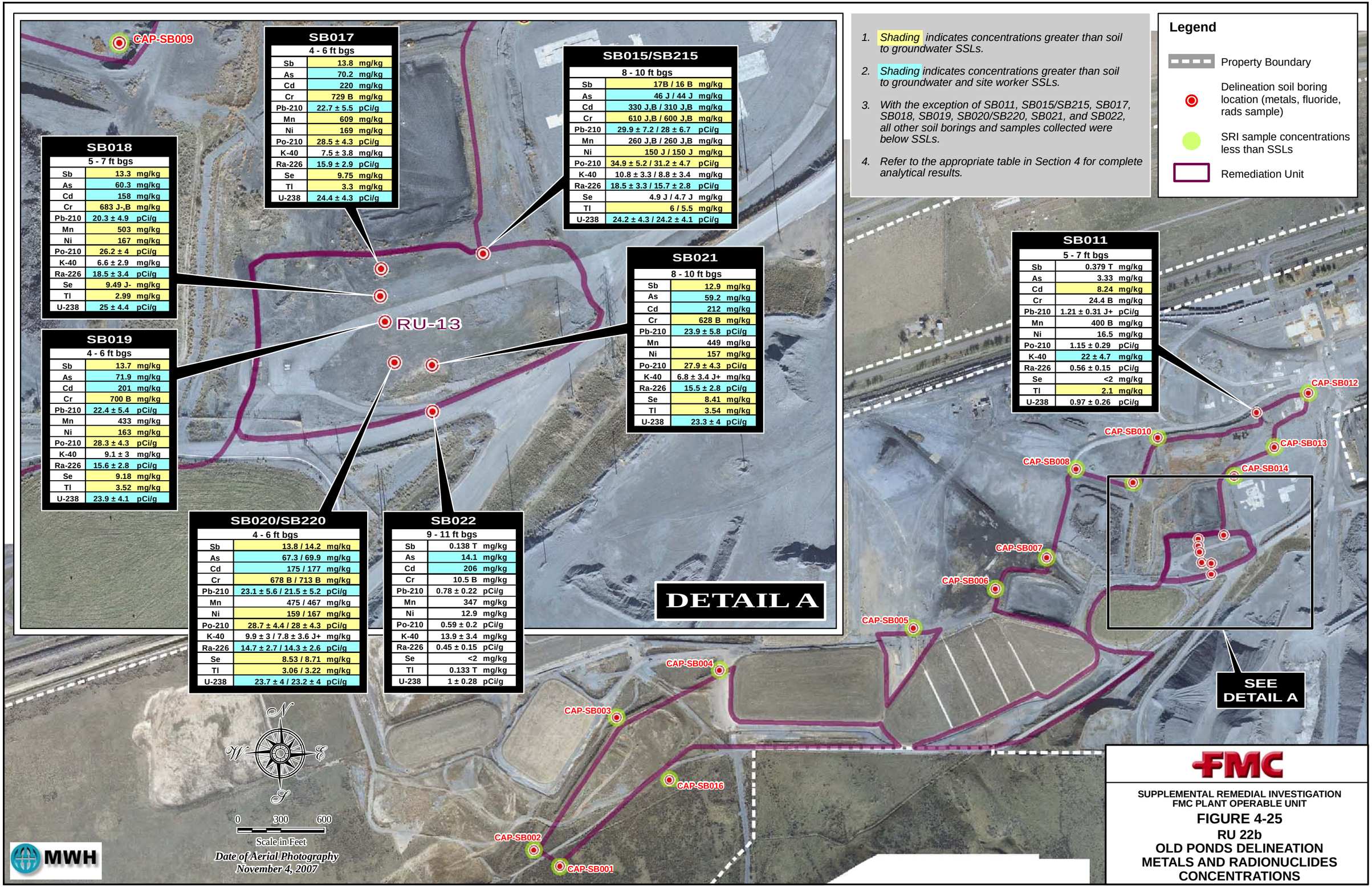
FILE *Fig 4-24_RU20_SIA3AND4_508.mxd* *6/11/08*



1. *Shading indicates concentrations greater than soil to groundwater SSLs.*
2. *Shading indicates concentrations greater than soil to groundwater and site worker SSLs.*
3. *With the exception of SB011, SB015/SB215, SB017, SB018, SB019, SB020/SB220, SB021, and SB022, all other soil borings and samples collected were below SSLs.*
4. *Refer to the appropriate table in Section 4 for complete analytical results.*

Legend

- Property Boundary
- Delineation soil boring location (metals, fluoride, rads sample)
- SRI sample concentrations less than SSLs
- Remediation Unit



SB017

4 - 6 ft bgs	
Sb	13.8 mg/kg
As	70.2 mg/kg
Cd	220 mg/kg
Cr	729 B mg/kg
Pb-210	22.7 ± 5.5 pCi/g
Mn	609 mg/kg
Ni	169 mg/kg
Po-210	28.5 ± 4.3 pCi/g
K-40	7.5 ± 3.8 mg/kg
Ra-226	15.9 ± 2.9 pCi/g
Se	9.75 mg/kg
Tl	3.3 mg/kg
U-238	24.4 ± 4.3 pCi/g

SB018

5 - 7 ft bgs	
Sb	13.3 mg/kg
As	60.3 mg/kg
Cd	158 mg/kg
Cr	683 J-,B mg/kg
Pb-210	20.3 ± 4.9 pCi/g
Mn	503 mg/kg
Ni	167 mg/kg
Po-210	26.2 ± 4 pCi/g
K-40	6.6 ± 2.9 mg/kg
Ra-226	18.5 ± 3.4 pCi/g
Se	9.49 J- mg/kg
Tl	2.99 mg/kg
U-238	25 ± 4.4 pCi/g

SB019

4 - 6 ft bgs	
Sb	13.7 mg/kg
As	71.9 mg/kg
Cd	201 mg/kg
Cr	700 B mg/kg
Pb-210	22.4 ± 5.4 pCi/g
Mn	433 mg/kg
Ni	163 mg/kg
Po-210	28.3 ± 4.3 pCi/g
K-40	9.1 ± 3 mg/kg
Ra-226	15.6 ± 2.8 pCi/g
Se	9.18 mg/kg
Tl	3.52 mg/kg
U-238	23.9 ± 4.1 pCi/g

SB020/SB220

4 - 6 ft bgs	
Sb	13.8 / 14.2 mg/kg
As	67.3 / 69.9 mg/kg
Cd	175 / 177 mg/kg
Cr	678 B / 713 B mg/kg
Pb-210	23.1 ± 5.6 / 21.5 ± 5.2 pCi/g
Mn	475 / 467 mg/kg
Ni	159 / 167 mg/kg
Po-210	28.7 ± 4.4 / 28 ± 4.3 pCi/g
K-40	9.9 ± 3 / 7.8 ± 3.6 J+ mg/kg
Ra-226	14.7 ± 2.7 / 14.3 ± 2.6 pCi/g
Se	8.53 / 8.71 mg/kg
Tl	3.06 / 3.22 mg/kg
U-238	23.7 ± 4 / 23.2 ± 4 pCi/g

SB015/SB215

8 - 10 ft bgs	
Sb	17B / 16 B mg/kg
As	46 J / 44 J mg/kg
Cd	330 J,B / 310 J,B mg/kg
Cr	610 J,B / 600 J,B mg/kg
Pb-210	29.9 ± 7.2 / 28 ± 6.7 pCi/g
Mn	260 J,B / 260 J,B mg/kg
Ni	150 J / 150 J mg/kg
Po-210	34.9 ± 5.2 / 31.2 ± 4.7 pCi/g
K-40	10.8 ± 3.3 / 8.8 ± 3.4 mg/kg
Ra-226	18.5 ± 3.3 / 15.7 ± 2.8 pCi/g
Se	4.9 J / 4.7 J mg/kg
Tl	6 / 5.5 mg/kg
U-238	24.2 ± 4.3 / 24.2 ± 4.1 pCi/g

SB021

8 - 10 ft bgs	
Sb	12.9 mg/kg
As	59.2 mg/kg
Cd	212 mg/kg
Cr	628 B mg/kg
Pb-210	23.9 ± 5.8 pCi/g
Mn	449 mg/kg
Ni	157 mg/kg
Po-210	27.9 ± 4.3 pCi/g
K-40	6.8 ± 3.4 J+ mg/kg
Ra-226	15.5 ± 2.8 pCi/g
Se	8.41 mg/kg
Tl	3.54 mg/kg
U-238	23.3 ± 4 pCi/g

SB022

9 - 11 ft bgs	
Sb	0.138 T mg/kg
As	14.1 mg/kg
Cd	206 mg/kg
Cr	10.5 B mg/kg
Pb-210	0.78 ± 0.22 pCi/g
Mn	347 mg/kg
Ni	12.9 mg/kg
Po-210	0.59 ± 0.2 pCi/g
K-40	13.9 ± 3.4 mg/kg
Ra-226	0.45 ± 0.15 pCi/g
Se	<2 mg/kg
Tl	0.133 T mg/kg
U-238	1 ± 0.28 pCi/g

SB011

5 - 7 ft bgs	
Sb	0.379 T mg/kg
As	3.33 mg/kg
Cd	8.24 mg/kg
Cr	24.4 B mg/kg
Pb-210	1.21 ± 0.31 J+ pCi/g
Mn	400 B mg/kg
Ni	16.5 mg/kg
Po-210	1.15 ± 0.29 pCi/g
K-40	22 ± 4.7 mg/kg
Ra-226	0.56 ± 0.15 pCi/g
Se	<2 mg/kg
Tl	2.1 mg/kg
U-238	0.97 ± 0.26 pCi/g

MWH

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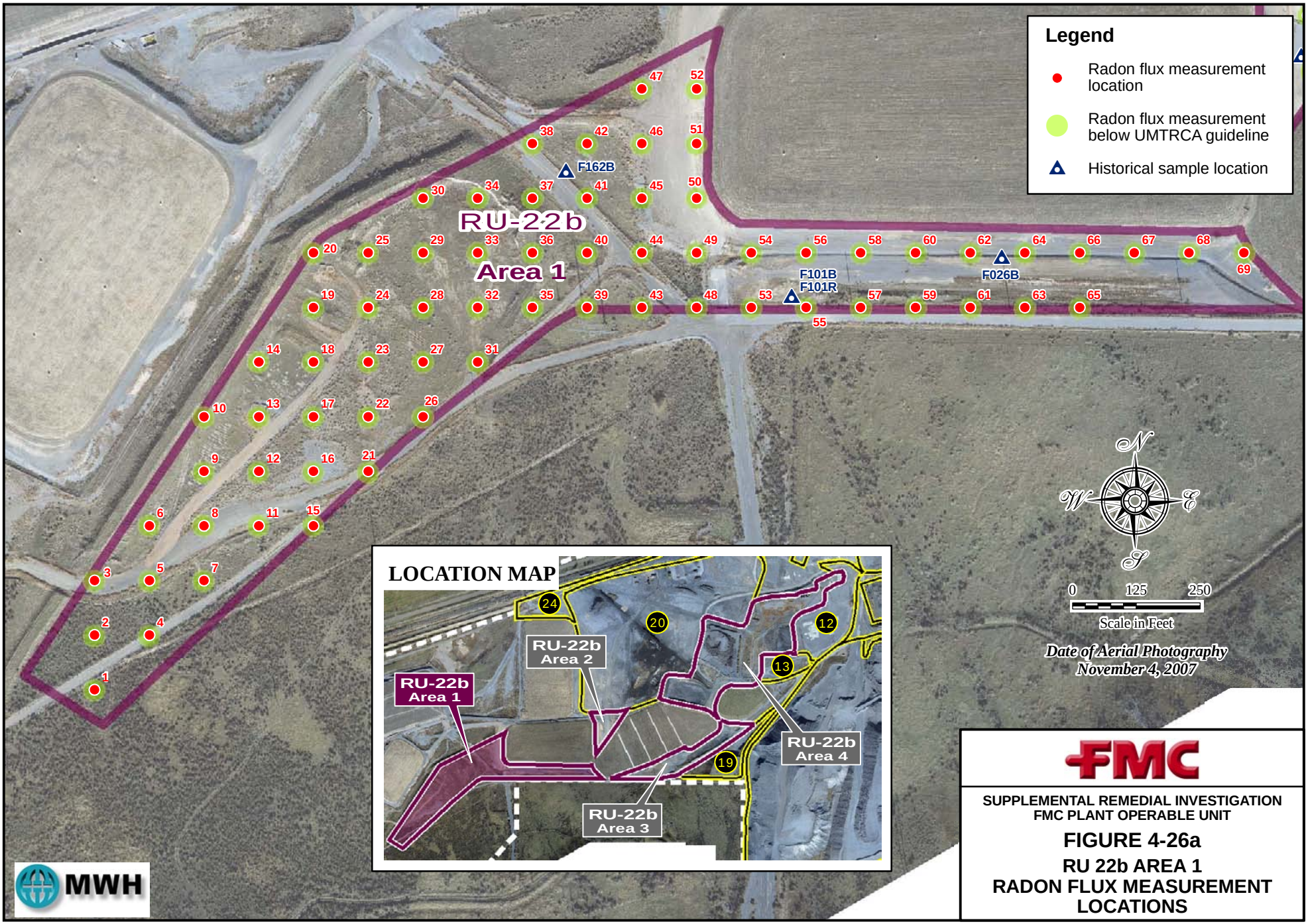
FIGURE 4-25
RU 22b
OLD PONDS DELINEATION
METALS AND RADIONUCLIDES CONCENTRATIONS

FILE *Fig 4-25_RU22b_Old Ponds Delineation_RESULTS_508_11x17.mxd 6/11/08*

FILE *Fig 4-26a_Radon FluxRU22B_Area 1_508.mxd* *6/11/08*



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SUPPLEMENTAL REMEDIAL INVESTIGATION
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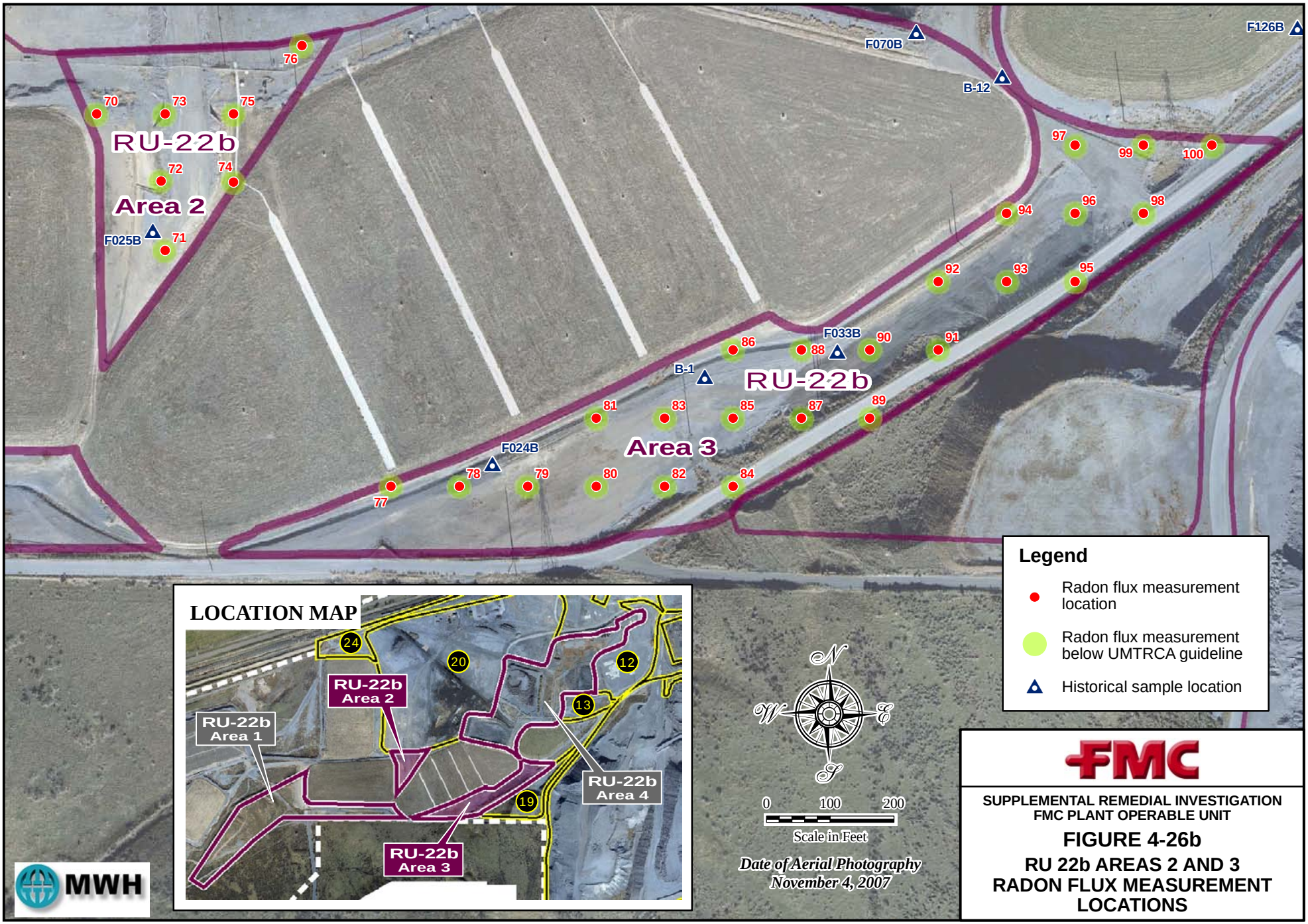
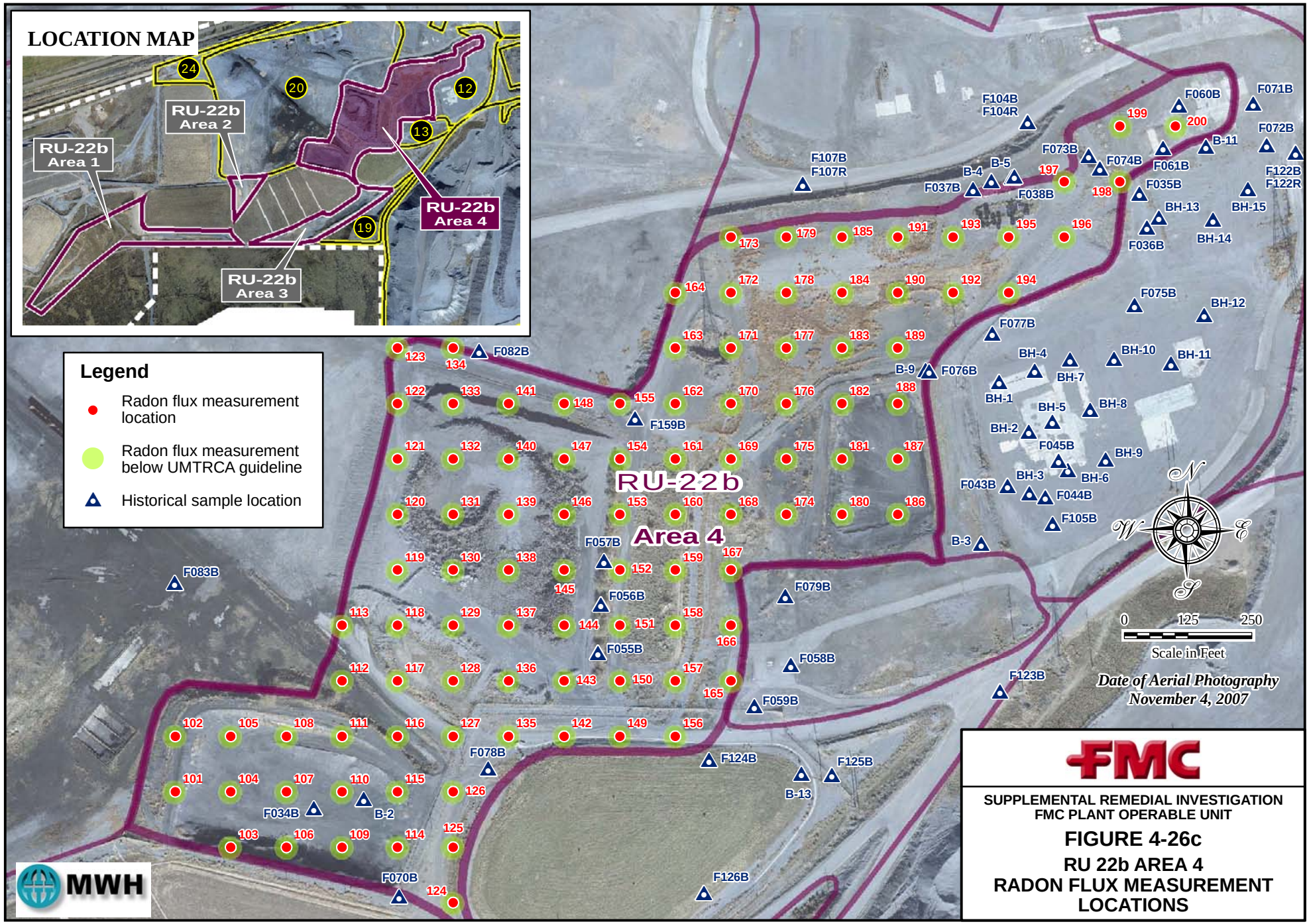
FIGURE 4-26a

RU 22b AREA 1
RADON FLUX MEASUREMENT LOCATIONS

FILE *Fig 4-26b_Radon FluxRU22B_Area 2_3_508.mxd* *6/11/08*



FILE *Fig 4-26c_Radon FluxRU22B_Area 4_508.mxd* *6/11/08*



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SUPPLEMENTAL REMEDIAL INVESTIGATION
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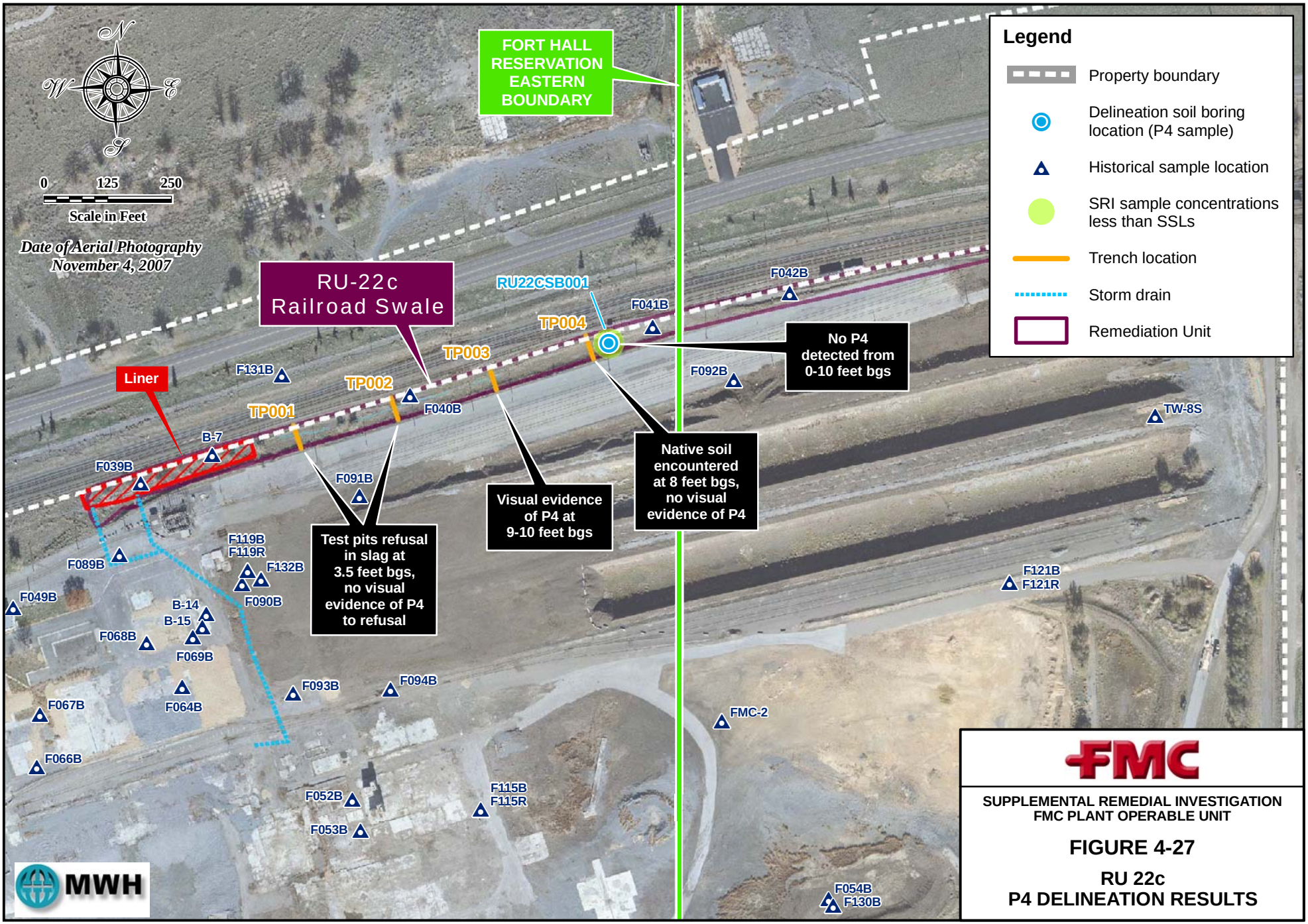
FIGURE 4-26c

RU 22b AREA 4
RADON FLUX MEASUREMENT LOCATIONS

FILE *Fig 4-27_P4 Delineation Locs_RU22c_RESULTS_508.mxd 6/11/08*



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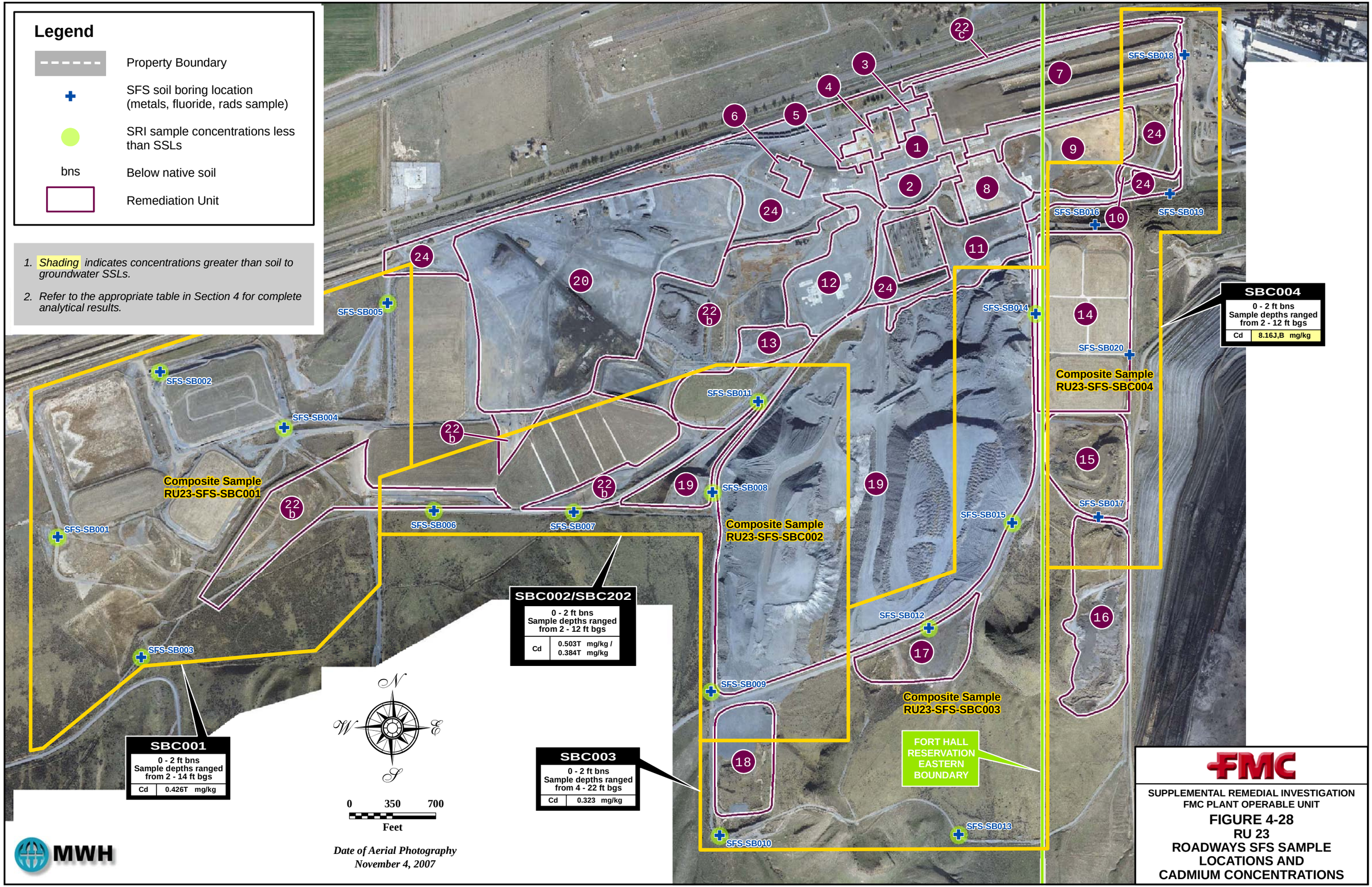
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-27

RU 22c
P4 DELINEATION RESULTS


Legend
Property Boundary
SFS soil boring location (metals, fluoride, rads sample)
SRI sample concentrations less than SSLs
bns
Below native soil
Remediation Unit
1. Shading indicates concentrations greater than soil to groundwater SSLs.
2. Refer to the appropriate table in Section 4 for complete analytical results.
SFS-SB001
SFS-SB002
SFS-SB003
SFS-SB004
SFS-SB005
SFS-SB006
SFS-SB007
SFS-SB008
SFS-SB009
SFS-SB010
SFS-SB011
SFS-SB012
SFS-SB013
SFS-SB014
SFS-SB015
SFS-SB016
SFS-SB017
SFS-SB018
SFS-SB019
SFS-SB020
Composite Sample RU23-SFS-SBC001
Composite Sample RU23-SFS-SBC002
Composite Sample RU23-SFS-SBC003
Composite Sample RU23-SFS-SBC004
SBC001
0 - 2 ft bns
Sample depths ranged from 2 - 14 ft bgs
Cd 0.426T mg/kg
SBC002/SBC202
0 - 2 ft bns
Sample depths ranged from 2 - 12 ft bgs
Cd 0.503T mg/kg / 0.384T mg/kg
SBC003
0 - 2 ft bns
Sample depths ranged from 4 - 22 ft bgs
Cd 0.323 mg/kg
SBC004
0 - 2 ft bns
Sample depths ranged from 2 - 12 ft bgs
Cd 8.16J,B mg/kg
FORT HALL RESERVATION EASTERN BOUNDARY
N
W
E
S
0 350 700
Feet
Date of Aerial Photography
November 4, 2007
MWH
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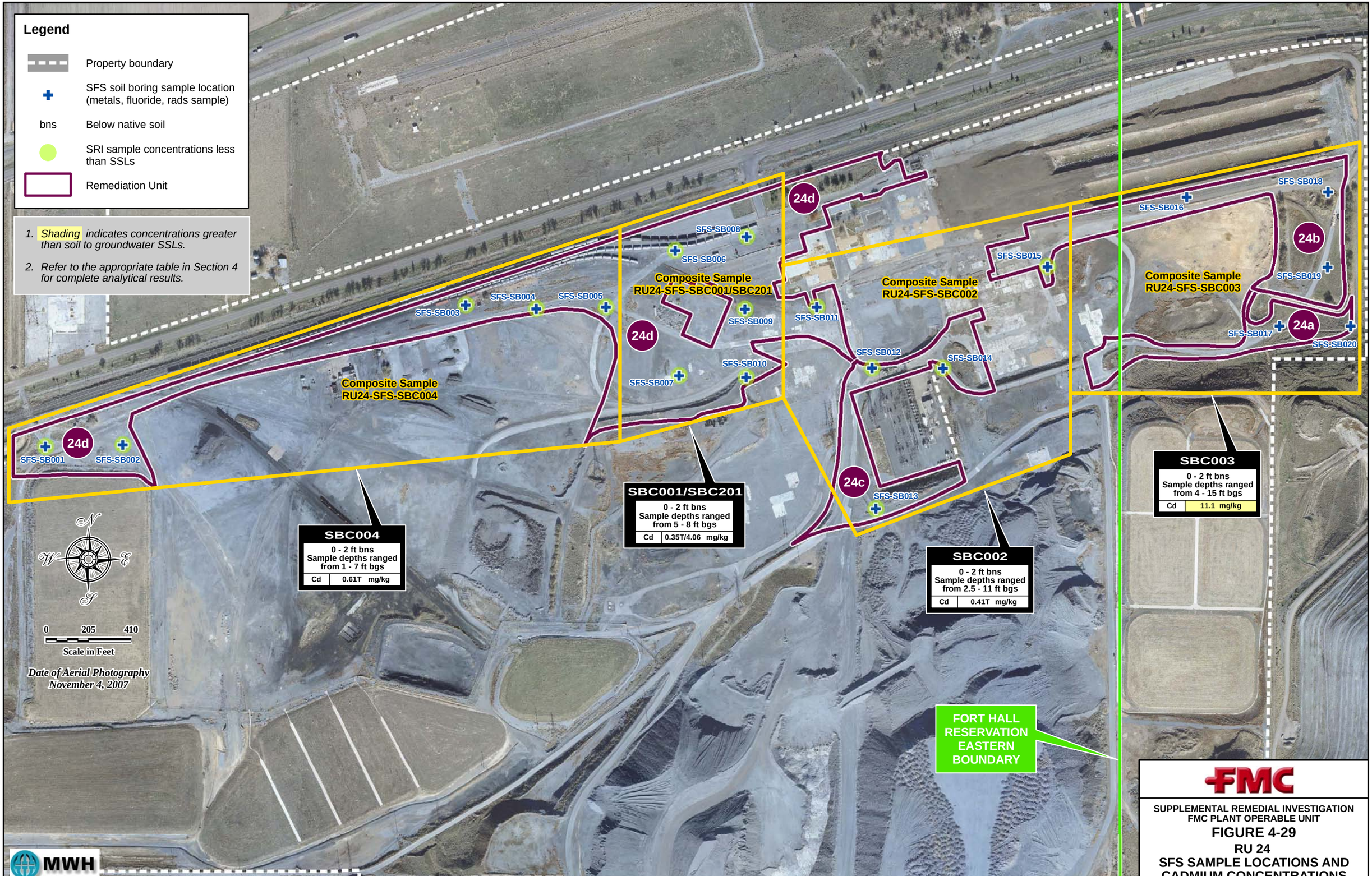
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT
FIGURE 4-28
RU 23
ROADWAYS SFS SAMPLE LOCATIONS AND CADMIUM CONCENTRATIONS
FILE Fig 4-28_RU23_SFS_Sample_508.mxd 5/30/08



SUPPLEMENTAL REMEDIAL INVESTIGATION
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FIGURE 4-29

RU 24

SFS SAMPLE LOCATIONS AND CADMIUM CONCENTRATIONS

FILE Fig 4-29_RU24_SFS_Samples_508.mxd 5/30/08

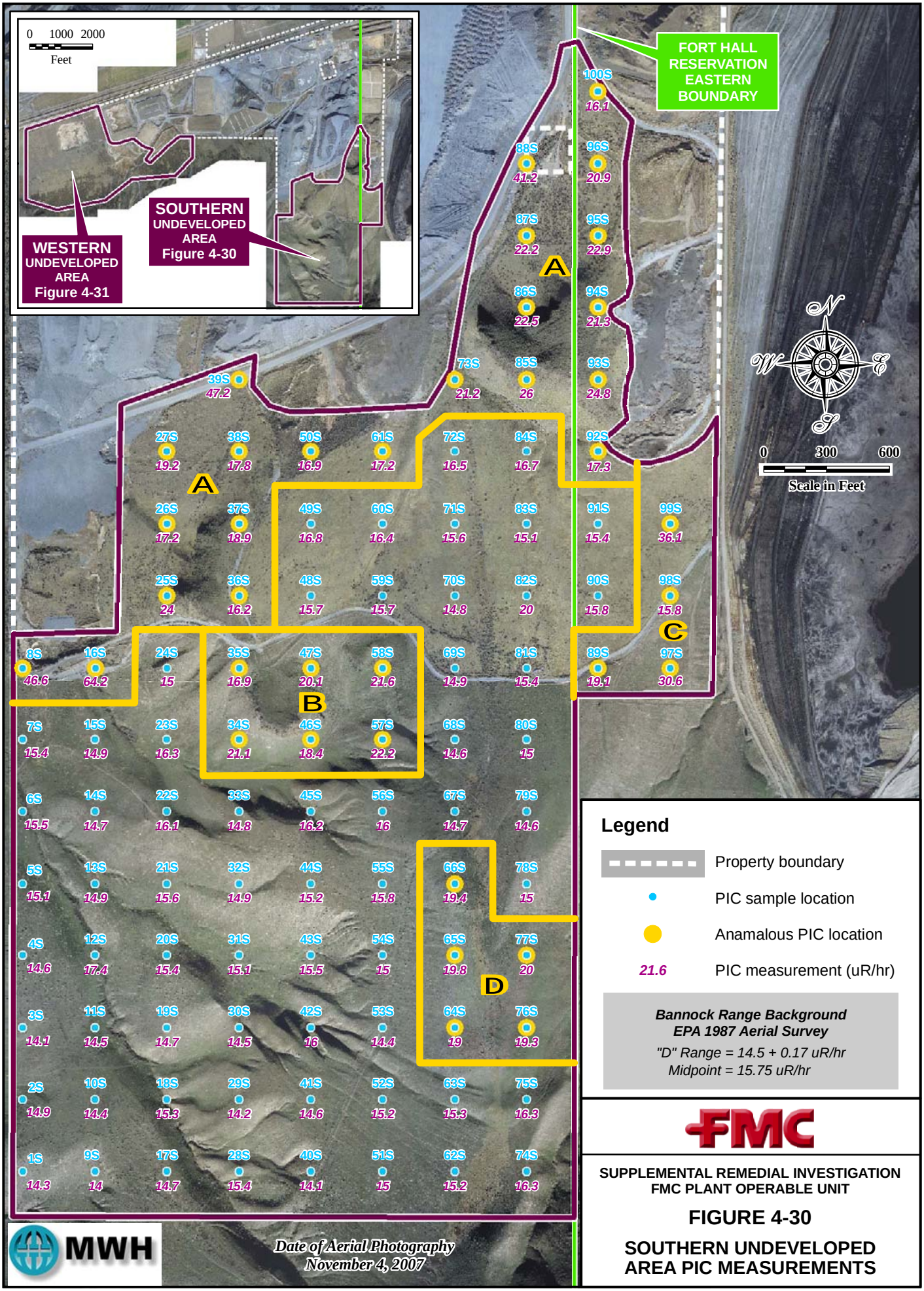

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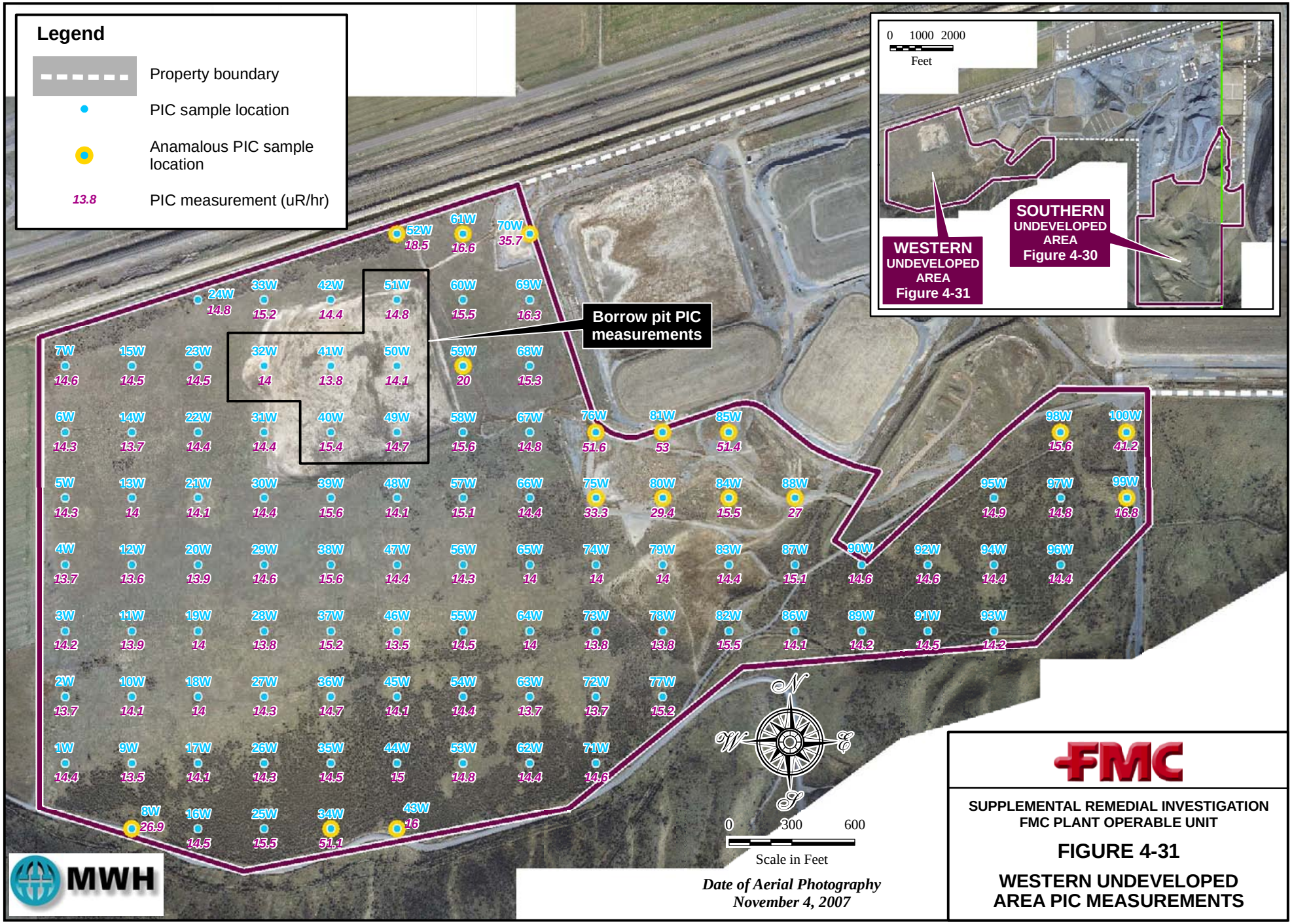
FIGURE 4-30

SOUTHERN UNDEVELOPED AREA PIC MEASUREMENTS

FILE Fig 4-30_Southern Undev Area PIC_508.mxd 6/11/08

FILE *Fig 4-31_Western Undev Area PIC_508.mxd 5/30/08*



Date of Aerial Photography
November 4, 2007

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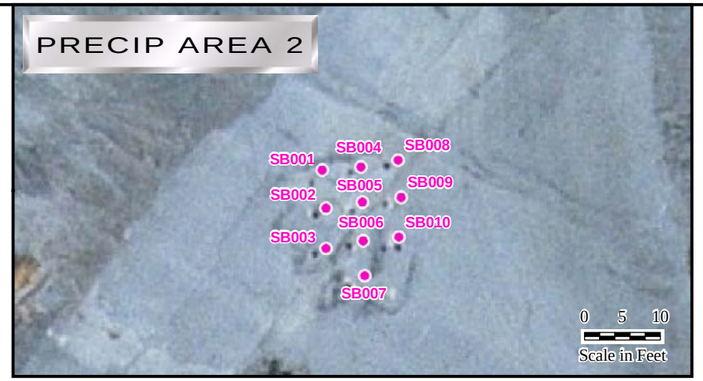
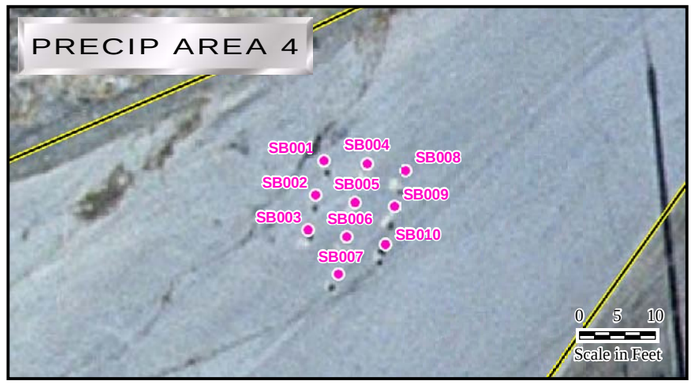
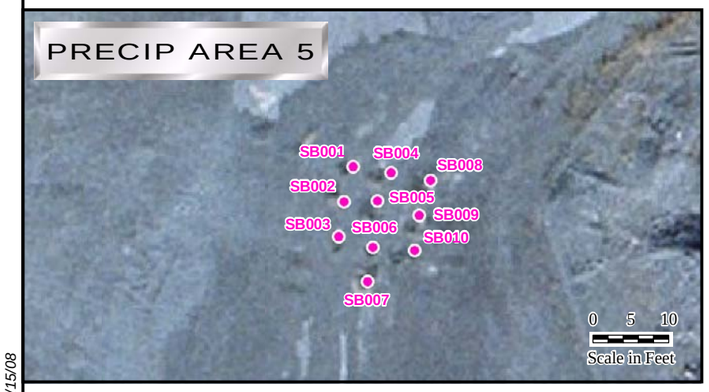
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

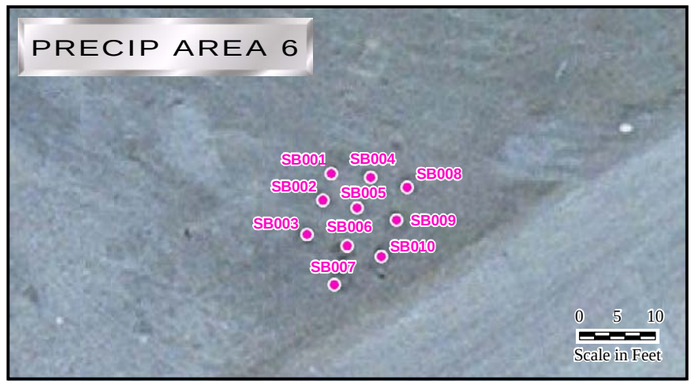
FIGURE 4-31

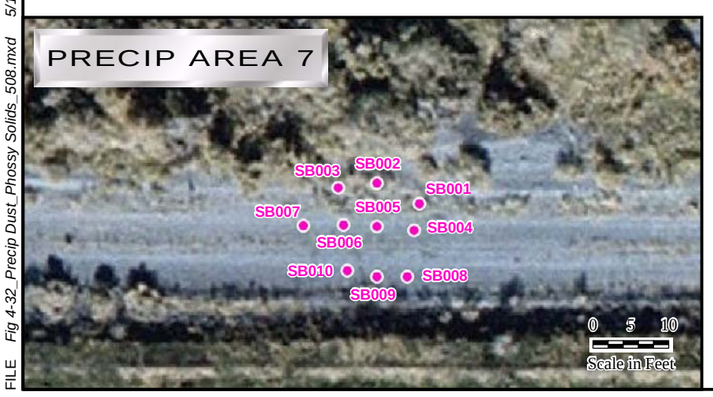
WESTERN UNDEVELOPED AREA PIC MEASUREMENTS







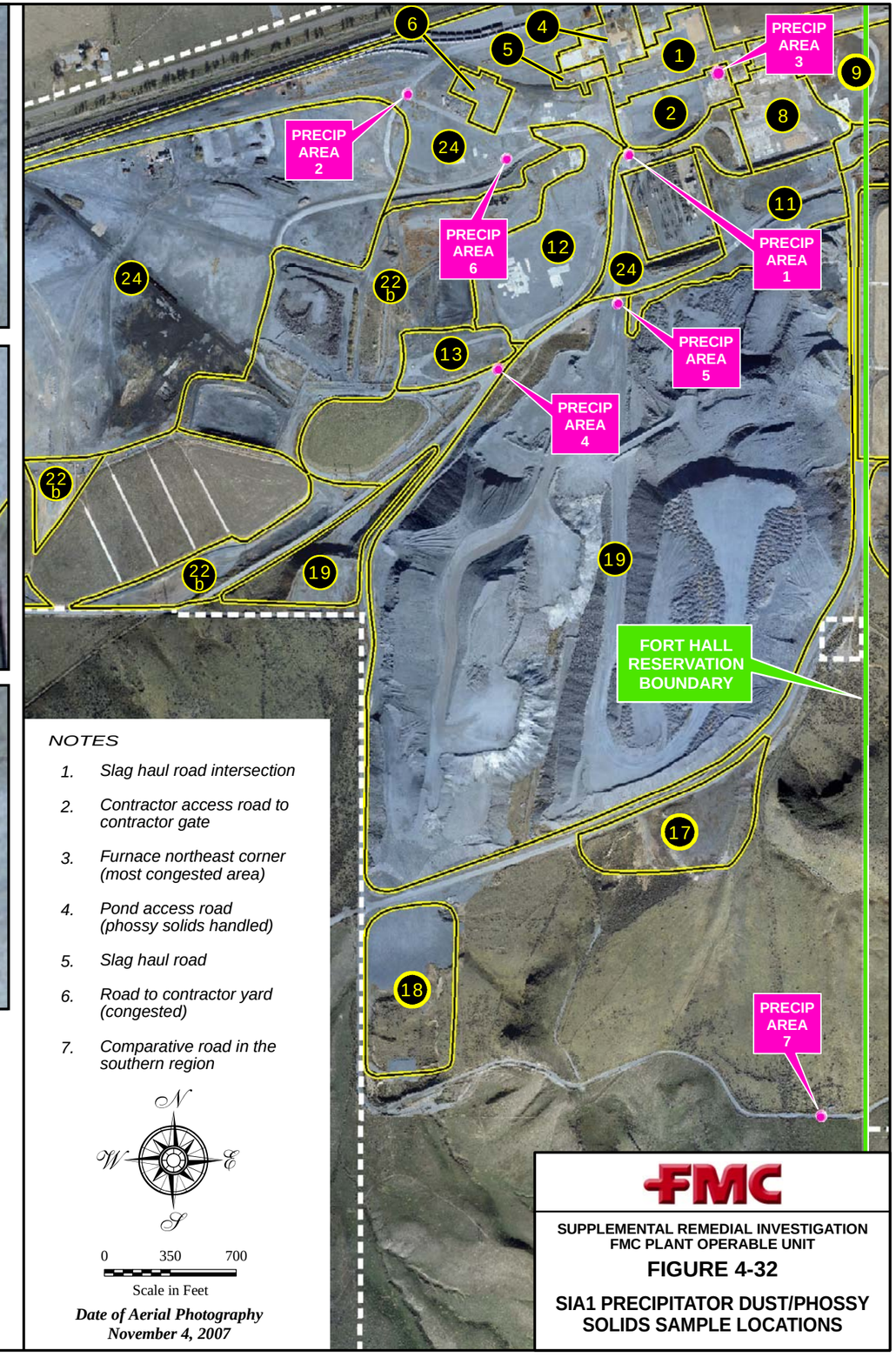




Legend

- Remediation Unit
- Property Boundary
- SIA soil boring location (Pb-210 sample)

MWH



NOTES

1. *Slag haul road intersection*
2. *Contractor access road to contractor gate*
3. *Furnace northeast corner (most congested area)*
4. *Pond access road (phossy solids handled)*
5. *Slag haul road*
6. *Road to contractor yard (congested)*
7. *Comparative road in the southern region*

N W E S

0 350 700
Scale in Feet

Date of Aerial Photography November 4, 2007

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SUPPLEMENTAL REMEDIAL INVESTIGATION
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FIGURE 4-32

SIA1 PRECIPITATOR DUST/PHOSSY SOLIDS SAMPLE LOCATIONS

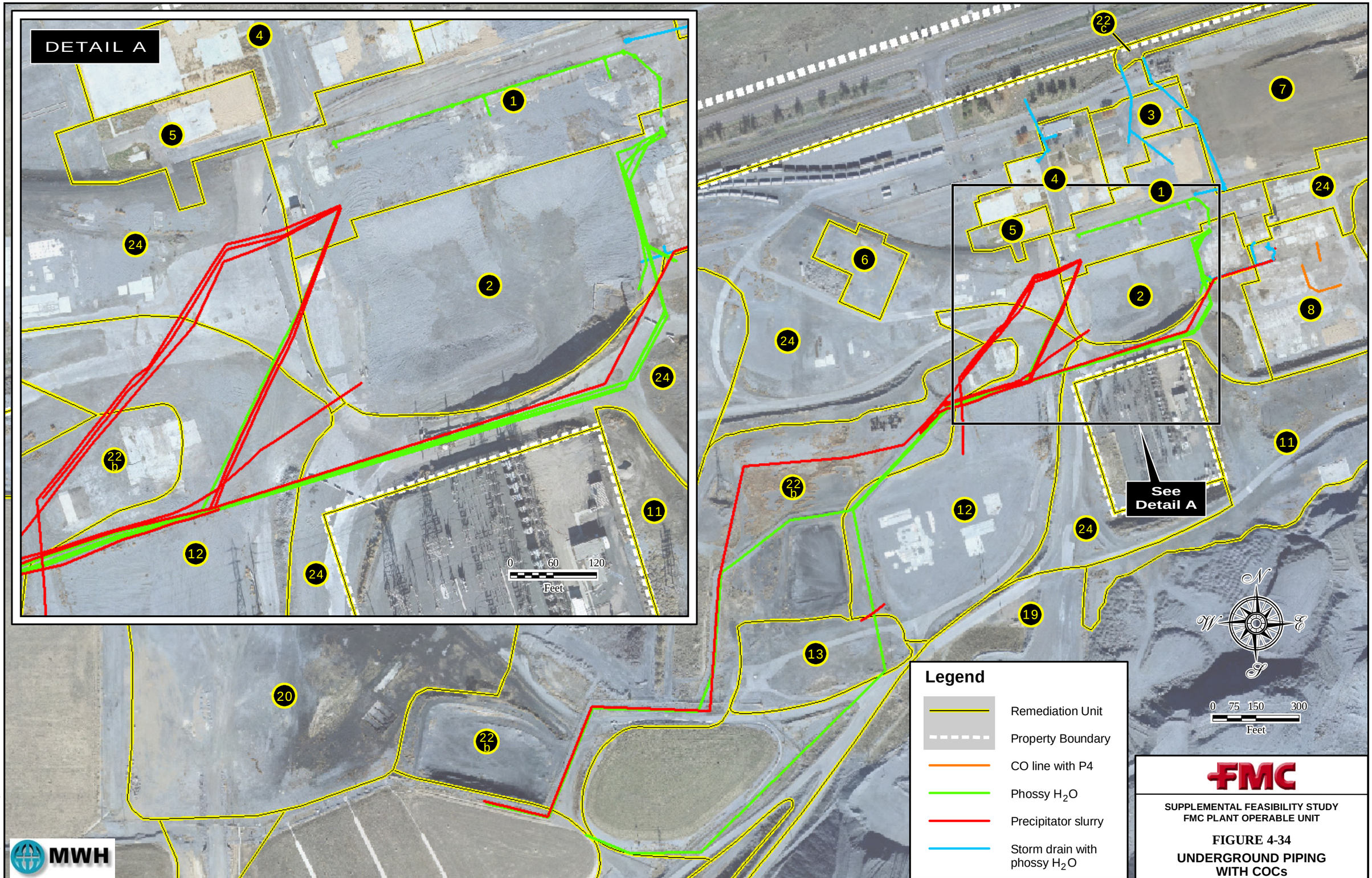
FILE *Fig 4-32_Precip Dust_Phossy Solids_508.mxd* *5/15/08*

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-33

SIA PCDT ROADWAY SAMPLE LOCATIONS

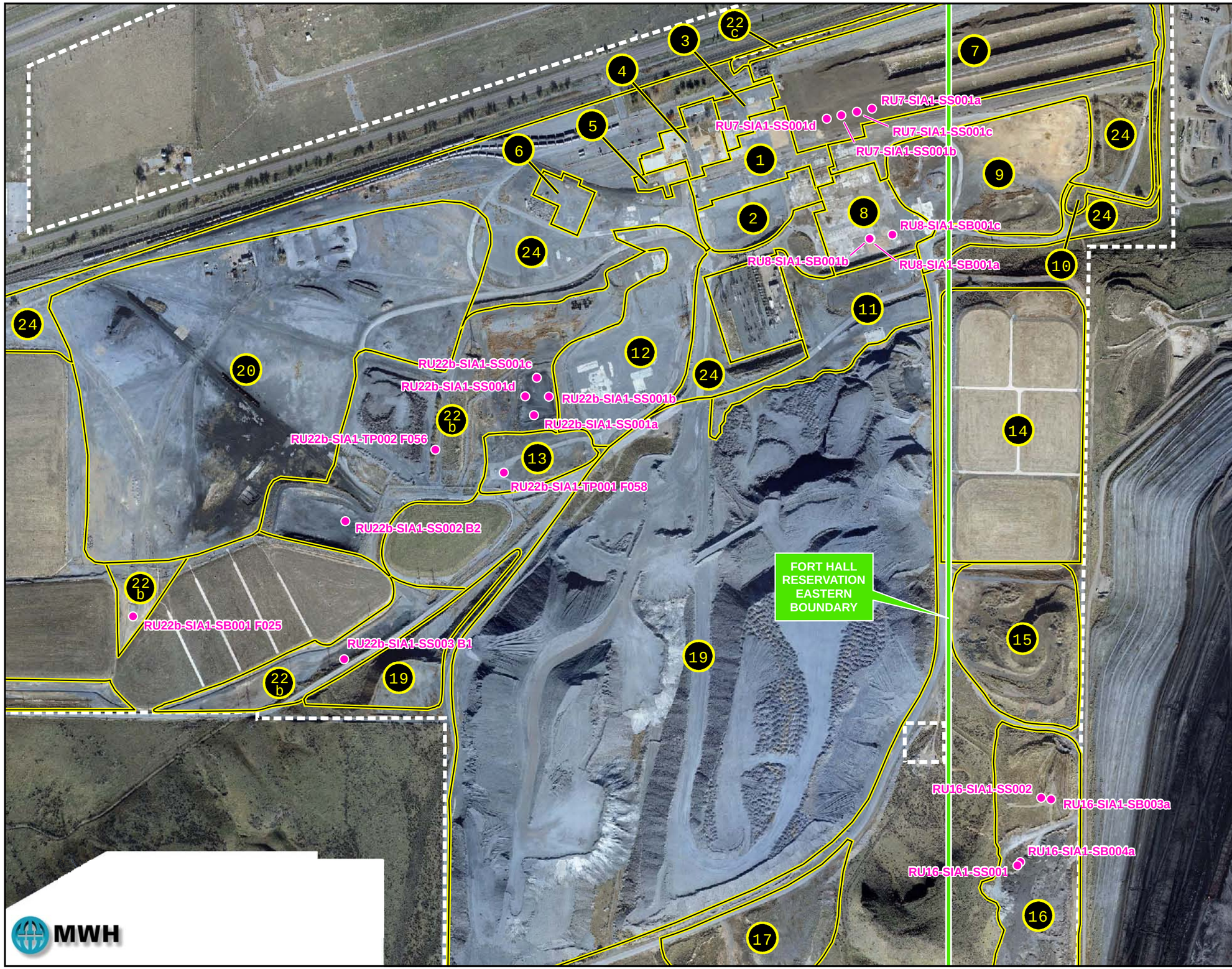
FILE Fig 4-33_PCDT Roadway_508.mxd 5/15/08



SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

FIGURE 4-34
UNDERGROUND PIPING WITH COCs

FILE Fig 4-34_Underground Piping with COCs_309 .mxd 3/20/09



Legend

- Remediation Unit
- Property Boundary
- Fill characterization study location

N W E S

0 250 500
Feet

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 4-35
FILL CHARACTERIZATION SAMPLE LOCATIONS

FILE Fig 4-35_Fill Characterization Sample Locations_508.mxd 6/12/08

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Residual subsurface P4 exceeds SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. U-238, Ra-226 and Pb-210 in RU 1 fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Antimony, arsenic, cadmium, lead, U-238, Ra-226, Pb-210, Po-210 and K-40 in RU 2 fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>All Receptors</u> Residual P4 within the subsurface of RUs 1 and 2 poses an unacceptable acute health hazard to potential future receptors due to the potential for spontaneous combustion of P4. <u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RUs 1 and 2 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials identified within RU 2 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to outdoor workers associated with incidental fill materials in RU 2 also exceed a hazard index of 1 for the dermal absorption pathway. <u>Construction Worker</u> Incremental cancer and non-cancer risks associated with incidental fill materials in RU 2 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials in RU 2 also exceed a hazard index of 1 for the dermal absorption and inhalation pathways. Potential risks exceed ROD RAOs. As a result, these RUs will proceed to the SFS.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit **(continued)**	P4 Delineation	Define the extent and concentration of P4 in shallow subsurface soils to: 1) define the extent of P4 in the subsurface and 2) evaluate the future worker risk for P4 outside the lateral extent of acute P4 risks.	Drilled 7 auger borings to groundwater around the perimeter of RU 1 and 7 auger borings to groundwater around the perimeter of RU 2. Visually evaluated cuttings for the presence of P4. Stepped-out as required.	Visual evaluation P4	P4 was not visually detected in RU 1 soils until reaching the capillary fringe in native soils borings SB004, SB004a, and SB005 as evidenced by smoking or burning. As a result, decision rules were revised and field modification #12 was approved. P4 was not visually detected in any other soil borings at the boundary of RU 1 and RU 2.	P4 was not visually detected until reaching the capillary fringe at the boundary of RU 1; however samples were submitted for laboratory analyses of P4 in the shallow soils (0-10' bgs) and are described below.
			Collected samples for laboratory analysis from 0-2' bgs and 0-10' bgs from outermost step-out locations.	P4	P4 was detected in one RU 2 boundary sample significantly below SSLs. P4 was not detected in any other RU1 or RU 2 boundary soil boring samples from 0-10' bgs.	P4 was not detected above SSLs in the shallow soil; therefore, no additional step-out borings are required, and the limit of P4 in the shallow subsurface is defined by the SRI confirmation borings and the current RU boundaries.
	SIA1 - P4 Capillary Fringe Investigation downgradient of RU 1 (SRI Field Mod #12)	Define the lateral (horizontal) extent of P4 within the capillary fringe associated with the shallow groundwater.	Drilled 6 percussion hammer borings downgradient of RU 1 because during the P4 Delineation program visual evidence of P4 was encountered at the capillary fringe in borings SB004, SB004a, and SB005. Visually evaluated cuttings for the presence of P4. Stepped-in for one boring. Collected samples for laboratory analysis from the two-foot interval above the water table.	P4 Geotechnical Analyses	P4 was not visually detected in native soils above, at, or below the capillary fringe. P4 was not detected in native soils samples collected within the capillary fringe.	The maximum lateral extent of P4 at the capillary fringe has been delineated downgradient of RU 1. This information will be taken into consideration during formulation of remedial alternatives.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit **(continued)**	Underground Piping, Sumps, and Other Structures SIA	Compile information on underground piping, sumps and structures that may have carried P4-containing waste streams and could contain residual P4 deposits or other COCs. Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RUs 1 and 2 has been compiled. <u>Risk Assessment:</u> Any residual P4 in underground piping presumed to exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual precipitator solids in precipitator slurry underground piping presumed to contain U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within these RUs. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded for consideration during the SFS. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 3: Receiving Stores, Paint Shop and P4 Decon	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 3 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 3 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.
	SIA1 - Phossy Water	Characterize the potential impacts associated with phossy water P4 contamination in native soils to evaluate whether to remediate the specific investigation area or to take no further action.	Drilled 15 sample locations in the area of the phossy water surface flow path. Collected one sample from each boring for laboratory analysis from 0-2' bns.	P4 Metals Fluoride	P4 was not visually detected in native soils. Concentrations of metals, fluoride, and P4 in native soils were below SSLs.	Metals, fluoride, and P4 levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by possible phossy water. RU does not pose a risk to groundwater.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 5 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 3: Receiving Stores, Paint Shop and P4 Decon **(continued)**	SIA - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps, and structures that may have carried P4-containing waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RU 3 has been compiled. A Phase 2 investigation was not required during the SRI field work because RU 3 is being forwarded to the SFS based on the findings of the Supplemental HHRA. <u>Risk Assessment:</u> Any residual P4 in underground piping presumed to exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within this RU. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded for consideration during the SFS process. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.
RU 4: Office Buildings and Training Center	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 4 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 4 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 6 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[(a)]	Field Program Results	Contamination Assessment
RU 4: Office Buildings and Training Center **(continued)**	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.
	SIA1 – Organic Solvent – Lab-Related Solvents around soil boring F028B	Characterize the lateral and vertical extent of solvents to evaluate whether to remediate the solvent specific investigation area or to take no further action.	Phase 1: Drilled 14 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Lab-related solvents	Concentrations of lab-related solvents were not detected in any soil sample at any depth interval. Phase 2 sampling to define the lateral and vertical extent of solvent COCs was not required during the SRI field work at RU 4 because the SSLs were not exceeded.	Lab-related organic solvent concentrations in native soils were not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was necessary and the RU does not pose a threat to groundwater because of organic solvents.
RU 5: Lab and Old Drainfield	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 5 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 5 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 5: Lab and Old Drainfield **(continued)**	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.
	SIA1 – Organic Solvent – Lab-Related Solvents near SWMU 61 and Chemical Lab	Characterize the lateral and vertical extent of solvents to evaluate whether to remediate the solvent specific investigation area or to take no further action.	Phase 1: Drilled 24 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Lab-related solvents	Six of 24 borings detected low-level concentrations of laboratory-related solvents. No detections of solvents in the deepest sample intervals. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of solvent COCs was not required during the SRI field work at RU 5 because the SSLs were not exceeded.	Lab-related organic solvent concentrations in native soils were not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was necessary and the RU does not pose a threat to groundwater because of organic solvents.
RU 6: Former Long-Term Phos Storage Tanks	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, nickel, vanadium and six coke-related PAHs in RU 6 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 6 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks to outdoor workers, primarily associated with incidental fill materials, exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to indoor workers, associated with incidental fill materials, also exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with incidental fill materials in RU 6 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 6: Former Long-Term Phos Storage Tanks **(continued)**	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.
	SIA1 – Phossy Water impacts under former storage tanks	Characterize the potential impacts associated with phossy water P4 contamination in native soils to evaluate whether to remediate the specific investigation area or to take no further action.	Drilled 20 borings on a random grid around former tanks and railspurs, and drilled 12 borings beneath the center of the former tanks. Visually evaluated cuttings for the presence of P4. Collected one sample from each boring for laboratory analysis from 0-2' bns.	P4 Metals Fluoride	P4 was not visually detected in native soils. Concentrations of metals, fluoride, and P4 in native soils were below SSLs.	Metals, fluoride, and P4 levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by possible phossy water. RU does not pose a risk to groundwater.
RU 7: Shale Unloading, Crushing and Stockpile	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, arsenic, cadmium and six coke-related PAHs in RU 7 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 7 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer risks to outdoor workers, primarily associated with incidental fill materials, exceed the 1998 ROD RAO for the soil ingestion pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 7: Shale Unloading, Crushing and Stockpile (continued)	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	One (1) of four (4) composite samples reported a level of K-40 above SSLs. Concentrations of all other metals, fluoride, and radionuclides in underlying native soils were below SSLs.	With the exception of one sample with K-40 concentration above SSLs, metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were generally not impacted by overlying fill. RU does not pose a risk to groundwater.
	SFS - Reference Area Investigation (Ore)	Characterize the soils beneath the shale (ore) stockpile in order to evaluate whether fill constituents have leached from the ore in underlying native soils.	Drilled 20 borings on random grid. Collected a sample in each boring from 0-2' bns for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	One (1) of 20 borings reported an exceedance of SSLs. One (1) sample reported an exceedance of the soil to groundwater SSL for chromium. Two (2) borings reported detections above background.	One sample reported an exceedance of SSL for cadmium. Based on the limited number of concentrations above background, leaching from ore to underlying native soils is not a concern.
	SIA1 – Coke Constituents	Characterize the potential impacts associated with coke constituents in native soils to evaluate whether to remediate the specific investigation area or to take no further action.	Evaluated data from RU 20 Coke Reference Area Investigation	NA	Concentrations of coke PAHs in RU 20 SIA3 soils were below SSLs.	Leaching of coke PAHs from the coke handling areas in RU 7 to underlying native soils is not a concern.
	SIA – Radon Flux - Ore Fill Material	Characterize radon flux to evaluate radon emanation from ore fill material.	Collected 100 radon flux measurements on a random grid using electret ion chamber	Radon Flux	Radon flux rates were below the UMTRCA standard.	Radon mitigation measures do not need to be considered in the SFS.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 8: Former Kiln Scrubber Ponds and Calciners	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	U-238, Ra-226, Pb-210, Po-210, K-40, arsenic, cadmium, fluoride and thallium in RU 8 fill materials exceed background levels and SSLs – these constituents were carried forward as COCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 8 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with incidental fill materials in RU 8 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	Kiln Pond Sediments Delineation	Define the extent of kiln pond sediments to: 1) define the lateral extent of pond solids 2) evaluate the future worker risk outside the extent of pond solids.	Visually evaluated cuttings for the presence of pond sediments down to native soil. Drilled 14 initial borings. Stepped-out 10' as required and collected a sample from 0-2' bns in final step-out borings for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Kiln scrubber pond sediments were not visually observed in the borings. Four (4) borings reported at least once exceedance of soil to groundwater SSLs for arsenic, cadmium, chromium, selenium, or thallium. A fifth boring reported a concentration of K-40 slightly above SSLs.	Additional step-out borings needed for delineation of kiln pond solids.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, Po-210, K-40, arsenic, cadmium, fluoride, thallium and six coke-related PAHs in RU 9 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 9 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with incidental fill materials in RU 9 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 10: IWW Pond and Ditch	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in RU 10 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 10 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials identified within RU 10 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to outdoor workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption pathway. <u>Construction Worker</u> Incremental cancer and non-cancer risks associated with incidental fill materials in RU 10 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption and inhalation pathways. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soil were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 10: IWW Pond and Ditch **(continued)**	SIA1 – Phossy Water and Precipitator Solids - IWW Ditch and Pond Area	Characterize the potential impacts associated with phossy water P4 and precipitator solids in native soils and sediments to evaluate whether to remediate the specific investigation area or to take no further action.	Drilled 20 borings/excavated test pits. Visually evaluated cuttings for evidence of P4. Collected one sample from each location for laboratory analysis from 0-2' bns for the ditch and 0-2' bgs for the pond.	P4 Metals Fluoride Po-210 Pb-210	No visible P4 observed. One manganese detection above SSL in the IWW ditch. All four borings in IWW pond reported exceedances of arsenic, cadmium, chromium, Pb-210, manganese, mercury, Po-210, selenium, and thallium in the fill materials from 0-to-2' bgs in the IWW pond.	Metal, fluoride, and radionuclide levels in native soils are not elevated above any future worker or soil to groundwater SSL in the IWW ditch. Metals and radionuclides are elevated above SSLs in the IWW Pond. The impacted materials in RU 10 are confined to the IWW Pond and the lateral and vertical extent has been delineated.
RU 11: Equipment Area South of Calciners	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 11 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 11 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 12: Former RP&S Area and Mobile Shop	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium, lead, nickel and vanadium in RU 12 fill materials exceed background levels, CVs and SSLs – these constituents carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 12 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials identified within RU 12 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to outdoor workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption pathway. <u>Construction and Utility Workers</u> Incremental cancer and non-cancer risks to construction workers associated with incidental fill materials in RU 12 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to construction workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption and inhalation pathways. Incremental non-cancer risks to utility workers associated with incidental fill materials exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SIA1 – Liquid Petroleum Fuels and Organic Solvents – Mobile Shop and Fuel Islands	Characterize the lateral and vertical extent of fuels and solvents to evaluate whether to remediate the specific investigation area or to take no further action.	Phase 1: Drilled 16 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Shop-related solvents	Twelve of 16 borings detected low-level concentrations of shop-related solvents solvents. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of solvent COCs was not required during the SRI field work at RU 12 because the SSLs were not exceeded.	Shop-related organic solvent concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was necessary and the RU does not pose a threat to groundwater because of organic solvents.
			Phase 1: Drilled 42 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid Petroleum Fuels	Two of 42 borings detected low-level concentrations of fuel VOCs and 18 of 42 borings detected low level concentrations of fuel PAHs. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of fuel COCs was not required during the SRI field work at RU 12 because the SSLs were not exceeded.	Fuel VOC and PAH concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required for fuels and the RU does not pose a threat to groundwater because of fuels.
	SIA 2 - Fuels – Steam Cleaning Area	Characterize the lateral and vertical extent of fuels to evaluate whether to remediate the specific investigation area or to take no further action.	Phase 1: Drilled 8 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid petroleum fuels	Two of 8 borings detected low-level concentrations of fuel VOCs and 8 of 8 borings detected low level concentrations of fuel PAHs. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of fuel COCs was not required during the SRI field work at RU 12 because the SSLs were not exceeded.	Fuel VOC and PAH concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required for fuels and the RU does not pose a threat to groundwater because of fuels..
	SIA3 – PCBs-Former Transformer Storage Area	Characterize PCBs in soil to evaluate whether to remediate the specific investigation area or to take no further action.	Drilled 33 borings on a random grid. Collected a discrete sample at surface, every 2.5' to native soil, native soil and 2' bns for laboratory analysis.	PCBs	Ten of 33 borings detected low-level concentrations of PCBs. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of PCB COCs was not required during the SRI field work at RU 12 because the SSLs were not exceeded.	PCB concentrations in soil are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required for PCBs and the RU does not pose a threat to groundwater because of PCBs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 12: Former RP&S Area and Mobile Shop **(continued)**	SIA4 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4-containing waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RU 12 has been compiled. A Phase 2 investigation was not required during the SRI field work because the gamma levels were above the CV and the RU will be forwarded to the SFS. <u>Risk Assessment:</u> Residual P4 presumed to be present in underground piping at levels that exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual precipitator solids in precipitator slurry underground piping presumed to contain U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within this RU. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded to the SFS for consideration during the SFS. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Residual subsurface P4 exceeds SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Gamma radiation, U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in RU 13 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs into the Supplemental HHRA.	<u>All Receptors</u> Residual P4 within the subsurface of RU 13 poses an unacceptable acute health hazard to potential future receptors due to the potential for spontaneous combustion of P4. <u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 13 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials identified within RU 13 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to outdoor workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption pathway. <u>Construction Worker</u> Incremental cancer and non-cancer risks associated with incidental fill materials in RU 13 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption and inhalation pathways. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Pond sediments encountered in several borings on the border with RU 22b. Smoking P4 was encountered in one boring. Concentrations of metals and radionuclides in soils are above SSLs for all four composite samples	Metals, fluoride, and radionuclides levels in native soils are elevated above any future worker SSL or soil to groundwater SSL.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area **(continued)**	SIA1 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4-containing waste streams and could contain residual P4 deposits; Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RU 13 has been compiled. A Phase 2 investigation was not required during the SRI field work because the gamma levels were above the CV and the RU will be forwarded to the SFS. <u>Risk Assessment:</u> Any residual P4 in underground piping presumed to exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual precipitator solids in precipitator slurry underground piping presumed to contain U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within this RU. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded to the SFS for consideration during the SFS. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	U-238, Ra-226, Pb-210, Po-210, K-40, arsenic, cadmium, fluoride, thallium and six coke-related PAHs in RU 15 fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Outdoor and Indoor Commercial/Industrial Workers Incremental cancer risks associated with predominant fill materials present within RU 15 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. Construction Worker Incremental non-cancer risks associated with incidental fill materials in RU 15 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SIA1 - Leaching Potential from Ore, Used Electrodes, and Baghouse Dust	Characterize vertical impact to native soils underlying these materials to assess potential transport of metals and fluoride in vadose zone for the purpose of designing the proposed cap/cover.	Drilled 5 borings. Collected samples at 0-2' bns and a discrete sample every 10' bns to refusal or groundwater for laboratory analysis.	Metals Fluoride	Two (2) of five (5) borings detected concentrations of cadmium above soil to groundwater SSL at shallow and deep depths in the vadose zone.	Exceedances of cadmium at shallow depths appear to be the result of mixture of fill and native soils. Exceedances of cadmium at depth may be natural or due to leaching

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 16: Calciner Solids Stockpile	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	U-238, Ra-226, Pb-210, Po-210, K-40, arsenic, cadmium, fluoride and thallium in RU 16 fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 16 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with predominant fill materials also exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with predominant fill materials in RU 16 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with predominant fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SIA1 - Leaching Potential from Calciner Solids	Characterize vertical impact to native soils underlying these materials to assess potential transport of metals and fluoride in vadose zone for the purpose of designing the proposed cap/cover.	Drilled 8 borings. Collected samples at 0-2' bns and a discrete sample every 10' bns to refusal or groundwater for laboratory analysis.	Metals Fluoride	Four (4) of eight (8) borings detected concentration of arsenic, cadmium, chromium, manganese, selenium, and thallium at shallow and deep depths in the vadose zone.	Exceedances of metals at shallow depths appear to be the result of mixture of fill and native soils. Exceedances of metals at depth appear to be due to migration of metals into the subsurface from calciner solids.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 19: Slag Pile	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	U-238, Ra-226, Pb-210, arsenic, and cadmium in RU 19 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA..	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 19 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	Soil Cover Area Radiation Survey	Evaluate whether the test soil cover over slag material reduces the risk from surface external gamma radiation to future site workers to evaluate remedial alternatives.	Performed surface radiation scan over soil cover area.	NA	Gamma radiation with soil cover over slag was below the CV.	The soil cover over portions of the slag pile reduces gamma dose rates to regional background levels.
	SIA1 - Radon Flux - Measurements from the slag and bullrock piles	Characterize radon flux to evaluate the design of the proposed cap/cover (e.g., appropriate thickness).	Collect 100 radon flux measurements using electret ion chamber from each: slag pile, bull rock pile and test soil cover area, if required.	Radon Flux	Radon flux rates were below the UMTRCA standard for both the slag pile and bullrock pile. No measurements were required for the soil test cover area.	Radon mitigation measures do not need to be considered in the SFS.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 20: Former Bannock Paving Area	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226, Pb-210, nickel, vanadium and six coke-related PAHs in RU 20 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 20 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks to outdoor workers, primarily associated with incidental fill materials, exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to indoor workers, associated with incidental fill materials, also exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with incidental fill materials in RU 20 exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Concentrations of metals, fluoride, and radionuclides in underlying native soils were below SSLs.	Metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were not impacted by overlying fill. RU does not pose a risk to groundwater.
	SFS - Reference Area Investigation (Slag)	Characterize the soils beneath the slag to evaluate if fill constituents have leached in underlying native soils.	Drilled 20 borings on random grid. Collected a sample in each boring from 0-2' bns for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Two (2) of 20 boring reported exceedances of SSLs for two metals. One sample reported an exceedance of the soil to groundwater SSL for cadmium and one sample reported a slight exceedance of the manganese soil to gw SSL. Three (3) borings reported concentrations of metals above background.	Two samples reported slight exceedances of SSLs for two metals. Leaching from slag to underlying native soils is not a concern. Based on the limited number of concentrations above background, leaching from slag to underlying native soils is not a concern.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 20: Former Bannock Paving Area **(continued)**	SIA1 – Fuels near Hot Batch Plant	Characterize the lateral and vertical extent of fuels to evaluate whether to remediate the specific investigation area or to take no further action.	Phase 1: Drilled 43 borings on a random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis. Phase 2: Presented Phase 1 data to Agency. Designed a sampling program. Drilled 21 additional shallow soil borings on a random grid. Collected additional samples from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid petroleum fuels	Three (3) of 43 borings detected low-level concentrations of fuel VOCs and several borings detected low level concentrations of fuel PAHs. Three borings detected concentrations of PAHs in the shallow intervals above SSLs. No detections of PAHs above SSLs in any of 21 Phase 2 borings. Four fuel-related PAHs detected above worker SSLs – these constituents were carried forward as COCs into the Supplemental HHRA.	Fuel VOC concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. Fuel PAHs in three borings exceeded PAHs in shallow interval but no exceedances reported for Phase 2. As a result, no additional lateral or vertical delineation was required for fuels and the RU does not pose a threat to groundwater because of fuels. Incremental cancer and non-cancer risks to potential future workers from exposure to fuel-related PAHs and fill materials within the Former Hot Batch Plant area are comparable to the risk levels associated with exposure to fill materials in the remainder of RU 20 (described in the Risk Assessment Field Program).
	SIA2 – Fuels around the Maintenance and Equipment Shop	Characterize the lateral and vertical extent of fuels and shop-related solvents to evaluate whether to remediate the specific investigation area or to take no further action.	Phase 1: Drilled 30 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Shop-related solvents	One of 30 borings detected a low-level concentration of a shop-related solvent. Concentration at was less than SSLs. Phase 2 sampling to define the lateral and vertical extent of solvent COCs was not required during the SRI field work at RU 20 because the SSLs were not exceeded.	Shop-related organic solvent concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required for organic solvents and the RU does not pose a threat to groundwater because of organic solvents.
			Phase 1: Drilled 30 borings on random grid. Collected a discrete sample in each boring from native soil interface, 2' bns, 10' bns and/or 10' bgs for laboratory analysis.	Liquid Petroleum Fuels	Five of 30 borings detected low-level concentrations of fuel VOCs and 12 of 42 borings detected low level concentrations of fuel PAHs. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of fuel COCs was not required during the SRI field work at RU 20 because the SSLs were not exceeded.	Fuel VOC and PAH concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation is required for fuels and the RU does not pose a threat to groundwater because of fuels..
	SIA3 – Coke Constituents and Reference Area Investigation - Coke	Characterize the soils beneath the coke handling area to evaluate whether fill constituents have leached in underlying native soils.	Drilled 20 borings on random grid. Collected a sample in each boring from 0-2' bns for laboratory analysis.	Coke PAHs	Seven of 20 borings detected low-level concentrations of coke PAHs. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of coke COCs was not required during the SRI field work at RU 20 because the SSLs were not exceeded.	Coke PAH concentrations in native soils are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required for coke PAHs and the RU does not pose a threat to groundwater because of coke constituents.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 20: Former Bannock Paving Area **(continued)**	SIA4 – Coke Constituents underlying the Coke Settling Basins	Characterize the vertical extent of constituents associated with coke beneath the concrete-lined coke settling basins to evaluate the remediation vision for coke constituents.	Drilled 3 borings to 10' below the bottom of the basins. Collected a discrete sample from each boring at 0', 2' and 10' below the basin for laboratory analysis.	Metals Coke PAHs	One boring reported low level concentrations of coke PAHs SSLs. All three borings detected concentrations of metals. Concentrations at all depth intervals were less than SSLs. Phase 2 sampling to define the lateral and vertical extent of coke COCs was not required during the SRI field work at RU 20 because the SSLs were not exceeded.	Coke PAH and metals concentrations in native soil are not elevated above any future worker SSL or soil to groundwater SSL. As a result, no additional lateral or vertical delineation was required and .the RU does not pose a threat to groundwater because of coke PAHs or metals.
	SIA5 – Coke Constituents	Characterize toxicity of coke for handling purposes. Information will be used during the SFS for evaluation of potential remedial alternatives.	Collected 1 composite sample at the coke handling area and a composite sample from sediments in each of the three coke settling basins.	TCLP Metals Semi volatiles	Two (2) composite samples reported low level concentrations of mercury. No other SVOCs or metals were detected. Concentrations at all depth intervals were less than TCLP Maximum Contaminant Levels.	Coke in RUs 7 and 20 is not considered a hazardous waste as will not be managed as such.
RU 21: Other Onsite Railspurs	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 21 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Utility Workers Incremental cancer and non-cancer risks associated fill materials present within RU 21 do not exceed the 1998 ROD RAOs. While potential risks do not exceed the ROD RAOs, given its close proximity to other RUs that do exceed these levels, RU 21 will proceed to the SFS.

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SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 22b: Old Ponds	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials..	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Residual subsurface P4 exceeds SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium, lead, nickel and vanadium in RU 22b fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>All Receptors</u> Residual P4 within the subsurface of RU 22b poses an unacceptable acute health hazard to potential future receptors due to the potential for spontaneous combustion of P4. <u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 22b exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to outdoor workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption pathway. <u>Construction and Utility Workers</u> Incremental cancer and non-cancer risks to construction workers associated with incidental fill materials in RU 22b exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks to construction workers associated with incidental fill materials also exceed a hazard index of 1 for the dermal absorption and inhalation pathways. Incremental non-cancer risks to utility workers associated with incidental fill materials exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SIA1 - Radon Flux	Characterize radon flux in the Ponds to evaluate the design of the proposed cap/cover.	Collected 100 radon flux measurements over the east-most parcel and 100 radon flux measurements over the combined three west-most parcels of the former ponds not covered by the RCRA ponds using electret ion chamber.	Radon Flux	Radon flux rates were below the UMTRCA standard.	Radon mitigation measures do not need to be considered in the SFS.

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 22b: Old Ponds **(continued)**	Old Ponds Delineation	Define the horizontal extent of Old Phossy Pond sediments to 1) define the lateral extent of pond solids and 2) evaluate the future worker risk outside of the extent of pond solids.	Drilled 22 borings around RU 22b. Visually evaluated cuttings for the presence of pond sediments down to native soil. Collected samples for laboratory analysis from either or 0-2' bgs and 0-10'bgs or 0-2' bns based upon presence of fill material at the surface of the boring.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Phossy pond sediments were not visually observed in the borings. Eight (8) borings reported at least once exceedance of soil to groundwater SSLs for arsenic, antimony, cadmium, chromium, Pb-210, manganese, nickel, Po-210, K-40, selenium, thallium, and U-238.	Additional step-out borings needed for phossy pond sediment delineation.
	SIA - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4-containing waste streams and could contain residual P4 deposits or other COCs. Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RU 22b has been compiled. <u>Risk Assessment:</u> Any residual P4 present in underground piping presumed to exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual precipitator solids in precipitator slurry underground piping presumed to contain U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within this RU. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded to the SFS for consideration during the SFS. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 22c: Railroad Swale	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Residual subsurface P4 exceeds SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic and cadmium in RU 22c fill materials exceed background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>All Receptors</u> Residual P4 within the subsurface of RU 22c poses an unacceptable acute health hazard to potential future receptors due to the potential for spontaneous combustion of P4. <u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 22c exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Incremental cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Incremental non-cancer risks associated with incidental fill materials in RU 22c exceed the 1998 ROD RAO for the soil ingestion pathway. Incremental non-cancer risks associated with incidental fill materials also exceed a hazard index of 1 for the inhalation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	P4 Delineation	Define the extent and concentration of P4 in shallow subsurface soils to: 1) define the extent of P4 in the subsurface and 2) evaluate the future worker risk for P4 outside the lateral extent of acute P4 risks.	Investigated 4 locations with test pits. Visually evaluated test pits and spoils pile for the presence of P4. Stepped-out as required. Collected samples for laboratory analysis from 0-2' bgs and 0-10' bgs from a boring proximate to the outermost step-out test pit location.	P4	P4 visibly observed in one of the test pits. Additional step-out trench and confirmation borings did not observe P4. Confirmation samples did not detect P4.	Visual observation and lack of detected P4, confirmed the lateral extent of P4 above a level of acute and chronic health concern.

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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 23: Road Segments not within RU Boundaries	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 23 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Maintenance Workers</u> Incremental cancer and non-cancer risks associated fill materials present within RU 23 do not exceed the 1998 ROD RAOs. While potential risks do not exceed the ROD RAOs, given its close proximity to other RUs that do exceed these levels, RU 23 will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	One (1) of four (4) composite samples reported a level of cadmium above SSLs. Concentrations of all other metals, fluoride, and radionuclides in underlying native soils were below SSLs.	With the exception of one (1) sample with a cadmium concentration above the soil to groundwater SSL, metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were generally not impacted by overlying fill. RU does not pose a risk to groundwater.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 24: Plant Areas not within RU Boundaries	Risk Assessment	Characterize risks to potential receptors from exposure to radiological, inorganic (metals, and fluoride) and organic constituents associated with residual surface and subsurface fill materials.	Performed surface radiation scan with NaI detectors to evaluate external gamma radiation risk. SFS field work below performed because gamma radiation was above its CV for the future site worker. Collected Fill Characterization data (see "Other Studies" section below) to supplement historical Fill Characterization data.	Gamma radiation Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210 (data collected under "Other Studies")	Gamma radiation, U-238, Ra-226 and Pb-210 in RU 24 fill materials exceed background levels, CVs and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Incremental cancer risks associated with predominant fill materials present within RU 24 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Potential risks exceed ROD RAOs. As a result, this RU will proceed to the SFS.
	SFS	Determine nature and extent of possible leaching from fill materials into underlying native soils	Drilled 20 borings on a random grid. Native soil was detected in the upper 10 feet of each borehole[b], therefore collected one sample from each boring from 0-2' bns. Composited the 20 samples into groups of 5. Submitted 4 samples for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	One (1) of four (4) composite samples reported a level of cadmium above SSLs. Concentrations of all other metals, fluoride, and radionuclides in underlying native soils were below SSLs.	With the exception of one (1) sample with a cadmium concentration above the soil to groundwater SSL, metals, fluoride, and radionuclides levels in native soils were not elevated above any future worker SSLs or soil to groundwater SSLs. Native soils were generally not impacted by overlying fill. RU does not pose a risk to groundwater.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 30 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
RU 24: Plant Areas not within RU Boundaries **(continued)**	SIA1 - Underground Piping, Sumps, and Other Structures	Compile information on underground piping, sumps and structures that may have carried P4-containing waste streams and could contain residual P4 deposits or other COCs. Use this information for an SFS evaluation.	Compiled information from existing drawings, construction records, aerial photos/maps, and conducted plant personnel interviews (i.e., persons knowledgeable regarding underground piping, sumps and structures).	NA	A detailed inventory of underground piping, conduits, sump, foundations, and other significant features in RU 24 has been compiled. A Phase 2 investigation was not required during the SRI field work because the gamma levels were above the CV and the RU will be forwarded to the SFS. <u>Risk Assessment:</u> Residual P4 presumed to be present in underground piping at levels that exceed SSLs – this COC was carried forward for qualitative evaluation in the Supplemental HHRA. Any residual precipitator solids in precipitator slurry underground piping presumed to contain U-238, Ra-226, Pb-210, Po-210, K-40, antimony, arsenic, cadmium and lead in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA. Any residual phossy solids in phossy water underground piping presumed to contain Pb-210, Po-210, K-40, antimony, arsenic, cadmium in excess of background levels and SSLs – these constituents were carried forward as COCs/ROCs into the Supplemental HHRA.	Piping, sumps and/or structures were identified as present within this RU. COCs could be present in these pipes/sumps/structures and could impact remedial alternative design/selection. This information will be forwarded to the SFS for consideration during the SFS. <u>Utility Workers</u> Residual P4 presumed to be present in the underground piping at levels that could pose an unacceptable acute health hazard due to the potential for spontaneous combustion of P4. Incremental cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 31 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[a]	Field Program Results	Contamination Assessment
Other Studies	SIA - Southern and Western Undeveloped Area – PIC Measurements	Characterize surface external gamma dose. Forward RU to the SFS data collection pathway if surface gamma dose rate exceeds the gamma benchmark.	Collected 100 PIC measurements from each area.	PIC Measurement	After removal of anomalies, such as slag roads and rock outcrops, the mean dose rate in the SUA is 15.4 uR/hr. After removal of anomalies, such as slag roads and disturbed areas with slag, the mean dose rate in the WUA is 14.4 uR/hr. The mean does rate in the borrow pit exposed in 2004/2005 was 14.4 uR/hr.	The mean gamma dose rate in the SUA is not determined to be impacted and does not need to be evaluated in the SFS. The roads and disturbed areas will be evaluated for remedial action in the SFS. The mean gamma dose rate in the WUA exceeded the background rate; however, the borrow source in the WUA was exposed since plant shut-down and has the same mean as the general WUA. It is believed that the site-specific background for these PIC measurements in 14.4 uR/hr and that the WUA does not need to be evaluated in the SFS. The roads and disturbed areas will be evaluated for remedial action in the SFS.
	SIA – Precipitator Solids Roadway Investigation	Evaluate whether precipitator dust/phossy solids were applied on roads.	Investigated 6 locations and a reference location. Collected 10 soil samples of the roadway material (approximately 0-0.5' bgs) at each location for laboratory analysis.	Pb-210	Statistical evaluations showed that the each of the six roadways are less than or equal to the reference roadway.	The areas were determined not to be impacted by precipitator solids and do not need to evaluated in the SFS. However, several FMC Plant Site roadways are in RUs that will proceed to the SFS. In addition RU 23 road segments will proceed to the SFS given their close proximity to other RUs that do exceed the 1998 ROD RAO.
	SIA – PCDT Roadway Investigation	Evaluate the potential impact of PCDT water application along roads within the FMC Plant OU.	Investigated 6 roadway locations and a reference roadway location. Collected 10 soil samples from the roadway material (approximately 0-0.5' bgs) at each location for laboratory analysis.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Statistical evaluation showed some metals in the worst-case road segment exceeded the reference road.	Roadways receiving PCDT water will be forwarded to the SFS for evaluation of metals and radionuclides. It must be noted that several FMC Plant Site roadways are in RUs that will proceed to the SFS. In addition RU 23 road segments will proceed to the SFS given their close proximity to other RUs that do exceed the 1998 ROD RAO.

TABLE 4-1

SUMMARY OF FIELD PROGRAM RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 32 of 32)

Location Remediation Unit Number, Name	Field Programs (by RU)	Investigation Rationale	Field Program Data Collection Description	Data Collection Analytes[(a)]	Field Program Results	Contamination Assessment
Other Studies **(continued)**	Fill Char. Study	Collect additional chemical information on specific source materials (e.g., phosphate ore) and waste streams (e.g., precipitator solids) historically managed at the plant for the SRI risk assessment.	Collect up to 7 samples of precipitator solids from EMF RI locations in RU 22b. Collect two sample of phossy solids form EMF RI location F025B. Collect 2 samples of calciner solids; one from southern area and one from northern area of RU 16. Collect 2 samples of kiln solids in RU 8. Collect 1 composite sample of ore material in RU 7.	Metals Fluoride Ra-226 U-238 K-40 Po-210 Pb-210	Samples were collected from all source materials except for kiln solids, which could not be located in RU 8. At least one sample of each fill type detected concentrations of metals and radionuclides that exceeded future worker SSLs.	Sample data confirms and supports historical sample data for specific source materials. Metals and radionuclide concentrations in these source materials were used in conjunction with historical data for these and other types of fill material, to bound risks to potential future receptors from exposure to the fill materials observed to be present within each RU.

(a) P4 – elemental phosphorus
Metals – See list in Table 1-6
Ra-226 – radium-226
U-238 – uranium-238
K-40 – potassium-40
Po-210 – polonium-210
Pb-210 – lead-210

(b) Note that in a few soil borings, the native ground surface was greater than 10 feet bgs and in those instances, the borehole was extended to the native ground surface and a soil sample from 0-2' bns was collected.

bns – below native surface
bgs – below ground surface

TABLE 4-2
FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 4)

Remediation Unit Number, Name, and Size	Predominant Surface Fill Material [1]	Predominant Subsurface Fill Materials [2]	Potential Source Materials Incidental to Fill Material [3]	Depth to Native Soil Based upon RI/SRI Borings [3] (Feet bgs)	Depth of Fill from Cut & Fill Isopach Model (Feet)	Fill/Source Materials Considered for HHRA Exposure Scenarios[7]	Estimated Total Volume of Fill (yd^3)	Estimated Volume of P4 Min – Max. (tons)
RU 1: Furnace Building, Phos Dock and Secondary Condenser 4.1 acres	Slag Concrete foundations Asphalt w/ slag aggregate Silica	Slag Concrete foundations Silica	P4 Underground Piping [4] Precipitator solids Phossy solids	Min: 5 feet Max: 10 feet	Min: 2.7 Max: 14.5 Ave: 8.2	Slag P4 Precipitator solids Phossy Solids	56,580	580 to 5,470 An upper bound max. volume based upon 1% of lifetime production has been calculated at 52,400 tons
RU 2: Slag Pit 3.7 acres	Slag Concrete foundations	Slag Concrete foundations Reworked native soil w/ slag	P4 Precipitator Solids Underground Piping [4] Phossy solids	Min: No data Max: No data	Min: 1 Max: 12.3 Ave: 4.7	Slag P4 Precipitator solids Phossy solids	20,485	Included with RU 1
RU 3: Receiving, Stores, Paint Shop and P_4 Decon 1.3 acres	Slag Concrete foundations Asphalt w/ slag aggregate Silica Reworked native soil w/ slag	Slag Concrete foundations Silica Reworked native soil w/ slag	Underground Piping [5]	Min: 2 feet Max: 20 feet	Min: 2 Max: 20 Ave: 5.9	Slag	15,860	0[5] P4 present in the capillary fringe beneath this RU, down gradient of RU1 & RU2 is included in the volume estimated for RU1.
RU 4: Office Buildings and Training Center 2.5 acres	Slag Concrete foundations Asphalt w/ slag aggregate Silica Reworked native soil w/ slag	Slag Concrete foundations Silica Reworked native soil w/ slag		Min: 1.5 feet Max: 14 feet	Min: 1.5 Max: 14 Ave: 6.9	Slag	28,830	0
RU 5: Lab and Old Drainfield 0.6 acres	Slag Concrete foundations Asphalt w/ slag aggregate Silica Reworked native soil w/ slag	Slag Concrete foundations Silica Reworked native soil w/ slag		Min: 1.5 feet Max: 12 feet	Min: 1.5 Max: 18.1 Ave: 6.8	Slag	7,140	0
RU 6: Former Long-Term Phos Storage Tanks 1.4 acres	Slag	Slag Reworked native soil w/ slag	Coke Ferrophos	Min: 5 feet Max: 15 feet	Min: 5 Max: 17.2 Ave: 12.6	Slag Coke Ferrophos	28,294	0
RU 7: Shale Unload, Crushing and Stockpile 25.0 acres	Raw ore Slag Concrete foundations Asphalt w/ slag aggregate Silica	Raw ore Slag Concrete foundations Silica Reworked native soil w/ slag	Coke	Min: 1 feet Max: 25 feet	Min: 1 Max: 29.3 Ave: 9.3	Slag Ore Coke	487,542	0 P4 present in the capillary fringe beneath this RU, down gradient of RU1 & RU2 is included in the volume estimated for RU1.

[1] "Predominant Surface Fill Material" describes primary materials as observed on the surface during the SRI.
[2] "Predominant Subsurface Fill Material" describes primary materials as observed during SRI trenching/boring down to native soil interface.
[3] Based upon RI and SRI observations as reported on boring logs.
[4] Underground piping formerly used for precipitator slurry or phossy water, thus presumed to contain precipitator solids, phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 2.8 to 28 tons.
[5] Underground piping formerly used for stormwater, but often carried overflow phossy water from RU 1 to RU 22c, thus presumed to contain phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.13 to 0.6 tons.
[6] Underground piping formerly used for carbon monoxide gas, thus presumed to contain P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.2 to 1.8 tons.
[7] Risks associated with exposure to the contents of underground piping runs are evaluated separately from risks associated with exposure to other surface and subsurface fill/source materials identified in an RU.

TABLE 4-2
FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 4)

Remediation Unit Number, Name, and Size	Predominant Surface Fill Material [1]	Predominant Subsurface Fill Materials [2]	Potential Source Materials Incidental to Fill Material [3]	Depth to Native Soil Based upon RI/SRI Borings [3] (Feet bgs)	Depth of Fill from Cut & Fill Isopach Model (Feet)	Fill/Source Materials Considered for HHRA Exposure Scenarios[7]	Estimated Total Volume of Fill (yd^3)	Estimated Volume of P4 Min – Max. (tons)
RU 8: Former Kiln Scrubber Ponds and Calciners 6.7 acres	Calcined ore Slag Concrete foundations Asphalt w/ slag aggregate Silica	Calcined ore Slag Concrete foundations Silica Reworked native soil w/ slag	Kiln pond solids Underground Piping [6]	Min: 3 feet Max: 12.5 feet	Min: 1 Max: 17 Ave: 5.1	Slag Ore Calciner pond solids Calcined ore	41,630	0 [6]
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond 12.9 acres	Calcined ore Raw ore Slag Silica Asphalt w/ slag aggregate	Calcined ore Raw ore Slag Silica Reworked native soil w/ slag	Kiln pond solids Coke	Min: 3 feet Max: 40 feet	Min: 1 Max: 40 Ave: 9.9	Slag Ore Calciner pond solids Coke Calcined ore	206,110	0
RU 10: IWW Pond and Ditch 1.3 acres	Slag Silica Asphalt w/ slag aggregate	Slag Silica Reworked native soil w/ slag	Precipitator solids	Min: 0 feet Max: 8 feet	Min: 1 Max: 18.7 Ave: 8.9	Slag Precipitator solids	22,883	0
RU 11: Equipment Area South of Calciners 8.4 acres	Slag Concrete foundations Asphalt w/ slag aggregate	Slag Concrete foundations Reworked native soil w/ slag		Min: 3 feet Max: 30 feet	Min: 1 Max: 30.7 Ave: 12.5	Slag	169,230	0
RU 12: Former RP&S Area and Mobile Shop 11.6 acres	Slag Concrete foundations Asphalt w/ slag aggregate	Slag Concrete foundations Reworked native soil w/ slag	Ferrophos PCDT water residues Underground Piping [4] Precipitator solids Phossy solids P4	Min: 1 feet Max: 13.5 feet	Min: 1 Max: 16.3 Ave: 6.9	Slag P4 Precipitator solids Phossy solids Ferrophos PCDT water residue	129,165	0 [4] Assumes P4 in shallow soils from historical pipeline releases.
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area 3.6 acres	Slag Concrete foundations Asphalt w/ slag aggregate	Slag Concrete foundations	P4 Precipitator solids Phossy solids Underground Piping [4]	Min: 4 feet Max: 23 feet	Min: 1 Max: 24.5 Ave: 11.6	Slag Precipitator solids Phossy solids P4	66,630	25 to 60 Min. assumes 1000 ppm in fill. Max assumes 2500 ppm in fill.

[1] "Predominant Surface Fill Material" describes primary materials as observed on the surface during the SRI.
[2] "Predominant Subsurface Fill Material" describes primary materials as observed during SRI trenching/boring down to native soil interface.
[3] Based upon RI and SRI observations as reported on boring logs.
[4] Underground piping formerly used for precipitator slurry or phossy water, thus presumed to contain precipitator solids, phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 2.8 to 28 tons.
[5] Underground piping formerly used for stormwater, but often carried overflow phossy water from RU 1 to RU 22c, thus presumed to contain phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.13 to 0.6 tons.
[6] Underground piping formerly used for carbon monoxide gas, thus presumed to contain P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.2 to 1.8 tons.
[7] Risks associated with exposure to the contents of underground piping runs are evaluated separately from risks associated with exposure to other surface and subsurface fill/source materials identified in an RU.

TABLE 4-2
FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

Remediation Unit Number, Name, and Size	Predominant Surface Fill Material [1]	Predominant Subsurface Fill Materials [2]	Potential Source Materials Incidental to Fill Material [3]	Depth to Native Soil Based upon RI/SRI Borings [3] (Feet bgs)	Depth of Fill from Cut & Fill Isopach Model (Feet)	Fill/Source Materials Considered for HHRA Exposure Scenarios[7]	Estimated Total Volume of Fill (yd^3)	Estimated Volume of P4 Min – Max. (tons)
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area 11.7 acres	Calcined Ore Slag Bullrock	Calcined Ore Slag Bullrock	Coke Graphite/carbon Calciner pond solids	Min: 5 feet Max: 39 feet	Min: 1 Max: 45 Ave: 11.4	Slag Ore Coke Calciner pond solids Calcined Ore	212,370	0
RU 16: Calciner Solids Stockpile 15.1 acres	Calciner pond solids Slag	Calciner pond solids Slag		Min: 1.5 feet Max: 42 feet	Min: 1 Max: 42 Ave: 4	Slag Calciner pond solids	92,750	0
RU 19: Slag Pile, Bull Rock Pile 151.5 acres	Slag Bull rock	Slag Bull rock	P4 Phossy solids (presumed at depth in buried rail cars)	Min: 5 feet Max: No data	Min: 1 Max: 152.8 Ave: 62.9	Slag Ore	14,528,100	200 to 2,000 P4 is associated with sludge in buried railcars in slag pile. Min. based upon railcars being 10% full. Max. is based upon railcars being 75% full.
RU 20: Former Bannock Paving Area 61.6 acres	Slag Concrete foundations Asphalt w/ slag aggregate	Slag Concrete foundations Reworked native soil w/ slag	Coke Ferrophos PCDT water residues Fuel spill residues	Min: 1.5 feet Max: 12 feet	Min: 1.5 Max: 42.1 Ave: 7.4	Slag Coke Ferrophos PCDT water residue Fuel spill residue	735,790	0
RU 21: Other Onsite Railspurs NA	Slag	Slag		Unknown	TBD	Slag	TBD	0
RU 22b: Old Ponds 37.7 acres	Slag Reworked native soil w/ slag	Slag Reworked native soil w/ slag	P4 Phossy solids Precipitator solids Ferrophos Underground Piping [4]	Min: 0 feet Max: 20 feet	Min: 0 Max: 43.9 Ave: 9.8	Slag Precipitator solids Phossy solids P4 Ferrophos	595,820	4,440 to 10,800 Min. is based upon plant estimate in 1991. Max. is based upon a percentage of total fill in ponds.
RU 22c: Railroad Swale 2.4 acres	Slag Reworked native soil w/ slag	Slag	P4 Phossy solids Ore	Min: 8 feet Max: 14 feet	Min: 8 Max: 15 Ave: 12	Slag Phossy solids P4 Ore	40,607	4 to 10 Min. assumes 1000 ppm in fill. Max assumes 2500 ppm in fill

[1] "Predominant Surface Fill Material" describes primary materials as observed on the surface during the SRI.
[2] "Predominant Subsurface Fill Material" describes primary materials as observed during SRI trenching/boring down to native soil interface.
[3] Based upon RI and SRI observations as reported on boring logs.
[4] Underground piping formerly used for precipitator slurry or phossy water, thus presumed to contain precipitator solids, phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 2.8 to 28 tons.
[5] Underground piping formerly used for stormwater, but often carried overflow phossy water from RU 1 to RU 22c, thus presumed to contain phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.13 to 0.6 tons.
[6] Underground piping formerly used for carbon monoxide gas, thus presumed to contain P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.2 to 1.8 tons.
[7] Risks associated with exposure to the contents of underground piping runs are evaluated separately from risks associated with exposure to other surface and subsurface fill/source materials identified in an RU.

TABLE 4-2
FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

Remediation Unit Number, Name, and Size	Predominant Surface Fill Material [1]	Predominant Subsurface Fill Materials [2]	Potential Source Materials Incidental to Fill Material [3]	Depth to Native Soil Based upon RI/SRI Borings [3] (Feet bgs)	Depth of Fill from Cut & Fill Isopach Model (Feet)	Fill/Source Materials Considered for HHRA Exposure Scenarios[7]	Estimated Total Volume of Fill (yd^3)	Estimated Volume of P4 Min – Max. (tons)
RU 23: Road Segments not within RU Boundaries 23.0 acres	Slag Reworked native soil w/ slag Asphalt w/ slag aggregate	Slag Reworked native soil w/ slag	PCDT water residues	Min: 2 feet Max: 20 feet	Min: 1 Max: 20 Ave: 1	Slag PCDT water residue	33,904	0
RU 24: Plant Areas not within RU Boundaries 52.5 acres	Slag Concrete foundations Asphalt w/ slag aggregate Silica Reworked native soil w/ slag	Slag Concrete foundations Silica Reworked native soil w/ slag	Underground Piping [4]	Min: 1 feet Max: 13 feet	Min: 1 Max: 15 Ave: 6.7	Slag	565,430	0 [4]

[1] "Predominant Surface Fill Material" describes primary materials as observed on the surface during the SRI.
[2] "Predominant Subsurface Fill Material" describes primary materials as observed during SRI trenching/boring down to native soil interface.
[3] Based upon RI and SRI observations as reported on boring logs.
[4] Underground piping formerly used for precipitator slurry or phossy water, thus presumed to contain precipitator solids, phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 2.8 to 28 tons.
[5] Underground piping formerly used for stormwater, but often carried overflow phossy water from RU 1 to RU 22c, thus presumed to contain phossy solids and P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.13 to 0.6 tons.
[6] Underground piping formerly used for carbon monoxide gas, thus presumed to contain P4. Total P4 volume estimated collectively across the FMC OU in these underground pipes ranges from 0.2 to 1.8 tons.
[7] Risks associated with exposure to the contents of underground piping runs are evaluated separately from risks associated with exposure to other surface and subsurface fill/source materials identified in an RU.

TABLE 4-3

COMPARISON OF FILL/SOURCE MATERIAL DATA TO SCREENING LEVELS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Constituent	Soil Screening Levels (mg/kg & pCi/g)				Ore			Slag		
	EPA Background	SRI - Outdoor Commercial/Industrial Worker	SRI - Construction Worker	SRI - Utility Worker	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration
COPCs										
Antimony	2.20E+00	4.54E+02	1.04E+02	1.36E+03	1/1	6.73E+00	6.73E+00	8/20	3.50E-01	1.90E+00
Arsenic	7.70E+00	7.70E+00	1.46E+01	1.73E+02	2/2	1.45E+01	1.46E+01	20/26	1.60E-01	1.45E+00
Barium	1.88E+02	6.17E+04	8.36E+03	1.09E+05	2/2	7.94E+01	1.05E+02	26/26	1.80E+02	2.54E+02
Beryllium	1.00E+00	6.45E+02	6.10E+01	7.92E+02	2/2	1.68E+00	1.90E+00	26/26	1.50E+00	2.20E+00
Boron	1.28E+01	2.23E+05	5.21E+03	6.78E+04	2/2	3.99E+01	7.43E+01	26/26	6.75E+01	1.10E+02
Cadmium	1.90E+00	8.60E+02	8.13E+01	1.06E+03	2/2	7.78E+01	1.25E+02	23/26	1.85E+00	3.60E+01
Chromium	2.75E+01	1.00E+06	5.51E+05	1.00E+06	2/2	6.99E+02	8.22E+02	26/26	1.72E+02	5.10E+02
Cobalt	7.60E+00	5.53E+02	5.22E+01	6.79E+02	1/2	4.14E+00	4.14E+00	22/26	1.10E+00	2.55E+00
Copper	1.26E+01	4.20E+04	2.20E+04	2.86E+05	2/2	8.90E+01	1.04E+02	26/26	1.00E+01	7.00E+01
Fluoride	6.00E+02	6.81E+04	3.30E+04	4.30E+05	2/2	1.40E+01	1.32E+04	26/26	4.50E+01	1.78E+04
Lead	2.91E+01	8.00E+02	8.00E+02	8.00E+02	1/2	1.33E+01	1.33E+01	20/26	5.50E-01	1.14E+01
Lithium	1.61E+01	2.27E+04	1.19E+04	1.55E+05	1/1	1.09E+01	1.09E+01	20/26	2.80E+01	4.00E+01
Manganese	4.82E+02	2.35E+04	7.71E+04	1.00E+06	2/2	1.22E+02	1.32E+02	26/26	9.10E+01	2.05E+02
Mercury	1.60E-01	3.40E+02	4.64E+02	6.03E+03	1/2	6.15E-01	6.15E-01	9/20	5.33E-03	1.70E-02
Molybdenum	2.15E+00	5.67E+03	2.75E+03	3.58E+04	1/2	2.16E+01	2.16E+01	20/26	6.20E-01	6.20E+00
Nickel	1.55E+01	6.45E+03	4.04E+02	5.25E+03	2/2	1.26E+02	1.66E+02	25/26	6.50E+00	6.50E+01
Selenium	1.36E+00	5.67E+03	2.75E+03	3.58E+04	2/2	6.10E+00	3.62E+01	25/26	3.20E+00	9.20E+00
Silver	1.90E+00	5.67E+03	2.75E+03	3.58E+04	2/2	5.10E+00	6.32E+00	26/26	1.20E+00	5.60E+00
Thallium	2.70E-01	7.72E+01	3.74E+02	4.87E+03	1/1	2.22E+00	2.22E+00	20/20	6.20E-02	6.75E-01
Uranium	-	3.40E+03	4.91E+02	6.39E+03	1/1	1.01E+02	1.01E+02	20/20	4.90E+01	9.10E+01
Vanadium	4.54E+01	7.95E+03	3.50E+03	4.55E+04	2/2	9.96E+02	1.04E+03	26/26	1.50E+02	5.80E+02
Zinc	5.28E+01	3.40E+05	1.65E+05	1,000,000b	2/2	9.91E+02	1.24E+03	26/26	3.40E+01	5.10E+02
Acenaphthene	-	3.70E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Anthracene	-	1.80E+05	1.00E+06	1.00E+06	0/0	-	-	0/0	-	-
Benzo(a)anthracene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(a)pyrene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Benzo(b)fluoranthene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(k)fluoranthene	-	2.30E+01	4.10E+02	3.40E+03	0/0	-	-	0/0	-	-
Chrysene	-	2.30E+02	4.10E+03	3.40E+04	0/0	-	-	0/0	-	-
Dibenz(a,h)anthracene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Fluoranthene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Fluorene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Indeno(1,2,3-cd)pyrene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Naphthalene	-	1.20E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Pyrene	-	1.80E+04	1.30E+05	1.00E+06	0/0	-	-	0/0	-	-
ROPCs										
Uranium-238	3.88E+00	3.88E+00	2.06E+01	2.67E+02	8/8	2.05E+01	3.53E+01	32/32	2.13E+01	3.79E+01
Radium-226	3.88E+00	3.88E+00	3.88E+00	1.23E+01	7/7	1.76E+01	3.69E+01	26/26	6.76E+00	3.48E+01
Lead-210	3.03E+00	3.03E+00	7.44E+00	9.67E+01	7/8	1.54E+01	3.19E+01	95/101	5.00E+00	1.98E+01
Polonium-210	3.58E+00	2.69E+02	4.33E+01	5.63E+02	7/7	2.07E+01	3.03E+01	22/22	8.27E+00	2.37E+01
Potassium-40	2.05E+01	2.05E+01	2.05E+01	1.36E+02	2/2	6.00E+00	1.09E+01	26/26	3.80E+00	1.09E+01

= COPC/ROPC exceeds at least one of the future worker SSLs developed in the SRI Work Plan.

TABLE 4-3

COMPARISON OF FILL/SOURCE MATERIAL DATA TO SCREENING LEVELS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Constituent	Soil Screening Levels (mg/kg & pCi/g)				Precipitator Solids			Phossy Solids		
	EPA Background	SRI - Outdoor Commercial/Industrial Worker	SRI - Construction Worker	SRI - Utility Worker	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration
COPCs										
Antimony	2.20E+00	4.54E+02	1.04E+02	1.36E+03	6/6	5.46E+01	1.62E+02	5/5	2.04E+01	1.89E+02
Arsenic	7.70E+00	7.70E+00	1.46E+01	1.73E+02	6/6	1.71E+01	5.79E+01	5/5	7.05E+00	2.56E+02
Barium	1.88E+02	6.17E+04	8.36E+03	1.09E+05	6/6	5.08E+01	1.72E+02	5/5	1.87E+01	1.43E+02
Beryllium	1.00E+00	6.45E+02	6.10E+01	7.92E+02	6/6	3.70E-01	1.81E+00	3/5	2.90E-01	9.35E-01
Boron	1.28E+01	2.23E+05	5.21E+03	6.78E+04	6/6	7.33E+01	1.69E+02	5/5	2.57E+01	7.96E+01
Cadmium	1.90E+00	8.60E+02	8.13E+01	1.06E+03	6/6	2.41E+03	5.51E+03	5/5	6.72E+02	2.04E+03
Chromium	2.75E+01	1.00E+06	5.51E+05	1.00E+06	6/6	1.92E+02	3.38E+02	5/5	5.16E+01	1.33E+02
Cobalt	7.60E+00	5.53E+02	5.22E+01	6.79E+02	6/6	1.70E+00	6.60E+00	3/5	1.80E+00	3.59E+00
Copper	1.26E+01	4.20E+04	2.20E+04	2.86E+05	6/6	7.54E+01	2.07E+02	5/5	2.91E+01	7.49E+01
Fluoride	6.00E+02	6.81E+04	3.30E+04	4.30E+05	6/6	1.10E+02	1.61E+04	5/5	3.00E+02	1.71E+04
Lead	2.91E+01	8.00E+02	8.00E+02	8.00E+02	6/6	3.38E+02	1.39E+03	5/5	1.43E+02	3.86E+02
Lithium	1.61E+01	2.27E+04	1.19E+04	1.55E+05	5/6	4.33E+00	2.17E+01	1/5	1.38E+01	1.38E+01
Manganese	4.82E+02	2.35E+04	7.71E+04	1.00E+06	6/6	5.20E+01	4.79E+02	5/5	3.79E+01	2.44E+02
Mercury	1.60E-01	3.40E+02	4.64E+02	6.03E+03	6/6	1.80E-02	8.20E-01	5/5	1.80E-02	7.40E-01
Molybdenum	2.15E+00	5.67E+03	2.75E+03	3.58E+04	6/6	6.60E+00	2.60E+01	3/5	4.50E+00	7.10E+00
Nickel	1.55E+01	6.45E+03	4.04E+02	5.25E+03	6/6	2.65E+01	1.14E+02	5/5	1.62E+01	1.82E+01
Selenium	1.36E+00	5.67E+03	2.75E+03	3.58E+04	6/6	4.20E+01	6.24E+01	5/5	1.08E+01	4.96E+01
Silver	1.90E+00	5.67E+03	2.75E+03	3.58E+04	6/6	5.12E+01	2.18E+02	5/5	6.19E+01	1.99E+02
Thallium	2.70E-01	7.72E+01	3.74E+02	4.87E+03	6/6	6.60E+00	4.13E+01	5/5	9.31E+00	2.60E+01
Uranium	-	3.40E+03	4.91E+02	6.39E+03	13/13	2.00E+00	2.70E+01	1/1	1.81E+00	1.81E+00
Vanadium	4.54E+01	7.95E+03	3.50E+03	4.55E+04	6/6	1.69E+02	2.98E+02	5/5	4.29E+01	9.34E+01
Zinc	5.28E+01	3.40E+05	1.65E+05	1,000,000b	6/6	2.14E+04	8.45E+04	5/5	1.04E+04	2.66E+04
Acenaphthene	-	3.70E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Anthracene	-	1.80E+05	1.00E+06	1.00E+06	0/0	-	-	0/0	-	-
Benzo(a)anthracene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(a)pyrene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Benzo(b)fluoranthene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(k)fluoranthene	-	2.30E+01	4.10E+02	3.40E+03	0/0	-	-	0/0	-	-
Chrysene	-	2.30E+02	4.10E+03	3.40E+04	0/0	-	-	0/0	-	-
Dibenz(a,h)anthracene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Fluoranthene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Fluorene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Indeno(1,2,3-cd)pyrene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Naphthalene	-	1.20E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Pyrene	-	1.80E+04	1.30E+05	1.00E+06	0/0	-	-	0/0	-	-
ROPCs										
Uranium-238	3.88E+00	3.88E+00	2.06E+01	2.67E+02	6/6	2.74E+00	8.36E+00	1/1	1.28E+00	1.28E+00
Radium-226	3.88E+00	3.88E+00	3.88E+00	1.23E+01	14/14	7.50E+00	1.35E+01	1/1	3.61E+00	3.61E+00
Lead-210	3.03E+00	3.03E+00	7.44E+00	9.67E+01	14/15	5.20E+01	1.88E+03	5/5	6.00E+01	4.65E+02
Polonium-210	3.58E+00	2.69E+02	4.33E+01	5.63E+02	14/14	3.20E+01	9.10E+02	1/1	7.23E+01	7.23E+01
Potassium-40	2.05E+01	2.05E+01	2.05E+01	1.36E+02	10/10	1.41E+01	1.76E+02	5/5	1.31E+01	2.74E+01

= COPC/ROPC exceeds at least one of the future worker SSLs developed in the SRI Work Plan.

TABLE 4-3

COMPARISON OF FILL/SOURCE MATERIAL DATA TO SCREENING LEVELS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Constituent	Soil Screening Levels (mg/kg & pCi/g)				Calciner Pond Solids			Calcined Ore		
	EPA Background	SRI - Outdoor Commercial/Industrial Worker	SRI - Construction Worker	SRI - Utility Worker	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration
COPCs										
Antimony	2.20E+00	4.54E+02	1.04E+02	1.36E+03	4/5	1.02E+01	5.92E+01	0/0	-	-
Arsenic	7.70E+00	7.70E+00	1.46E+01	1.73E+02	3/5	4.03E+00	1.43E+01	0/0	-	-
Barium	1.88E+02	6.17E+04	8.36E+03	1.09E+05	5/5	8.56E+01	2.32E+02	0/0	-	-
Beryllium	1.00E+00	6.45E+02	6.10E+01	7.92E+02	5/5	5.10E-01	1.36E+00	0/0	-	-
Boron	1.28E+01	2.23E+05	5.21E+03	6.78E+04	5/5	3.64E+00	2.64E+03	0/0	-	-
Cadmium	1.90E+00	8.60E+02	8.13E+01	1.06E+03	5/5	4.03E-01	5.83E+02	0/0	-	-
Chromium	2.75E+01	1.00E+06	5.51E+05	1.00E+06	5/5	1.07E+01	5.31E+02	0/0	-	-
Cobalt	7.60E+00	5.53E+02	5.22E+01	6.79E+02	4/5	2.26E+00	4.83E+00	0/0	-	-
Copper	1.26E+01	4.20E+04	2.20E+04	2.86E+05	5/5	1.08E+01	5.89E+01	0/0	-	-
Fluoride	6.00E+02	6.81E+04	3.30E+04	4.30E+05	5/5	6.60E+00	1.91E+05	0/0	-	-
Lead	2.91E+01	8.00E+02	8.00E+02	8.00E+02	4/5	8.57E+00	4.64E+01	0/0	-	-
Lithium	1.61E+01	2.27E+04	1.19E+04	1.55E+05	4/4	7.49E+00	1.43E+01	0/0	-	-
Manganese	4.82E+02	2.35E+04	7.71E+04	1.00E+06	5/5	9.18E+01	3.90E+02	0/0	-	-
Mercury	1.60E-01	3.40E+02	4.64E+02	6.03E+03	4/5	1.30E-02	1.30E+01	0/0	-	-
Molybdenum	2.15E+00	5.67E+03	2.75E+03	3.58E+04	3/5	2.43E+01	3.73E+01	0/0	-	-
Nickel	1.55E+01	6.45E+03	4.04E+02	5.25E+03	5/5	1.23E+01	8.92E+01	0/0	-	-
Selenium	1.36E+00	5.67E+03	2.75E+03	3.58E+04	3/5	2.30E+02	2.51E+03	0/0	-	-
Silver	1.90E+00	5.67E+03	2.75E+03	3.58E+04	5/5	8.19E-02	2.69E+01	0/0	-	-
Thallium	2.70E-01	7.72E+01	3.74E+02	4.87E+03	4/4	2.68E-01	3.40E+02	0/0	-	-
Uranium	-	3.40E+03	4.91E+02	6.39E+03	4/4	8.62E-01	5.44E+01	0/0	-	-
Vanadium	4.54E+01	7.95E+03	3.50E+03	4.55E+04	5/5	1.52E+01	6.21E+02	0/0	-	-
Zinc	5.28E+01	3.40E+05	1.65E+05	1,000,000b	5/5	3.93E+01	6.00E+03	0/0	-	-
Acenaphthene	-	3.70E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Anthracene	-	1.80E+05	1.00E+06	1.00E+06	0/0	-	-	0/0	-	-
Benzo(a)anthracene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(a)pyrene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Benzo(b)fluoranthene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Benzo(k)fluoranthene	-	2.30E+01	4.10E+02	3.40E+03	0/0	-	-	0/0	-	-
Chrysene	-	2.30E+02	4.10E+03	3.40E+04	0/0	-	-	0/0	-	-
Dibenz(a,h)anthracene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	0/0	-	-
Fluoranthene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Fluorene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	0/0	-	-
Indeno(1,2,3-cd)pyrene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	0/0	-	-
Naphthalene	-	1.20E+04	2.60E+05	1.00E+06	0/0	-	-	0/0	-	-
Pyrene	-	1.80E+04	1.30E+05	1.00E+06	0/0	-	-	0/0	-	-
ROPCs										
Uranium-238	3.88E+00	3.88E+00	2.06E+01	2.67E+02	4/4	8.30E+00	1.79E+01	6/6	2.25E+01	2.45E+01
Radium-226	3.88E+00	3.88E+00	3.88E+00	1.23E+01	3/3	6.50E+00	1.74E+01	6/6	2.09E+01	2.68E+01
Lead-210	3.03E+00	3.03E+00	7.44E+00	9.67E+01	3/4	2.22E+01	3.41E+01	6/6	1.28E+01	2.51E+01
Polonium-210	3.58E+00	2.69E+02	4.33E+01	5.63E+02	3/3	3.13E+01	4.58E+02	0/1	-	-
Potassium-40	2.05E+01	2.05E+01	2.05E+01	1.36E+02	4/4	2.42E+01	7.04E+01	0/0	-	-

= COPC/ROPC exceeds at least one of the future worker SSLs developed in the SRI Work Plan.

TABLE 4-3

COMPARISON OF FILL/SOURCE MATERIAL DATA TO SCREENING LEVELS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Constituent	Soil Screening Levels (mg/kg & pCi/g)				Ferrophos			Coke		
	EPA Background	SRI - Outdoor Commercial/Industrial Worker	SRI - Construction Worker	SRI - Utility Worker	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration
COPCs										
Antimony	2.20E+00	4.54E+02	1.04E+02	1.36E+03	3/3	2.85E+01	6.14E+01	4/4	4.30E-01	9.60E-01
Arsenic	7.70E+00	7.70E+00	1.46E+01	1.73E+02	0/3	-	-	15/15	1.00E+00	6.60E+00
Barium	1.88E+02	6.17E+04	8.36E+03	1.09E+05	3/3	1.45E+01	2.36E+01	15/15	9.04E+01	2.43E+02
Beryllium	1.00E+00	6.45E+02	6.10E+01	7.92E+02	3/3	1.70E+00	4.10E+00	15/15	9.80E-02	7.00E-01
Boron	1.28E+01	2.23E+05	5.21E+03	6.78E+04	3/3	4.80E+00	7.60E+00	0/0	-	-
Cadmium	1.90E+00	8.60E+02	8.13E+01	1.06E+03	0/3	-	-	13/15	8.40E-02	1.20E+00
Chromium	2.75E+01	1.00E+06	5.51E+05	1.00E+06	3/3	2.37E+03	6.32E+03	15/15	1.90E+00	3.21E+01
Cobalt	7.60E+00	5.53E+02	5.22E+01	6.79E+02	3/3	1.26E+01	2.91E+01	15/15	1.30E+00	5.20E+00
Copper	1.26E+01	4.20E+04	2.20E+04	2.86E+05	3/3	4.04E+02	8.51E+02	15/15	3.30E+00	5.26E+01
Fluoride	6.00E+02	6.81E+04	3.30E+04	4.30E+05	3/3	1.79E+03	3.37E+03	0/0	-	-
Lead	2.91E+01	8.00E+02	8.00E+02	8.00E+02	0/3	-	-	15/15	5.70E+00	2.15E+01
Lithium	1.61E+01	2.27E+04	1.19E+04	1.55E+05	0/3	-	-	0/0	-	-
Manganese	4.82E+02	2.35E+04	7.71E+04	1.00E+06	3/3	1.90E+02	3.07E+02	15/15	5.26E+01	2.68E+02
Mercury	1.60E-01	3.40E+02	4.64E+02	6.03E+03	0/3	-	-	9/9	2.50E-02	5.20E-02
Molybdenum	2.15E+00	5.67E+03	2.75E+03	3.58E+04	3/3	9.06E+01	1.51E+02	0/0	-	-
Nickel	1.55E+01	6.45E+03	4.04E+02	5.25E+03	3/3	5.35E+02	1.15E+03	15/15	3.00E+00	2.59E+01
Selenium	1.36E+00	5.67E+03	2.75E+03	3.58E+04	0/3	-	-	5/15	6.90E-01	1.60E+00
Silver	1.90E+00	5.67E+03	2.75E+03	3.58E+04	3/3	2.67E+01	4.70E+01	1/1	1.80E-01	1.80E-01
Thallium	2.70E-01	7.72E+01	3.74E+02	4.87E+03	0/0	-	-	12/15	6.80E-01	1.50E+00
Uranium	-	3.40E+03	4.91E+02	6.39E+03	0/0	-	-	0/0	-	-
Vanadium	4.54E+01	7.95E+03	3.50E+03	4.55E+04	3/3	2.61E+03	6.33E+03	15/15	4.20E+00	2.80E+01
Zinc	5.28E+01	3.40E+05	1.65E+05	1,000,000b	3/3	7.03E+01	1.69E+02	15/15	2.39E+01	1.06E+02
Acenaphthene	-	3.70E+04	2.60E+05	1.00E+06	0/0	-	-	14/15	4.00E-02	3.30E+00
Anthracene	-	1.80E+05	1.00E+06	1.00E+06	0/0	-	-	14/15	1.60E-02	4.30E+01
Benzo(a)anthracene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	15/15	3.60E-02	6.90E+01
Benzo(a)pyrene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	15/15	4.00E-02	6.40E+01
Benzo(b)fluoranthene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	15/15	5.00E-02	6.20E+01
Benzo(k)fluoranthene	-	2.30E+01	4.10E+02	3.40E+03	0/0	-	-	15/15	2.20E-02	4.30E+01
Chrysene	-	2.30E+02	4.10E+03	3.40E+04	0/0	-	-	15/15	5.30E-02	8.00E+01
Dibenz(a,h)anthracene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-	5/14	5.90E-01	8.70E+00
Fluoranthene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	15/15	9.80E-02	1.70E+02
Fluorene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-	2/13	7.10E-01	1.50E+01
Indeno(1,2,3-cd)pyrene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-	15/15	2.70E-02	2.90E+01
Naphthalene	-	1.20E+04	2.60E+05	1.00E+06	0/0	-	-	15/15	5.00E-02	7.30E+01
Pyrene	-	1.80E+04	1.30E+05	1.00E+06	0/0	-	-	15/15	8.10E-02	1.40E+02
ROPCs										
Uranium-238	3.88E+00	3.88E+00	2.06E+01	2.67E+02	3/4	9.69E+00	1.90E+01	0/1	-	-
Radium-226	3.88E+00	3.88E+00	3.88E+00	1.23E+01	1/1	2.70E-01	2.70E-01	1/1	7.80E-01	7.80E-01
Lead-210	3.03E+00	3.03E+00	7.44E+00	9.67E+01	1/1	1.10E+00	1.10E+00	1/1	2.40E+00	2.40E+00
Polonium-210	3.58E+00	2.69E+02	4.33E+01	5.63E+02	0/1	-	-	0/1	-	-
Potassium-40	2.05E+01	2.05E+01	2.05E+01	1.36E+02	2/3	2.04E+00	2.30E+00	0/0	-	-

= COPC/ROPC exceeds at least one of the future worker SSLs developed in the SRI Work Plan.

TABLE 4-3

COMPARISON OF FILL/SOURCE MATERIAL DATA TO SCREENING LEVELS
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Constituent	Soil Screening Levels (mg/kg & pCi/g)				Silica		
	EPA Background	SRI - Outdoor Commercial/Industrial Worker	SRI - Construction Worker	SRI - Utility Worker	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration
COPCs							
Antimony	2.20E+00	4.54E+02	1.04E+02	1.36E+03	0/0	-	-
Arsenic	7.70E+00	7.70E+00	1.46E+01	1.73E+02	0/0	-	-
Barium	1.88E+02	6.17E+04	8.36E+03	1.09E+05	0/0	-	-
Beryllium	1.00E+00	6.45E+02	6.10E+01	7.92E+02	0/0	-	-
Boron	1.28E+01	2.23E+05	5.21E+03	6.78E+04	0/0	-	-
Cadmium	1.90E+00	8.60E+02	8.13E+01	1.06E+03	0/0	-	-
Chromium	2.75E+01	1.00E+06	5.51E+05	1.00E+06	0/0	-	-
Cobalt	7.60E+00	5.53E+02	5.22E+01	6.79E+02	0/0	-	-
Copper	1.26E+01	4.20E+04	2.20E+04	2.86E+05	0/0	-	-
Fluoride	6.00E+02	6.81E+04	3.30E+04	4.30E+05	0/0	-	-
Lead	2.91E+01	8.00E+02	8.00E+02	8.00E+02	0/0	-	-
Lithium	1.61E+01	2.27E+04	1.19E+04	1.55E+05	0/0	-	-
Manganese	4.82E+02	2.35E+04	7.71E+04	1.00E+06	0/0	-	-
Mercury	1.60E-01	3.40E+02	4.64E+02	6.03E+03	0/0	-	-
Molybdenum	2.15E+00	5.67E+03	2.75E+03	3.58E+04	0/0	-	-
Nickel	1.55E+01	6.45E+03	4.04E+02	5.25E+03	0/0	-	-
Selenium	1.36E+00	5.67E+03	2.75E+03	3.58E+04	0/0	-	-
Silver	1.90E+00	5.67E+03	2.75E+03	3.58E+04	0/0	-	-
Thallium	2.70E-01	7.72E+01	3.74E+02	4.87E+03	0/0	-	-
Uranium	-	3.40E+03	4.91E+02	6.39E+03	0/0	-	-
Vanadium	4.54E+01	7.95E+03	3.50E+03	4.55E+04	0/0	-	-
Zinc	5.28E+01	3.40E+05	1.65E+05	1,000,000b	0/0	-	-
Acenaphthene	-	3.70E+04	2.60E+05	1.00E+06	0/0	-	-
Anthracene	-	1.80E+05	1.00E+06	1.00E+06	0/0	-	-
Benzo(a)anthracene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-
Benzo(a)pyrene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-
Benzo(b)fluoranthene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-
Benzo(k)fluoranthene	-	2.30E+01	4.10E+02	3.40E+03	0/0	-	-
Chrysene	-	2.30E+02	4.10E+03	3.40E+04	0/0	-	-
Dibenz(a,h)anthracene	-	2.00E-01	4.00E+00	3.40E+01	0/0	-	-
Fluoranthene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-
Fluorene	-	2.40E+04	1.70E+05	1.00E+06	0/0	-	-
Indeno(1,2,3-cd)pyrene	-	2.00E+00	4.10E+01	3.40E+02	0/0	-	-
Naphthalene	-	1.20E+04	2.60E+05	1.00E+06	0/0	-	-
Pyrene	-	1.80E+04	1.30E+05	1.00E+06	0/0	-	-
ROPCs							
Uranium-238	3.88E+00	3.88E+00	2.06E+01	2.67E+02	1/1	1.50E+00	1.50E+00
Radium-226	3.88E+00	3.88E+00	3.88E+00	1.23E+01	1/1	1.70E+00	1.70E+00
Lead-210	3.03E+00	3.03E+00	7.44E+00	9.67E+01	1/1	6.70E-01	6.70E-01
Polonium-210	3.58E+00	2.69E+02	4.33E+01	5.63E+02	1/1	2.60E+00	2.60E+00
Potassium-40	2.05E+01	2.05E+01	2.05E+01	1.36E+02	0/0	-	-

= COPC/ROPC exceeds at least one of the future worker SSLs developed in the SRI Work Plan.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

	RU 1					RU 2					RU 3	
Constituent	**Slag (95% UCL)***	**Precipitator Solids (95% UCL)***	**Phossy Solids (95% UCL)***	**P4**	**EPC****	**Slag (95% UCL)***	**Precipitator Solids (95% UCL)***	**Phossy Solids (95% UCL)***	**P4**	**EPC****	**Slag (95% UCL)***	**EPC****
COCs (mg/kg)												
Antimony	-	1.46E+02	1.94E+02	-	1.94E+02	-	1.46E+02	1.94E+02	-	1.94E+02	-	-
Arsenic	-	4.46E+01	1.80E+02	-	1.80E+02	-	4.46E+01	1.80E+02	-	1.80E+02	-	-
Barium	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	-	5.24E+03	2.01E+03	-	5.24E+03	-	5.24E+03	2.01E+03	-	5.24E+03	-	-
Chromium	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	-	-	-	-	-
Lead	-	1.07E+03	-	-	1.07E+03	-	1.07E+03	-	-	1.07E+03	-	-
Lithium	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	-	-	-	3.00E+03	3.00E+03	-	-	-	3.00E+03	3.00E+03	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)												
Uranium-238	2.93E+01	6.39E+00	-	-	2.93E+01	2.93E+01	6.39E+00	-	-	2.93E+01	2.93E+01	2.93E+01
Radium-226	2.51E+01	1.13E+01	-	-	2.51E+01	2.51E+01	1.13E+01	-	-	2.51E+01	2.51E+01	2.51E+01
Lead-210	1.30E+01	1.14E+03	4.09E+02	-	1.14E+03	1.30E+01	1.14E+03	4.09E+02	-	1.14E+03	1.30E+01	1.30E+01
Polonium-210	-	6.57E+02	7.23E+01	-	6.57E+02	-	6.57E+02	7.23E+01	-	6.57E+02	-	-
Potassium-40	-	1.52E+02	2.74E+01	-	1.52E+02	-	1.52E+02	2.74E+01	-	1.52E+02	-	-

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

	RU 4		RU 5		RU 6			
Constituent	**Slag (95% UCL)***	**EPC****	**Slag (95% UCL)***	**EPC****	**Slag (95% UCL)***	**Coke (95% UCL)***	**Ferrophos (95% UCL)***	**EPC****
COCs (mg/kg)								
Antimony	-	-	-	-	-	-	-	-
Arsenic	-	-	-	-	-	-	-	-
Barium	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-
Cadmium	-	-	-	-	-	-	-	-
Chromium	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Lithium	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	1.15E+03	1.15E+03
Phosphorus	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	6.33E+03	6.33E+03
Zinc	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	3.11E+01	-	3.11E+01
Benzo(a)pyrene	-	-	-	-	-	2.70E+01	-	2.70E+01
Benzo(b)fluoranthene	-	-	-	-	-	2.65E+01	-	2.65E+01
Benzo(k)fluoranthene	-	-	-	-	-	1.87E+01	-	1.87E+01
Chrysene	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	3.75E+00	-	3.75E+00
Fluoranthene	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	1.15E+01	-	1.15E+01
Naphthalene	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-
ROCs (pCi/g)								
Uranium-238	2.93E+01	2.93E+01	2.93E+01	2.93E+01	2.93E+01	-	1.90E+01	2.93E+01
Radium-226	2.51E+01	2.51E+01	2.51E+01	2.51E+01	2.51E+01	-	-	2.51E+01
Lead-210	1.30E+01	1.30E+01	1.30E+01	1.30E+01	1.30E+01	-	-	1.30E+01
Polonium-210	-	-	-	-	-	-	-	-
Potassium-40	-	-	-	-	-	-	-	-

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

Constituent	RU 7				RU 8				
	Slag (95% UCL)*	Ore (95% UCL)*	Coke (95% UCL)*	EPC**	Slag (95% UCL)*	Ore (95% UCL)*	Calcined Ore (95% UCL)*	Calciner Pond Solids (95% UCL)*	EPC**
COCs (mg/kg)									
Antimony	-	-	-	-	-	-	-	-	-
Arsenic	-	1.46E+01	-	1.46E+01	-	1.46E+01	-	1.43E+01	1.46E+01
Barium	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-
Cadmium	-	1.25E+02	-	1.25E+02	-	1.25E+02	-	5.38E+02	5.38E+02
Chromium	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	1.30E+03	1.30E+03
Lead	-	-	-	-	-	-	-	-	-
Lithium	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-	-
Phosphorus	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	3.40E+02	3.40E+02
Uranium	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	3.11E+01	3.11E+01	-	-	-	-	-
Benzo(a)pyrene	-	-	2.70E+01	2.70E+01	-	-	-	-	-
Benzo(b)fluoranthene	-	-	2.65E+01	2.65E+01	-	-	-	-	-
Benzo(k)fluoranthene	-	-	1.87E+01	1.87E+01	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	3.75E+00	3.75E+00	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	1.15E+01	1.15E+01	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)									
Uranium-238	2.93E+01	2.75E+01	-	2.93E+01	2.93E+01	2.75E+01	2.42E+01	1.79E+01	2.93E+01
Radium-226	2.51E+01	2.96E+01	-	2.96E+01	2.51E+01	2.96E+01	2.67E+01	1.74E+01	2.96E+01
Lead-210	1.30E+01	3.63E+01	-	3.63E+01	1.30E+01	3.63E+01	2.19E+01	3.41E+01	3.63E+01
Polonium-210	-	-	-	-	-	-	-	4.58E+02	4.58E+02
Potassium-40	-	-	-	-	-	-	-	7.04E+01	7.04E+01

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

Constituent	RU 9						RU 10			RU 11	
	Slag (95% UCL)*	Ore (95% UCL)*	Calcined Ore (95% UCL)*	Calciner Pond Solids (95% UCL)*	Coke (95% UCL)*	EPC**	Slag (95% UCL)*	Precipitator Solids (95% UCL)*	EPC**	Slag (95% UCL)*	EPC**
COCs (mg/kg)											
Antimony	-	-	-	-	-	-	-	1.46E+02	1.46E+02	-	-
Arsenic	-	1.46E+01	-	1.43E+01	-	1.46E+01	-	4.46E+01	4.46E+01	-	-
Barium	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-
Cadmium	-	1.25E+02	-	5.38E+02	-	5.38E+02	-	5.24E+03	5.24E+03	-	-
Chromium	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	1.30E+03	-	1.30E+03	-	-	-	-	-
Lead	-	-	-	-	-	-	-	1.07E+03	1.07E+03	-	-
Lithium	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	3.40E+02	-	3.40E+02	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	3.11E+01	3.11E+01	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	2.70E+01	2.70E+01	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	2.65E+01	2.65E+01	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	1.87E+01	1.87E+01	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	3.75E+00	3.75E+00	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	1.15E+01	1.15E+01	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)											
Uranium-238	2.93E+01	2.75E+01	2.42E+01	1.79E+01	-	2.93E+01	2.93E+01	6.39E+00	2.93E+01	2.93E+01	2.93E+01
Radium-226	2.51E+01	2.96E+01	2.67E+01	1.74E+01	-	2.96E+01	2.51E+01	1.13E+01	2.51E+01	2.51E+01	2.51E+01
Lead-210	1.30E+01	3.63E+01	2.19E+01	3.41E+01	-	3.63E+01	1.30E+01	1.14E+03	1.14E+03	1.30E+01	1.30E+01
Polonium-210	-	-	-	4.58E+02	-	4.58E+02	-	6.57E+02	6.57E+02	-	-
Potassium-40	-	-	-	7.04E+01	-	7.04E+01	-	1.52E+02	1.52E+02	-	-

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

Constituent	RU 12						RU 13				
	Slag (95% UCL)*	Precipitator Solids (95% UCL)*	Phossy Solids (95% UCL)*	Ferrophos (95% UCL)*	P4	EPC**	Slag (95% UCL)*	Precipitator Solids (95% UCL)*	Phossy Solids (95% UCL)*	P4	EPC**
COCs (mg/kg)											
Antimony	-	1.46E+02	1.94E+02	-	-	1.94E+02	-	1.46E+02	1.94E+02	-	1.94E+02
Arsenic	-	4.46E+01	1.80E+02	-	-	1.80E+02	-	4.46E+01	1.80E+02	-	1.80E+02
Barium	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-
Cadmium	-	5.24E+03	2.01E+03	-	-	5.24E+03	-	5.24E+03	2.01E+03	-	5.24E+03
Chromium	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	-	-	-	-
Lead	-	1.07E+03	-	-	-	1.07E+03	-	1.07E+03	-	-	1.07E+03
Lithium	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	1.15E+03	-	1.15E+03	-	-	-	-	-
Phosphorus	-	-	-	-	3.00E+03	3.00E+03	-	-	-	3.00E+03	3.00E+03
Selenium	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	6.33E+03	-	6.33E+03	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)											
Uranium-238	2.93E+01	6.39E+00	-	1.90E+01	-	2.93E+01	2.93E+01	6.39E+00	-	-	2.93E+01
Radium-226	2.51E+01	1.13E+01	-	-	-	2.51E+01	2.51E+01	1.13E+01	-	-	2.51E+01
Lead-210	1.30E+01	1.14E+03	4.09E+02	-	-	1.14E+03	1.30E+01	1.14E+03	4.09E+02	-	1.14E+03
Polonium-210	-	6.57E+02	7.23E+01	-	-	6.57E+02	-	6.57E+02	7.23E+01	-	6.57E+02
Potassium-40	-	1.52E+02	2.74E+01	-	-	1.52E+02	-	1.52E+02	2.74E+01	-	1.52E+02

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

	RU 15						RU 16			RU 19		
Constituent	Slag (95% UCL)*	Ore (95% UCL)*	Calciner Pond Solids (95% UCL)*	Calcined Ore (95% UCL)*	Coke (95% UCL)*	EPC**	Slag (95% UCL)*	Calciner Pond Solids (95% UCL)*	EPC**	Slag (95% UCL)*	Ore (95% UCL)*	EPC**
COCs (mg/kg)												
Antimony	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	-	1.46E+01	1.43E+01	-	-	1.46E+01	-	1.43E+01	1.43E+01	-	1.46E+01	1.46E+01
Barium	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	-	1.25E+02	5.38E+02	-	-	5.38E+02	-	5.38E+02	5.38E+02	-	1.25E+02	1.25E+02
Chromium	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	-	-	1.30E+03	-	-	1.30E+03	-	1.30E+03	1.30E+03	-	-	-
Lead	-	-	-	-	-	-	-	-	-	-	-	-
Lithium	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	3.40E+02	-	-	3.40E+02	-	3.40E+02	3.40E+02	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	3.11E+01	3.11E+01	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	2.70E+01	2.70E+01	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	2.65E+01	2.65E+01	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	1.87E+01	1.87E+01	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	3.75E+00	3.75E+00	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	1.15E+01	1.15E+01	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)												
Uranium-238	2.93E+01	2.75E+01	1.79E+01	2.42E+01	-	2.93E+01	2.93E+01	1.79E+01	2.93E+01	2.93E+01	2.75E+01	2.93E+01
Radium-226	2.51E+01	2.96E+01	1.74E+01	2.67E+01	-	2.96E+01	2.51E+01	1.74E+01	2.51E+01	2.51E+01	2.96E+01	2.96E+01
Lead-210	1.30E+01	3.63E+01	3.41E+01	2.19E+01	-	3.63E+01	1.30E+01	3.41E+01	3.41E+01	1.30E+01	3.63E+01	3.63E+01
Polonium-210	-	-	4.58E+02	-	-	4.58E+02	-	4.58E+02	4.58E+02	-	-	-
Potassium-40	-	-	7.04E+01	-	-	7.04E+01	-	7.04E+01	7.04E+01	-	-	-

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

	RU 20***				RU 21		RU 22b					
Constituent	Slag (95% UCL)*	Coke (95% UCL)*	Ferrophos (95% UCL)*	EPC**	Slag (95% UCL)*	EPC**	Slag (95% UCL)*	Precipitator Solids (95% UCL)*	Phossy Solids (95% UCL)*	Ferrophos (95% UCL)*	P4	EPC**
COCs (mg/kg)												
Antimony	-	-	-	-	-	-	-	1.46E+02	1.94E+02	-	-	1.94E+02
Arsenic	-	-	-	-	-	-	-	4.46E+01	1.80E+02	-	-	1.80E+02
Barium	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	-	-	-	-	-	-	-	5.24E+03	2.01E+03	-	-	5.24E+03
Chromium	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	1.07E+03	-	-	-	1.07E+03
Lithium	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	-	1.15E+03	1.15E+03	-	-	-	-	-	1.15E+03	-	1.15E+03
Phosphorus	-	-	-	-	-	-	-	-	-	-	3.00E+03	3.00E+03
Selenium	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	6.33E+03	6.33E+03	-	-	-	-	-	6.33E+03	-	6.33E+03
Zinc	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	3.11E+01	-	3.11E+01	-	-	-	-	-	-	-	-
Benzo(a)pyrene	-	2.70E+01	-	2.70E+01	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	2.65E+01	-	2.65E+01	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	1.87E+01	-	1.87E+01	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	3.75E+00	-	3.75E+00	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	1.15E+01	-	1.15E+01	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)												
Uranium-238	2.93E+01	-	1.90E+01	2.93E+01	2.93E+01	2.93E+01	2.93E+01	6.39E+00	-	1.90E+01	-	2.93E+01
Radium-226	2.51E+01	-	-	2.51E+01	2.51E+01	2.51E+01	2.51E+01	1.13E+01	-	-	-	2.51E+01
Lead-210	1.30E+01	-	-	1.30E+01	1.30E+01	1.30E+01	1.30E+01	1.14E+03	4.09E+02	-	-	1.14E+03
Polonium-210	-	-	-	-	-	-	-	6.57E+02	7.23E+01	-	-	6.57E+02
Potassium-40	-	-	-	-	-	-	-	1.52E+02	2.74E+01	-	-	1.52E+02

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

*** EPCs associated with the fuel PAH COCs identified in the RU 20 Former Hot Batch Plants SIA are not provided. The maximum concentration of these COCs, shown in Table 4-28, were used to characterize EPCs in the Supplement HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

Constituent	RU 22c					RU 23		RU 24	
	Slag (95% UCL)*	Phossy Solids (95% UCL)*	Ore (95% UCL)*	P4	EPC**	Slag (95% UCL)*	EPC**	Slag (95% UCL)*	EPC**
COCs (mg/kg)									
Antimony	-	1.94E+02	-	-	1.94E+02	-	-	-	-
Arsenic	-	1.80E+02	1.46E+01	-	1.80E+02	-	-	-	-
Barium	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-	-
Cadmium	-	2.01E+03	1.25E+02	-	2.01E+03	-	-	-	-
Chromium	-	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-	-
Lithium	-	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-	-
Phosphorus	-	-	-	3.00E+03	3.00E+03	-	-	-	-
Selenium	-	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-
ROCs (pCi/g)									
Uranium-238	2.93E+01	-	2.75E+01	-	2.93E+01	2.93E+01	2.93E+01	2.93E+01	2.93E+01
Radium-226	2.51E+01	-	2.96E+01	-	2.96E+01	2.51E+01	2.51E+01	2.51E+01	2.51E+01
Lead-210	1.30E+01	4.09E+02	3.63E+01	-	4.09E+02	1.30E+01	1.30E+01	1.30E+01	1.30E+01
Polonium-210	-	7.23E+01	-	-	7.23E+01	-	-	-	-
Potassium-40	-	2.74E+01	-	-	2.74E+01	-	-	-	-

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-4

SUMMARY OF FILL/SOURCE MATERIAL COC/ROC EXPOSURE POINT CONCENTRATIONS FOR USE IN THE SUPPLEMENTAL HHRA
FMC Corporation, Pocatello, Idaho

	Precipitator Slurry Underground Piping			Phossy Water Underground Piping		
Constituent	**Precipitator Solids (95% UCL)***	**P4**	**EPC****	**Phossy Solids (95% UCL)***	**P4**	**EPC****
COCs (mg/kg)						
Antimony	1.46E+02	-	1.46E+02	1.94E+02	-	1.94E+02
Arsenic	4.46E+01	-	4.46E+01	1.80E+02	-	1.80E+02
Barium	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-
Boron	-	-	-	-	-	-
Cadmium	5.24E+03	-	5.24E+03	2.01E+03	-	2.01E+03
Chromium	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-
Lead	1.07E+03	-	1.07E+03	-	-	-
Lithium	-	-	-	-	-	-
Manganese	-	-	-	-	-	-
Mercury	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Phosphorus	-	3.00E+03	3.00E+03	-	3.00E+03	3.00E+03
Selenium	-	-	-	-	-	-
Silver	-	-	-	-	-	-
Thallium	-	-	-	-	-	-
Uranium	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-
Zinc	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-
ROCs (pCi/g)						
Uranium-238	6.39E+00	-	6.39E+00	-	-	-
Radium-226	1.13E+01	-	1.13E+01	-	-	-
Lead-210	1.14E+03	-	1.14E+03	4.09E+02	-	4.09E+02
Polonium-210	6.57E+02	-	6.57E+02	7.23E+01	-	7.23E+01
Potassium-40	1.52E+02	-	1.52E+02	2.74E+01	-	2.74E+01

* The derivation of the COC/ROC 95% UCL concentrations in each fill material is described in the Supplemental HHRA.

** The highest COC/ROC concentration in a fill material within an RU used to characterize the exposure point concentration (EPC) in the Supplemental HHRA.

TABLE 4-5

P4 DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 3)

				Analyte	**Phosphorus (P4)**
				Units	**µg/kg**
				Background	**NE**
				Commercial/Industrial Worker SSL	**22,700**
				Construction Worker SSL	**117,000**
				Utility Worker SSL	**1,000,000**
				SSL Protective of Groundwater	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**		
RU1-CAP-SB001	RU1-CAP-SB001 (0-2)	10/18/07	0 - 2		<0.5 UJ
RU1-CAP-SB001	RU1-CAP-SB001 (2-4)	10/18/07	2 - 4		<0.5 UJ
RU1-CAP-SB001	RU1-CAP-SB001 (4-6)	10/18/07	4 - 6		<0.5 UJ
RU1-CAP-SB001	RU1-CAP-SB001 (6-8)	10/18/07	6 - 8		<0.5 UJ
RU1-CAP-SB001	RU1-CAP-SB001 (8-10)	10/18/07	8 - 10		<0.5 UJ
RU1-CAP-SB002	RU1-CAP-SB002 (0-2)	10/17/07	0 - 2		<0.5
RU1-CAP-SB002	RU1-CAP-SB002 (2-4)	10/17/07	2 - 4		<0.5
RU1-CAP-SB002	RU1-CAP-SB002 (4-6)	10/17/07	4 - 6		<0.5
RU1-CAP-SB002	RU1-CAP-SB002 (6-8)	10/17/07	6 - 8		<0.5
RU1-CAP-SB002	RU1-CAP-SB002 (8-10)	10/17/07	8 - 10		<0.5
RU1-CAP-SB003	RU1-CAP-SB003 (0-2)	10/18/07	0 - 2		<0.5 UJ
RU1-CAP-SB003	RU1-CAP-SB003 (2-4)	10/18/07	2 - 4		<0.5 UJ
RU1-CAP-SB003	RU1-CAP-SB003 (4-6)	10/18/07	4 - 6		<0.5 UJ
RU1-CAP-SB003	RU1-CAP-SB003 (6-8)	10/18/07	6 - 8		<0.5 UJ
RU1-CAP-SB003	RU1-CAP-SB003 (8-10)	10/18/07	8 - 10		<0.5 UJ
RU1-CAP-SB003a	RU1-CAP-SB003a (0-2)	11/14/07	0 - 2		<0.5
RU1-CAP-SB003a	RU1-CAP-SB003a (2-4)	11/14/07	2 - 4		<0.5
RU1-CAP-SB003a	RU1-CAP-SB003a (4-6)	11/14/07	4 - 6		<0.5
RU1-CAP-SB003a	RU1-CAP-SB003a (6-8)	11/14/07	6 - 8		<0.5
RU1-CAP-SB003a	RU1-CAP-SB003a (8-10)	11/14/07	8 - 10		<0.5
RU1-CAP-SB004	RU1-CAP-SB004 (0-2)	11/29/07	0 - 2		<0.5
RU1-CAP-SB004	RU1-CAP-SB004 (2-4)	11/29/07	2 - 4		<0.5
RU1-CAP-SB004	RU1-CAP-SB004 (4-6)	11/29/07	4 - 6		<0.5
RU1-CAP-SB004	RU1-CAP-SB004 (6-8)	11/29/07	6 - 8		<0.5
RU1-CAP-SB004	RU1-CAP-SB004 (8-10)	11/29/07	8 - 10		<0.5
RU1-CAP-SB005	RU1-CAP-SB005 (0-2)	11/29/07	0 - 2		<0.5
RU1-CAP-SB005	RU1-CAP-SB005 (2-4)	11/29/07	2 - 4		<0.5
RU1-CAP-SB005	RU1-CAP-SB005 (4-6)	11/29/07	4 - 6		<0.5
RU1-CAP-SB005	RU1-CAP-SB005 (6-8)	11/29/07	6 - 8		<0.5
RU1-CAP-SB005	RU1-CAP-SB005 (8-10)	11/29/07	8 - 10		<0.5
RU1-CAP-SB006	RU1-CAP-SB006 (0-2)	10/25/07	0 - 2		<0.5
RU1-CAP-SB006	RU1-CAP-SB006 (2-4)	10/25/07	2 - 4		<0.5
RU1-CAP-SB006	RU1-CAP-SB006 (4-6)	10/25/07	4 - 6		<0.5
RU1-CAP-SB006	RU1-CAP-SB006 (6-8)	10/25/07	6 - 8		<0.5
RU1-CAP-SB006	RU1-CAP-SB006 (8-10)	10/25/07	8 - 10		<0.5
RU1-CAP-SB007	RU1-CAP-SB007 (0-2)	10/26/07	0 - 2		<0.5
RU1-CAP-SB007	RU1-CAP-SB007 (2-4)	10/26/07	2 - 4		<0.5
RU1-CAP-SB007	RU1-CAP-SB007 (4-6)	10/26/07	4 - 6		<0.5
RU1-CAP-SB007	RU1-CAP-SB007 (6-8)	10/26/07	6 - 8		<0.5
RU1-CAP-SB007	RU1-CAP-SB007 (8-10)	10/26/07	8 - 10		<0.5
RU1-CAP-SB007 CL	RU1-CAP-SB207 (0-2)	10/29/07	0 - 2		<0.5

TABLE 4-5

P4 DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 3)

				Analyte	**Phosphorus (P4)**
				Units	**µg/kg**
				Background	**NE**
				Commercial/Industrial Worker SSL	**22,700**
				Construction Worker SSL	**117,000**
				Utility Worker SSL	**1,000,000**
				SSL Protective of Groundwater	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**		
RU1-CAP-SB007 CL	RU1-CAP-SB207 (2-4)	10/29/07	2 - 4		<0.5
RU1-CAP-SB007 CL	RU1-CAP-SB207 (4-6)	10/29/07	4 - 6		<0.5
RU1-CAP-SB007 CL	RU1-CAP-SB207 (6-8)	10/29/07	6 - 8		<0.5
RU1-CAP-SB007 CL	RU1-CAP-SB207 (8-10)	10/29/07	8 - 10		<0.5
RU2-CAP-SB001	RU2-CAP-SB001 (0-2)	10/31/07	0 - 2		<0.5
RU2-CAP-SB001	RU2-CAP-SB001 (2-4)	10/31/07	2 - 4		<0.5
RU2-CAP-SB001	RU2-CAP-SB001 (4-6)	10/31/07	4 - 6		<0.5
RU2-CAP-SB001	RU2-CAP-SB001 (6-8)	10/31/07	6 - 8		<0.5
RU2-CAP-SB001	RU2-CAP-SB001 (8-10)	10/31/07	8 - 10		<0.5
RU2-CAP-SB002	RU2-CAP-SB002 (0-2)	11/13/07	0 - 2		<0.5
RU2-CAP-SB002	RU2-CAP-SB002 (2-4)	11/13/07	2 - 4		<0.5
RU2-CAP-SB002	RU2-CAP-SB002 (4-6)	11/13/07	4 - 6		<0.5
RU2-CAP-SB002	RU2-CAP-SB002 (6-8)	11/13/07	6 - 8		<0.5
RU2-CAP-SB002	RU2-CAP-SB002 (8-10)	11/13/07	8 - 10		<0.5
RU2-CAP-SB003	RU2-SIA1-SB003 (0-2)	11/16/07	0 - 2		<0.5
RU2-CAP-SB003	RU2-SIA1-SB003 (2-4)	11/16/07	2 - 4		<0.5
RU2-CAP-SB003	RU2-SIA1-SB003 (4-6)	11/16/07	4 - 6		<0.5
RU2-CAP-SB003	RU2-SIA1-SB003 (6-8)	11/16/07	6 - 8		<0.5
RU2-CAP-SB003	RU2-SIA1-SB003 (8-10)	11/16/07	8 - 10		<0.5
RU2-CAP-SB004	RU2-CAP-SB004 (0-2)	11/02/07	0 - 2		<0.5
RU2-CAP-SB004	RU2-CAP-SB004 (2-4)	11/02/07	2 - 4		<0.5
RU2-CAP-SB004	RU2-CAP-SB004 (4-6)	11/02/07	4 - 6		<0.5
RU2-CAP-SB004	RU2-CAP-SB004 (6-8)	11/02/07	6 - 8		<0.5
RU2-CAP-SB004	RU2-CAP-SB004 (8-10)	11/02/07	8 - 10		<0.5
RU2-CAP-SB005	RU2-CAP-SB005 (0-2)	11/06/07	0 - 2		<0.5
RU2-CAP-SB005	RU2-CAP-SB005 (2-4)	11/06/07	2 - 4		<0.5
RU2-CAP-SB005	RU2-CAP-SB005 (4-6)	11/06/07	4 - 6		<0.5
RU2-CAP-SB005	RU2-CAP-SB005 (6-8)	11/06/07	6 - 8		<0.5
RU2-CAP-SB005	RU2-CAP-SB005 (8-10)	11/06/07	8 - 10		<0.5
RU2-CAP-SB006	RU2-CAP-SB006 (0-2)	11/08/07	0 - 2		<0.5
RU2-CAP-SB006	RU2-CAP-SB006 (2-4)	11/08/07	2 - 4		<0.5
RU2-CAP-SB006	RU2-CAP-SB006 (4-6)	11/08/07	4 - 6		<0.5
RU2-CAP-SB006	RU2-CAP-SB006 (6-8)	11/08/07	6 - 8		<0.5
RU2-CAP-SB006	RU2-CAP-SB006 (8-10)	11/08/07	8 - 10		<0.5
RU2-CAP-SB007	RU2-CAP-SB0007 (0-2)	11/09/07	0 - 2		<0.5
RU2-CAP-SB007	RU2-CAP-SB0007 (2-4)	11/09/07	2 - 4		**0.348 T**
RU2-CAP-SB007	RU2-CAP-SB0007 (4-6)	11/09/07	4 - 6		<0.5
RU2-CAP-SB007	RU2-CAP-SB0007 (6-8)	11/09/07	6 - 8		<0.5
RU2-CAP-SB007	RU2-CAP-SB0007 (8-10)	11/09/07	8 - 10		<0.5
RU2-CAP-SB007 CL	RU2-CAP-SB0207 (0-2)	11/09/07	0 - 2		<0.5
RU2-CAP-SB007 CL	RU2-CAP-SB0207 (2-4)	11/09/07	2 - 4		<0.5

TABLE 4-5

P4 DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 3)

				Analyte	**Phosphorus (P4)**
				Units	**µg/kg**
				Background	**NE**
				Commercial/Industrial Worker SSL	**22,700**
				Construction Worker SSL	**117,000**
				Utility Worker SSL	**1,000,000**
				SSL Protective of Groundwater	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**		
RU2-CAP-SB007 CL	RU2-CAP-SB0207 (4-6)	11/09/07	4 - 6		<0.5
RU2-CAP-SB007 CL	RU2-CAP-SB0207 (6-8)	11/09/07	6 - 8		<0.5
RU2-CAP-SB007 CL	RU2-CAP-SB0207 (8-10)	11/09/07	8 - 10		<0.5
RU22c-CAP-SB001	RU22C-CAP-SB001 (0-2)	11/08/07	0 - 2		<0.5
RU22c-CAP-SB001	RU22C-CAP-SB001 (2-4)	11/08/07	2 - 4		<0.5
RU22c-CAP-SB001	RU22C-CAP-SB001 (4-6)	11/08/07	4 - 6		<0.5
RU22c-CAP-SB001	RU22C-CAP-SB001 (6-8)	11/08/07	6 - 8		<0.5
RU22c-CAP-SB001	RU22C-CAP-SB001 (8-10)	11/08/07	8 - 10		<0.5

µg/kg micrograms per kilogram.
Bold Bolded result indicates positively identified compound.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UJ Potential low bias, possible false negative.
NE Not established
CL Colocated sample for blind replicate analysis

TABLE 4-6

P4 CAPILLARY FRINGE INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	**Phosphorus (P4)**
				Units	**µg/kg**
				Background	**NE**
				Commercial/Industrial Worker SSL	**22,700**
				Construction Worker SSL	**117,000**
				Utility Worker SSL	**1,000,000**
				SSL Protective of Groundwater	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**		
RU1-SIA1-SB001	RU1-SIA1-SB001 (80-81)	12/5/2007	80 - 81		<0.5
RU1-SIA1-SB002	RU1-SIA1-SB002 (77-80)	11/30/2007	77 - 80		<0.5
RU1-SIA1-SB003	RU1-SIA1-SB003 (77.5-78)	11/30/2007	77.5 - 78		<0.5
RU1-SIA1-SB004	RU1-SIA1-SB004 (75-76)	11/29/2007	75 - 76		<0.5
RU1-SIA1-SB005	RU1-SIA1-SB005 (77.5-78)	11/30/2007	77.5 - 78		<0.5
RU1-SIA1-SB006	RU1-SIA1-SB006 (83-84)	12/4/2007	83 - 84		<0.5
RU1-SIA1-SB007	RU1-SIA1-SB007 (86-86.5)	12/5/2007	86 - 86.5		<0.5

µg/kg micrograms per kilogram.
NE Not established

TABLE 4-7

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 1***
(FURNACE BUILDING, PHOS DOCK AND SECONDARY CONDENSER)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As, Cd*	*5.E-05*	*As*	*8.E-05*	*Cd, As*	*6.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226, K-40
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Cd**	**3.E-05**	**Pb-210, Cd**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	6	Cd	3	Cd	11	Cd, As	0.8	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.3	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.06	-	NA	-	13	Cd	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**139.0**	**P4, Cd**	**76**	**P4, Cd**	**50**	**P4, Cd**	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when "smoke" became apparent due to the irritant effect of the acid aerosol which comprises the "smoke". This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

*** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-8

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 2***
(SLAG PIT)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As, Cd*	*5.E-05*	*As*	*8.E-05*	*Cd, As*	*6.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226, K-40
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Cd**	**3.E-05**	**Pb-210, Cd**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	6	Cd	3	Cd	11	Cd, As	0.8	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.3	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.06	-	NA	-	13	Cd	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**139**	**P4, Cd**	**76**	**P4, Cd**	**50**	**P4, Cd**	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when "smoke" became apparent due to the irritant effect of the acid aerosol which comprises the "smoke". This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

*** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 10)

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU 3	RU3-SFS-SBC001 (0-2' bns)	SB001	4-6	
		SB002	7-9	
		SB003	4-6	
		SB004	3-5	
		SB005	4-6	
	RU3-SFS-SBC201 (0-2' bns)	SB201	4-6	colocated with RU3-SFS-SBC001
		SB202	7-9	
		SB203	4-6	
		SB204	3-5	
		SB205	4-6	
	RU3-SFS-SBC002 (0-2' bns)	SB006	7-9	
		SB007	5-7	
		SB008	5-7	
		SB012	5-7	
		SB013	6.5-8.5	
	RU3-SFS-SBC003 (0-2' bns)	SB009	3-5	
		SB0010	2-4	
		SB011	2-4	
		SB014	3-5	
		SB015	4-6	
	RU3-SFS-SBC004 (0-2' bns)	SB016	3-5	
		SB017	3-5	
		SB018	20-22	
		SB019	4-6	
		SB020	10-12	
RU 4	RU4-SFS-SBC001 (0-2' bns)	SB001	9-11	
		SB002	5-7	
		SB003	3-5	
		SB004	5-7	
		SB007	5-7	
	RU4-SFS-SBC002 (0-2' bns)	SB005	3-5	
		SB006	3-5	
		SB010	7-9	
		SB011	2.5-4.5	
		SB012	8-10	
	RU4-SFS-SBC003 (0-2' bns)	SB008	5-7	
		SB009	7-9	
		SB013	5-7	
		SB014	5-7	
		SB015	5-7	
	RU4-SFS-SBC004 (0-2' bns)	SB208	5-7	colocated with RU4-SFS-SBC003
		SB209	7-9	
		SB213	5-7	
		SB214	5-7	
		SB215	5-7	
	RU4-SFS-SBC005 (0-2' bns)	SB016	10-12	
		SB017	7-9	
		SB018	7-9	
		SB019	7-9	
		SB020	10-12	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU 5	RU5-SFS-SBC001 (0-2' bns)	SB001	10-12	
		SB002	1.5-3.5	
		SB003	7-9	
		SB005	2-4	
		SB006	2-4	
	RU5-SFS-SBC002 (0-2' bns)	SB008	2-4	
		SB009	1.5-3.5	
		SB011	3-5	
		SB012	6-8	
		SB014	7-9	
	RU5-SFS-SBC202 (0-2' bns)	SB208	2-4	colocated with RU5-SFS-SBC002
		SB209	1.5-3.5	
		SB211	3-5	
		SB212	6-8	
		SB214	7-9	
	RU5-SFS-SBC003 (0-2' bns)	SB013	8-10	
		SB015	2.5-4.5	
		SB018	5-7	
		SB019	5-7	
		SB020	3.5-5.5	
	RU5-SFS-SBC004 (0-2' bns)	SB004	5-7	
		SB007	5-7	
		SB010	5-7	
		SB016	5-7	
		SB017	4-6	
RU 6	RU6-SFS-SBC001 (0-2' bns)	SB001	5-7	
		SB002	5-7	
		SB003	10-12	
		SB004	13.5-15.5	
		SB005	14-16	
	RU6-SFS-SBC002 (0-2' bns)	SB006	8-10	
		SB011	4-6	
		SB016	14-16	
		SB017	10-12	
		SB020	8-10	
	RU6-SFS-SBC202 (0-2' bns)	SB206	8-10	colocated with RU6-SFS-SBC002
		SB211	4-6	
		SB216	14-16	
		SB217	10-12	
		SB220	14-16	
	RU6-SFS-SBC003 (0-2' bns)	SB007	15-17	
		SB008	13-15	
		SB012	14-16	
		SB013	10-12	
		SB018	10-12	
	RU6-SFS-SBC004 (0-2' bns)	SB009	8-10	
		SB010	10-12	
		SB014	8-10	
		SB015	14-16	
		SB019	8-10	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU7	RU7-SFS-SBC001 (0-2' bns)	SB005	5-7	
		SB007	2-4	
		SB011	5-7	
		SB014	8-10	
		SB017	6-8	
	RU7-SFS-SBC201 (0-2' bns)	SB205	5-7	colocated with RU7-SFS-SBC001
		SB207	2-4	
		SB211	5-7	
		SB214	8-10	
		SB217	6-8	
	RU7-SFS-SBC002 (0-2' bns)	SB008	13-15	
		SB010	1-3	
		SB013	1.5-3.5	
		SB016	12-14	
		SB020	12-14	
	RU7-SFS-SBC003 (0-2' bns)	SB001	8-10	
		SB002	5-7	
		SB003	25-27	
		SB004	15-17	
		SB006	16.5-18.5	
	RU7-SFS-SBC004 (0-2' bns)	SB009	15-17	
		SB012	4-6	
		SB015	15-17	
		SB018	15-17	
		SB019	15-17	
RU 9	RU9-SFS-SBC001 (0-2' bns)	SB001	5-7	
		SB002	7-9	
		SB003	10-12	
		SB004	5-7	
		SB005	10.5-12.5	
	RU9-SFS-SBC002 (0-2' bns)	SB010	5-7	
		SB011	9-11	
		SB013	5-7	
		SB014	9-11	
		SB015	15-17	
	RU9-SFS-SBC202 (0-2' bns)	SB210	5-7	colocated with RU9-SFS-SBC002
		SB211	9-11	
		SB213	5-7	
		SB214	9-11	
		SB215	15-17	
	RU9-SFS-SBC003 (0-2' bns)	SB006	12-14	
		SB007	9-11	
		SB008	6-8	
		SB009	5-7	
		SB012	5-7	
	RU9-SFS-SBC004 (0-2' bns)	SB016	7-9	
		SB017	14-16	
		SB018	4-6	
		SB019	9-11	
		SB020	5-7	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU10	RU10-SFS-SBC001 (0-2' bns)			
		SB006	6-8	
		SB017	6-8	
		SB018	5-7	
		SB019	5-7	
		SB020	7-9	
	RU10-SFS-SBC201 (0-2' bns)			
		SB206	6-8	colocated with RU10-SFS-SBC001
		SB217	6-8	
		SB218	5-7	
		SB219	5-7	
		SB220	7-9	
	RU10-SFS-SBC002 (0-2' bns)			
		SB012	7-9	
		SB013	8-10	
		SB014	5-7	
		SB015	5-7	
		SB016	5-7	
	RU10-SFS-SBC003 (0-2' bns)			
		SB007	4-6	
		SB008	6-8	
		SB009	7-9	
		SB010	8-10	
		SB011	8-10	
	RU10-SFS-SBC004 (0-2' bns)			
		TP001	7-9	
		SB002	2.5-4.5	
		TP003	5.5-7.5	
		SB004	1-3	
		SB005	8-10	
RU 11	RU11-SFS-SBC001 (0-2' bns)			
		SB001	4-6	
		SB002	3-5	
		SB003	4-6	
		SB005	5-7	
		SB009	5-7	
	RU11-SFS-SBC002 (0-2' bns)			
		SB008	5-7	
		SB012	15-17	
		SB015	17-19	
		SB018	5-7	
		SB020	10-12	
	RU11-SFS-SBC003 (0-2' bns)			
		SB013	9-11	
		SB014	14-16	
		SB016	4-6	
		SB017	5-7	
		SB019	16-18	
	RU11-SFS-SBC004 (0-2' bns)			
		SB213	9-11	colocated with RU11-SFS-SBC003
		SB214	14-16	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
		SB216	4-6	
		SB217	5-7	
		SB219	16-18	
	RU11-SFS-SBC005 (0-2' bns)			
		SB004	6-8	
		SB006	30-32	
		SB007	17-19	
		SB010	20-22	
		SB011	30-32	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU 12	RU12-SFS-SBC001 (0-2' bns)			
		SB007	5-7	
		SB008	10-12	
		SB009	10-12	
		SB010	7-9	
		SB015	5-7	
	RU12-SFS-SBC002 (0-2' bns)			
		SB001	13.5-15.5	
		SB002	12-14	
		SB003	10-12	
		SB004	9-11	
		SB005	8-10	
	RU12-SFS-SBC003 (0-2' bns)			
		SB012	3-5	
		SB013	7.5-9.5	
		SB014	7-9	
		SB019	5-7	
		SB020	3-5	
	RU12-SFS-SBC203 (0-2' bns)			
		SB212	3-5	colocated with RU12-SFS-SBC003
		SB213	7.5-9.5	
		SB214	7-9	
		SB219	5-7	
		SB220	3-5	
	RU12-SFS-SBC004 (0-2' bns)			
		SB006	5-7	
		SB011	3-5	
		SB016	5-7	
		SB017	3-5	
		SB018	4-6	
RU 13	RU13-SFS-SBC001 (0-2' bns)			
		SB004	5-7	
		SB005	5-7	
		SB008	2-4	
		SB009	4-6	
		SB012	4-6	
	RU13-SFS-SBC002 (0-2' bns)			
		SB006	15-17	
		SB010	13-15	
		SB013	3-5	
		SB014	10.5-12.5	
		SB017	3-5	
	RU13-SFS-SBC003 (0-2' bns)			
		SB015	13-15	
		SB016	3-5	
		SB018	7-9	
		SB019	7-9	
		SB020	4-6	
	RU13-SFS-SBC203 (0-2' bns)			
		SB215	13-15	colocated with RU13-SFS-SBC003
		SB216	3-5	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
		SB218	7-9	
		SB219	7-9	
		SB220	4-6	
	RU13-SFS-SBC004 (0-2' bns)			
		SB001	4-6	
		SB002	4-6	
		SB003	4-6	
		SB007	4-6	
		SB011	5-7	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU 20	RU20-SFS-SBC001 (0-2' bns)			
		SB001	5.5-7.5	
		SB002	4-6	
		SB003	4.5-6.5	
		SB004	6-8	
		SB005	6-8	
	RU20-SFS-SBC002 (0-2' bns)			
		SB011	5-7	
		SB012	5-7	
		SB013	7-9	
		SB014	2.5-4.5	
		SB015	5-7	
	RU20-SFS-SBC003 (0-2' bns)			
		SB006	4-6	
		SB007	4-6	
		SB008	4-6	
		SB009	6.5-8.5	
		SB010	6-8	
	RU20-SFS-SBC004 (0-2' bns)			
		SB206	4-6	colocated with RU20-SFS-SBC003
		SB207	4-6	
		SB208	4-6	
		SB209	6.5-8.5	
		SB210	6-8	
	RU20-SFS-SBC005 (0-2' bns)			
		SB016	5-7	
		SB017	7-9	
		SB018	3-5	
		SB019	2-4	
		SB020	2.5-4.5	
RU 23	RU23-SFS-SBC001 (0-2' bns)			
		SB001	2-4	
		SB002	3-5	
		SB003	2-4	
		SB004	12-14	
		SB005	5-7	
	RU23-SFS-SBC002 (0-2' bns)			
		SB006	3-5	
		SB007	2-4	
		SB008	2-4	
		SB009	2-4	
		SB011	10-12	
	RU23-SFS-SBC202 (0-2' bns)			
		SB206	3-5	colocated with RU23-SFS-SBC002
		SB207	2-4	
		SB208	2-4	
		SB209	2-4	
		SB211	10-12	
	RU23-SFS-SBC003 (0-2' bns)			
		SB010	5-7	
		SB012	4-6	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
		SB013	4-6	
		SB014	15-17	
		SB015	20-22	
	RU23-SFS-SBC004 (0-2' bns)			
		SB016	7-9	
		SB017	2-4	
		SB018	5-7	
		SB019	3-5	
		SB020	10-12	

TABLE 4-9

SFS COMPOSITE SAMPLE SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Composite Sample ID Number	Boring ID	Sample Interval (ft bgs)	Colocated (Replicate) ID
RU24	RU24-SFS-SBC001 (0-2' bns)			
		SB006	5-7	
		SB007	5-7	
		SB008	6-8	
		SB009	5-7	
		SB010	5-7	
	RU24-SFS-SBC201 (0-2' bns)			
		SB206	5-7	colocated with RU24-SFS-SBC001
		SB207	5-7	
		SB208	6-8	
		SB209	5-7	
		SB210	5-7	
	RU24-SFS-SBC002 (0-2' bns)			
		SB011	9-11	
		SB012	2.5-4.5	
		SB013	3.5-5.5	
		SB014	4.5-6.5	
		SB015	4-6	
	RU24-SFS-SBC003 (0-2' bns)			
		SB016	13-15	
		SB017	8-10	
		SB018	4-6	
		SB019	5-7	
		SB020	5-7	
	RU24-SFS-SBC004 (0-2' bns)			
		SB001	3-5	
		SB002	5-7	
		SB003	5-7	
		SB004	1-3	
		SB005	5-7	

TABLE 4-10

SFS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 4)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury
				Analyte															
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg
				Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16
				Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030
				SSL Protective of Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**																
RU3-SFS-SBC001	RU3-SFS-SBC001 (0-2 BNS)	09/21/07	0 - 2		**0.136 T**	**3.06**	**122**	**0.658 T**	**7.11 T**	**0.646 T**	**13.2 B**	**4.41**	**8.28**	**54**	**8.1**	**0.96 ± 0.25**	**11**	**362**	**0.013 T,B**
RU3-SFS-SBC001 CL	RU3-SFS-SBC201 (0-2 BNS)	09/21/07	0 - 2		<1	**2.97**	**122**	**0.614 T**	**5.85 T**	**0.261 T**	**10.6 B**	**4.35**	**7.51**	**37 J-**	**7.76**	**0.88 ± 0.24**	**10**	**350**	**0.01 T,B**
RU3-SFS-SBC002	RU3-SFS-SBC002 (0-2 BNS)	09/21/07	0 - 2		**0.134 T**	**2.91**	**122**	**0.571 T**	**5.68 T**	**0.352 T**	**10.5 B**	**4.3**	**7.46**	**14**	**7.81**	**1.07 ± 0.28**	**9.77**	**375**	**0.01 T,B**
RU3-SFS-SBC003	RU3-SFS-SBC003 (0-2 BNS)	09/24/07	0 - 2		**0.139 T**	**3**	**134**	**0.632 T**	**6.83 T**	**0.264 T**	**10.2 B**	**4.39**	**7.93**	**7.1 J-**	**7.8**	**0.86 ± 0.23**	**10.6**	**361**	**0.01 T,B**
RU3-SFS-SBC004	RU3-SFS-SBC004 (0-2 BNS)	09/25/07	0 - 2		<1	**2.97**	**124**	**0.554 T**	**5.13 T**	**0.572 T**	**10.6 B**	**4.22**	**7.78**	**23 J-**	**7.82**	**0.81 ± 0.22**	**9.37**	**340**	**0.011 T,B**
RU4-SFS-SBC001	RU4-SFS-SBC001 (0-2 BNS)	08/23/07	0 - 2		<1	**2.86**	**124**	**0.558 T**	**5.63 T**	**0.287 T**	**8.94 B**	**4.23**	**7.34**	**9.6**	**7.7 B**	**0.94 ± 0.25**	**9.59**	**354**	**0.0087 T**
RU4-SFS-SBC002	RU4-SFS-SBC002 (0-2 BNS)	08/28/07	0 - 2		0.138 T,UB	**3.19 B**	**126 B**	**0.637 T,B**	6.45 T,UB	0.289 T,UB	**11 B**	**4.5 B**	**8.32 B**	**9.5**	**8.1 B**	**0.72 ± 0.2**	**11.2 B**	**366 B**	**0.011 T,B**
RU4-SFS-SBC003	RU4-SFS-SBC003 (0-2 BNS)	08/29/07	0 - 2		<1 UJ	**2.9 B**	**135 B**	**0.588 T,B**	5.73 T,UB	0.281 T,UB	**10.4 B**	**4.25 B**	**6.98 B**	**26**	**7.55 B**	**0.84 ± 0.23**	**10.7 B**	**323 B**	0.01 T,UB
RU4-SFS-SBC003 CL	RU4-SFS-SBC004 (0-2 BNS)	08/29/07	0 - 2		0.184 T,UB	**2.87 B**	**127 B**	**0.623 T,B**	7.21 T,UB	0.292 T,UB	**11.6 B**	**4.43 B**	**7.34 B**	**25**	**7.89 B**	**0.8 ± 0.22**	**11.4 B**	**328 B**	**0.011 T,B**
RU4-SFS-SBC005	RU4-SFS-SBC005 (0-2 BNS)	08/29/07	0 - 2		0.154 T,UB	**3.19 B**	**129 B**	**0.592 T,B**	6.18 T,UB	0.285 T,UB	**11.3 B**	**4.47 B**	**7.85 B**	**9.3**	**7.9 B**	**0.86 ± 0.24**	**10.1 B**	**367 B**	0.0092 T,UB
RU5-SFS-SBC001	RU5-SFS-SBC001 (0-2 BNS)	08/13/07	0 - 2		0.244 T,J-,UB	**3.25 B**	**122 B**	0.545 T,UB	**6.74 T**	0.375 T,UB	**11.6 J,B**	**4.24 B**	**8.33 B**	**28 J-**	**7.65 B**	**0.84 ± 0.25**	**11 J,B**	**387 B**	**0.05 B**
RU5-SFS-SBC002	RU5-SFS-SBC002 (0-2 BNS)	08/14/07	0 - 2		0.157 T,J-,UB	**3.26 B**	**123 J+,B**	0.569 T,UB	**5.4 T**	0.324 T,UB	**10.9 B**	**4.49 B**	**8 B**	**36 J-**	**7.95 B**	**0.84 ± 0.25 J+**	**11.2 B**	**352 B**	**0.0086 T,B**
RU5-SFS-SBC002 CL	RU5-SFS-SBC202 (0-2 BNS)	08/14/07	0 - 2		0.227 T,UB	**3.2 B**	**129 B**	0.575 T,UB	**5.97 T**	1.17 UB	**15.5 B**	**4.48 B**	**8.26 B**	**38**	**8.07 B**	**0.96 ± 0.27**	**11.2 B**	**348 B**	**0.023 T,B**
RU5-SFS-SBC003	RU5-SFS-SBC003 (0-2 BNS)	08/14/07	0 - 2		0.228 T,UB	**3.36 B**	**130 B**	0.592 T,UB	**7.66 T**	0.525 T,UB	**11.8 B**	**4.53 B**	**7.93 B**	**9.3**	**8.15 B**	**0.82 ± 0.24**	**11.3 B**	**365 B**	**0.0096 T,B**
RU5-SFS-SBC004	RU5-SFS-SBC004 (0-2 BNS)	08/14/07	0 - 2		0.204 T,UB	**3.26 B**	**138 B**	0.591 T,UB	**7.09 T**	0.351 T,UB	**11 B**	**4.31 B**	**8.14 B**	**35**	**8.08 B**	**0.85 ± 0.25**	**13.4 B**	**372 B**	**0.007 T,B**
RU6-SFS-SBC001	RU6-SFS-SBC001 (0-2 BNS)	09/26/07	0 - 2		**0.177 T**	**3.22**	**102**	**0.489 T**	**4.55 T**	**0.287 T**	**12.4 B**	**4.01**	**7.71**	**9.3**	**7.46**	**0.74 ± 0.21**	**9.35**	**321**	**0.011 T,B**
RU6-SFS-SBC002	RU6-SFS-SBC002 (0-2 BNS)	09/26/07	0 - 2		<1	**3.17**	**122**	**0.603 T**	**5.75 T**	**0.382 T**	**11.8 B**	**4.51**	**13.7**	**8.8 J-**	**8.34**	**0.68 ± 0.19**	**11.5**	**389**	**0.011 T,B**
RU6-SFS-SBC002 CL	RU6-SFS-SBC202 (0-2 BNS)	09/26/07	0 - 2		**0.132 T**	**3.27**	**130**	**0.602 T**	**5.96 T**	**0.303 T**	**11.5 B**	**4.3**	**8.46**	**16**	**8.33**	**0.73 ± 0.2**	**11.3**	**388**	**0.01 T,B**
RU6-SFS-SBC003	RU6-SFS-SBC003 (0-2 BNS)	09/27/07	0 - 2		<1	**3.2**	**110 B**	**0.56 T**	5.6 T,UB	**0.33 T,B**	**11 B**	**4.1**	**7.5**	**8**	**7.6 B**	**0.73 ± 0.2**	**9 B**	**340 B**	0.0097 T,UB
RU6-SFS-SBC004	RU6-SFS-SBC004 (0-2 BNS)	09/27/07	0 - 2		<1 UJ	**3.1**	**130 B,J+**	**0.65 T**	5.1 T,UB	**0.3 T,B**	**10 B**	**4.4**	**7.9 J**	**8.7 J-**	**8.3 B**	**0.81 ± 0.22**	**10 B**	**380 B**	**0.011 T,J,B**
RU7-SFS-SBC001	RU7-SFS-SBC001 (0-2 BNS)	09/06/07	0 - 2		<1	**3.17**	**120**	**0.62 T**	**6.27 T**	**0.344 T**	**9.98 B**	**4.46**	**7.96**	<5	**8.17**	**0.87 ± 0.24**	**9.78**	**367**	0.011 T,UB
RU7-SFS-SBC001 CL	RU7-SFS-SBC201 (0-2 BNS)	09/06/07	0 - 2		<1	**3.35**	**132**	**0.669 T**	**6.46 T**	**0.398 T**	**11.2 B**	**4.76**	**8.71**	**5.8**	**8.87**	**0.85 ± 0.23**	**11**	**400**	0.0095 T,UB
RU7-SFS-SBC002	RU7-SFS-SBC002 (0-2 BNS)	09/20/07	0 - 2		<1	**3.32**	**123**	**0.629 T**	**6.67 T**	**0.369 T**	**11.7 B**	**4.74**	**16.5**	**7.8**	**8.58**	**0.9 ± 0.24**	**10.5**	**392**	**0.011 T,B**
RU7-SFS-SBC003	RU7-SFS-SBC003 (0-2 BNS)	09/07/07	0 - 2		<1	**2.92**	**114**	**0.603 T**	**6.23 T**	**0.533 T**	**11 B**	**4.42**	**7.68**	<5	**7.86**	**0.93 ± 0.25**	**9.03**	**377**	**0.01 T,B**
RU7-SFS-SBC004	RU7-SFS-SBC004 (0-2 BNS)	09/10/07	0 - 2		<1	**3.58**	**116**	**0.616 T**	**8.3 T**	**0.722 T**	**11.9 B**	**4.47**	**8.49**	**11 J-**	**8.14**	**1.07 ± 0.29**	**10.2**	**357**	**0.012 T,B**
RU9-SFS-SBC001	RU9-SFS-SBC001 (0-2 BNS)	08/30/07	0 - 2		0.144 T,UB	**3.08 B**	**109 B**	**0.534 T,B**	5.6 T,UB	**0.421 T,B**	**11.9 B**	**4.17 B**	**6.88 B**	**7**	**7.38 B**	**1.07 ± 0.28**	**9.12 B**	**329 B**	0.0081 T,UB
RU9-SFS-SBC002	RU9-SFS-SBC002 (0-2 BNS)	08/30/07	0 - 2		<1 UJ	**3.26 B**	**127 B**	**0.629 T,B**	6.3 T,UB	0.302 T,UB	**10.3 B**	**4.47 B**	**7.92 J,B**	**8.1 J-**	**8.15 B**	**0.85 ± 0.23**	**10.7 J,B**	**357 B**	0.0097 T,UB
RU9-SFS-SBC002 CL	RU9-SFS-SBC202 (0-2 BNS)	08/30/07	0 - 2		0.191 T,UB	**3.07 B**	**125 B**	**0.616 T,B**	6.94 T,UB	0.302 T,UB	**10.9 B**	**4.6 B**	**8.05 B**	**6.8**	**8.29 B**	**0.95 ± 0.26**	**11.3 B**	**370 B**	0.0091 T,UB
RU9-SFS-SBC003	RU9-SFS-SBC003 (0-2 BNS)	09/05/07	0 - 2		<1	**3.03**	**120**	**0.6 T**	**6.51 T,J+**	**0.549 T**	**11.5 B**	**4.33**	**8.03**	**6**	**7.97**	**0.87 ± 0.24**	**9.98**	**358**	0.011 T,UB
RU9-SFS-SBC004	RU9-SFS-SBC004 (0-2 BNS)	09/05/07	0 - 2		<1 UJ	**3.11**	**137**	**0.687 T**	**7.41 T,J+**	**0.381 T**	**10.3 J,B**	**4.63 J**	**8.82 J**	**6.6 J-**	**8.72**	**0.81 ± 0.22**	**11.5**	**384**	0.013 T,UB
RU10-SFS-SBC001	RU10-SFS-SBC001 (0-2 BNS)	10/16/07	0 - 2		<1 UJ	**3.17**	**126 B**	**0.536 T**	**4.86 T**	**0.487 T**	**9.8 B**	**4.8**	**8.99 J**	**9.5 J-**	**8.33**	**0.71 ± 0.2**	**9.58 B**	**393**	**0.021 T,B**
RU10-SFS-SBC001 CL	RU10-SFS-SBC201 (0-2 BNS)	10/16/07	0 - 2		**0.134 T**	**3.17**	**130 B**	**0.55 T**	**4.7 T**	**0.37 T**	**9.18 B**	**4.75**	**8.73**	**8.3**	**8.18**	**0.7 ± 0.2**	**9.28 B**	**362**	**0.015 T,B**
RU10-SFS-SBC002	RU10-SFS-SBC002 (0-2 BNS)	10/16/07	0 - 2		<1	**3.43**	**134 B**	**0.564 T,J**	**5.46 T,J**	**0.742 T**	**10.5 B**	**5.25**	**9.78**	**9.5**	**8.74**	**0.79 ± 0.22**	**10.4 J,B**	**453**	**0.018 T,B**
RU10-SFS-SBC003	RU10-SFS-SBC003 (0-2 BNS)	10/17/07	0 - 2		<1 UJ	**3.75**	**131**	**0.577 T**	**5.6 T**	**0.743 T**	**10.6 B**	**5.01**	**12 J,B**	**6.3 J**	**8.97**	**0.8 ± 0.22**	**12 J**	**406**	**0.017 T**
RU10-SFS-SBC004	RU10-SFS-SBC004 (0-2 BNS)	11/07/07	0 - 2		<1 UJ	**3.05**	**116**	**0.591 T**	**4.3 T**	**0.38 T**	**10.4 B**	**5.08**	**9.16 J,B**	**16**	**8.75**	**1.28 ± 0.35**	**10.4 B**	**371**	**0.011 T**
RU11-SFS-SBC001	RU11-SFS-SBC001 (0-2 BNS)	08/21/07	0 - 2		<1 UJ	**3.53**	**133**	**0.465 T**	**5.97 T**	**0.316 T**	**8.86 B**	**3.95**	**7.01**	**12**	**7.53**	**0.74 ± 0.21**	**10**	**321**	**0.0087 T**
RU11-SFS-SBC002	RU11-SFS-SBC002 (0-2 BNS)	08/21/07	0 - 2		<1 UJ	**3.34**	**139**	**0.504 T**	**5.62 T**	**0.288 T**	**8.68 B**	**4.13**	**7.15**	**9.6 J-**	**7.46**	**0.91 ± 0.25**	**10**	**340**	**0.005 T**
RU11-SFS-SBC003	RU11-SFS-SBC003 (0-2 BNS)	08/22/07	0 - 2		<1 UJ	**2.63**	**110**	**0.498 T**	**4.84 T**	**0.454 T**	**8.53 B**	**3.93**	**6.28**	<5	**7.06 B**	**0.86 ± 0.24**	**8.5**	**322**	**0.0078 T**
RU11-SFS-SBC003 CL	RU11-SFS-SBC004 (0-2 BNS)	08/22/07	0 - 2		<1 UJ	**2.66**	**120**	**0.5 T**	**5.32 T**	**0.44 T**	**7.87 B**	**3.72**	**6.49**	<5	**6.83 B**	**1.04 ± 0.28**	**8.73**	**343**	**0.007 T**
RU11-SFS-SBC005	RU11-SFS-SBC005 (0-2 BNS)	08/23/07	0 - 2		**0.17 T,J-**	**2.74**	**101 J-**	**0.484 T**	**5.28 T**	**0.271 T**	**8.6 B**	**3.71**	**6.04**	**7.9**	**7.31 B**	**1.06 ± 0.28**	**7.95**	**367**	**0.0018 T**
RU12-SFS-SBC001	RU12-SFS-SBC001 (0-2 BNS)	08/15/07	0 - 2		**0.225 T,J-**	**3.07**	**110**	**0.53 T**	**8.13 T**	**0.511 T**	**10 J,B**	**4.2**	**7.51**	**13 J-**	**7.67**	**0.77 ± 0.22**	**10.1**	**353**	**0.0072 T**
RU12-SFS-SBC002	RU12-SFS-SBC002 (0-2 BNS)	08/16/07	0 - 2		**0.451 T**	**3.4**	**125**	**0.557 T**	**10.8**	**1.82**	**10.9 B**	**4.2**	**8.02**	**81**	**7.65 B**	**1.11 ± 0.29**	**10.5**	**353**	**0.01 T**
RU12-SFS-SBC003	RU12-SFS-SBC003 (0-2 BNS)	08/16/07	0 - 2		**0.131 T,J-**	**3.12**	**122**	**0.549 T**	**7.71 T**	**0.33 T**	**9.73 J,B**	**4.32**	**8.24**	**15 J-**	**7.96 B**	**0.81 ± 0.23**	**11.3**	**367**	**0.007 T**

TABLE 4-10

SFS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 4)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury
				Analyte															
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg
				Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16
				Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030
				SSL Protective of Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2
RU12-SFS-SBC003 CL	RU12-SFS-SBC203 (0-2 BNS)	08/16/07	0 - 2		<1	3.08	130	0.541 T	8.39 T	0.402 T	10 B	4.29	7.7	16	8.3 B	0.88 ± 0.24	10.8	361	0.0075 T
RU12-SFS-SBC004	RU12-SFS-SBC004 (0-2 BNS)	08/17/07	0 - 2		0.298 T	3.56	141	0.633 T	12.2	0.348 T	13.3 B	4.67	9.01	11	8.81 B	0.78 ± 0.22	11.8	390	0.0072 T
RU13-SFS-SBC001	RU13-SFS-SBC001 (0-2 BNS)	09/14/07	0 - 2		14	65.8	167	1.57 B	43	225 B	639 B	3.92 B	72.1	16 J-	103	21.8 ± 5.3	8.78 B	486	0.088
RU13-SFS-SBC002	RU13-SFS-SBC002 (0-2 BNS)	09/18/07	0 - 2		5.43	28.8	124	1 UB	21.5	179 B	231 B	4.93 B	32.8	6.1	50.9	12.9 ± 3.1	8.87 B	466	0.056
RU13-SFS-SBC003	RU13-SFS-SBC003 (0-2 BNS)	09/18/07	0 - 2		1.72	14.8	127	0.767 T,UB	12.8	39.3 B	84.3 B	4.2 B	20	13	30.8	4.9 ± 1.2	11.3 B	374	0.022 T
RU13-SFS-SBC003 CL	RU13-SFS-SBC203 (0-2 BNS)	09/18/07	0 - 2		1.56	14	126	0.755 T,UB	12.6	36.1 B	80.3 B	4.06 B	18.3	14	31.4	5.1 ± 1.2	11.2 B	349	0.02 T
RU13-SFS-SBC004	RU13-SFS-SBC004 (0-2 BNS)	09/19/07	0 - 2		12.3	54.3	154	1.5 B	38.2	176 B	578 B	3.67 B	67.3	10	170	21.5 ± 5.2 J-	7.36 B	441	0.065
RU20-SFS-SBC001	RU20-SFS-SBC001 (0-2 BNS)	08/09/07	0 - 2		0.161 T,UB	3.3	148	0.677 T	6.63 T	0.349 T	11.5 B	4.79	10.4	37	9.24	0.68 ± 0.21	13.9 B	441	0.0089 T,B
RU20-SFS-SBC002	RU20-SFC-SBC002 (0-2 BNS))	08/10/07	0 - 2		0.148 T,UB	3.28 B	134 B	0.583 T,UB	7.11 T	0.353 T,UB	11.2 B	4.6 B	8.94 B	11	8.39 B	0.96 ± 0.28	11.8 B	417 B	0.0049 T,UB
RU20-SFS-SBC003	RU20-SFC-SBC003 (0-2 BNS)	08/10/07	0 - 2		0.195 T,UB	3.44 B	143 B	0.585 T,UB	7.3 T	0.487 T,UB	11.1 B	4.68 B	8.95 B	43	8.53 B	0.85 ± 0.25	12.6 B	417 B	0.0049 T,UB
RU20-SFS-SBC003 CL	RU20-SFC-SBC004 (0-2 BNS)	08/10/07	0 - 2		0.233 T,UB	3.38 B	143 B	0.593 T,UB	7.64 T	0.42 T,UB	13.2 B	4.52 B	8.6 B	64	8.51 B	0.82 ± 0.24	12.9 B	416 B	0.0054 T,UB
RU20-SFS-SBC005	RU20-SFS-SBC005 (0-2 BNS)	08/13/07	0 - 2		0.847 T,UB	3.61 B	131 B	0.574 T,UB	8.12 T	4.89 J,B	14.7 B	4.26 B	8.92 B	61	8.32 B	0.77 ± 0.23	13.1 B	395 B	0.0043 T,UB
RU23-SFS-SBC001	RU23-SFS-SBC001 (0-2 BNS)	09/11/07	0 - 2		<1	3.78	143	0.734 T	7.3 T	0.426 T	12.6 B	5.17	10.2	12	10.1	0.84 ± 0.23	12.6	429	0.013 T,B
RU23-SFS-SBC002	RU23-SFS-SBC002 (0-2 BNS)	09/12/07	0 - 2		<1	3.57	136	0.553 T	7.34 T	0.503 T	11.3 B	4.32	7.61	23	7.98	0.75 ± 0.21	12.4	336	0.013 T,B
RU23-SFS-SBC002 CL	RU23-SFS-SBC202 (0-2 BNS)	09/12/07	0 - 2		<1	3.38	135	0.569 T	6.97 T	0.384 T	10.7 B	4.31	7.58	22 J-	7.95	0.75 ± 0.21	12.1	338	0.015 T,B
RU23-SFS-SBC003	RU23-SFS-SBC003 (0-2 BNS)	09/12/07	0 - 2		<1	4.11	134	0.553 T	9.12 T	0.323 T	10.6 B	4.38	7.62	14	7.86	0.8 ± 0.22	12.8	341	0.012 T,B
RU23-SFS-SBC004	RU23-SFS-SBC004 (0-2 BNS)	09/13/07	0 - 2		0.26 T,J-	4.29 J-	114 J+	0.65 T,UB	7.79 T	8.16 J,B	20 J,B	4.19 B	9.28	52 J-	8.6	1.37 ± 0.36	12.5 B	336	0.11
RU24-SFS-SBC001	RU24-SFS-SBC001 (0-2 BNS)	09/06/07	0 - 2		<1	3	142	0.596 T	7.02 T	0.35 T	10.2 B	4.22	9.38	15	7.98	0.73 ± 0.2	11.9	377	0.0092 T,UB
RU24-SFS-SBC001 CL	RU24-SFS-SBC201 (0-2 BNS)	09/06/07	0 - 2		0.142 T	3.13	127	0.598 T	6.93 T	4.06	12.8 B	4.46	11.9	48	9.32	1.31 ± 0.34	12.6	365	0.012 T,UB
RU24-SFS-SBC002	RU24-SFS-SBC002 (0-2 BNS)	09/10/07	0 - 2		<1	3.07	114	0.545 T	6.2 T	0.41 T	9.47 B	4.13	6.9	6.6	7.3	0.96 ± 0.26	9.54	346	0.0082 T,B
RU24-SFS-SBC003	RU24-SBC-SBC003 (0-2 BNS)	09/11/07	0 - 2		<1	3.35	124	0.636 T	6.57 T	11.1	10 B	4.55	8.58	16	8.33	0.95 ± 0.25	10.8	341	0.013 T,B
RU24-SFS-SBC004	RU24-SFS-SBC004 (0-2 BNS)	09/11/07	0 - 2		<1	3.33	146	0.641 T	6.93 T	0.61 T	10.6 B	4.92	8.83	19	9.11	0.83 ± 0.23	12.2	400	0.011 T,B

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-10

SFS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
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					Molybdenum	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte												
				Units	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**
				Background[a]	**2.15**	**15.5**	**3.58**	**20.5**	**3.88**	**1.36**	**1.9**	**0.27**	**NA**	**3.88**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**5,670**	**6,450**	**269**	**20.5[b]**	**3.88[b]**	**5,670**	**5,670**	**77.2**	**3,400**	**3.88[a]**	**7,950**	**340,000**
				Construction Worker SSL	**2,750**	**404**	**43.3**	**20.5[b]**	**3.88[b]**	**2,750**	**2,750**	**374**	**491**	**20.6**	**3,500**	**165,000**
				Utility Worker SSL	**35,800**	**5,250**	**563**	**136**	**12**	**35,800**	**35,800**	**4,870**	**6,390**	**267**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**81**	**130**	**3.58[g]**	**20.5[g]**	**3.88[f]**	**5**	**34**	**0.7**	**900**	**3.88[f]**	**6,000**	**12,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**													
RU3-SFS-SBC001	RU3-SFS-SBC001 (0-2 BNS)	09/21/07	0 - 2		**0.547 T**	**10.9**	**0.44 ± 0.16**	**17.9 ± 3.4 J+**	**0.89 ± 0.21 J-**	<2	**0.095 T**	**0.12 T**	**1.42**	**1.01 ± 0.3**	**18 B**	**41.1**
RU3-SFS-SBC001 CL	RU3-SFS-SBC201 (0-2 BNS)	09/21/07	0 - 2		**0.448 T**	**10.5**	**0.42 ± 0.15**	**19.2 ± 3.7 J+**	**0.46 ± 0.13**	<2	<1	**0.103 T**	**0.681 T**	**0.92 ± 0.26**	**15.9 B**	**35.3**
RU3-SFS-SBC002	RU3-SFS-SBC002 (0-2 BNS)	09/21/07	0 - 2		**0.387 T**	**10.6**	**0.59 ± 0.17**	**15.6 ± 3.3 J+**	**0.46 ± 0.12**	<2	**0.0601 T**	**0.111 T**	**0.941 T**	**1 ± 0.26**	**16.2 B**	**38.4**
RU3-SFS-SBC003	RU3-SFS-SBC003 (0-2 BNS)	09/24/07	0 - 2		**0.355 T**	**10.6**	**0.42 ± 0.15**	**16 ± 3.5 J+**	**0.55 ± 0.15**	<2	**0.0651 T**	**0.114 T**	**0.623 T**	**0.94 ± 0.25**	**15.2 B**	**36.2**
RU3-SFS-SBC004	RU3-SFS-SBC004 (0-2 BNS)	09/25/07	0 - 2		**0.368 T**	**10.7**	**0.57 ± 0.18**	**15.5 ± 3.2 J+**	**1.02 ± 0.24**	<2	**0.0738 T**	**0.111 T**	**0.873 T**	**1.28 ± 0.32**	**15.5 B**	**39.9**
RU4-SFS-SBC001	RU4-SFS-SBC001 (0-2 BNS)	08/23/07	0 - 2		**0.302 T**	**10.1**	**0.53 ± 0.24**	**13.5 ± 3.7 J+**	**0.59 ± 0.15**	<2	0.138 T,UB	0.164 T,UB	**0.657 T,B**	**0.76 ± 0.21 B**	**13.6**	**33.1 B**
RU4-SFS-SBC002	RU4-SFS-SBC002 (0-2 BNS)	08/28/07	0 - 2		0.339 T,UB	**11 B**	**0.49 ± 0.17**	**14.1 ± 3.9**	**0.68 ± 0.17**	<2	0.0829 T,UB	0.0861 T,UB	**0.744 T,B**	**0.77 ± 0.25 B**	**16.5 B**	**36.9 B**
RU4-SFS-SBC003	RU4-SFS-SBC003 (0-2 BNS)	08/29/07	0 - 2		0.382 T,UB	**10.3 B**	**0.55 ± 0.19**	**11.1 ± 3.7 J+**	**0.32 ± 0.1**	<2	0.0776 T,UB	0.0676 T,UB	**0.785 T,B**	**1.04 ± 0.28 B**	**16 B**	**33.4 B**
RU4-SFS-SBC003 CL	RU4-SFS-SBC004 (0-2 BNS)	08/29/07	0 - 2		0.425 T,UB	**10.7 B**	**0.29 ± 0.16**	**11.5 ± 3.5 J+**	**0.75 ± 0.18**	<2	0.127 T,UB	0.129 T,UB	**0.935 T,B**	**1.18 ± 0.38 J-,B**	**17.4 B**	**34.9 B**
RU4-SFS-SBC005	RU4-SFS-SBC005 (0-2 BNS)	08/29/07	0 - 2		0.519 T,UB	**11.1 B**	**0.46 ± 0.18**	**16.1 ± 4.5 J+**	**0.55 ± 0.15**	<2	0.0794 T,UB	0.0866 T,UB	**0.774 T,B**	**0.93 ± 0.27 B**	**17.4 B**	**36.7 B**
RU5-SFS-SBC001	RU5-SFS-SBC001 (0-2 BNS)	08/13/07	0 - 2		2.32 UB	**10.6**	**0.51 ± 0.18**	**14.3 ± 2.4**	**0.6 ± 0.16**	0.308 T,UB	**0.113 T**	0.141 T,UB	1.39 UB	**1.04 ± 0.21**	**17.6 B**	**43.1 J,B**
RU5-SFS-SBC002	RU5-SFS-SBC002 (0-2 BNS)	08/14/07	0 - 2		0.382 T,UB	**11**	**0.64 ± 0.32**	**14.1 ± 3.1 J+**	**0.86 ± 0.21**	0.218 T,UB	**0.125 T**	0.124 T,UB	0.809 T,UB	**1 ± 0.2**	**16.4 B**	**35.5 B**
RU5-SFS-SBC002 CL	RU5-SFS-SBC202 (0-2 BNS)	08/14/07	0 - 2		0.586 T,UB	**11.5**	**0.48 ± 0.25**	**11.8 ± 2.8 J+**	**1.43 ± 0.31**	0.315 T,UB	**0.523 T**	0.131 T,UB	1.46 UB	**1.06 ± 0.22**	**20.8 B**	**45.9 B**
RU5-SFS-SBC003	RU5-SFS-SBC003 (0-2 BNS)	08/14/07	0 - 2		0.511 T,UB	**11**	**0.51 ± 0.26**	**16 ± 2.5 J+**	**0.94 ± 0.22**	0.335 T,UB	**0.144 T**	0.165 T,UB	0.835 T,UB	**0.89 ± 0.18**	**17.6 B**	**37.5 B**
RU5-SFS-SBC004	RU5-SFS-SBC004 (0-2 BNS)	08/14/07	0 - 2		0.422 T,UB	**11.2**	**0.57 ± 0.28**	**17.1 ± 2.8 J+**	**0.75 ± 0.19**	0.28 T,UB	**0.0777 T**	0.155 T,UB	0.72 T,UB	**0.9 ± 0.19**	**15.9 B**	**36.2 B**
RU6-SFS-SBC001	RU6-SFS-SBC001 (0-2 BNS)	09/26/07	0 - 2		**0.461 T**	**10.8**	**0.43 ± 0.15**	**18.8 ± 3.4**	**0.61 ± 0.15**	<2	**0.0636 T**	**0.206 T**	**0.624 T**	**0.85 ± 0.26**	**14.4 B**	**35.3**
RU6-SFS-SBC002	RU6-SFS-SBC002 (0-2 BNS)	09/26/07	0 - 2		**0.579 T**	**11.8**	**0.55 ± 0.19**	**15.5 ± 3.4 J+**	**0.35 ± 0.1**	<2	**0.0855 T**	**0.142 T**	**0.864 T**	**0.94 ± 0.29**	**16.8 B**	**40.1**
RU6-SFS-SBC002 CL	RU6-SFS-SBC202 (0-2 BNS)	09/26/07	0 - 2		**0.549 T**	**11.4**	**0.71 ± 0.2**	**18.4 ± 3.4 J+**	**0.321 ± 0.095**	<2	**0.138 T**	**0.116 T**	**0.786 T**	**0.92 ± 0.25**	**17.6 B**	**64.6**
RU6-SFS-SBC003	RU6-SFS-SBC003 (0-2 BNS)	09/27/07	0 - 2		**0.53 T,B**	**10**	**0.54 ± 0.18 B**	**12 ± 3.5 J+**	**0.64 ± 0.17**	<2	**0.1 T**	**0.18 T**	**0.81 T**	**1.12 ± 0.31**	**15 B**	**34 B**
RU6-SFS-SBC004	RU6-SFS-SBC004 (0-2 BNS)	09/27/07	0 - 2		0.43 T,UB	**11**	**0.54 ± 0.18 B**	**18.5 ± 3.4 J+**	**0.48 ± 0.13**	<2	**0.065 T**	**0.14 T**	**0.7 T**	**1.02 ± 0.28**	**15 B**	**37 J,B**
RU7-SFS-SBC001	RU7-SFS-SBC001 (0-2 BNS)	09/06/07	0 - 2		0.367 T,UB	**11**	**0.62 ± 0.21**	**21.1 ± 4.7 J+**	**0.67 ± 0.16**	<2	**0.0715 T**	**0.105 T**	**0.688 T**	**0.93 ± 0.26**	**14.2**	**37.1**
RU7-SFS-SBC001 CL	RU7-SFS-SBC201 (0-2 BNS)	09/06/07	0 - 2		0.407 T,UB	**11.9**	**0.61 ± 0.19**	**15.2 ± 4.1 J+**	**0.7 ± 0.17 J-**	<2	**0.0523 T**	**0.111 T**	**0.805 T**	**0.86 ± 0.25**	**15.4**	**39.9**
RU7-SFS-SBC002	RU7-SFS-SBC002 (0-2 BNS)	09/20/07	0 - 2		**0.575 T**	**11.8**	**0.57 ± 0.18**	**15.4 ± 4 J+**	**0.65 ± 0.16**	<2	**0.0609 T**	**0.122 T**	**0.728 T**	**1.04 ± 0.27**	**17.3 B**	**42.6**
RU7-SFS-SBC003	RU7-SFS-SBC003 (0-2 BNS)	09/07/07	0 - 2		0.394 T,UB	**10.8 B**	**0.71 ± 0.23**	**14.3 ± 3.7**	**0.7 ± 0.17**	<2	**0.0761 T**	**0.121 T**	**0.942 T**	**1.14 ± 0.3**	**16.8 B**	**38.3 B**
RU7-SFS-SBC004	RU7-SFS-SBC004 (0-2 BNS)	09/10/07	0 - 2		**0.61 T,B**	**11.8 B**	**0.73 ± 0.25**	**10.1 ± 3.5 J+**	**0.61 ± 0.15**	<2	**0.0774 T**	**0.115 T**	**1.1**	**1.18 ± 0.29**	**19.1 B**	**42.3 B**
RU9-SFS-SBC001	RU9-SFS-SBC001 (0-2 BNS)	08/30/07	0 - 2		0.885 T,UB	**9.79 B**	**0.62 ± 0.27**	**17.6 ± 4.6 J+**	**0.45 ± 0.13 J-**	<2	0.108 T,UB	0.121 T,UB	**0.827 T,B**	**1.12 ± 0.3 B**	**18.2 B**	**34.7 B**
RU9-SFS-SBC002	RU9-SFS-SBC002 (0-2 BNS)	08/30/07	0 - 2		0.735 T,UB	**10.7 B**	**0.61 ± 0.27**	**15.9 ± 4.1 J+**	**0.8 ± 0.21**	<2	0.0768 T,UB	0.0918 T,UB	**0.701 T,B**	**0.98 ± 0.28 B**	**15.8 B**	**35.3 J,B**
RU9-SFS-SBC002 CL	RU9-SFS-SBC202 (0-2 BNS)	08/30/07	0 - 2		0.655 T,UB	**10.9 B**	**0.85 ± 0.3**	**11.3 ± 3.5 J+**	**0.46 ± 0.13**	<2	0.109 T,UB	0.0946 T,UB	**0.736 T,B**	**1.04 ± 0.29 B**	**16.4 B**	**36.1 B**
RU9-SFS-SBC003	RU9-SFS-SBC003 (0-2 BNS)	09/05/07	0 - 2		0.619 T,UB	**10.7**	**0.54 ± 0.25**	**13.9 ± 3.7 J+**	**0.63 ± 0.15**	<2	**0.0842 T**	**0.252 T**	**0.802 T**	**1.1 ± 0.3**	**15.6**	**39.3**
RU9-SFS-SBC004	RU9-SFS-SBC004 (0-2 BNS)	09/05/07	0 - 2		0.913 T,J-,UB	**11.2**	**0.57 ± 0.26**	**16.3 ± 4.4 J+**	**0.76 ± 0.19**	<2	**0.0637 T**	**0.157 T**	**0.679 T,J**	**0.91 ± 0.29**	**15.2**	**39.4 J**
RU10-SFS-SBC001	RU10-SFS-SBC001 (0-2 BNS)	10/16/07	0 - 2		**0.305 T**	**12**	**0.54 ± 0.18**	**11.8 ± 3.2 J+**	**0.85 ± 0.2**	<2	**0.0599 T**	**0.203 T**	**0.808 T,J,B**	**0.85 ± 0.24**	**14.2**	**39.3 J,B**
RU10-SFS-SBC001 CL	RU10-SFS-SBC201 (0-2 BNS)	10/16/07	0 - 2		**0.301 T**	**11.9**	**0.45 ± 0.16**	**12.9 ± 3.2 J+**	**0.77 ± 0.18**	<2	**0.0672 T**	**0.17 T**	**0.734 T,B**	**1.22 ± 0.33**	**13.6**	**38.4 B**
RU10-SFS-SBC002	RU10-SFS-SBC002 (0-2 BNS)	10/16/07	0 - 2		**0.336 T**	**12.6**	**0.52 ± 0.18**	**12.6 ± 3 J+**	**0.82 ± 0.2**	<2	**0.0758 T**	**0.156 T**	**0.985 T,B**	**0.92 ± 0.26**	**15.2**	**44 B**
RU10-SFS-SBC003	RU10-SFS-SBC003 (0-2 BNS)	10/17/07	0 - 2		0.367 T,UB	**13.8**	**0.7 ± 0.24**	**16.1 ± 4.1 J+**	**0.75 ± 0.18**	<2	**0.0678 T**	**0.15 T**	**0.949 T,B**	**0.87 ± 0.26**	**15.6**	**44.8 J,B**
RU10-SFS-SBC004	RU10-SFS-SBC004 (0-2 BNS)	11/07/07	0 - 2		0.451 T,UB	**12.2**	**0.68 ± 0.21**	**11.8 ± 3.4**	**0.73 ± 0.21**	<2	**0.0798 T**	**0.151 T**	**0.653 T,J,B**	**0.81 ± 0.24**	**14.7**	**42.6 B**
RU11-SFS-SBC001	RU11-SFS-SBC001 (0-2 BNS)	08/21/07	0 - 2		**0.435 T**	**10.3**	**0.67 ± 0.22**	**12.4 ± 2.8 J+**	**0.89 ± 0.2**	<2	**0.128 T**	0.187 T,UB	**0.836 T,B**	**0.9 ± 0.23 B**	**14.2**	**32.6 B**
RU11-SFS-SBC002	RU11-SFS-SBC002 (0-2 BNS)	08/21/07	0 - 2		**0.383 T**	**10.4**	**0.65 ± 0.22**	**15.4 ± 4 J+**	**0.64 ± 0.19**	<2	**0.0533 T**	0.118 T,UB	**0.745 T,B**	**0.93 ± 0.23 B**	**13.6**	**31.3 B**
RU11-SFS-SBC003	RU11-SFS-SBC003 (0-2 BNS)	08/22/07	0 - 2		**0.397 T**	**9.08**	**0.65 ± 0.22**	**14.6 ± 3.7 J+**	**0.63 ± 0.16**	<2	0.11 T,UB	0.167 T,UB	**0.83 T,B**	**1.05 ± 0.25 B**	**12.8**	**30.4 B**
RU11-SFS-SBC003 CL	RU11-SFS-SBC004 (0-2 BNS)	08/22/07	0 - 2		**0.34 T**	**8.67**	**0.58 ± 0.21**	**12.8 ± 4.1 J+**	**0.78 ± 0.18**	<2	0.0533 T,UB	0.112 T,UB	**0.714 T,B**	**1.1 ± 0.28 B**	**11.8**	**29.6 B**
RU11-SFS-SBC005	RU11-SFS-SBC005 (0-2 BNS)	08/23/07	0 - 2		**0.589 T**	**9.35**	**0.41 ± 0.2**	**20 ± 3.8 J+**	**0.89 ± 0.2**	<2	0.0642 T,UB	0.0896 T,UB	**0.781 T,B**	**0.92 ± 0.23 B**	**13.1**	**33.8 B**
RU12-SFS-SBC001	RU12-SFS-SBC001 (0-2 BNS)	08/15/07	0 - 2		**0.479 T**	**10.7**	**0.46 ± 0.17**	**16.1 ± 3.2 J+**	**0.71 ± 0.17**	<2	**0.109 T**	0.113 T,UB	**0.708 T,B**	**0.87 ± 0.23 B**	**14.8**	**35.8 B**
RU12-SFS-SBC002	RU12-SFS-SBC002 (0-2 BNS)	08/16/07	0 - 2		**0.499 T**	**11.4**	**0.79 ± 0.23**	**18.2 ± 3.3 J+**	**0.71 ± 0.18**	<2	**0.496 T,B**	0.501 T,UB	**0.748 T,B**	**0.94 ± 0.25 B**	**23.3**	**130 B**
RU12-SFS-SBC003	RU12-SFS-SBC003 (0-2 BNS)	08/16/07	0 - 2		**0.442 T,J-**	**10.7**	**0.58 ± 0.19**	**19.2 ± 3.7 J+**	**0.88 ± 0.2**	<2	0.0852 T,UB	0.123 T,UB	**0.682 T,B**	**1.02 ± 0.3 B**	**14.1**	**36.2 B**

TABLE 4-10

SFS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
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					Molybdenum	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte												
				Units	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**
				Background[a]	**2.15**	**15.5**	**3.58**	**20.5**	**3.88**	**1.36**	**1.9**	**0.27**	**NA**	**3.88**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**5,670**	**6,450**	**269**	**20.5[b]**	**3.88[b]**	**5,670**	**5,670**	**77.2**	**3,400**	**3.88[a]**	**7,950**	**340,000**
				Construction Worker SSL	**2,750**	**404**	**43.3**	**20.5[b]**	**3.88[b]**	**2,750**	**2,750**	**374**	**491**	**20.6**	**3,500**	**165,000**
				Utility Worker SSL	**35,800**	**5,250**	**563**	**136**	**12**	**35,800**	**35,800**	**4,870**	**6,390**	**267**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**81**	**130**	**3.58[g]**	**20.5[g]**	**3.88[f]**	**5**	**34**	**0.7**	**900**	**3.88[f]**	**6,000**	**12,000**
RU12-SFS-SBC003 CL	RU12-SFS-SBC203 (0-2 BNS)	08/16/07	0 - 2		**0.353 T**	**10.6**	**0.59 ± 0.21**	**12.6 ± 4.1 J+**	**0.55 ± 0.14**	<2	0.122 T,UB	0.172 T,UB	**0.781 T,B**	**0.91 ± 0.23 B**	**14.2**	**37.1 B**
RU12-SFS-SBC004	RU12-SFS-SBC004 (0-2 BNS)	08/17/07	0 - 2		**0.582 T**	**12.4**	**0.63 ± 0.21**	**15.5 ± 4.3 J+**	**0.74 ± 0.18**	<2	0.257 T,UB	0.134 T,UB	**0.71 T,B**	**0.93 ± 0.24 B**	**18.2**	**40.7 J,B**
RU13-SFS-SBC001	RU13-SFS-SBC001 (0-2 BNS)	09/14/07	0 - 2		**24**	**156**	**28.9 ± 4.3**	**9.3 ± 3.5 J+**	**15 ± 2.7 J-**	**9.49**	6.99 UB	**3.67 B**	**72.7 B**	**25 ± 4.2**	**911**	**1320 B**
RU13-SFS-SBC002	RU13-SFS-SBC002 (0-2 BNS)	09/18/07	0 - 2		**9.61**	**84.4**	**16.5 ± 2.5**	**16.4 ± 4.3**	**6.7 ± 1.2**	**3.75**	4.29 UB	**2.64 B**	**28.2 B**	**10.9 ± 1.9**	**349**	**1710 B**
RU13-SFS-SBC003	RU13-SFS-SBC003 (0-2 BNS)	09/18/07	0 - 2		**4.82**	**36.9**	**5.8 ± 0.94**	**11.8 ± 4.1 J+**	**5 ± 0.94**	**2.2**	1.35 UB	0.74 T,UB	**14.1 B**	**5.4 ± 1**	**141**	**251 B**
RU13-SFS-SBC003 CL	RU13-SFS-SBC203 (0-2 BNS)	09/18/07	0 - 2		**4.57**	**34.5**	**5.9 ± 1**	**12 ± 3.3 J+**	**5.19 ± 0.98**	**2.01**	1.14 UB	0.715 T,UB	**12.4 B**	**5.4 ± 1**	**132**	**237 B**
RU13-SFS-SBC004	RU13-SFS-SBC004 (0-2 BNS)	09/19/07	0 - 2		**19.2**	**145**	**25.7 ± 3.8**	**7.2 ± 3**	**12.8 ± 2.3**	**8.5**	5.77 UB	**3 B**	**70.6 B**	**24.8 ± 4.2**	**849**	**1050 B**
RU20-SFS-SBC001	RU20-SFS-SBC001 (0-2 BNS)	08/09/07	0 - 2		**0.486 T**	**11.7**	**0.56 ± 0.28**	**16.3 ± 3.2 J+**	**0.83 ± 0.2**	<2	<1	0.139 T,UB	0.588 T,UB	**0.83 ± 0.18**	**17.6**	**43.2**
RU20-SFS-SBC002	RU20-SFC-SBC002 (0-2 BNS))	08/10/07	0 - 2		0.53 T,UB	**11.4**	**0.44 ± 0.16**	**14.5 ± 3 J+**	**0.94 ± 0.23**	0.244 T,UB	0.0823 T,UB	0.127 T,UB	0.602 T,UB	**0.77 ± 0.16**	**16 B**	**41.9 B**
RU20-SFS-SBC003	RU20-SFC-SBC003 (0-2 BNS)	08/10/07	0 - 2		0.44 T,UB	**11.6**	**0.56 ± 0.2**	**16.1 ± 3.3 J+**	**0.69 ± 0.18**	0.237 T,UB	0.0867 T,UB	0.147 T,UB	0.622 T,UB	**0.89 ± 0.19**	**16 B**	**70.2 B**
RU20-SFS-SBC003 CL	RU20-SFC-SBC004 (0-2 BNS)	08/10/07	0 - 2		0.668 T,UB	**11.7**	**0.45 ± 0.15**	**14.2 ± 3.1 J+**	**0.89 ± 0.23**	0.255 T,UB	0.0766 T,UB	0.133 T,UB	0.709 T,UB	**0.8 ± 0.17**	**18.9 B**	**84.2 B**
RU20-SFS-SBC005	RU20-SFS-SBC005 (0-2 BNS)	08/13/07	0 - 2		0.763 T,UB	**11.9**	**0.54 ± 0.18**	**20.2 ± 3.1 J+**	**0.79 ± 0.2**	0.354 T,UB	**0.277 T**	0.293 T,UB	0.752 T,UB	**0.88 ± 0.19**	**19.2 B**	**73.4 B**
RU23-SFS-SBC001	RU23-SFS-SBC001 (0-2 BNS)	09/11/07	0 - 2		0.307 T,UB	**13.1 B**	**0.5 ± 0.2**	**12.7 ± 3.5 J+**	**0.84 ± 0.2**	<2	**0.107 T**	**0.147 T**	**0.772 T**	**0.99 ± 0.27**	**17.7 B**	**46.1 B**
RU23-SFS-SBC002	RU23-SFS-SBC002 (0-2 BNS)	09/12/07	0 - 2		0.379 T,UB	**11.4 B**	**0.45 ± 0.18**	**12.4 ± 3.6 J+**	**0.87 ± 0.21**	<2	**0.348 T**	**0.108 T**	**0.968 T**	**0.88 ± 0.29**	**17.4 B**	**38.1 B**
RU23-SFS-SBC002 CL	RU23-SFS-SBC202 (0-2 BNS)	09/12/07	0 - 2		0.334 T,UB	**11.1 B**	**0.51 ± 0.19**	**11.6 ± 3.6 J+**	**0.55 ± 0.15**	<2	**0.0769 T**	**0.106 T**	**0.801 T**	**0.87 ± 0.27**	**16.4 B**	**36.6 B**
RU23-SFS-SBC003	RU23-SFS-SBC003 (0-2 BNS)	09/12/07	0 - 2		0.453 T,UB	**11.1 B**	**0.55 ± 0.18**	**11 ± 3.6 J+**	**0.72 ± 0.18**	<2	**0.0569 T**	**0.0922 T**	**1.08**	**0.86 ± 0.25**	**17.1 B**	**34.8 B**
RU23-SFS-SBC004	RU23-SFS-SBC004 (0-2 BNS)	09/13/07	0 - 2		**1.54**	**13**	**1.29 ± 0.32**	**13.1 ± 4.1 J+**	**1.27 ± 0.28**	**3.97**	0.483 T,UB	0.596 T,UB	**2.42 B**	**1.57 ± 0.41**	**29.3 J**	**84.7 J,B-**
RU24-SFS-SBC001	RU24-SFS-SBC001 (0-2 BNS)	09/06/07	0 - 2		0.373 T,UB	**11.1**	**0.5 ± 0.18**	**16.4 ± 4.1 J+**	**0.69 ± 0.16**	<2	**0.231 T**	**0.115 T**	**0.644 T**	**0.74 ± 0.23**	**15**	**104**
RU24-SFS-SBC001 CL	RU24-SFS-SBC201 (0-2 BNS)	09/06/07	0 - 2		0.454 T,UB	**12.1**	**0.98 ± 0.26**	**12.6 ± 3.9 J+**	**0.89 ± 0.2**	<2	**0.736 T**	**0.295 T**	**0.718 T**	**1.09 ± 0.31**	**16.3**	**162**
RU24-SFS-SBC002	RU24-SFS-SBC002 (0-2 BNS)	09/10/07	0 - 2		**0.534 T,B**	**9.84 B**	**0.46 ± 0.17**	**16.5 ± 3.9 J+**	**0.99 ± 0.23**	<2	**0.0518 T**	**0.0906 T**	**0.773 T**	**0.95 ± 0.28**	**14.6 B**	**33.6 B**
RU24-SFS-SBC003	RU24-SBC-SBC003 (0-2 BNS)	09/11/07	0 - 2		0.272 T,UB	**14.2 B**	**0.73 ± 0.22**	**17.4 ± 4.4 J+**	**0.6 ± 0.15**	<2	**0.0569 T**	**0.16 T**	**0.678 T**	**0.88 ± 0.25**	**22.6 B**	**83.7 B**
RU24-SFS-SBC004	RU24-SFS-SBC004 (0-2 BNS)	09/11/07	0 - 2		0.299 T,UB	**12.2 B**	**0.71 ± 0.24**	**15.8 ± 4.3 J+**	**0.7 ± 0.17**	<2	**0.095 T**	**0.116 T**	**0.716 T**	**0.96 ± 0.29**	**15.4 B**	**42.5 B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-11

PHOSSY WATER INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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				Analyte	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lithium
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	16.1
				Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[d]	22,700
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[d]	11,900
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[d]	155,000
				SSL Protective of Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[d]	4,200
Location Identification	Field Sample Identification	Date Collected	Depth (ft)													
RU3-SIA1-SB001	RU3-SIA1-SB001 (3-5)	10/09/07	3 - 5		0.161 T	3.41	139 B	0.684 T	8.72 T,UB	0.318 T	12 B	4.84	10.4 B	35	8.43	12.7
RU3-SIA1-SB002	RU3-SIA1-SB002 (3-5)	10/09/07	3 - 5		0.134 T,J-	3.4	137 B	0.701 T	10.2 UB	0.745 T	15.3 B	4.61	10.9 B	5.7 J-	8.79	12.6
RU3-SIA1-SB003	RU3-SIA1-SB003 (4-6)	10/09/07	4 - 6		0.164 T	3.09	133 B	0.611 T	9.25 T,UB	0.258 T	11.1 B	4.33	6.9 B	6.7	7.39	11.5
RU3-SIA1-SB004	RU3-SIA1-SB004 (2-4)	10/09/07	2 - 4		0.156 T	3.54	138 B	0.676 T	9.48 T,UB	0.318 T	12 B	4.7	9.14 B	<5	8.53	12.5
RU3-SIA1-SB005	RU3-SIA1-SB005 (3-5)	10/09/07	3 - 5		<1	3.58	139 B	0.636 T	11.3 UB	0.285 T	12.2 B	4.71	9.27 B	<5	8.04	12.1
RU3-SIA1-SB006	RU3-SIA1-SB006 (4-6)	10/09/07	4 - 6		<1	2.87	120 B	0.565 T	6.13 T,UB	0.227 T	10.4 B	4.46	6.92 B	<5	7.31	10.1
RU3-SIA1-SB007	RU3-SIA1-SB007 (3-5)	10/09/07	3 - 5		<1	3.03	118 B	0.565 T	4.98 T,UB	0.254 T	9.76 B	4.19	7.02 B	<5	7.32	9.91
RU3-SIA1-SB008	RU3-SIA1-SB008 (3-5)	10/09/07	3 - 5		<1	3.05	110 B	0.566 T	6.75 T,UB	0.239 T	10.9 B	4.26	6.85 B	<5	7.49	10.4
RU3-SIA1-SB009	RU3-SIA1-SB009 (5.5-7.5)	10/09/07	5.5 - 7.5		<1	2.94	133 B	0.624 T	6.48 T,UB	0.281 T	11.6 B	4.69	8.2 B	<5	8.05	11.5
RU3-SIA1-SB010	RU3-SIA1-SB010 (5-7)	10/09/07	5 - 7		<1	3.41	121 B	0.645 T	8.04 T,UB	0.291 T	11.7 B	4.7	8.68 B	<5	8.28	12.4
RU3-SIA1-SB010 CL	RU3-SIA1-SB210 (5-7)	10/09/07	5 - 7		0.141 T	3.6	126 B	0.698 T	7.81 T,UB	0.326 T	11.7 B	4.5	8.22 B	<5	8.37	12.5
RU3-SIA1-SB011	RU3-SIA1-SB011 (7-9)	10/09/07	7 - 9		<1	2.72	110 B	0.588 T	5.33 T,UB	0.281 T	10.8 B	4.3	7.37 B	19	7.49	9.84
RU3-SIA1-SB012	RU3-SIA1-SB012 (4-6)	10/10/07	4 - 6		0.159 T	2.86	121	0.566 T	5.52 T,UB	0.234 T	9.88 B	4.09	6.6 B	<5	7.23	9.49 B
RU3-SIA1-SB013	RU3-SIA1-SB013 (4-6)	10/10/07	4 - 6		<1	2.77	125	0.587 T	4.44 T,UB	0.298 T	10.1 B	4.37	7.23 B	<5	7.47	9.57 B
RU3-SIA1-SB014	RU3-SIA1-SB014 (7-9)	10/10/07	7 - 9		<1	2.62	123	0.584 T	4.89 T,UB	0.258 T	10.1 B	4.14	7.54 B	<5	7.51	10 B
RU3-SIA1-SB015	RU3-SIA1-SB015 (9-11)	10/10/07	9 - 11		<1	2.79	144	0.567 T	4.46 T,UB	0.294 T	10.6 B	4.14	7.55 B	<5	7.6	9.31 B
RU6-SIA1-SB001	RU6-SIA1-SB001 (8-10)	10/11/07	8 - 10		<1	2.8	107	0.5 T	5.36 T	0.307 T	10.5 B	4.62	7.94	<5	8.04	9.66
RU6-SIA1-SB002	RU6-SIA1-SB002 (10-12)	10/11/07	10 - 12		<1	2.75	128	0.575 T	4.82 T	0.332 T	9.79 B	4.48	7.9	<5	7.99	9.72
RU6-SIA1-SB003	RU6-SIA1-SB003 (7-9)	10/12/07	7 - 9		<1	3.44	124	0.551 T	4.64 T	0.328 T	10.7 B	4.65	8.39	<5	8.13	10.9
RU6-SIA1-SB004	RU6-SIA1-SB004 (9-11)	10/12/07	9 - 11		0.169 T	3.04	165	0.575 T	4.74 T	0.384 T	10.5 B	4.75	8.68	42	8.32	9.82
RU6-SIA1-SB005	RU6-SIA1-SB005 (14-16)	10/12/07	14 - 16		0.147 T	3.32	116	0.577 T	4.93 T	0.288 T	9.99 B	4.74	8.56	<5	8.63	9.74
RU6-SIA1-SB006	RU6-SIA1-SB006 (6-8)	10/10/07	6 - 8		<1	3.34	108	0.611 T	6.33 T,UB	0.336 T	10.7 B	4.48	8.17 B	<5	8.23	11.7 B
RU6-SIA1-SB007	RU6-SIA1-SB007 (9-11)	10/12/07	9 - 11		0.135 T	3.09	124	0.636 T	5.62 T	0.318 T	10.4 B	4.84	8.75	9.1	8.77	10.5
RU6-SIA1-SB008	RU6-SIA1-SB008 (8-10)	10/10/07	8 - 10		<1	3.63	125	0.644 T	7.91 T,UB	0.485 T	12.9 B	4.83	9.38 B	6.3	8.7	12 B
RU6-SIA1-SB009	RU6-SIA1-SB009 (9-11)	10/12/07	9 - 11		<1	2.45	107	0.514 T	4.17 T	0.244 T	9.54 B	4.33	7.24	26	7.56	7.8
RU6-SIA1-SB010	RU6-SIA1-SB010 (13-15)	10/12/07	13 - 15		<1	3.07	97	0.537 T	4.23 T	0.298 T	10.5 B	4.54	8.18	7.7	8.15	9.2
RU6-SIA1-SB010 CL	RU6-SIA1-SB210 (13-15)	10/12/07	13 - 15		<1	3.18	118	0.5 T	3.91 T,J	0.278 T,J	9.84 B	4.66	8.21	<5	8.03	8.97 J
RU6-SIA1-SB011	RU6-SIA1-SB011 (14-16)	10/11/07	14 - 16		<1	3.4	138	0.582 T	6.73 T	0.367 T	11 B	4.93	9.09	<5	8.99	9.75
RU6-SIA1-SB012	RU6-SIA1-SB012 (9-11)	10/12/07	9 - 11		<1	3.15	130	0.548 T	5.61 T	0.31 T	10.5 B	4.68	8.44	<5	8.34	9.76
RU6-SIA1-SB013	RU6-SIA1-SB013 (14-16)	10/10/07	14 - 16		0.137 T	3.34	111	0.621 T	6.63 T,UB	0.311 T	11.9 B	4.44	8 B	<5	8.03	10.9 B
RU6-SIA1-SB014	RU6-SIA1-SB014 (15-17)	10/11/07	15 - 17		<1 UJ	3.3	113	0.625 T	4.35 T	0.329 T	10.2 B	4.76	8.68	<5	8.92	9.67
RU6-SIA1-SB015	RU6-SIA1-SB015 (14-16)	10/10/07	14 - 16		0.142 T	3.39	138	0.63 T	6.85 T,UB	0.316 T	11.7 B	4.68	8.96 B	9.2	8.53	11.4 B
RU6-SIA1-SB016	RU6-SIA1-SB016 (15-17)	10/11/07	15 - 17		<1	3.33	117	0.565 T	4.23 T	0.304 T	10.3 B	4.68	8.42	<5	8.63	9.34
RU6-SIA1-SB017	RU6-SIA1-SB017 (10-12)	10/10/07	10 - 12		<1	3.25	139	0.673 T	6.59 T,UB	0.303 T	12.4 B	4.72	8.95 B	11	8.54	12.8 B
RU6-SIA1-SB018	RU6-SIA1-SB018 (12-14)	10/11/07	12 - 14		<1	3.24	131	0.64 T	7.01 T	0.336 T	14 B	4.63	8.82	<5	8.37	10.7
RU6-SIA1-SB019	RU6-SIA1-SB019 (8-10)	10/11/07	8 - 10		<1	2.96	131	0.57 T	5.83 T	0.399 T	10.3 B	4.64	8.36	<5	8.2	11.8
RU6-SIA1-SB020	RU6-SIA1-SB020 (11.5-13.5)	10/11/07	11.5 - 13.5		<1	3.22	125	0.547 T	4.9 T	0.307 T	10.4 B	4.73	8.33	<5	8.39	9.57
RU6-SIA1-SB020 CL	RU6-SIA1-SB220 (11.5-13.5)	10/11/07	11.5 - 13.5		<1	3.07	110	0.55 T	4.99 T	0.294 T	11.2 B	4.61	8.19	<5	8.25	9.96

TABLE 4-11

PHOSSY WATER INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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				Analyte	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Copper**	**Fluoride**	**Lead**	**Lithium**
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[a]	**2.2**	**7.7**	**188**	**1**	**12.8**	**1.9**	**27.5**	**7.6**	**12.6**	**600**	**29.1**	**16.1**
				Commercial/Industrial Worker SSL	**454**	**7.7[b]**	**61,700**	**645**	**223,000**	**860**	**1,000,000[c]**	**553**	**42,000**	**68,100**	**800[d]**	**22,700**
				Construction Worker SSL	**104**	**14.6**	**8,360**	**61**	**5,210**	**81.3**	**551,000**	**52.2**	**22,000**	**33,000**	**800[d]**	**11,900**
				Utility Worker SSL	**1,360**	**173**	**109,000**	**792**	**67,800**	**1,060**	**1,000,000[c]**	**679**	**286,000**	**430,000**	**800[d]**	**155,000**
				SSL Protective of Groundwater[d]	**5**	**7.7[f]**	**1,600**	**63**	**450**	**8**	**38**	**630**	**9,400**	**12,000**	**800[d]**	**4,200**
RU6-SIA1-SB021	RU6-SIA1-SB021 (15-17)	10/11/07	15 - 17		<1	**3.91**	**153**	**0.686 T**	**7.65 T**	**0.405 T**	**13.1 B**	**5.52**	**11**	<5	**10.4**	**11.4**
RU6-SIA1-SB022	RU6-SIA1-SB022 (15-17)	10/12/07	15 - 17		<1 UJ	**3.31**	**134**	**0.633 T,J**	**4.68 T,J**	**0.361 T**	**10.1 B**	**5.14**	**9.77 J**	<4.9	**9.57**	**9.74 J**
RU6-SIA1-SB023	RU6-SIA1-SB023 (15-17)	10/12/07	15 - 17		<1	**3.41**	**143**	**0.651 T**	**5.39 T**	**0.379 T**	**10.8 B**	**5.27**	**10.7**	<5	**9.84**	**9.38**
RU6-SIA1-SB024	RU6-SIA1-SB024 (14-16)	10/12/07	14 - 16		<1	**3.17**	**106**	**0.499 T,J**	**3.91 T,J**	**0.279 T**	**8.91 B**	**4.5**	**7.94**	<5	**7.91**	**8.34 J**
RU6-SIA1-SB025	RU6-SIA1-SB025 (14-16)	10/10/07	14 - 16		<1	**3.36**	**117**	**0.632 T**	**7.16 T,UB**	**0.336 T**	**12.5 B**	**4.64**	**8.7 B**	<5	**8.41**	**11.4 B**
RU6-SIA1-SB026	RU6-SIA1-SB026 (14-16)	10/11/07	14 - 16		<1	**3.16**	**110**	**0.523 T**	**4.38 T**	**0.253 T**	**10.4 B**	**4.45**	**7.79**	<5	**7.89**	**9.05**
RU6-SIA1-SB027	RU6-SIA1-SB027 (14-16)	10/10/07	14 - 16		<1	**3.57**	**125**	**0.699 T**	**6.34 T,UB**	**0.328 T**	**12.1 B**	**4.81**	**9.39 B**	<5	**9.01**	**12.3 B**
RU6-SIA1-SB028	RU6-SIA1-SB028 (15-17)	10/11/07	15 - 17		**0.133 T**	**3.41**	**117**	**0.591 T**	**4.74 T**	**0.309 T**	**10.4 B**	**4.78**	**8.73**	<5	**8.52**	**9.49**
RU6-SIA1-SB029	RU6-SIA1-SB029 (14-16)	10/10/07	14 - 16		<1 UJ	**3.25**	**148 J-**	**0.569 T**	**5.9 T,UB**	**0.28 T**	**11.2 B**	**4.39 J**	**7.93 J,B**	<5 UJ	**7.94**	**10.7 B**
RU6-SIA1-SB030	RU6-SIA1-SB030 (10-12)	10/11/07	10 - 12		<1	**3.17**	**123**	**0.542 T**	**3.97 T**	**0.294 T**	**9.86 B**	**4.43**	**7.84**	<5	**8.1**	**9.63**
RU6-SIA1-SB030 CL	RU6-SIA1-SB230 (10-12)	10/11/07	10 - 12		<1	**3.15**	**127**	**0.539 T**	**4.35 T**	**0.302 T**	**9.86 B**	**4.44**	**8.1**	**5.1**	**7.93**	**9.46**
RU6-SIA1-SB031	RU6-SIA1-SB031 (10-12)	10/10/07	10 - 12		**0.142 T**	**3.31**	**155**	**0.743 T**	**6.91 T,UB**	**0.344 T**	**12.1 B**	**4.7**	**8.66 B**	**6**	**8.67**	**13.3 B**
RU6-SIA1-SB032	RU6-SIA1-SB032 (12-14)	10/11/07	12 - 14		<1	**3.04**	**110**	**0.525 T**	**4.41 T**	**0.296 T**	**9.58 B**	**4.52**	**8**	<5	**8.18**	**9.11**

µg/kg micrograms per kilogram.
mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
NA Not analyzed.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-11

PHOSSY WATER INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

				Analyte	**Manganese**	**Mercury**	**Molybdenu**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Uranium**	**Vanadium**	**Zinc**	**Phosphorus (P4)**
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/kg**
				Background[a]	**482**	**0.16**	**2.15**	**15.5**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**	**NE**
				Commercial/Industrial Worker SSL	**23,500**	**340**	**5,670**	**6,450**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**	**22,700**
				Construction Worker SSL	**77,100**	**464**	**2,750**	**404**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**	**117,000**
				Utility Worker SSL	**1,000,000**	**6,030**	**35,800**	**5,250**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000d**	**1,000,000**
				SSL Protective of Groundwater[d]	**482[g]**	**2**	**81**	**130**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**												
RU3-SIA1-SB001	RU3-SIA1-SB001 (3-5)	10/09/07	3 - 5		**384 B**	**0.012 T**	**0.45 T**	**12**	<2	**0.0843 T**	**0.223 T**	**0.628 T,B**	**17 B**	**40.6 B**	<0.5
RU3-SIA1-SB002	RU3-SIA1-SB002 (3-5)	10/09/07	3 - 5		**396 B**	**0.013 T**	**0.554 T**	**12.6**	<2	**0.217 T**	**0.181 T**	**0.912 T,B**	**21 J-,B**	**49.1 J-,B**	<0.5
RU3-SIA1-SB003	RU3-SIA1-SB003 (4-6)	10/09/07	4 - 6		**329 B**	**0.0099 T**	**0.379 T**	**10.6**	<2	**0.0667 T**	**0.147 T**	**0.705 T,B**	**18 B**	**32.9 B**	<0.5
RU3-SIA1-SB004	RU3-SIA1-SB004 (2-4)	10/09/07	2 - 4		**398 B**	**0.011 T**	**0.392 T**	**11.2**	<2	**0.0538 T**	**0.168 T**	**0.625 T,B**	**18 B**	**40.4 B**	<0.5
RU3-SIA1-SB005	RU3-SIA1-SB005 (3-5)	10/09/07	3 - 5		**357 B**	**0.011 T**	**0.369 T**	**11.6**	<2	**0.0708 T**	**0.169 T**	**0.822 T,B**	**17.8 B**	**37.4 B**	<0.5
RU3-SIA1-SB006	RU3-SIA1-SB006 (4-6)	10/09/07	4 - 6		**334 B**	**0.0093 T**	**0.319 T**	**10.7**	<2	**0.086 T**	**0.136 T**	**0.658 T,B**	**15.5 B**	**32.4 B**	<0.5
RU3-SIA1-SB007	RU3-SIA1-SB007 (3-5)	10/09/07	3 - 5		**321 B**	**0.009 T**	**0.296 T**	**10.4**	<2	**0.0595 T**	**0.133 T**	**0.603 T,B**	**15.1 B**	**32 B**	<0.5
RU3-SIA1-SB008	RU3-SIA1-SB008 (3-5)	10/09/07	3 - 5		**327 B**	**0.009 T**	**0.367 T**	**10.2**	<2	**0.0617 T**	**0.129 T**	**0.637 T,B**	**17.1 B**	**32.8 B**	<0.5
RU3-SIA1-SB009	RU3-SIA1-SB009 (5.5-7.5)	10/09/07	5.5 - 7.5		**387 B**	**0.01 T**	**0.416 T**	**11.5**	<2	**0.0694 T**	**0.147 T**	**0.78 T,B**	**16.9 B**	**38 B**	<0.5
RU3-SIA1-SB010	RU3-SIA1-SB010 (5-7)	10/09/07	5 - 7		**396 B**	**0.0082 T**	**0.438 T**	**11.8**	<2	**0.0783 T**	**0.149 T**	**0.732 T,B**	**17.1 B**	**39.5 B**	<0.5
RU3-SIA1-SB010 CL	RU3-SIA1-SB210 (5-7)	10/09/07	5 - 7		**413 B**	**0.0091 T**	**0.466 T**	**11.5**	<2	**0.0739 T**	**0.159 T**	**0.71 T,B**	**17.7 B**	**39.3 B**	<0.5
RU3-SIA1-SB011	RU3-SIA1-SB011 (7-9)	10/09/07	7 - 9		**349 B**	**0.0085 T**	**0.445 T**	**10.5**	<2	**0.0601 T**	**0.137 T**	**0.844 T,B**	**15.5 B**	**35.4 B**	<0.5
RU3-SIA1-SB012	RU3-SIA1-SB012 (4-6)	10/10/07	4 - 6		**327**	**0.01 T**	**0.481 T,UB**	**10.3**	<2	**0.0578 T**	**0.191 T**	**0.618 T,B**	**14.9**	**31.8 B**	<0.5
RU3-SIA1-SB013	RU3-SIA1-SB013 (4-6)	10/10/07	4 - 6		**337**	**0.013 T**	**0.454 T,UB**	**10.3**	<2	**0.0659 T**	**0.147 T**	**0.628 T,B**	**15.1**	**32.3 B**	<0.5
RU3-SIA1-SB014	RU3-SIA1-SB014 (7-9)	10/10/07	7 - 9		**350**	**0.0084 T**	**0.356 T,UB**	**10.3**	<2	**0.071 T**	**0.137 T**	**0.745 T,B**	**14.8**	**35.3 B**	<0.5
RU3-SIA1-SB015	RU3-SIA1-SB015 (9-11)	10/10/07	9 - 11		**357**	**0.01 T**	**0.367 T,UB**	**10.3**	<2	**0.0751 T**	**0.133 T**	**0.77 T,B**	**15**	**36.9 B**	<0.5
RU6-SIA1-SB001	RU6-SIA1-SB001 (8-10)	10/11/07	8 - 10		**394**	**0.0065 T**	**0.249 T,UB**	**11.4**	<2	**0.0763 T**	**0.129 T,UB**	**0.727 T,B**	**15.3**	**36.5**	<0.5
RU6-SIA1-SB002	RU6-SIA1-SB002 (10-12)	10/11/07	10 - 12		**372**	**0.0064 T**	**0.256 T,UB**	**11.6**	<2	**0.0673 T**	**0.135 T,UB**	**0.692 T,B**	**14**	**35.9**	<0.5
RU6-SIA1-SB003	RU6-SIA1-SB003 (7-9)	10/12/07	7 - 9		**375 B**	**0.0079 T**	**0.361 T**	**11.6**	<2	**0.0741 T**	**0.185 T,UB**	**0.736 T,B**	**15.3**	**36.1 B**	<0.5
RU6-SIA1-SB004	RU6-SIA1-SB004 (9-11)	10/12/07	9 - 11		**394 B**	**0.007 T**	**0.266 T**	**11.7**	<2	**0.0595 T**	**0.129 T,UB**	**0.822 T,B**	**15.3**	**38.4 B**	<0.5
RU6-SIA1-SB005	RU6-SIA1-SB005 (14-16)	10/12/07	14 - 16		**385 B**	**0.01 T**	**0.315 T**	**11.8**	<2	**0.0767 T**	**0.142 T,UB**	**0.696 T,B**	**14.7**	**37.9 B**	<0.5
RU6-SIA1-SB006	RU6-SIA1-SB006 (6-8)	10/10/07	6 - 8		**379**	**0.006 T**	**0.82 T,UB**	**11.5**	<2	**0.0749 T**	**0.137 T**	**0.688 T,B**	**16**	**38.8 B**	<0.5
RU6-SIA1-SB007	RU6-SIA1-SB007 (9-11)	10/12/07	9 - 11		**393 B**	**0.0095 T**	**0.307 T**	**11.9**	<2	**0.0693 T**	**0.144 T,UB**	**0.721 T,B**	**15.6**	**40.2 B**	<0.5
RU6-SIA1-SB008	RU6-SIA1-SB008 (8-10)	10/10/07	8 - 10		**397**	**0.009 T**	**0.812 T,UB**	**12.7**	<2	**0.121 T**	**0.157 T**	**0.804 T,B**	**17.9**	**42.8 B**	<0.5
RU6-SIA1-SB009	RU6-SIA1-SB009 (9-11)	10/12/07	9 - 11		**363 B**	**0.0083 T**	**0.56 T**	**10.4**	<2	**0.0581 T**	**0.115 T,UB**	**0.679 T,B**	**14.9**	**33.1 B**	<0.5
RU6-SIA1-SB010	RU6-SIA1-SB010 (13-15)	10/12/07	13 - 15		**391 B**	**0.0093 T**	**0.35 T**	**11.3**	<2	**0.0633 T**	**0.138 T,UB**	**0.666 T,B**	**15.4**	**38.7 B**	<0.5
RU6-SIA1-SB010 CL	RU6-SIA1-SB210 (13-15)	10/12/07	13 - 15		**385 B**	**0.0093 T**	**0.394 T**	**11.7**	<2	**0.0734 T**	**0.141 T,UB**	**0.635 T,B**	**14.2**	**37 B**	<0.5
RU6-SIA1-SB011	RU6-SIA1-SB011 (14-16)	10/11/07	14 - 16		**411**	**0.0078 T**	**0.31 T,UB**	**12.6**	<2	**0.0837 T**	**0.145 T,UB**	**0.747 T,B**	**15.5**	**40.3**	<0.5
RU6-SIA1-SB012	RU6-SIA1-SB012 (9-11)	10/12/07	9 - 11		**381 B**	**0.01 T**	**0.306 T**	**12.8**	<2	**0.0873 T**	**0.137 T,UB**	**0.713 T,B**	**15.7**	**38 B**	<0.5
RU6-SIA1-SB013	RU6-SIA1-SB013 (14-16)	10/10/07	14 - 16		**376**	**0.0082 T**	**0.598 T,UB**	**11.5**	<2	**0.0698 T**	**0.146 T**	**0.886 T,B**	**17.2**	**38.5 B**	<0.5
RU6-SIA1-SB014	RU6-SIA1-SB014 (15-17)	10/11/07	15 - 17		**408**	**0.0088 T**	**0.617 T,UB**	**11.8**	<2	**0.0747 T**	**0.189 T,UB**	**0.647 T,B**	**14.6**	**38.7 J**	<0.5
RU6-SIA1-SB015	RU6-SIA1-SB015 (14-16)	10/10/07	14 - 16		**390**	**0.0092 T**	**0.503 T,UB**	**12**	<2	**0.0754 T**	**0.152 T**	**0.733 T,B**	**17.1**	**41.8 B**	<0.5
RU6-SIA1-SB016	RU6-SIA1-SB016 (15-17)	10/11/07	15 - 17		**398**	**0.0085 T**	**0.323 T,UB**	**11.9**	<2	**0.0694 T**	**0.133 T,UB**	**0.67 T,B**	**14.7**	**38.4**	<0.5
RU6-SIA1-SB017	RU6-SIA1-SB017 (10-12)	10/10/07	10 - 12		**386**	**0.0083 T**	**0.434 T,UB**	**12.2**	<2	**0.141 T**	**0.15 T**	**0.764 T,B**	**17.6**	**39.7 B**	<0.5
RU6-SIA1-SB018	RU6-SIA1-SB018 (12-14)	10/11/07	12 - 14		**381**	**0.0083 T**	**0.531 T,UB**	**11.8**	<2	**0.0791 T**	**0.138 T,UB**	**2.87 B**	**18.2**	**36.7**	<0.5
RU6-SIA1-SB019	RU6-SIA1-SB019 (8-10)	10/11/07	8 - 10		**385**	**0.0068 T**	**0.264 T,UB**	**11.8**	<2	**0.0852 T**	**0.133 T,UB**	**0.69 T,B**	**14.7**	**37.9**	<0.5
RU6-SIA1-SB020	RU6-SIA1-SB020 (11.5-13.5)	10/11/07	11.5 - 13.5		**404**	**0.0075 T**	**0.494 T,UB**	**11.9**	<2	**0.0595 T**	**0.134 T,UB**	**0.706 T,B**	**14.9**	**36.9**	<0.5
RU6-SIA1-SB020 CL	RU6-SIA1-SB220 (11.5-13.5)	10/11/07	11.5 - 13.5		**387**	**0.0078 T**	**0.526 T,UB**	**11.7**	<2	**0.0791 T**	**0.132 T,UB**	**0.711 T,B**	**15.7**	**36.9**	<0.5

TABLE 4-11

PHOSSY WATER INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

					Analyte	**Manganese**	**Mercury**	**Molybdenu**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Uranium**	**Vanadium**	**Zinc**	**Phosphorus (P4)**
					Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/kg**
					Background[a]	**482**	**0.16**	**2.15**	**15.5**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**	**NE**
					Commercial/Industrial Worker SSL	**23,500**	**340**	**5,670**	**6,450**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**	**22,700**
					Construction Worker SSL	**77,100**	**464**	**2,750**	**404**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**	**117,000**
					Utility Worker SSL	**1,000,000**	**6,030**	**35,800**	**5,250**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000d**	**1,000,000**
					SSL Protective of Groundwater[d]	**482[g]**	**2**	**81**	**130**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**	**NE**
RU6-SIA1-SB021	RU6-SIA1-SB021 (15-17)	10/11/07	15 - 17		**460**	**0.01 T**	**0.369 T,UB**	**14.3**	<2	**0.161 T**	**0.158 T,UB**	**0.772 T,B**	**18.6**	**47.1**	<0.5
RU6-SIA1-SB022	RU6-SIA1-SB022 (15-17)	10/12/07	15 - 17		**442 B**	**0.01 T**	**0.274 T**	**12.9**	<2	**0.0818 T**	**0.158 T,UB**	**0.7 T,B**	**14.6**	**42.4 J,B**	<0.5
RU6-SIA1-SB023	RU6-SIA1-SB023 (15-17)	10/12/07	15 - 17		**468 B**	**0.014 T**	**0.286 T**	**13**	<2	**0.0856 T**	**0.165 T,UB**	**0.661 T,B**	**15.3**	**47.2 B**	<0.5
RU6-SIA1-SB024	RU6-SIA1-SB024 (14-16)	10/12/07	14 - 16		**371 B**	**0.0083 T**	**0.323 T**	**11.3**	<2	**0.0632 T**	**0.127 T,UB**	**0.609 T,B**	**13.1**	**35.1 B**	<0.5
RU6-SIA1-SB025	RU6-SIA1-SB025 (14-16)	10/10/07	14 - 16		**388**	**0.016 T**	**0.702 T,UB**	**12.3**	<2	**0.113 T**	**0.142 T**	**0.85 T,B**	**18.1**	**41 B**	<0.5
RU6-SIA1-SB026	RU6-SIA1-SB026 (14-16)	10/11/07	14 - 16		**366**	**0.0096 T**	**0.569 T,UB**	**11.5**	<2	**0.0601 T**	**0.126 T,UB**	**0.682 T,B**	**15**	**36.2**	<0.5
RU6-SIA1-SB027	RU6-SIA1-SB027 (14-16)	10/10/07	14 - 16		**402**	**0.0098 T**	**0.597 T,UB**	**12.2**	<2	**0.0891 T**	**0.16 T**	**0.732 T,B**	**18**	**42.2 B**	<0.5
RU6-SIA1-SB028	RU6-SIA1-SB028 (15-17)	10/11/07	15 - 17		**393**	**0.0086 T**	**0.405 T,UB**	**12.2**	<2	**0.0957 T**	**0.154 T,UB**	**0.683 T,B**	**15.2**	**38.9**	<0.5
RU6-SIA1-SB029	RU6-SIA1-SB029 (14-16)	10/10/07	14 - 16		**366**	**0.0089 T**	**0.66 T,UB**	**11.3**	<2	**0.0534 T**	**0.124 T**	**0.742 T,J,B**	**16.7**	**37.7 J,B**	<0.5
RU6-SIA1-SB030	RU6-SIA1-SB030 (10-12)	10/11/07	10 - 12		**375**	**0.007 T**	**0.4 T,UB**	**11**	<2	**0.0604 T**	**0.123 T,UB**	**0.673 T,B**	**14.8**	**35.1**	<0.5
RU6-SIA1-SB030 CL	RU6-SIA1-SB230 (10-12)	10/11/07	10 - 12		**368**	**0.0099 T**	**0.58 T,UB**	**11.6**	<2	**0.0701 T**	**0.124 T,UB**	**0.662 T,B**	**14.1**	**35.6**	<0.5
RU6-SIA1-SB031	RU6-SIA1-SB031 (10-12)	10/10/07	10 - 12		**386**	**0.01 T**	**0.686 T,UB**	**11.7**	<2	**0.0789 T**	**0.168 T**	**0.821 T,B**	**17.6**	**40.1 B**	<0.5
RU6-SIA1-SB032	RU6-SIA1-SB032 (12-14)	10/11/07	12 - 14		**379**	**0.0069 T**	**0.272 T,UB**	**11.3**	<2	**0.061 T**	**0.124 T,UB**	**0.642 T,B**	**14.2**	**35.8**	<0.5

µg/kg micrograms per kilogram.
mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
NA Not analyzed.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-12

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 3**
(RECEIVING, STORES, PAINT SHOP AND P4 DECON)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*		*BScr*		*BScr*		*BScr*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, U-238**	**4.E-04**	**Ra-226, Pb-210**	**3.E-05**	**Ra-226, Pb-210**	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.
** Risks associated with exposure to underground piping formerly used to convey phossy water in this RU are evaluated separately.

TABLE 4-13

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 4
(OFFICE BUILDINGS AND TRANING CENTER)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*		*BScr*		*BScr*		*BScr*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, U-238**	**4.E-04**	**Ra-226, Pb-210**	**3.E-05**	**Ra-226, Pb-210**	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-14

LABORATORY-RELATED SOLVENTS INVESTIGATION AREAS
DETECTION SUMMARY TABLE[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	**Chloroform**	**2-Butanone (MEK)**	**PCE**	**Toluene**
				Units	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
				Commercial/Industrial Worker SSL[b]	**200,000**	**26,000,000**	**1,000**	**650,000**
				Construction Worker SSL[b]	**120,000**	**14,000,000**	**6,000**	**650,000**
				Utility Worker SSL[b]	**450,000**	**27,000,000**	**21,000**	**650,000**
				SSL Protective of Groundwater[c]	**500**	**91,000**	**60**	**12,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**					
RU5-SIA1-SB002	RU5-SIA1-SB002(1.5)	07/16/07	1.5		**2.9 T**	<14	**1.8 T**	<7.2
RU5-SIA1-SB013	RU5-SIA1-SB013(4.0)	07/17/07	4		<5.2	**7.3 T**	<5.2	<5.2
RU5-SIA1-SB015	RU5-SIA1-SB015(1.0)	07/17/07	1		<5.6	**5.9 T**	<5.6	**1.2 T,J+**
RU5-SIA1-SB015	RU5-SIA1-SB015(3.0)	07/17/07	3		<7.4	**7.4 T**	<7.4	<7.4
RU5-SIA1-SB020 CL	RU5-SIA1-SB220(3.5)	07/18/07	3.5		<6.5	**7.7 T**	<6.5	<6.5
RU5-SIA1-SB021	RU5-SIA1-SB021(4)	07/18/07	4		<5.6	**6.4 T**	<5.6	<5.6
RU5-SIA1-SB024	RU5-SIA1-SB024(4)	07/18/07	4		<5.2	**6.1 T**	<5.2	<5.2

SSL Soil screening level
a For the complete data summary, refer to Appendix D of this report. Samples were collected at RUs 4 and 5
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil* Screening Levels for Superfund Sites EPA (2002), supplemented with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
µg/kg micrograms per kilogram.
ft feet
Bold Bolded result indicates positively identified compound.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
PCE Tetrachloroethene
CL Colocated sample for blind replicate analysis
J+ Data are estimated, potentially biased high, due to associated quality control data.

TABLE 4-15

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 5
(LAB AND OLD DRAINFIELD)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*		*BScr*		*BScr*		*BScr*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, U-238**	**4.E-04**	**Ra-226, Pb-210**	**3.E-05**	**Ra-226, Pb-210**	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-16

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 6
(FORMER LONG-TERM PHOS STORAGE TANKS)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	9.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	5.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	7.E-06	Benzo(a)pyrene	5.E-07	-
Dermal Absorption	7.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	NA	-	3.E-06	Benzo(a)pyrene	6.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	-	2.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*2.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*5.E-05*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*1.E-05*	*Benzo(a)pyrene*	*1.E-06*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, Benzo(a)pyrene**	**5.E-04**	**Ra-226, Benzo(a)pyrene**	**4.E-05**	**Ra-226, Benzo(a)pyrene**	**3.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	1	V	1	V	2	V	0.1	-
Dermal Absorption	0.004	-	NA	-	0.0001	-	0.00003	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.02	-	NA	-	3	Ni	0	-
Total Incremental Non-Cancer Hazard Quotient	**1**	**V**	**1**	**V**	**5**	**Ni, V**	**0.4**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-17

ORE AND SLAG REFERENCE AREAS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 4)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury
				Analyte															
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[a]	**2.2**	**7.7**	**188**	**1**	**12.8**	**1.9**	**27.5**	**7.6**	**12.6**	**600**	**29.1**	**3.03**	**16.1**	**482**	**0.16**
				Commercial/Industrial Worker SSL	**454**	**7.7[b]**	**61,700**	**645**	**223,000**	**860**	**1,000,000[c]**	**553**	**42,000**	**68,100**	**800[e]**	**3.03[b]**	**22,700**	**23,500**	**340**
				Construction Worker SSL	**104**	**14.6**	**8,360**	**61**	**5,210**	**81.3**	**551,000**	**52.2**	**22,000**	**33,000**	**800[e]**	**7.44**	**11,900**	**77,100**	**464**
				Utility Worker SSL	**1,360**	**173**	**109,000**	**792**	**67,800**	**1,060**	**1,000,000[c]**	**679**	**286,000**	**430,000**	**800[e]**	**96.7**	**155,000**	**1,000,000**	**6,030**
				SSL Protective of Groundwater[d]	**5**	**7.7[f]**	**1,600**	**63**	**450**	**8**	**38**	**630**	**9,400**	**12,000**	**800[e]**	**3.03[f]**	**4,200**	**482[f]**	**2**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**																
RU7-REF-SB001	RU7-REF-SB001 (8-10)	9/6/2007	8 - 10		<1	**2.81**	**125**	**0.627 T**	**5.67 T**	**0.308 T**	**9.63 B**	**4.54**	**7.82**	<5	**8.25**	**0.89 ± 0.25**	**10.2**	**390**	0.012 T,UB
RU7-REF-SB002	RU7-REF-SB002 (5-7)	9/6/2007	5 - 7		<1	**2.67**	**122**	**0.537 T**	**5.97 T**	**0.304 T**	**8.86 B**	**4.01**	**6.45**	<4.9	**7.02**	**0.87 ± 0.24**	**9.03**	**311**	0.012 T,UB
RU7-REF-SB003	RU7-REF-SB003 (25-27)	9/7/2007	25 - 27		<1	**3**	**118**	**0.615 T**	**6.56 T**	**0.388 T**	**9.2 B**	**4.63**	**8.44**	<5	**8.62**	**0.92 ± 0.25**	**8.15**	**419**	**0.01 T,B**
RU7-REF-SB004	RU7-REF-SB004 (15-17)	9/7/2007	15 - 17		<1 UJ	**2.88 J-**	**98.2 J-**	**0.493 T,J-**	**4.82 T,J**	**0.438 T,J-**	**8.81 J-,B**	**3.97 J-**	**6.49 J-**	<5	**7.03 J-**	**0.95 ± 0.26**	**6.88**	**347**	**0.0094 T,B**
RU7-REF-SB005	RU7-REF-SB005 (5-7)	9/5/2007	5 - 7		<1	**2.84**	**110**	**0.566 T**	**5.11 T**	**0.294 T**	**9.93 B**	**4.18**	**7.28**	<5	**7.53**	**0.87 ± 0.24**	**9.68**	**353**	0.012 T,UB
RU7-REF-SB006	RU7-REF-SB006 (16.5-18.5)	9/7/2007	16.5 - 18.5		<1	**3.25**	**129**	**0.606 T**	**6.22 T**	**0.269 T**	**11.2 B**	**4.38**	**7.45**	**6.2**	**7.9**	**0.88 ± 0.24**	**10.5**	**358**	**0.011 T,B**
RU7-REF-SB007	RU7-REF-SB007 (2-4)	9/6/2007	2 - 4		<1	**2.82**	**127**	**0.606 T**	**6.2 T**	**0.285 T**	**9.65 B**	**4.33**	**7.29**	**5.9**	**7.73**	**0.88 ± 0.24**	**9.8**	**341**	0.012 T,UB
RU7-REF-SB008	RU7-REF-SB008 (13-15)	9/20/2007	13 - 15		**0.136 T**	**3.15**	**120**	**0.654 T**	**6.66 T**	**0.993 T**	**12.7 B**	**4.45**	**9.31**	**24**	**8.27**	**1.16 ± 0.3**	**9.98**	**380**	**0.012 T,B**
RU7-REF-SB008 CL	RU7-REF-SB208 (13-15)	9/20/2007	13 - 15		**0.131 T**	**3.22**	**123**	**0.609 T**	**6.07 T**	**0.827 T**	**12.5 B**	**4.3**	**8.99**	**29**	**8.05**	**1.05 ± 0.28**	**9.53**	**378**	**0.011 T,B**
RU7-REF-SB009	RU7-REF-SB009 (15-17)	9/7/2007	15 - 17		**0.154 T**	**3.61**	**130**	**0.596 T**	**7.96 T**	**2.22**	**13.3 B**	**3.94**	**9.14**	**8.2**	**7.87**	**1.2 ± 0.31**	**9.46**	**358**	**0.014 T,B**
RU7-REF-SB010	RU7-REF-SB010 (1-3)	9/19/2007	1 - 3		<1	**3.59**	**111**	0.704 T,UB	**5.44 T**	0.694 T,UB	**11.4 B**	**4.92 B**	**10.7**	<5	**9.65**	**0.93 ± 0.25**	**9.13 B**	**452**	**0.013 T**
RU7-REF-SB011	RU7-REF-SB011 (5-7)	9/5/2007	5 - 7		<1	**3.34**	**138**	**0.686 T**	**6.6 T**	**0.415 T**	**11.5 B**	**4.8**	**8.8**	**9.3**	**8.8**	**0.91 ± 0.25**	**12.1**	**399**	0.012 T,UB
RU7-REF-SB012	RU7-REF-SB012 (4-6)	9/7/2007	4 - 6		<1	**3.61**	**89.6**	**0.517 T**	**6.11 T**	**0.287 T**	**9.04 B**	**4.23**	**6.71**	**5.8**	**7.85**	**0.79 ± 0.22**	**7.84**	**343**	**0.0098 T,B**
RU7-REF-SB013	RU7-REF-SB013 (1.5-3.5)	9/19/2007	1.5 - 3.5		<1	**3.69**	**111**	0.527 T,UB	**4.01 T**	0.332 T,UB	**9.46 B**	**4.04 B**	**6.62**	<5	**7.74**	**0.86 ± 0.23**	**8.08 B**	**341**	**0.01 T**
RU7-REF-SB014	RU7-REF-SB014 (8-10)	9/5/2007	8 - 10		<1	**3.91**	**126**	**0.619 T**	**7.2 T**	**0.308 T**	**117 B**	**5.44**	**10.8**	**5.5**	**8.64**	**0.78 ± 0.22**	**9.67**	**399**	0.012 T,UB
RU7-REF-SB015	RU7-REF-SB015 (15-17)	9/7/2007	15 - 17		<1	**3.15**	**139**	**0.696 T**	**8.73 T**	**0.994 T**	**13.9 B**	**4.48**	**9.11**	**21**	**8.19**	**1.05 ± 0.28**	**11.5**	**366**	**0.015 T,B**
RU7-REF-SB016	RU7-REF-SB016 (12-14)	9/19/2007	12 - 14		<1	**3.73**	**140**	0.704 T,UB	**7.33 T**	0.925 T,UB	**12.2 B**	**4.32 B**	**8.5**	**20**	**9.57**	**0.89 ± 0.24**	**11.3 B**	**361**	**0.012 T**
RU7-REF-SB017	RU7-REF-SB017 (6-8)	9/6/2007	6 - 8		<1	**3.53**	**168**	**0.688 T**	**8.87 T**	**0.591 T**	**11.1 B**	**4.96**	**9.79**	**12**	**9.21**	**0.81 ± 0.22**	**10.9**	**414**	0.012 T,UB
RU7-REF-SB018	RU7-REF-SB018 (15-17)	9/10/2007	15 - 17		<1	**3.04**	**125**	**0.638 T**	**8.54 T**	**0.371 T**	**10.6 B**	**4.51**	**8.14**	**11**	**8.16**	**0.81 ± 0.22**	**10.8**	**361**	**0.011 T,B**
RU7-REF-SB019	RU7-REF-SB019 (15-17)	9/7/2007	15 - 17		<1	**4.65**	**130**	**0.647 T**	**7.24 T**	**0.299 T**	**10.5 B**	**4.62**	**8.61**	**8.6**	**8.94**	**0.78 ± 0.22**	**9.98**	**368**	**0.012 T,B**
RU7-REF-SB020	RU7-REF-SB020 (12-14)	9/20/2007	12 - 14		<1	**3.35**	**137**	**0.677 T**	**7.73 T**	**0.315 T**	**11 B**	**4.69**	**8.89**	**7.9**	**8.48**	**0.93 ± 0.25**	**11**	**383**	**0.011 T,B**
RU7-REF-SB020 CL	RU7-REF-SB220 (12-14)	9/20/2007	12 - 14		<1 UJ	**3.4**	**134**	**0.663 T**	**7.28 T**	**0.382 T**	**12.4 B**	**4.7**	**8.89**	**8.2 J-**	**8.95**	**0.82 ± 0.22**	**10.9**	**378**	**0.012 T,B**
RU20-REF-SB001	RU20-REF-SB001 (5.5-7.5)	8/8/2007	5.5 - 7.5		0.186 T,UB	**3.36**	**155**	**0.659 T**	**8.45 T**	**0.353 T**	**11.7 B**	**4.99**	**10.6**	**21**	**9.36**	**0.78 ± 0.23 J+**	**15.2 B**	**442**	**0.013 T,B**
RU20-REF-SB002	RU20-REF-SB002 (4-6)	8/8/2007	4 - 6		0.342 T,J-,UB	**3.38**	**157**	**0.722 T**	**9.17 T**	**0.412 T**	**11.9 B**	**4.91**	**11.5 J**	**71 J-**	**9.77**	**0.76 ± 0.23**	**14 B**	**494**	**0.0097 T,B**
RU20-REF-SB003	RU20-REF-SB003 (4.5-6.5)	8/9/2007	4.5 - 6.5		0.364 T,UB	**3.3**	**142**	**0.644 T**	**6.28 T**	**0.457 T**	**11.4 B**	**4.39**	**8.41**	**49**	**8.89**	**0.73 ± 0.23**	**13 B**	**426**	**0.0081 T,B**
RU20-REF-SB004	RU20-REF-SB004 (6-8)	8/9/2007	6 - 8		0.175 T,UB	**3.06**	**141**	**0.614 T**	**5.68 T**	**0.313 T**	**11.4 B**	**4.46**	**8.76**	**44**	**8.62**	**0.57 ± 0.19 J+**	**12.3 B**	**439**	**0.0074 T,B**
RU20-REF-SB005	RU20-REF-SB005 (6-8)	8/9/2007	6 - 8		0.171 T,UB	**3.51**	**146**	**0.641 T**	**6.55 T**	**0.425 T**	**12.2 B**	**4.82**	**10.2**	**45**	**9.28**	**0.76 ± 0.23 J+**	**13.1 B**	**437**	**0.0089 T,B**
RU20-REF-SB006	RU20-REF-SB006 (4-6)	8/9/2007	4 - 6		0.151 T,UB	**3.2**	**147**	**0.605 T**	**5.68 T**	**0.342 T**	**10.2 B**	**4.54**	**8.67**	**40**	**8.53**	**0.7 ± 0.22**	**12.4 B**	**396**	**0.0075 T,B**
RU20-REF-SB007	RU20-REF-SB007 (4-6)	8/9/2007	4 - 6		0.188 T,UB	**3.52**	**159**	**0.669 T**	**6.99 T**	**0.37 T**	**12.5 B**	**5.02**	**10.5**	**54**	**9.27**	**0.74 ± 0.23**	**13.8 B**	**442**	**0.0083 T,B**
RU20-REF-SB008	RU20-RREF-SB008 (4-6)	8/9/2007	4 - 6		0.251 T,UB	**3.07**	**115**	**0.522 T**	**6.61 T**	**0.284 T**	**10 B**	**3.97**	**7.47**	**44**	**7.32**	**0.64 ± 0.21**	**10.8 B**	**353**	**0.0082 T,B**
RU20-REF-SB009	RU20-REF-SB009 (6.5-8.5)	8/9/2007	6.5 - 8.5		0.494 T,UB	**2.92**	**127**	**0.574 T**	**6.7 T**	**0.653 T**	**11.9 B**	**4.07**	**6.33**	**57**	**7.91**	**0.87 ± 0.25**	**12.1 B**	**417**	**0.004 T,B**
RU20-REF-SB010	RU20-REF-SB010 (6-8)	8/9/2007	6 - 8		0.45 T,UB	**2.56**	**94.5**	**0.53 T**	**6.15 T**	**0.359 T**	**8.45 B**	**3.28**	**6.11**	**33**	**6.15**	**0.71 ± 0.22**	**8.61 B**	**281**	**0.0085 T,B**
RU20-REF-SB010 CL	RU20-REF-SB210 (6-8)	8/9/2007	6 - 8		0.146 T,UB	**2.94**	**119**	**0.522 T**	**4.78 T**	**0.273 T**	**10.2 B**	**4**	**7.56**	**29**	**16.4**	**0.65 ± 0.21**	**10.2 B**	**361**	**0.0087 T,B**
RU20-REF-SB011	RU20-REF-SB011 (5-7)	8/10/2007	5 - 7		0.435 T,UB	**3.4 B**	**147 B**	0.679 T,UB	**7.94 T**	0.684 T,UB	**11.5 B**	**4.88 B**	**11.7 B**	**30**	**9.43 B**	**0.93 ± 0.27**	**14.3 B**	**457 B**	**0.0072 T,B**
RU20-REF-SB012	RU20-REF-SB012 (5-7)	8/10/2007	5 - 7		0.309 T,J-,UB	**3.31 B**	**150 B**	0.639 T,UB	**6.59 T**	0.356 T,UB	**11.3 B**	**5.13 B**	**10.5 J,B**	**65 J-**	**8.74 B**	**0.82 ± 0.25**	**12.9 B**	**436 B**	**0.0062 T,B**
RU20-REF-SB013	RU20-REF-SB013 (7-9)	8/10/2007	7 - 9		2.33 UB	**3.34 B**	**152 B**	0.723 T,UB	**7.4 T**	5.04 UB	**14.4 B**	**6.23 B**	**11.6 B**	**100**	**8.82 B**	**0.86 ± 0.25**	**13.9 B**	**443 B**	0.0043 T,UB
RU20-REF-SB014	RU20-REF-SB014 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.205 T,UB	**3.31 B**	**112 B**	0.504 T,UB	**6.7 T**	0.311 T,UB	**11.4 B**	**4.19 B**	**7.47 B**	<5	**7.31 B**	**0.81 ± 0.25**	**10.4 B**	**352 B**	0.0053 T,UB

TABLE 4-17

ORE AND SLAG REFERENCE AREAS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 4)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury
				Analyte															
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[a]	**2.2**	**7.7**	**188**	**1**	**12.8**	**1.9**	**27.5**	**7.6**	**12.6**	**600**	**29.1**	**3.03**	**16.1**	**482**	**0.16**
				Commercial/Industrial Worker SSL	**454**	**7.7[b]**	**61,700**	**645**	**223,000**	**860**	**1,000,000[c]**	**553**	**42,000**	**68,100**	**800[e]**	**3.03[b]**	**22,700**	**23,500**	**340**
				Construction Worker SSL	**104**	**14.6**	**8,360**	**61**	**5,210**	**81.3**	**551,000**	**52.2**	**22,000**	**33,000**	**800[e]**	**7.44**	**11,900**	**77,100**	**464**
				Utility Worker SSL	**1,360**	**173**	**109,000**	**792**	**67,800**	**1,060**	**1,000,000[c]**	**679**	**286,000**	**430,000**	**800[e]**	**96.7**	**155,000**	**1,000,000**	**6,030**
				SSL Protective of Groundwater[d]	**5**	**7.7[f]**	**1,600**	**63**	**450**	**8**	**38**	**630**	**9,400**	**12,000**	**800[e]**	**3.03[f]**	**4,200**	**482[f]**	**2**
RU20-REF-SB015	RU20-REF-SB015 (5-7)	8/10/2007	5 - 7		0.182 T,UB	**3.47 B**	**148 B**	0.632 T,UB	**7.84 T**	0.4 T,UB	**13.4 B**	**4.85 B**	**10.1 B**	**14**	**9.01 B**	**0.84 ± 0.25**	**13.1 B**	**437 B**	**0.0057 T,B**
RU20-REF-SB016	RU20-REF-SB016 (5-7)	8/10/2007	5 - 7		0.816 T,UB	**3.22 B**	**140 B**	0.642 T,UB	**7.25 T**	1.77 UB	**13.3 B**	**4.59 B**	**9.31 B**	**75**	**8.38 B**	**0.79 ± 0.24**	**12.5 B**	**386 B**	0.005 T,UB
RU20-REF-SB017	RU20-REF-SB017 (7-9)	8/10/2007	7 - 9		**3.92 B**	**3.47 B**	**136 B**	0.724 T,UB	**8 T**	**32.6 B**	**16.2 B**	**3.58 B**	**6.74 B**	**120**	**7.8 B**	**0.87 ± 0.27**	**14.4 B**	**319 B**	0.0038 T,UB
RU20-REF-SB018	RU20-REF-SB018 (3-5)	8/10/2007	3 - 5		0.289 T,UB	**3.24 B**	**123 B**	0.544 T,UB	**8.3 T**	0.293 T,UB	**13.4 B**	**4.36 B**	**7.91 B**	**32**	**7.77 B**	**0.82 ± 0.25**	**10.6 B**	**385 B**	0.0042 T,UB
RU20-REF-SB019	RU20-REF-SB019 (2-4)	8/10/2007	2 - 4		0.221 T,UB	**3.63 B**	**124 B**	0.564 T,UB	**7.62 T**	0.294 T,UB	**11.8 B**	**4.54 B**	**7.79 B**	<5	**7.99 B**	**0.74 ± 0.24**	**14.8 B**	**336 B**	**0.0058 T,B**
RU20-REF-SB020	RU20-REF-SB020 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.274 T,UB	**3.32 B**	**136 B**	0.533 T,UB	**13.7**	0.334 T,UB	**11.5 B**	**3.76 B**	**6.74 B**	**68**	**7.71 B**	**0.81 ± 0.24**	**11.4 B**	**372 B**	0.0051 T,UB
RU20-REF-SB020 CL	RU20-REF-SB220 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.137 T,UB	**3.36 B**	**123 B**	0.501 T,UB	**10.7**	0.282 T,UB	**10.2 B**	**4.23 B**	**7.72 B**	<5	**7.62 B**	**0.82 ± 0.24**	**10.3 B**	**358 B**	**0.0085 T,B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-17

ORE AND SLAG REFERENCE AREAS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

					Molybdenum	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte	**Molybdenum**	**Nickel**	**Polonium-210**	**Potassium-40**	**Radium-226**	**Selenium**	**Silver**	**Thallium**	**Uranium**	**Uranium-238**	**Vanadium**	**Zinc**
				Units	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**
				Background[a]	**2.15**	**15.5**	**3.58**	**20.5**	**3.88**	**1.36**	**1.9**	**0.27**	**NA**	**3.88**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**5,670**	**6,450**	**269**	**20.5[b]**	**3.88[b]**	**5,670**	**5,670**	**77.2**	**3,400**	**3.88[b]**	**7,950**	**340,000**
				Construction Worker SSL	**2,750**	**404**	**43.3**	**20.5[b]**	**3.88[b]**	**2,750**	**2,750**	**374**	**491**	**20.6**	**3,500**	**165,000**
				Utility Worker SSL	**35,800**	**5,250**	**563**	**136**	**12**	**35,800**	**35,800**	**4,870**	**6,390**	**267**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**81**	**130**	**3.58[f]**	**20.5[f]**	**3.88[f]**	**5**	**34**	**0.7**	**900**	**3.88[f]**	**6,000**	**12,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**													
RU7-REF-SB001	RU7-REF-SB001 (8-10)	9/6/2007	8 - 10		0.273 T,UB	**11.1**	**0.5 ± 0.19**	**15.2 ± 4.3 J+**	**0.74 ± 0.17**	<2	**0.0651 T**	**0.111 T**	**0.663 T**	**0.78 ± 0.23**	**13.5**	**36.7**
RU7-REF-SB002	RU7-REF-SB002 (5-7)	9/6/2007	5 - 7		0.246 T,UB	**9.94**	**0.66 ± 0.21**	**16.3 ± 4.4 J+**	**0.77 ± 0.17**	<2	<1	**0.0948 T**	**0.691 T**	**1.11 ± 0.29**	**14**	**30.2**
RU7-REF-SB003	RU7-REF-SB003 (25-27)	9/7/2007	25 - 27		0.345 T,UB	**11.1 B**	**0.79 ± 0.24**	**11.2 ± 3.6 J+**	**0.54 ± 0.14**	<2	**0.0641 T**	**0.242 T**	**0.756 T**	**0.78 ± 0.24**	**13.4 B**	**40.6 B**
RU7-REF-SB004	RU7-REF-SB004 (15-17)	9/7/2007	15 - 17		**0.38 T,J-,B**	**9.52 B**	**0.64 ± 0.2**	**13.3 ± 3.3 J+**	**1.11 ± 0.25**	<2 UJ	**0.0534 T,J-**	**0.123 T,J-**	**0.787 T,J**	**1.04 ± 0.3**	**14 J-,B**	**32.9 J-,B**
RU7-REF-SB005	RU7-REF-SB005 (5-7)	9/5/2007	5 - 7		0.313 T,UB	**10.3**	**0.51 ± 0.23**	**18 ± 5 J+**	**0.48 ± 0.13**	<2	**0.0558 T**	**0.0889 T**	**0.721 T**	**0.93 ± 0.26**	**14.6**	**34.2**
RU7-REF-SB006	RU7-REF-SB006 (16.5-18.5)	9/7/2007	16.5 - 18.5		0.419 T,UB	**10.8 B**	**0.65 ± 0.21**	**11.9 ± 3.9 J+**	**0.71 ± 0.17**	<2	<1	**0.117 T**	**0.759 T**	**0.8 ± 0.23**	**14.9 B**	**35.1 B**
RU7-REF-SB007	RU7-REF-SB007 (2-4)	9/6/2007	2 - 4		0.338 T,UB	**10.8**	**0.42 ± 0.16**	**12.4 ± 3.5 J+**	**0.78 ± 0.18**	<2	**0.0684 T**	**0.122 T**	**0.594 T**	**1.01 ± 0.28**	**14.3**	**33.5**
RU7-REF-SB008	RU7-REF-SB008 (13-15)	9/20/2007	13 - 15		**0.635 T**	**11.8**	**0.77 ± 0.21**	**18.7 ± 3.5 J+**	**0.67 ± 0.16**	<2	**0.0832 T**	**0.127 T**	**1.18**	**1.31 ± 0.34**	**19.6 B**	**46.6**
RU7-REF-SB008 CL	RU7-REF-SB208 (13-15)	9/20/2007	13 - 15		**0.628 T**	**11.1**	**0.59 ± 0.17**	**19.7 ± 3.6 J+**	**0.75 ± 0.18**	<2	**0.0736 T**	**0.104 T**	**0.988 T**	**1 ± 0.26**	**17.4 B**	**42.9**
RU7-REF-SB009	RU7-REF-SB009 (15-17)	9/7/2007	15 - 17		**0.93 T,B**	**12 B**	**0.86 ± 0.24**	**18.2 ± 4.1 J+**	**1.39 ± 0.29**	<2	**0.119 T**	**0.124 T**	**2.21**	**1.55 ± 0.39**	**23.9 B**	**50.6 B**
RU7-REF-SB010	RU7-REF-SB010 (1-3)	9/19/2007	1 - 3		**0.515 T**	**12.3**	**0.51 ± 0.16**	**15.2 ± 4.2 J+**	**0.63 ± 0.19**	<2	0.139 T,UB	0.189 T,UB	**0.737 T,B**	**1.07 ± 0.29**	**16.6**	**51.4 B**
RU7-REF-SB011	RU7-REF-SB011 (5-7)	9/5/2007	5 - 7		0.444 T,UB	**12.2**	**0.58 ± 0.26**	**15.7 ± 4.7 J+**	**0.69 ± 0.16**	<2	**0.0765 T**	**0.142 T**	**0.9 T**	**0.78 ± 0.23**	**17.3**	**40.9**
RU7-REF-SB012	RU7-REF-SB012 (4-6)	9/7/2007	4 - 6		0.313 T,UB	**10.8 B**	**0.54 ± 0.2**	**12.7 ± 3.2**	**1 ± 0.24**	<2	**0.0478 T**	**0.0891 T**	**0.806 T**	**0.78 ± 0.26**	**15.5 B**	**36 B**
RU7-REF-SB013	RU7-REF-SB013 (1.5-3.5)	9/19/2007	1.5 - 3.5		**0.727 T**	**10.3**	**0.49 ± 0.17**	**13.5 ± 3.8 J+**	**0.95 ± 0.22**	<2	0.113 T,UB	0.121 T,UB	**0.77 T,B**	**0.92 ± 0.26**	**15.4**	**33.5 B**
RU7-REF-SB014	RU7-REF-SB014 (8-10)	9/5/2007	8 - 10		**1.6 B**	**59.6**	**0.69 ± 0.28**	**16.7 ± 4.2 J+**	**0.53 ± 0.14**	<2	**0.0642 T**	**0.113 T**	**0.735 T**	**0.89 ± 0.26**	**17.3**	**41**
RU7-REF-SB015	RU7-REF-SB015 (15-17)	9/7/2007	15 - 17		**0.758 T,B**	**11.9 B**	**1.04 ± 0.29**	**16.4 ± 4.3 J+**	**1.12 ± 0.24**	<2	**0.164 T**	**0.132 T**	**2.18**	**1.22 ± 0.33**	**19.1 B**	**45.6 B**
RU7-REF-SB016	RU7-REF-SB016 (12-14)	9/19/2007	12 - 14		**1.39**	**12.4**	**0.78 ± 0.22**	**17.4 ± 4.1 J+**	**1 ± 0.23**	<2	0.182 T,UB	0.189 T,UB	**1.11 B**	**0.89 ± 0.25**	**18.5**	**44.3 B**
RU7-REF-SB017	RU7-REF-SB017 (6-8)	9/6/2007	6 - 8		0.355 T,UB	**12.5**	**0.61 ± 0.2**	**13.7 ± 3.5 J+**	**0.5 ± 0.12**	<2	**0.057 T**	**0.118 T**	**0.859 T**	**0.82 ± 0.24**	**16.8**	**45.2**
RU7-REF-SB018	RU7-REF-SB018 (15-17)	9/10/2007	15 - 17		**0.521 T,B**	**11.3 B**	**0.44 ± 0.15**	**14.9 ± 4.1 J+**	**0.85 ± 0.2**	<2	**0.0915 T**	**0.119 T**	**0.684 T**	**0.97 ± 0.27**	**15.3 B**	**37.2 B**
RU7-REF-SB019	RU7-REF-SB019 (15-17)	9/7/2007	15 - 17		0.396 T,UB	**11.8 B**	**0.67 ± 0.21**	**9.5 ± 3.2**	**0.9 ± 0.2**	<2	**0.051 T**	**0.112 T**	**1.46**	**1.24 ± 0.33**	**17.7 B**	**39 B**
RU7-REF-SB020	RU7-REF-SB020 (12-14)	9/20/2007	12 - 14		**0.442 T**	**11.5**	**0.57 ± 0.19**	**11.8 ± 3.4 J+**	**0.7 ± 0.18**	<2	<1	**0.119 T**	**0.718 T**	**1.01 ± 0.27**	**16.3 B**	**38.6**
RU7-REF-SB020 CL	RU7-REF-SB220 (12-14)	9/20/2007	12 - 14		**0.43 T**	**12.1**	**0.59 ± 0.17**	**12.5 ± 3.5 J+**	**0.77 ± 0.18**	<2	**0.0487 T**	**0.115 T**	**0.749 T**	**0.84 ± 0.24**	**16.2 B**	**39.4**
RU20-REF-SB001	RU20-REF-SB001 (5.5-7.5)	8/8/2007	5.5 - 7.5		**0.599 T**	**12.2**	**0.46 ± 0.25**	**18.6 ± 2.9 J+**	**1.04 ± 0.25**	<2	<1	0.209 T,UB	0.545 T,UB	**0.74 ± 0.16**	**16.1**	**44.4**
RU20-REF-SB002	RU20-REF-SB002 (4-6)	8/8/2007	4 - 6		**0.58 T,J-**	**12.1**	**0.62 ± 0.32**	**16.7 ± 2.7 J+**	**0.65 ± 0.19**	<2	<1	0.137 T,UB	0.594 T,UB	**0.68 ± 0.15**	**16.9**	**47.6 J**
RU20-REF-SB003	RU20-REF-SB003 (4.5-6.5)	8/9/2007	4.5 - 6.5		**0.528 T**	**11.1**	**0.51 ± 0.27**	**15.7 ± 2.5 J+**	**0.88 ± 0.2**	<2	<1	0.155 T,UB	0.683 T,UB	**0.77 ± 0.17**	**20.6**	**52.4**
RU20-REF-SB004	RU20-REF-SB004 (6-8)	8/9/2007	6 - 8		**0.529 T**	**10.9**	**0.34 ± 0.18**	**17.7 ± 2.8 J+**	**1.16 ± 0.27**	<2	<1	0.131 T,UB	0.58 T,UB	**0.81 ± 0.18**	**16.3**	**41.3**
RU20-REF-SB005	RU20-REF-SB005 (6-8)	8/9/2007	6 - 8		**0.549 T**	**12**	**0.4 ± 0.21**	**14.4 ± 3 J+**	**0.88 ± 0.22**	<2	<1	0.15 T,UB	0.772 T,UB	**0.79 ± 0.17**	**18.2**	**43.8**
RU20-REF-SB006	RU20-REF-SB006 (4-6)	8/9/2007	4 - 6		**0.777 T**	**11**	**0.5 ± 0.26**	**17.3 ± 2.8 J+**	**0.79 ± 0.2**	<2	<1	0.119 T,UB	0.597 T,UB	**0.76 ± 0.17**	**14.8**	**37.9**
RU20-REF-SB007	RU20-REF-SB007 (4-6)	8/9/2007	4 - 6		**0.494 T**	**12.5**	**0.66 ± 0.31**	**17.3 ± 2.7 J+**	**0.83 ± 0.22**	<2	<1	0.15 T,UB	0.63 T,UB	**0.86 ± 0.18**	**17.8**	**44.6**
RU20-REF-SB008	RU20-RREF-SB008 (4-6)	8/9/2007	4 - 6		**0.65 T**	**9.81**	**0.42 ± 0.23**	**15.6 ± 2.6 J+**	**0.59 ± 0.16**	<2	<1	0.102 T,UB	0.736 T,UB	**0.87 ± 0.18**	**15**	**34.7**
RU20-REF-SB009	RU20-REF-SB009 (6.5-8.5)	8/9/2007	6.5 - 8.5		**0.748 T**	**9.96**	**0.45 ± 0.25**	**16 ± 2.6 J+**	**0.98 ± 0.23**	<2	<1	0.12 T,UB	0.624 T,UB	**0.81 ± 0.18**	**18.8**	**179**
RU20-REF-SB010	RU20-REF-SB010 (6-8)	8/9/2007	6 - 8		**0.432 T**	**8.23**	**0.42 ± 0.24**	**14.7 ± 3.1 J+**	**0.69 ± 0.17**	<2	<1	0.148 T,UB	0.708 T,UB	**0.81 ± 0.17**	**14.7**	**29.7**
RU20-REF-SB010 CL	RU20-REF-SB210 (6-8)	8/9/2007	6 - 8		**0.372 T**	**9.97**	**0.31 ± 0.19**	**14.6 ± 2.4 J+**	**0.7 ± 0.2**	<2	<1	0.108 T,UB	0.826 T,UB	**0.8 ± 0.17**	**15.7**	**35.6**
RU20-REF-SB011	RU20-REF-SB011 (5-7)	8/10/2007	5 - 7		0.476 T,UB	**12.6**	**0.6 ± 0.19**	**16.3 ± 3.4 J+**	**1.29 ± 0.3**	0.567 T,UB	0.203 T,UB	0.238 T,UB	0.829 T,UB	**0.93 ± 0.19**	**22.9 B**	**49.8 B**
RU20-REF-SB012	RU20-REF-SB012 (5-7)	8/10/2007	5 - 7		0.317 T,UB	**12**	**0.46 ± 0.17**	**14.7 ± 3.1 J+**	**0.7 ± 0.19**	0.401 T,UB	0.066 T,UB	0.144 T,UB	0.637 T,UB	**0.79 ± 0.17**	**17.8 B**	**41.4 J,B**
RU20-REF-SB013	RU20-REF-SB013 (7-9)	8/10/2007	7 - 9		0.705 T,UB	**10.7**	**0.54 ± 0.19**	**13.8 ± 2.8 J+**	**0.79 ± 0.2**	0.7 T,UB	**1.64 B**	0.335 T,UB	0.617 T,UB	**0.73 ± 0.16**	**39.2 B**	**891 B**
RU20-REF-SB014	RU20-REF-SB014 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.496 T,UB	**10.3**	**0.41 ± 0.15**	**16.8 ± 3.5 J+**	**0.83 ± 0.2**	0.206 T,UB	0.111 T,UB	0.112 T,UB	0.76 T,UB	**0.88 ± 0.18**	**17.3 B**	**35.7 B**

TABLE 4-17

ORE AND SLAG REFERENCE AREAS INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

					Molybdenum	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte												
				Units	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**
				Background[a]	**2.15**	**15.5**	**3.58**	**20.5**	**3.88**	**1.36**	**1.9**	**0.27**	**NA**	**3.88**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**5,670**	**6,450**	**269**	**20.5[b]**	**3.88[b]**	**5,670**	**5,670**	**77.2**	**3,400**	**3.88[b]**	**7,950**	**340,000**
				Construction Worker SSL	**2,750**	**404**	**43.3**	**20.5[b]**	**3.88[b]**	**2,750**	**2,750**	**374**	**491**	**20.6**	**3,500**	**165,000**
				Utility Worker SSL	**35,800**	**5,250**	**563**	**136**	**12**	**35,800**	**35,800**	**4,870**	**6,390**	**267**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**81**	**130**	**3.58[f]**	**20.5[f]**	**3.88[f]**	**5**	**34**	**0.7**	**900**	**3.88[f]**	**6,000**	**12,000**
RU20-REF-SB015	RU20-REF-SB015 (5-7)	8/10/2007	5 - 7		0.539 T,UB	**12.6**	**0.54 ± 0.18**	**15.3 ± 3.3 J+**	**0.86 ± 0.22**	0.27 T,UB	0.107 T,UB	0.151 T,UB	0.752 T,UB	**0.69 ± 0.15**	**17.3 B**	**43.5 B**
RU20-REF-SB016	RU20-REF-SB016 (5-7)	8/10/2007	5 - 7		0.473 T,UB	**10.9**	**0.57 ± 0.2**	**15.2 ± 3.3 J+**	**1 ± 0.24**	0.566 T,UB	**0.287 T,B**	0.16 T,UB	1.44 UB	**0.84 ± 0.18**	**24 B**	**222 B**
RU20-REF-SB017	RU20-REF-SB017 (7-9)	8/10/2007	7 - 9		0.97 T,UB	**10.2**	**0.53 ± 0.18**	**17 ± 3.3 J+**	**0.72 ± 0.19**	0.949 T,UB	0.189 T,UB	0.762 T,UB	0.641 T,UB	**0.76 ± 0.16**	**21.7 B**	**1190 B**
RU20-REF-SB018	RU20-REF-SB018 (3-5)	8/10/2007	3 - 5		0.988 T,UB	**11**	**0.36 ± 0.14**	**16.8 ± 3.2 J+**	**0.78 ± 0.2**	0.204 T,UB	0.154 T,UB	0.117 T,UB	0.797 T,UB	**0.91 ± 0.19**	**20 B**	**36.3 B**
RU20-REF-SB019	RU20-REF-SB019 (2-4)	8/10/2007	2 - 4		0.357 T,UB	**11.3**	**0.56 ± 0.2**	**16 ± 3.2**	**0.85 ± 0.21**	0.279 T,UB	0.0891 T,UB	0.136 T,UB	0.833 T,UB	**0.75 ± 0.17**	**18.3 B**	**34.2 B**
RU20-REF-SB020	RU20-REF-SB020 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.611 T,UB	**9.73**	**0.54 ± 0.19**	**18.1 ± 2.8 J+**	**0.78 ± 0.19**	0.243 T,UB	0.106 T,UB	0.124 T,UB	0.964 T,UB	**0.92 ± 0.19**	**18.1 B**	**67.2 B**
RU20-REF-SB020 CL	RU20-REF-SB220 (2.5-4.5)	8/10/2007	2.5 - 4.5		0.733 T,UB	**10.4**	**0.53 ± 0.19**	**16.9 ± 3.2 J+**	**0.89 ± 0.22**	0.162 T,UB	0.118 T,UB	0.116 T,UB	0.591 T,UB	**1.09 ± 0.21**	**15 B**	**33.6 B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 12)

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
7	1	556348.1279	452623.3461	0.05
7	2	556452.8934	452518.5806	0.56
7	3	556452.8934	452623.3461	0.55
7	4	556452.8934	452728.1115	0.09
7	5	556557.6588	452309.0498	0.19
7	6	556557.6588	452413.8152	2.18
7	7	556557.6588	452518.5806	1.64
7	8	556557.6588	452623.3461	1.26
7	9	556557.6588	452728.1115	0.69
7	10	556662.4242	452309.0498	0.15
7	11	556662.4242	452413.8152	1.09
7	12	556662.4242	452518.5806	1.14
7	13	556662.4242	452623.3461	0.88
7	14	556662.4242	452728.1115	0.40
7	15	556767.1896	452309.0498	0.18
7	16	556767.1896	452413.8152	1.79
7	17	556767.1896	452518.5806	0.17
7	18	556767.1896	452623.3461	0.96
7	19	556767.1896	452728.1115	0.55
7	20	556767.1896	452832.8769	0.06
7	21	556871.9551	452413.8152	0.29
7	22	556871.9551	452518.5806	1.04
7	23	556871.9551	452623.3461	0.83
7	24	556871.9551	452728.1115	0.10
7	25	556871.9551	452832.8769	0.07
7	26	556976.7205	452413.8152	0.85
7	27	556976.7205	452518.5806	2.58
7	28	556976.7205	452623.3461	1.69
7	29	556976.7205	452728.1115	0.46
7	30	556976.7205	452832.8769	-0.03
7	31	557081.4859	452518.5806	0.21
7	32	557081.4859	452623.3461	0.41
7	33	557081.7330	452720.6850	1.03
7	34	557081.4859	452832.8769	1.29
7	35	557192.4900	452511.6880	0.52
7	36	557186.2514	452623.3461	0.07
7	37	557186.2514	452728.1115	0.39
7	38	557193.8610	452834.3840	1.30
7	39	557186.2514	452937.6424	0.05
7	40	557291.0168	452518.5806	0.70
7	41	557297.6710	452621.2480	0.28
7	42	557300.2900	452724.6390	1.60
7	43	557292.0400	452824.1600	0.14
7	44	557291.0168	452937.6424	0.07

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
7	45	557395.7822	452518.5806	0.89
7	46	557397.7050	452634.9400	0.27
7	47	557395.7822	452728.1115	1.39
7	48	557395.7822	452832.8769	1.14
7	49	557398.9930	452930.3820	0.70
7	50	557500.5477	452623.3461	1.24
7	51	557500.5477	452728.1115	0.43
7	52	557500.5477	452832.8769	0.63
7	53	557500.5477	452937.6424	1.70
7	54	557500.5477	453042.4078	0.08
7	55	557605.3131	452623.3461	0.31
7	56	557605.3131	452728.1115	0.11
7	57	557605.1170	452829.2070	0.31
7	58	557602.7590	452922.4720	2.91
7	59	557614.8920	452994.8830	0.84
7	60	557710.0785	452623.3461	-0.59
7	61	557717.7760	452721.6210	0.26
7	62	557710.0785	452832.8769	0.74
7	63	557710.0785	452937.6424	0.38
7	64	557713.2860	453026.5700	1.00
7	65	557799.3980	452606.7680	1.05
7	66	557808.0700	452732.9510	0.26
7	67	557814.8440	452832.8769	0.25
7	68	557814.8440	452937.6424	1.20
7	69	557814.8440	453042.4078	0.91
7	70	557919.6094	452623.3461	0.10
7	71	557925.3380	452723.1590	0.94
7	72	557924.5420	452827.2650	0.42
7	73	557906.1130	452950.1170	0.88
7	74	557919.6094	453042.4078	2.03
7	75	557919.6094	453147.1732	0.28
7	76	558024.3748	452728.1115	0.92
7	77	558024.3748	452832.8769	0.13
7	78	558024.3748	452937.6424	0.44
7	79	558024.3748	453042.4078	1.31
7	80	558024.3748	453147.1732	0.19
7	81	558129.1402	452728.1115	0.97
7	82	558129.1402	452832.8769	0.08
7	83	558129.1402	452937.6424	1.15
7	84	558139.3040	453022.4400	0.58
7	85	558129.8320	453140.1550	1.19
7	86	558236.8550	452730.9040	0.37
7	87	558238.5090	452827.3430	0.19
7	88	558233.9057	452937.6424	0.73

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
7	89	558233.9057	453042.4078	0.57
7	90	558233.9057	453147.1732	0.51
7	91	558338.6711	452728.1115	0.18
7	92	558341.3970	452843.2040	1.56
7	93	558338.6711	452937.6424	0.12
7	94	558338.6711	453042.4078	0.16
7	95	558338.6711	453147.1732	0.91
7	96	558443.4365	452728.1115	0.05
7	97	558443.4365	452832.8769	0.07
7	98	558443.4365	452937.6424	0.13
7	99	558443.4365	453042.4078	0.48
7	100	558443.4365	453147.1732	0.19
19 Bullrock	1	553975.2389	449322.6875	0.30
19 Bullrock	2	553975.2389	449373.0266	0.14
19 Bullrock	3	554025.5781	449322.6875	0.45
19 Bullrock	4	554025.5781	449373.0266	0.20
19 Bullrock	5	554075.9172	449322.6875	0.25
19 Bullrock	6	554075.9172	449373.0266	0.74
19 Bullrock	7	554075.9172	449423.3658	0.48
19 Bullrock	8	554126.2564	449322.6875	0.12
19 Bullrock	9	554126.2564	449373.0266	0.18
19 Bullrock	10	554126.2564	449423.3658	0.12
19 Bullrock	11	554165.3710	449334.7980	1.14
19 Bullrock	12	554176.5955	449373.0266	0.57
19 Bullrock	13	554176.5955	449423.3658	-0.30
19 Bullrock	14	554176.5955	449473.7049	0.28
19 Bullrock	15	554226.9347	449322.6875	0.10
19 Bullrock	16	554230.7150	449375.7870	0.16
19 Bullrock	17	554226.9347	449423.3658	0.48
19 Bullrock	18	554226.9347	449473.7049	0.34
19 Bullrock	19	554226.9347	449524.0441	0.88
19 Bullrock	20	554277.2738	449322.6875	0.82
19 Bullrock	21	554283.2990	449349.6610	0.07
19 Bullrock	22	554306.9280	449418.0640	0.15
19 Bullrock	23	554258.7670	449468.7000	0.10
19 Bullrock	24	554226.9347	449524.0441	1.27
19 Bullrock	25	554327.6130	449322.6875	0.17
19 Bullrock	26	554327.6130	449373.0266	0.18
19 Bullrock	27	554327.6130	449423.3658	0.11
19 Bullrock	28	554329.2440	449465.7670	0.27
19 Bullrock	29	554305.5040	449536.7360	0.23
19 Bullrock	30	554327.6130	449574.3832	4.80
19 Bullrock	31	554377.9521	449322.6875	0.08
19 Bullrock	32	554377.9521	449373.0266	0.10

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
19 Bullrock	33	554377.9521	449423.3658	0.14
19 Bullrock	34	554377.9521	449473.7049	0.33
19 Bullrock	35	554377.9521	449524.0441	0.06
19 Bullrock	36	554360.4110	449591.5940	0.26
19 Bullrock	37	554428.2913	449322.6875	0.09
19 Bullrock	38	554428.2913	449373.0266	0.10
19 Bullrock	39	554428.2913	449423.3658	0.11
19 Bullrock	40	554428.2913	449473.7049	0.05
19 Bullrock	41	554428.2913	449524.0441	0.21
19 Bullrock	42	554418.9340	449540.2060	-0.06
19 Bullrock	43	554431.8540	449622.6130	1.30
19 Bullrock	44	554478.6304	449322.6875	0.50
19 Bullrock	45	554478.6304	449373.0266	0.04
19 Bullrock	46	554478.6304	449423.3658	0.13
19 Bullrock	47	554478.6304	449473.7049	0.07
19 Bullrock	48	554478.6304	449524.0441	0.52
19 Bullrock	49	554485.8110	449610.3420	0.06
19 Bullrock	49	554485.8110	449610.3420	0.11
19 Bullrock	50	554478.6304	449624.7224	0.11
19 Bullrock	51	554478.6304	449675.0615	0.45
19 Bullrock	52	554528.9696	449322.6875	0.16
19 Bullrock	53	554528.9696	449373.0266	0.09
19 Bullrock	54	554528.9696	449423.3658	0.24
19 Bullrock	55	554528.9696	449473.7049	0.04
19 Bullrock	56	554528.9696	449524.0441	0.03
19 Bullrock	57	554527.7470	449554.1580	0.06
19 Bullrock	58	554528.9696	449624.7224	0.69
19 Bullrock	59	554528.9696	449675.0615	0.30
19 Bullrock	60	554528.9696	449725.4007	0.07
19 Bullrock	61	554579.3087	449322.6875	0.56
19 Bullrock	62	554579.3087	449373.0266	0.23
19 Bullrock	63	554579.3087	449423.3658	0.06
19 Bullrock	64	554579.3087	449473.7049	0.31
19 Bullrock	65	554579.3087	449524.0441	0.11
19 Bullrock	66	554585.0560	449544.4740	0.10
19 Bullrock	67	554579.3087	449624.7224	0.24
19 Bullrock	68	554579.3087	449675.0615	0.08
19 Bullrock	69	554579.3087	449725.4007	0.10
19 Bullrock	70	554629.6479	449322.6875	0.49
19 Bullrock	71	554629.6479	449373.0266	0.09
19 Bullrock	72	554629.6479	449423.3658	0.16
19 Bullrock	73	554629.6479	449473.7049	-0.27
19 Bullrock	74	554629.6479	449524.0441	0.94
19 Bullrock	75	554686.4670	449564.1790	-0.02

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
19 Bullrock	76	554629.6479	449624.7224	0.14
19 Bullrock	77	554629.6479	449675.0615	0.06
19 Bullrock	78	554629.6479	449725.4007	0.10
19 Bullrock	79	554629.6479	449775.7398	0.07
19 Bullrock	80	554679.9870	449624.7224	0.09
19 Bullrock	81	554748.2010	449677.6670	0.13
19 Bullrock	82	554679.9870	449725.4007	0.04
19 Bullrock	83	554679.9870	449775.7398	0.07
19 Bullrock	84	554679.9870	449826.0790	1.38
19 Bullrock	85	554791.1060	449725.5840	0.17
19 Bullrock	86	554730.3262	449775.7398	0.26
19 Bullrock	87	554730.3262	449826.0790	0.85
19 Bullrock	88	554837.3620	449781.1890	0.29
19 Bullrock	89	554780.6653	449826.0790	0.37
19 Bullrock	90	554780.6653	449876.4181	0.31
19 Bullrock	91	554875.4250	449820.0880	0.11
19 Bullrock	92	554826.7680	449867.2480	0.92
19 Bullrock	93	554831.0045	449926.7573	0.17
19 Bullrock	94	554881.3436	449926.7573	0.47
19 Bullrock	95	554881.3436	449977.0964	0.04
19 Bullrock	96	554933.7490	449983.3020	0.09
19 Bullrock	97	554931.6828	450027.4356	0.07
19 Bullrock	98	555041.7460	450023.5320	0.12
19 Bullrock	99	554982.0219	450077.7747	1.36
19 Bullrock	100	555073.1120	450068.2410	0.11
19 Slag pile	1	554687.5520	448025.2350	0.05
19 Slag pile	2	554691.1930	448275.3990	0.49
19 Slag pile	3	554715.9360	448531.6435	0.49
19 Slag pile	4	554715.9360	448781.0127	0.14
19 Slag pile	5	554723.1240	449521.4020	0.16
19 Slag pile	6	554965.3052	448032.9051	0.08
19 Slag pile	7	554995.5360	448282.1080	0.09
19 Slag pile	8	554965.3052	448531.6435	0.06
19 Slag pile	9	554965.3052	448781.0127	0.13
19 Slag pile	10	554965.3052	449030.3819	0.07
19 Slag pile	11	554965.3052	449279.7511	0.14
19 Slag pile	12	554965.3052	449529.1203	0.11
19 Slag pile	13	554940.5420	449808.9450	0.17
19 Slag pile	14	555206.1330	448049.2240	0.03
19 Slag pile	15	555209.7910	448305.1720	0.12
19 Slag pile	16	555214.6744	448531.6435	0.06
19 Slag pile	17	555214.6744	448781.0127	-0.13
19 Slag pile	18	555173.0590	449028.1520	0.32
19 Slag pile	19	555171.8490	449273.3340	0.09

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
19 Slag pile	20	555214.6744	449529.1203	0.13
19 Slag pile	21	555214.6744	449778.4895	0.10
19 Slag pile	22	555143.7590	450090.4400	0.30
19 Slag pile	23	555464.0436	448032.9051	0.11
19 Slag pile	24	555464.0436	448282.2743	0.37
19 Slag pile	25	555451.9420	448543.1720	0.13
19 Slag pile	26	555464.0436	448781.0127	0.09
19 Slag pile	27	555441.0800	449038.1770	0.06
19 Slag pile	28	555464.0436	449279.7511	0.28
19 Slag pile	29	555466.6070	449447.4060	0.07
19 Slag pile	30	555464.0436	449778.4895	0.10
19 Slag pile	31	555464.0436	450027.8587	0.09
19 Slag pile	32	555464.0436	450277.2279	0.13
19 Slag pile	33	555713.4129	448282.2743	0.12
19 Slag pile	34	555659.1200	448531.3460	-0.21
19 Slag pile	35	555713.4129	448781.0127	0.31
19 Slag pile	36	555741.0460	449027.8430	0.46
19 Slag pile	37	555712.1840	449275.4510	0.05
19 Slag pile	38	555713.4129	449529.1203	-0.15
19 Slag pile	39	555697.8910	449764.9750	0.11
19 Slag pile	40	555713.4129	450027.8587	0.29
19 Slag pile	41	555713.4129	450277.2279	0.68
19 Slag pile	42	555713.4129	450526.5971	0.25
19 Slag pile	43	555967.7960	448319.1200	0.13
19 Slag pile	44	555962.7821	448531.6435	0.12
19 Slag pile	45	555962.7821	448781.0127	0.11
19 Slag pile	46	555962.7821	449030.3819	0.11
19 Slag pile	47	555962.7821	449279.7511	0.16
19 Slag pile	48	556000.6450	449514.6550	0.18
19 Slag pile	49	556003.3200	449820.7230	0.16
19 Slag pile	50	555962.7821	450027.8587	0.10
19 Slag pile	51	555962.7821	450277.2279	0.28
19 Slag pile	52	555962.7821	450526.5971	0.27
19 Slag pile	53	556214.1030	448511.3700	1.13
19 Slag pile	54	556212.1513	448781.0127	0.51
19 Slag pile	55	556212.1513	449030.3819	0.05
19 Slag pile	56	556212.1513	449279.7511	0.08
19 Slag pile	57	556247.0420	449532.5510	0.15
19 Slag pile	58	556274.8210	449675.9570	0.18
19 Slag pile	59	556247.1510	450020.6240	0.09
19 Slag pile	60	556240.8630	450232.1360	0.42
19 Slag pile	61	556201.5850	450520.0470	0.25
19 Slag pile	62	556234.5670	450758.5070	0.08
19 Slag pile	63	556417.1680	448560.9630	0.15

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
19 Slag pile	64	556461.5205	448781.0127	0.30
19 Slag pile	65	556461.5205	449030.3819	0.29
19 Slag pile	66	556599.9460	449275.5880	0.63
19 Slag pile	67	556461.5205	449529.1203	0.13
19 Slag pile	68	556461.5205	449778.4895	0.05
19 Slag pile	69	556456.4720	450051.6830	0.17
19 Slag pile	70	556483.2920	450257.9700	0.01
19 Slag pile	71	556443.8720	450574.3060	0.32
19 Slag pile	72	556459.7440	450775.2900	0.12
19 Slag pile	73	556461.5205	451025.3355	0.84
19 Slag pile	74	556869.8060	448775.2670	0.36
19 Slag pile	75	556661.1590	449061.3360	0.11
19 Slag pile	76	556710.8897	449279.7511	-0.07
19 Slag pile	77	556710.8897	449529.1203	0.07
19 Slag pile	78	556710.8897	449778.4895	0.17
19 Slag pile	79	556712.2270	450027.2760	0.09
19 Slag pile	80	556710.8897	450277.2279	0.17
19 Slag pile	81	556703.3970	450495.3100	0.17
19 Slag pile	82	556631.4410	450684.1850	0.22
19 Slag pile	83	556715.8950	451052.5590	0.10
19 Slag pile	84	556967.7950	449032.5670	1.12
19 Slag pile	85	557080.5820	449247.4340	0.74
19 Slag pile	86	556762.0180	449547.8590	0.03
19 Slag pile	87	556938.7010	449814.0160	0.17
19 Slag pile	88	556960.2589	450027.8587	0.12
19 Slag pile	89	556964.1350	450274.0040	0.09
19 Slag pile	90	556960.2589	450526.5971	0.09
19 Slag pile	91	556966.1580	450771.4560	0.10
19 Slag pile	92	556965.3500	451021.9700	0.11
19 Slag pile	93	557245.3370	449521.4400	1.02
19 Slag pile	94	557279.0460	449783.7320	0.81
19 Slag pile	95	557229.6100	450029.7420	0.27
19 Slag pile	96	557209.6281	450277.2279	0.50
19 Slag pile	97	557212.5100	450431.7350	0.28
19 Slag pile	98	557209.6281	450775.9663	0.45
19 Slag pile	99	557207.7130	451021.2200	0.40
19 Slag pile	100	557214.5430	451266.4920	0.42
22b	1	550652.8297	448536.3428	0.95
22b	2	550652.8297	448643.6746	0.70
22b	3	550652.8297	448751.0063	0.18
22b	4	550760.1615	448643.6746	0.27
22b	5	550760.1615	448751.0063	0.71
22b	6	550760.1615	448858.3381	1.11
22b	7	550867.4932	448751.0063	0.64

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
22b	8	550867.4932	448858.3381	0.24
22b	9	550867.4932	448965.6698	0.55
22b	10	550867.4932	449073.0016	0.95
22b	11	550974.8250	448858.3381	0.77
22b	12	550974.8250	448965.6698	0.08
22b	13	550974.8250	449073.0016	0.09
22b	14	550974.8250	449180.3333	0.47
22b	15	551082.1568	448858.3381	0.27
22b	16	551082.1568	448965.6698	0.08
22b	17	551082.1568	449073.0016	0.16
22b	18	551082.1568	449180.3333	0.83
22b	19	551082.1568	449287.6651	0.37
22b	20	551082.1568	449394.9969	0.29
22b	21	551189.4885	448965.6698	0.23
22b	22	551189.4885	449073.0016	0.12
22b	23	551189.4885	449180.3333	0.32
22b	24	551189.4885	449287.6651	0.30
22b	25	551189.4885	449394.9969	0.33
22b	26	551296.8203	449073.0016	0.49
22b	27	551296.8203	449180.3333	0.78
22b	28	551296.8203	449287.6651	0.90
22b	29	551296.8203	449394.9969	0.68
22b	30	551296.8203	449502.3286	0.71
22b	31	551404.1520	449180.3333	1.80
22b	32	551404.1520	449287.6651	0.86
22b	33	551404.1520	449394.9969	0.84
22b	34	551404.1520	449502.3286	1.17
22b	35	551511.4838	449287.6651	0.90
22b	36	551511.4838	449394.9969	0.85
22b	37	551511.4838	449502.3286	0.79
22b	38	551511.4838	449609.6604	0.51
22b	39	551618.8155	449287.6651	0.38
22b	40	551618.8155	449394.9969	0.21
22b	41	551618.8155	449502.3286	0.40
22b	42	551618.8155	449609.6604	1.30
22b	43	551726.1473	449287.6651	0.61
22b	44	551726.1473	449394.9969	0.27
22b	45	551726.1473	449502.3286	0.52
22b	46	551726.1473	449609.6604	0.22
22b	47	551726.1473	449716.9921	0.49
22b	48	551833.4791	449287.6651	0.12
22b	49	551833.4791	449394.9969	0.72
22b	50	551833.4791	449502.3286	0.38
22b	51	551833.4791	449609.6604	1.47

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
22b	52	551833.4791	449716.9921	0.82
22b	53	551940.8108	449287.6651	0.35
22b	54	551940.8108	449394.9969	0.90
22b	55	552048.1426	449287.6651	0.34
22b	56	552048.1426	449394.9969	0.48
22b	57	552155.4743	449287.6651	0.28
22b	58	552155.4743	449394.9969	0.18
22b	59	552262.8061	449287.6651	-0.09
22b	60	552262.8061	449394.9969	1.46
22b	61	552370.1378	449287.6651	0.66
22b	62	552370.1378	449394.9969	1.07
22b	63	552477.4696	449287.6651	0.52
22b	64	552477.4696	449394.9969	0.49
22b	65	552584.8014	449287.6651	0.29
22b	66	552584.8014	449394.9969	0.18
22b	67	552692.1331	449394.9969	0.44
22b	68	552799.4649	449394.9969	0.55
22b	69	552906.7966	449394.9969	1.16
22b	70	552931.1583	449967.3575	0.30
22b	71	553038.4900	449752.6940	0.59
22b	72	553032.1800	449861.8970	1.43
22b	73	553038.4900	449967.3575	0.06
22b	74	553145.8218	449860.0257	1.53
22b	75	553145.8218	449967.3575	1.02
22b	76	553253.1536	450074.6892	0.24
22b	77	553392.7755	449381.8562	1.67
22b	78	553500.1072	449381.8562	1.31
22b	79	553607.4390	449381.8562	3.02
22b	80	553714.7708	449381.8562	1.50
22b	81	553714.7708	449489.1880	1.22
22b	82	553822.1025	449381.8562	0.12
22b	83	553822.1025	449489.1880	0.49
22b	84	553929.4343	449381.8562	0.07
22b	85	553929.4343	449489.1880	0.13
22b	86	553929.4343	449596.5197	0.22
22b	87	554036.7660	449489.1880	0.99
22b	88	554036.7660	449596.5197	0.31
22b	89	554144.0978	449489.1880	0.48
22b	90	554144.0978	449596.5197	1.73
22b	91	554251.4295	449596.5197	0.87
22b	92	554251.4295	449703.8515	2.41
22b	93	554358.7613	449703.8515	1.02
22b	94	554358.7613	449811.1833	1.69
22b	95	554466.0931	449703.8515	1.13

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
22b	96	554466.0931	449811.1833	1.89
22b	97	554466.0931	449918.5150	0.16
22b	98	554573.4248	449811.1833	0.60
22b	99	554573.4248	449918.5150	0.22
22b	100	554680.7566	449918.5150	0.36
22b	101	553778.2085	450301.5810	1.02
22b	102	553778.2085	450410.5831	0.10
22b	103	553887.2107	450192.5788	0.75
22b	104	553887.2107	450301.5810	0.82
22b	105	553887.2107	450410.5831	1.83
22b	106	553996.2128	450192.5788	0.71
22b	107	553996.2128	450301.5810	2.43
22b	108	553996.2128	450410.5831	0.49
22b	109	554105.2150	450192.5788	1.74
22b	110	554105.2150	450301.5810	--
22b	111	554105.2150	450410.5831	0.89
22b	112	554105.2150	450519.5853	0.19
22b	113	554105.2150	450628.5874	0.07
22b	114	554214.2172	450192.5788	0.33
22b	115	554214.2172	450301.5810	1.13
22b	116	554214.2172	450410.5831	0.06
22b	117	554214.2172	450519.5853	-0.18
22b	118	554214.2172	450628.5874	0.60
22b	119	554214.2172	450737.5896	0.10
22b	120	554214.2172	450846.5918	-0.06
22b	121	554214.2172	450955.5939	0.09
22b	122	554214.2172	451064.5961	0.11
22b	123	554214.2172	451173.5983	0.09
22b	124	554323.2193	450083.5766	1.29
22b	125	554323.2193	450192.5788	1.23
22b	126	554323.2193	450301.5810	0.47
22b	127	554323.2193	450410.5831	0.11
22b	128	554323.2193	450519.5853	0.49
22b	129	554323.2193	450628.5874	0.22
22b	130	554323.2193	450737.5896	-0.27
22b	131	554323.2193	450846.5918	0.09
22b	132	554323.2193	450955.5939	0.04
22b	133	554323.2193	451064.5961	0.10
22b	134	554323.2193	451173.5983	0.07
22b	135	554432.2215	450410.5831	0.00
22b	136	554432.2215	450519.5853	0.15
22b	137	554432.2215	450628.5874	0.12
22b	138	554432.2215	450737.5896	0.05
22b	139	554432.2215	450846.5918	0.08

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
22b	140	554432.2215	450955.5939	0.07
22b	141	554432.2215	451064.5961	0.07
22b	142	554541.2236	450410.5831	0.16
22b	143	554541.2236	450519.5853	0.27
22b	144	554541.2236	450628.5874	0.12
22b	145	554541.2236	450737.5896	0.20
22b	146	554541.2236	450846.5918	0.11
22b	147	554541.2236	450955.5939	-0.08
22b	148	554541.2236	451064.5961	0.13
22b	149	554650.2258	450410.5831	0.00
22b	150	554650.2258	450519.5853	0.13
22b	151	554650.2258	450628.5874	0.12
22b	152	554650.2258	450737.5896	0.61
22b	153	554650.2258	450846.5918	1.79
22b	154	554650.2258	450955.5939	0.08
22b	155	554650.2258	451064.5961	0.10
22b	156	554759.2280	450410.5831	0.02
22b	157	554759.2280	450519.5853	0.10
22b	158	554759.2280	450628.5874	1.22
22b	159	554759.2280	450737.5896	1.49
22b	160	554759.2280	450846.5918	1.45
22b	161	554759.2280	450955.5939	1.37
22b	162	554759.2280	451064.5961	0.14
22b	163	554759.2280	451173.5983	0.45
22b	164	554759.2280	451282.6004	0.09
22b	165	554868.2301	450519.5853	0.06
22b	166	554868.2301	450628.5874	0.49
22b	167	554868.2301	450737.5896	0.64
22b	168	554868.2301	450846.5918	1.11
22b	169	554868.2301	450955.5939	0.05
22b	170	554868.2301	451064.5961	0.53
22b	171	554868.2301	451173.5983	0.34
22b	172	554868.2301	451282.6004	0.14
22b	173	554868.2301	451391.6026	0.13
22b	174	554977.2323	450846.5918	0.90
22b	175	554977.2323	450955.5939	1.14
22b	176	554977.2323	451064.5961	0.16
22b	177	554977.2323	451173.5983	0.83
22b	178	554977.2323	451282.6004	0.36
22b	179	554977.2323	451391.6026	0.17
22b	180	555086.2344	450846.5918	0.86
22b	181	555086.2344	450955.5939	0.19
22b	182	555086.2344	451064.5961	0.30
22b	183	555086.2344	451173.5983	0.22

TABLE 4-18

RADON FLUX INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

RU	Field Location ID	Easting	Northing	Net Flux (pCi/m2/s)
22b	184	555086.2344	451282.6004	0.48
22b	185	555086.2344	451391.6026	0.11
22b	186	555195.2366	450846.5918	0.20
22b	187	555195.2366	450955.5939	1.27
22b	188	555195.2366	451064.5961	0.55
22b	189	555195.2366	451173.5983	0.28
22b	190	555195.2366	451282.6004	0.65
22b	191	555195.2366	451391.6026	0.39
22b	192	555304.2388	451282.6004	0.48
22b	193	555304.2388	451391.6026	0.12
22b	194	555413.2409	451282.6004	0.09
22b	195	555413.2409	451391.6026	0.07
22b	196	555522.2431	451391.6026	0.08
22b	197	555522.2431	451500.6047	0.17
22b	198	555631.2453	451500.6047	1.32
22b	199	555631.2453	451609.6069	0.10
22b	200	555740.2474	451609.6069	0.06

Notes:

1. Shading indicates that the measurement was moved from the original location. Measurement was located as close as possible to the orginal location and was never moved more than 30 feet from the original location. Final coordinates were lost due to a corrupt data file and the original coordinates are provided herein.

2. Coordinates in State Plane, Idaho East, NAD 83, feet

TABLE 4-19

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 7
(SHALE UNLOAD, CRUSHING AND STOCKPILE)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario									
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker		Off-Site Resident	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk										
COCs										
Incidental Soil Ingestion	9.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	5.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	7.E-06	Benzo(a)pyrene	5.E-07	-	NA	-
Dermal Absorption	8.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	NA	-	3.E-06	Benzo(a)pyrene	6.E-07	-	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	Cd	1.E-07	-	5.E-08	-
Total COPC Lifetime Incremental Cancer Risk	*2.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*5.E-05*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*1.E-05*	*Benzo(a)pyrene, Cd*	*1.E-06*		*5.E-08*	
ROCs										
External Exposure to Gamma Radiation	1.E-03	Ra-226, U-238	5.E-04	Ra-226, U-238	3.E-05	Ra-226	2.E-06	Ra-226	NA	-
Incidental Soil Ingestion	6.E-05	Pb-210, Ra-226	4.E-05	Pb-210, Ra-226	5.E-06	Pb-210	4.E-07	-	NA	-
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	3.E-07	-	NA	-	3.E-06	Pb-210, Ra-226	3.E-07	-	8.E-08	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, Pb-210*	*5.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*3.E-06*	*Ra-226*	*8.E-08*	
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, Benzo(a)pyrene**	**6.E-04**	**Ra-226, Benzo(a)pyrene**	**5.E-05**	**Ra-226, Benzo(a)pyrene**	**4.E-06**	**Ra-226**	**1.E-07**	**-**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient										
COCs										
Incidental Soil Ingestion	0.1	-	0.07	-	0.2	-	0.02	-	NA	-
Dermal Absorption	0.04	-	NA	-	0.03	-	0.01	-	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	0.002	-	NA	-	0.3	-	0.02	-	0.0003	-
Total Incremental Non-Cancer Hazard Quotient	**0.2**	**-**	**0.07**	**-**	**0.6**	**-**	**0.05**	**-**	**0.0003**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-20

FORMER KILN AND PHOSSY POND DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 4)

				Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury	Molybdenum
			Analyte																
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg
			Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16	2.15
			Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340	5,670
			Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464	2,750
			Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030	35,800
			SSL Protective of Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2	81
Location Identification	Field Sample Identification	Date Collected	Depth (ft)																
RU8-CAP-SB001	RU8-CAP-SB001 (8-10)	10/02/07	8 - 10	0.14 T,UB	2.7	95 B	0.46 T	3.2 T,UB	0.6 T,B	9.6 B	3.7 B	6.4 B	17	6.9 B	0.94 ± 0.25	7.1 B	320 B	<0.033	0.87 T,UB
RU8-CAP-SB002	RU8-CAP-SB002 (12-14)	10/02/07	12 - 14	<1	2.8	100 B	0.54 T	3.3 T,UB	0.29 T,B	10 B	4.4 B	7.2 B	11	7.5 B	0.86 ± 0.23	8 B	390 B	0.02 T	0.62 T,UB
RU8-CAP-SB003	RU8-CAP-SB003 (15-17)	10/02/07	15 - 17	<1	2.6	90 B	0.53 T	3.9 T,UB	0.28 T,B	12 B	4.2 B	6.6 B	23	7.4 B	1.01 ± 0.27	7.6 B	460 B	<0.033	0.87 T,UB
RU8-CAP-SB004	RU8-CAP-SB004 (7-9)	10/02/07	7 - 9	<1	2.7	100 B	0.55 T	4.5 T,UB	0.27 T,B	11 B	4.3 B	7.4 B	<5	7.3 B	0.86 ± 0.23	8.8 B	350 B	0.0033 T	1.1 UB
RU8-CAP-SB005	RU8-CAP-SB005 (4-6)	10/03/07	4 - 6	<1	2.9	110 B	0.62 T	5.9 T,UB	0.26 T,B	11 B	4.5 B	7.4 B	<5	7.4 B	0.89 ± 0.24	9.9 B	350 B	0.01 T,UB	0.41 T,UB
RU8-CAP-SB006	RU8-CAP-SB006 (3-5)	10/03/07	3 - 5	0.17 T,UB	12	120 B	0.62 T	6.9 T,UB	0.33 T,B	11 B	4.6 B	8.1 B	<5 UJ	8 B	1.08 ± 0.29	11 B	370 B	0.01 T,UB	1 UB
RU8-CAP-SB007	RU8-CAP-SB007 (3-5)	10/03/07	3 - 5	0.57 T,UB	6.5	120 B	0.84 T	7.8 T,B	100 B	27 B	5 B	12 B	110	10 B	1.18 ± 0.31	12 B	370 B	0.028 T,B	0.95 T,UB
RU8-CAP-SB008	RU8-CAP-SB008 (7-9)	10/03/07	7 - 9	<1	3	130 B	0.62 T	5.3 T,UB	0.56 T,B	11 B	4.5 B	8.1 B	47	8.1 B	0.89 ± 0.24	11 B	350 B	0.013 T,B	0.47 T,UB
RU8-CAP-SB009	RU8-CAP-SB009 (5-7)	10/03/07	5 - 7	2.5 B	9.8	130 B	1.3	8.4 T,B	170 B	42 B	4.7 B	19 B	220 D	9.2 B	1.24 ± 0.32	11 B	270 B	0.096 B	1.1 UB
RU8-CAP-SB010	RU8-CAP-SB010 (5.5-7.5)	10/03/07	5.5 - 7.5	<1	3	120 B	0.6 T	6.2 T,UB	0.41 T,B	11 B	4.4 B	7.7 B	8.2	7.5 B	0.82 ± 0.23	12 B	350 B	0.011 T,B	0.44 T,UB
RU8-CAP-SB010 CL	RU8-CAP-SB210 (5.5-7.5)	10/04/07	5.5 - 7.5	<1	2.8	120 B	0.59 T	6.3 T,UB	0.33 T,B	11 B	4.4 B	7.6 B	<5	7.7 B	0.89 ± 0.24	11 B	350 B	0.01 T,UB	0.42 T,UB
RU8-CAP-SB011	RU8-CAP-SB011 (4-6)	10/04/07	4 - 6	<1	2.5	90 B	0.49 T	5 T,UB	0.24 T,B	9.5 B	4 B	6.5 B	7.1	6.4 B	0.95 ± 0.26	8.4 B	310 B	0.0095 T,UB	0.43 T,UB
RU8-CAP-SB012	RU8-CAP-SB012 (4-6)	10/04/07	4 - 6	<1	2.3	99 B	0.46 T	4 T,UB	0.43 T,B	10 B	4 B	6.5 B	45	6.6 B	1.03 ± 0.27	7.7 B	320 B	0.011 T,B	0.73 T,UB
RU8-CAP-SB013	RU8-CAP-SB013 (5-7)	10/04/07	5 - 7	2.8 B	13	130 B	2	7.1 T,UB	410 B	12 B	5 B	7.7 B	140	7.1 B	0.91 ± 0.24	9.7 B	300 B	0.019 T,B	0.65 T,UB
RU8-CAP-SB014	RU8-CAP-SB014 (8-10)	10/04/07	8 - 10	<1	2.7	100 B	0.62 T	4.6 T,UB	0.78 T,B	13 B	4.1 B	6.6 B	10	7.4 B	1.01 ± 0.27	8.2 B	350 B	0.013 T,B	0.34 T,UB
RU22b-CAP-SB001	RU22B-CAP-SB001 (0-2)	09/28/07	0 - 2	0.15 T	3.3	126 B	0.598 T	7.14 T	0.903 T	10.6 B	4.33	10.2	13	8.78	0.75 ± 0.22	11	424 B	0.011 T,B	0.318 T
RU22b-CAP-SB001	RU22B-CAP-SB001 (2-10)	09/28/07	2 - 10	<1	3.3	125 B	0.564 T	6.62 T	0.315 T	10.2 B	4.38	8.15	<5	7.95	0.73 ± 0.2	10.4	363 B	0.0099 T,B	0.367 T
RU22b-CAP-SB002	RU22B-CAP-SB002 (4-6)	09/28/07	4 - 6	<1 UJ	3.07	126 B	0.572 T	7.06 T	0.346 T	9.82 B	4.26	9.46 J	<5 UJ	7.97	0.71 ± 0.21	10.8	391 B	0.0096 T,B	0.277 T
RU22b-CAP-SB003	RU22B-CAP-SB003 (7-9)	09/28/07	7 - 9	<1	3.29	148 B	0.565 T	6.92 T	0.343 T	10.4 B	4.83	8.3	<5	8.51	0.8 ± 0.22	10.3	368 B	0.011 T,B	0.414 T
RU22b-CAP-SB004	RU22B-CAP-SB004 (9-11)	09/28/07	9 - 11	<1	3.24	134 B	0.636 T	8.9 T	0.675 T	12.6 B	4.9	11.3	<5	9.13	0.79 ± 0.22	12.6	473 B	0.012 T,B	0.351 T
RU22b-CAP-SB005	RU22B-CAP-SB005 (13-15)	10/01/07	13 - 15	0.181 T	3.42	150 B	0.635 T	7.02 T	0.334 T	11.3 B	4.76	9.4	39	8.7	0.84 ± 0.23	12.9	403 B	0.0017 T	0.511 T
RU22b-CAP-SB006	RU22B-CAP-SB006 (5-7)	10/01/07	5 - 7	<1	2.96	131 B	0.589 T	8.12 T	0.363 T	10.2 B	4.59	9.07	27 J-	8.38	0.71 ± 0.2	11.9	465 B	<0.033	0.357 T
RU22b-CAP-SB007	RU22B-CAP-SB007 (5-7)	10/01/07	5 - 7	<1	3.07	123 B	0.59 T	7.25 T	0.289 T	11.5 B	4.4	10.1	19	7.89	0.77 ± 0.22	11.3	406 B	<0.033	0.437 T
RU22b-CAP-SB008	RU22B-CAP-SB008 (4-6)	10/01/07	4 - 6	<1	3.85	136 B	0.61 T	10.1	0.323 T	11.6 B	4.67	9.59	25	8.25	0.81 ± 0.22	12.8	385 B	0.0026 T	0.778 T
RU22b-CAP-SB009	RU22B-CAP-SB009 (3-5)	10/01/07	3 - 5	0.132 T	3.71	129 B	0.565 T	8.22 T	0.299 T	15.7 B	4.15	9.96	<5	7.96	0.84 ± 0.23	11.9	354 B	<0.033	0.681 T
RU22b-CAP-SB010	RU22B-CAP-SB010 (12-14)	10/01/07	12 - 14	<1	3.23	112 B	0.494 T	7.02 T	0.29 T	12 B	4.48	7.51	39	7.31	0.95 ± 0.26	11.1	355 B	<0.033	1.04
RU22b-CAP-SB010 CL	RU22B-CAP-SB210 (12-14)	10/01/07	12 - 14	0.185 T	3.07	127 B	0.464 T	6.68 T	0.269 T	10.8 B	4.41	6.79	32	7.06	0.75 ± 0.21	9.75	350 B	<0.033	0.686 T
RU22b-CAP-SB011	RU22B-CAP-SB011 (5-7)	10/01/07	5 - 7	0.379 T	3.33	121 B	0.585 T	7.88 T	8.24	24.4 B	4.75	9.01	<5	10.3	1.21 ± 0.31 J+	12.8	400 B	<0.033	1.96
RU22b-CAP-SB012	RU22B-CAP-SB012 (3-5)	10/02/07	3 - 5	0.15 T,UB	3.3	130 B	0.66 T	8.6 T,B	0.55 T,B	12 B	4.8 B	10 B	<5	9.1 B	0.88 ± 0.24	17 B	420 B	0.0056 T	0.39 T,UB
RU22b-CAP-SB013	RU22B-CAP-SB013 (5-7)	10/02/07	5 - 7	0.19 T,J-,UB	3	130 B	0.55 T	6.9 T,UB	0.32 T,B	11 B	4.5 B	7.9 B	20 J-	7.8 B	0.83 ± 0.22	11 B	340 B	0.015 T	1.3 B
RU22b-CAP-SB014	RU22B-CAP-SB014 (10-12)	10/02/07	10 - 12	0.14 T,UB	3.6	140 B	0.59 T	11 B	0.48 T,B	14 B	4.7 B	8.5 B	20	8.1 B	0.85 ± 0.23	11 B	380 B	<0.033	0.45 T,UB
RU22b-CAP-SB015	RU22B-CAP-SB015 (8-10)	10/02/07	8 - 10	17 B	46 J	120 B	1.6	42 B	330 J,B	610 J,B	3.6 J,B	56 J,B	22	68 B	29.9 ± 7.2	8.1 B	260 J,B	0.063	16 J,B
RU22b-CAP-SB015 CL	RU22B-CAP-SB215 (8-10)	10/02/07	8 - 10	16 B	44 J	120 B	1.6	41 B	310 J,B	600 J,B	3.6 J,B	55 J,B	15	65 B	28 ± 6.7	7.7 B	260 J,B	0.072	15 J,B
RU22b-CAP-SB016	RU22B-CAP-SB016 (0-2)	10/05/07	0 - 2	<1	3.5	135 B	0.632 T	8.21 T	1.26	12.4 B	4.94	11.3	13	9.37	0.72 ± 0.2	12.8	478 B	0.017 T,B	0.375 T
RU22b-CAP-SB016	RU22B-CAP-SB016 (2-10)	10/05/07	2 - 10	<1	3.43	126 B	0.568 T	7.22 T	0.509 T	11.4 B	4.83	9.23	<5	8.67	0.8 ± 0.22	11.4	398 B	0.013 T,B	0.379 T
RU22b-CAP-SB017	RU22b-CAP-SB017 (4-6)	11/29/07	4 - 6	13.8	70.2	178	1.41	41.4 J-	220	729 B	4.11	80.1	10	77.2	22.7 ± 5.5	8.17	609	0.071	24.8
RU22b-CAP-SB018	RU22b-CAP-SB018 (5-7)	11/29/07	5 - 7	13.3	60.3	159	1.41	36.4 J-	158	683 J-,B	4.33	84.3	16 J-	86.5 J+	20.3 ± 4.9	8.76	503	0.11 J+	20.9

TABLE 4-20

FORMER KILN AND PHOSSY POND DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 4)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury	Molybdenum
				Analyte																
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg
				Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16	2.15
				Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340	5,670
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464	2,750
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030	35,800
				SSL Protective of Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2	81
RU22b-CAP-SB019	RU22b-CAP-SB019 (4-6)	11/29/07	4 - 6		**13.7**	**71.9**	**154**	**1.49**	**41.7 J-**	**201**	**700 B**	**4.18**	**76.9**	**12**	**56**	**22.4 ± 5.4**	**8.53**	**433**	**0.075**	**19.9**
RU22b-CAP-SB020	RU22b-CAP-SB020 (4-6)	11/29/07	4 - 6		**13.8**	**67.3**	**162**	**1.48**	**42.7 J-**	**175**	**678 B**	**4.09**	**78.6**	**25**	**46.8**	**23.1 ± 5.6**	**7.85**	**475**	**0.068**	**19.1**
RU22b-CAP-SB020 CL	RU22b-CAP-SB220 (4-6)	11/29/07	4 - 6		**14.2**	**69.9**	**161**	**1.54**	**45.9 J-**	**177**	**713 B**	**4.26**	**81.7**	**47**	**39.1**	**21.5 ± 5.2**	**8.11**	**467**	**0.09**	**19.6**
RU22b-CAP-SB021	RU22b-CAP-SB021 (8-10)	11/29/07	8 - 10		**12.9**	**59.2**	**151**	**1.37**	**39.9 J-**	**212**	**628 B**	**3.68**	**70.7**	**26**	**61.4**	**23.9 ± 5.8**	**7.91**	**449**	**0.067**	**18.7**
RU22b-CAP-SB022	RU22b-CAP-SB022 (9-11)	11/29/07	9 - 11		**0.138 T**	**14.1**	**109**	**0.486 T**	**6.62 T,J-**	**206**	**10.5 B**	**3.82**	**7.47**	<5	**6.78**	**0.78 ± 0.22**	**14.6**	**347**	**0.0021 T**	**0.329 T**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-20

FORMER KILN AND PHOSSY POND DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

					Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
				Background[a]	15.5	3.58	20.5	3.88	1.36	1.9	0.27	NA	3.88	45.4	52.8
				Commercial/Industrial Worker SSL	6,450	269	20.5[b]	3.88[b]	5,670	5,670	77.2	3,400	3.88[a]	7,950	340,000
				Construction Worker SSL	404	43.3	20.5[b]	3.88[b]	2,750	2,750	374	491	20.6	3,500	165,000
				Utility Worker SSL	5,250	563	136	12	35,800	35,800	4,870	6,390	267	45,500	1,000,000[c]
				SSL Protective of Groundwater[d]	130	3.58[g]	20.5[g]	3.88[f]	5	34	0.7	900	3.88[f]	6,000	12,000
Location Identification	Field Sample Identification	Date Collected	Depth (ft)												
RU8-CAP-SB001	RU8-CAP-SB001 (8-10)	10/02/07	8 - 10		9.5	0.64 ± 0.21	12 ± 3.1	1.06 ± 0.23	<2	0.07 T,UB	0.15 T	0.81 T,B	0.92 ± 0.27	14	56 B
RU8-CAP-SB002	RU8-CAP-SB002 (12-14)	10/02/07	12 - 14		11	0.46 ± 0.16	13.9 ± 3.6	0.86 ± 0.22	<2	0.061 T,UB	0.14 T	0.64 T,B	1.16 ± 0.31	14	34 B
RU8-CAP-SB003	RU8-CAP-SB003 (15-17)	10/02/07	15 - 17		10	0.56 ± 0.17	14.7 ± 3.8	0.91 ± 0.2	<2	0.052 T,UB	0.11 T	0.77 T,B	1.53 ± 0.38	16	35 B
RU8-CAP-SB004	RU8-CAP-SB004 (7-9)	10/02/07	7 - 9		10	0.62 ± 0.2	14.4 ± 3.6	0.74 ± 0.17	<2	0.073 T,UB	0.13 T	0.72 T,B	0.99 ± 0.27	15	34 B
RU8-CAP-SB005	RU8-CAP-SB005 (4-6)	10/03/07	4 - 6		11	0.64 ± 0.22	20.7 ± 3.6 J+	0.85 ± 0.2	<2	0.066 T,UB	0.13 T	0.69 T,B	0.98 ± 0.27	16	34 B
RU8-CAP-SB006	RU8-CAP-SB006 (3-5)	10/03/07	3 - 5		11	0.51 ± 0.2	16.6 ± 4 J+	0.68 ± 0.17	1.2 T	0.061 T,UB	0.13 T	0.61 T,B	1.01 ± 0.28	15	37 B
RU8-CAP-SB007	RU8-CAP-SB007 (3-5)	10/03/07	3 - 5		24	1 ± 0.29	10.4 ± 2.9	0.77 ± 0.18	2.1	0.27 T,B	2.1	2.7 B	1.37 ± 0.34	100	560 B
RU8-CAP-SB008	RU8-CAP-SB008 (7-9)	10/03/07	7 - 9		11	0.61 ± 0.2	12.8 ± 3.6	0.91 ± 0.21	<2	0.078 T,UB	0.16 T	0.81 T,B	1.11 ± 0.31	15	38 B
RU8-CAP-SB009	RU8-CAP-SB009 (5-7)	10/03/07	5 - 7		43	0.65 ± 0.22	13.1 ± 3.4	1.24 ± 0.25	8.9	0.21 T,B	13	4.3 B	1.9 ± 0.46	170	1200 B
RU8-CAP-SB010	RU8-CAP-SB010 (5.5-7.5)	10/03/07	5.5 - 7.5		11	0.67 ± 0.26	17.6 ± 3.4 J+	0.56 ± 0.15 J-	<2	0.061 T,UB	0.21 T	0.68 T,B	0.88 ± 0.26	16	36 B
RU8-CAP-SB010 CL	RU8-CAP-SB210 (5.5-7.5)	10/04/07	5.5 - 7.5		11	0.45 ± 0.19	14.9 ± 3.4	0.86 ± 0.21	<2	0.059 T,UB	0.14 T	0.72 T,B	1.06 ± 0.29	16	36 B
RU8-CAP-SB011	RU8-CAP-SB011 (4-6)	10/04/07	4 - 6		8.9	0.61 ± 0.22	16.9 ± 4.2	0.62 ± 0.15	<2	<1	0.1 T	0.68 T,B	1.05 ± 0.31	14	30 B
RU8-CAP-SB012	RU8-CAP-SB012 (4-6)	10/04/07	4 - 6		8.8	0.48 ± 0.19	18 ± 4.3	0.87 ± 0.19	<2	0.061 T,UB	0.11 T	0.79 T,B	1.19 ± 0.31	15	33 B
RU8-CAP-SB013	RU8-CAP-SB013 (5-7)	10/04/07	5 - 7		22	0.78 ± 0.24	12.9 ± 3.7	0.7 ± 0.18	9.2	0.061 T,UB	12	0.71 T,B	0.97 ± 0.26	79	1500 B
RU8-CAP-SB014	RU8-CAP-SB014 (8-10)	10/04/07	8 - 10		10	0.39 ± 0.15	13.5 ± 3.5	1.06 ± 0.23	<2	0.082 T,UB	0.21 T	1.6 B	0.93 ± 0.26	16	35 B
RU22b-CAP-SB001	RU22B-CAP-SB001 (0-2)	09/28/07	0 - 2		11.2	0.46 ± 0.17	14.4 ± 2.8 J+	0.61 ± 0.15	<2	0.107 T	0.217 T	0.625 T,B	0.92 ± 0.26	14.9 B	46.5 B
RU22b-CAP-SB001	RU22B-CAP-SB001 (2-10)	09/28/07	2 - 10		11.3	0.47 ± 0.19	14.7 ± 3 J+	0.98 ± 0.21	<2	0.0768 T	0.146 T	0.695 T,B	0.88 ± 0.24	15.1 B	38.1 B
RU22b-CAP-SB002	RU22B-CAP-SB002 (4-6)	09/28/07	4 - 6		10.9	0.45 ± 0.17	13.7 ± 4.2 J+	0.52 ± 0.13	<2	0.0686 T	0.151 T	0.505 T,B	0.89 ± 0.26	13.6 B	40.5 J,B
RU22b-CAP-SB003	RU22B-CAP-SB003 (7-9)	09/28/07	7 - 9		12.4	0.58 ± 0.19	10.5 ± 3.2	0.211 ± 0.097	<2	0.0609 T	0.155 T	0.823 T,B	0.94 ± 0.26	15.1 B	38.9 B
RU22b-CAP-SB004	RU22B-CAP-SB004 (9-11)	09/28/07	9 - 11		12.9	0.5 ± 0.18	11.5 ± 3.8 J+	0.68 ± 0.18 J-	<2	0.106 T	0.168 T	0.576 T,B	0.71 ± 0.23	16.5 B	47.8 B
RU22b-CAP-SB005	RU22B-CAP-SB005 (13-15)	10/01/07	13 - 15		12.4	0.44 ± 0.17	17.6 ± 3.4 J+	0.56 ± 0.14	<2	0.0571 T	0.165 T	0.592 T,B	0.63 ± 0.2	15.7 B	40.1 B
RU22b-CAP-SB006	RU22B-CAP-SB006 (5-7)	10/01/07	5 - 7		11.3	0.37 ± 0.15	17.4 ± 3.3 J+	0.89 ± 0.21	<2	0.0934 T	0.15 T	0.615 T,B	0.93 ± 0.26	14.9 B	42.1 B
RU22b-CAP-SB007	RU22B-CAP-SB007 (5-7)	10/01/07	5 - 7		11.3	0.45 ± 0.17	14.7 ± 3 J+	0.72 ± 0.18	<2	0.0686 T	0.13 T	0.62 T,B	0.57 ± 0.18	15.6 B	41.1 B
RU22b-CAP-SB008	RU22B-CAP-SB008 (4-6)	10/01/07	4 - 6		12.1	0.48 ± 0.18	17.8 ± 3.5 J+	0.59 ± 0.17	<2	0.0884 T	0.155 T	0.57 T,B	0.66 ± 0.2	17.1 B	41 B
RU22b-CAP-SB009	RU22B-CAP-SB009 (3-5)	10/01/07	3 - 5		12.6	0.44 ± 0.18	19.2 ± 3.6 J+	0.61 ± 0.15	<2	0.152 T	0.139 T	0.633 T,B	1.06 ± 0.28	20.1 B	51.7 B
RU22b-CAP-SB010	RU22B-CAP-SB010 (12-14)	10/01/07	12 - 14		11	0.59 ± 0.19	12.9 ± 3.9 J+	0.65 ± 0.18	<2	0.0823 T	0.126 T	0.663 T,B	1.05 ± 0.28	21.1 B	36.2 B
RU22b-CAP-SB010 CL	RU22B-CAP-SB210 (12-14)	10/01/07	12 - 14		10.6	0.6 ± 0.18	14.1 ± 3 J+	0.71 ± 0.18	<2	0.0818 T	0.127 T	0.627 T,B	0.98 ± 0.28	17 B	32.9 B
RU22b-CAP-SB011	RU22B-CAP-SB011 (5-7)	10/01/07	5 - 7		16.5	1.15 ± 0.29	22 ± 4.7	0.56 ± 0.15	<2	0.756 T	2.1	0.681 T,B	0.97 ± 0.26	15.8 B	384 B
RU22b-CAP-SB012	RU22B-CAP-SB012 (3-5)	10/02/07	3 - 5		12	0.62 ± 0.2	14.5 ± 4.2 J+	0.75 ± 0.18	<2	0.13 T,UB	0.24 T	0.69 T,B	1.04 ± 0.28	16	48 B
RU22b-CAP-SB013	RU22B-CAP-SB013 (5-7)	10/02/07	5 - 7		12	0.46 ± 0.16	18.6 ± 3.4 J+	0.58 ± 0.14	<2	0.073 T,UB	0.17 T	0.8 T,B	0.81 ± 0.24	16	36 J,B
RU22b-CAP-SB014	RU22B-CAP-SB014 (10-12)	10/02/07	10 - 12		13	0.54 ± 0.16	19.6 ± 4.5	0.73 ± 0.17	<2	0.15 T,UB	0.49 T	0.77 T,B	0.83 ± 0.24	15	42 B
RU22b-CAP-SB015	RU22B-CAP-SB015 (8-10)	10/02/07	8 - 10		150 J	34.9 ± 5.2	10.8 ± 3.3	18.5 ± 3.3	4.9 J	7.6 J,B	6	65 B	24.2 ± 4.3	830 J	1300 J,B
RU22b-CAP-SB015 CL	RU22B-CAP-SB215 (8-10)	10/02/07	8 - 10		150 J	31.2 ± 4.7	8.8 ± 3.4	15.7 ± 2.8	4.7 J	6.8 J,B	5.5	63 B	24.2 ± 4.1	810 J	1100 J,B
RU22b-CAP-SB016	RU22B-CAP-SB016 (0-2)	10/05/07	0 - 2		12.8	0.49 ± 0.2	17.3 ± 3.3	0.61 ± 0.18	<2	0.126 T	0.192 T	0.643 T,B	0.79 ± 0.24	17.7 B	53.8 B
RU22b-CAP-SB016	RU22B-CAP-SB016 (2-10)	10/05/07	2 - 10		12.3	0.61 ± 0.21	13.8 ± 3.5 J+	0.66 ± 0.18	<2	0.0921 T	0.153 T	0.695 T,B	0.89 ± 0.26	16.8 B	43.9 B
RU22b-CAP-SB017	RU22b-CAP-SB017 (4-6)	11/29/07	4 - 6		169	28.5 ± 4.3	7.5 ± 3.8	15.9 ± 2.9	9.75	6.53	3.3	69.1	24.4 ± 4.3	922	1310 B
RU22b-CAP-SB018	RU22b-CAP-SB018 (5-7)	11/29/07	5 - 7		167	26.2 ± 4	6.6 ± 2.9	18.5 ± 3.4	9.49 J-	6.18	2.99	72.8	25 ± 4.4	864	1280 B

TABLE 4-20

FORMER KILN AND PHOSSY POND DELINEATION INVESTIGATION AREAS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIATION INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

					Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte											
				Units	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**
				Background[a]	**15.5**	**3.58**	**20.5**	**3.88**	**1.36**	**1.9**	**0.27**	**NA**	**3.88**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**6,450**	**269**	**20.5[b]**	**3.88[b]**	**5,670**	**5,670**	**77.2**	**3,400**	**3.88[a]**	**7,950**	**340,000**
				Construction Worker SSL	**404**	**43.3**	**20.5[b]**	**3.88[b]**	**2,750**	**2,750**	**374**	**491**	**20.6**	**3,500**	**165,000**
				Utility Worker SSL	**5,250**	**563**	**136**	**12**	**35,800**	**35,800**	**4,870**	**6,390**	**267**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**130**	**3.58[g]**	**20.5[g]**	**3.88[f]**	**5**	**34**	**0.7**	**900**	**3.88[f]**	**6,000**	**12,000**
RU22b-CAP-SB019	RU22b-CAP-SB019 (4-6)	11/29/07	4 - 6		**163**	**28.3 ± 4.3**	**9.1 ± 3**	**15.6 ± 2.8**	**9.18**	**6.76**	**3.52**	**69.2**	**23.9 ± 4.1**	**894**	**1260 B**
RU22b-CAP-SB020	RU22b-CAP-SB020 (4-6)	11/29/07	4 - 6		**159**	**28.7 ± 4.4**	**9.9 ± 3**	**14.7 ± 2.7**	**8.53**	**6.52**	**3.06**	**70.7**	**23.7 ± 4**	**875**	**1210 B**
RU22b-CAP-SB020 CL	RU22b-CAP-SB220 (4-6)	11/29/07	4 - 6		**167**	**28 ± 4.3**	**7.8 ± 3.6 J+**	**14.3 ± 2.6**	**8.71**	**6.41**	**3.22**	**70.2**	**23.2 ± 4**	**937**	**1230 B**
RU22b-CAP-SB021	RU22b-CAP-SB021 (8-10)	11/29/07	8 - 10		**157**	**27.9 ± 4.3**	**6.8 ± 3.4 J+**	**15.5 ± 2.8**	**8.41**	**6.67**	**3.54**	**58.3**	**23.3 ± 4**	**838**	**1290 B**
RU22b-CAP-SB022	RU22b-CAP-SB022 (9-11)	11/29/07	9 - 11		**12.9**	**0.59 ± 0.2**	**13.9 ± 3.4**	**0.45 ± 0.15**	<2	<1	**0.133 T**	**0.667 T**	**1 ± 0.28**	**15.6**	**4500 DB**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-21

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 8**
(FORMER KILN SCRUBBER PONDS AND CALCINERS)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	3.E-06	As	2.E-06	As	2.E-07	-	2.E-08	-
Dermal Absorption	6.E-07	-	NA	-	2.E-08	-	5.E-09	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	6.E-07	-	NA	-	7.E-06	Cd	5.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*5.E-06*	*As*	*2.E-06*	*As*	*7.E-06*	*Cd*	*5.E-07*	
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, K-40	6.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-04	Po-210, Pb-210	1.E-04	Po-210, Pb-210	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-06	Po-210	NA	-	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Total ROPC Lifetime Incremental Cancer Risk	*2.E-03*	*Ra-226, K-40*	*7.E-04*	*Ra-226, K-40*	*7.E-05*	*Po-210, Ra-226*	*6.E-06*	*Po-210, Ra-226*
Total Lifetime Incremental Cancer Risk	**2.E-03**	**Ra-226, K-40**	**7.E-04**	**Ra-226, Po-210**	**8.E-05**	**Po-210, Ra-226**	**6.E-06**	**Po-210, Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	5	Tl	3	Tl	2	Cd, Tl	0.1	-
Dermal Absorption	0.1	-	NA	-	0.1	-	0.03	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.008	-	NA	-	1	Cd	0.1	-
Total Incremental Non-Cancer Hazard Quotient	**5**	**Tl**	**3**	**Tl**	**3**	**Cd, Tl**	**0.3**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified
** Risks associated with exposure to underground piping formerly used to convey carbon monoxide gas in this RU are evaluated separately.

TABLE 4-22

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 9
(SILICA STOCKPILES AND FORMER KILN SCRUBBER OVERFLOW POND)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	9.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	5.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	7.E-06	Benzo(a)pyrene	5.E-07	-
Dermal Absorption	8.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	NA	-	3.E-06	Benzo(a)pyrene	6.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-07	-	NA	-	7.E-06	Cd	5.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*2.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*5.E-05*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*2.E-05*	*Benzo(a)pyrene, Cd*	*2.E-06*	
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, K-40	6.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-04	Po-210, Pb-210	1.E-04	Po-210, Pb-210	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-06	Po-210	NA	-	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Total ROPC Lifetime Incremental Cancer Risk	*2.E-03*	*Ra-226, K-40*	*7.E-04*	*Ra-226, Po-210*	*7.E-05*	*Po-210, Ra-226*	*6.E-06*	*Po-210, Ra-226*
Total Lifetime Incremental Cancer Risk	**2.E-03**	**Ra-226, K-40**	**8.E-04**	**Ra-226, Po-210**	**9.E-05**	**Po-210, Ra-226**	**7.E-06**	**Po-210, Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	5	Tl	3	Tl	2	Cd, Tl	0.1	-
Dermal Absorption	0.1	-	NA	-	0.1	-	0.03	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.008	-	NA	-	1	Cd	0.1	-
Total Incremental Non-Cancer Hazard Quotient	**5**	**Tl**	**3**	**Tl**	**3**	**Cd, Tl**	**0.3**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-23

PHOSSY WATER AND PRECIPITATOR SOLIDS INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

				Analyte	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg
				Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1
				Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000
				SSL Protective og Groundwater[d]	5	7.7[f]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU10-SIA1-SB001	RU10-SIA1-SB001 (0-2)	10/18/07	0 - 2		**3.66**	**15.5**	**288**	**0.9 T**	**23.4**	**221**	**258 B**	**22.7**	**499 B**	**11**	**29.7**	**23.3 ± 5.6**	**7.66**
RU10-SIA1-SB002	RU10-SIA1-SB002 (0-2)	10/18/07	0 - 2		**2.03**	**12.1**	**199**	**0.806 T**	**16.5**	**107**	**135 B**	**19.1**	**390 B**	**15**	**22.4**	**11.4 ± 2.8**	**11.3**
RU10-SIA1-SB003	RU10-SIA1-SB003 (0-2)	10/18/07	0 - 2		**0.282 T**	**6.28**	**112**	**0.76 T**	**6.39 T**	**15.5**	**25.5 B**	**6.98**	**60.1 B**	**28**	**10.9**	**2.47 ± 0.61**	**10.7**
RU10-SIA1-SB004	RU10-SIA1-SB004 (0-2)	10/18/07	0 - 2		**4.66**	**16.8**	**579**	**0.96 T**	**29.7**	**311**	**300 B**	**38.5**	**907 B**	**40 J-**	**67.9**	**32.8 ± 7.9**	**9.9**
RU10-SIA1-SB005	RU10-SIA1-SB005 (8-10)	11/07/07	8 - 10		<1	**3.84**	**158**	**0.649 T**	**5.87 T**	**0.375 T**	**11.1 B**	**5.24**	**10.5 B**	**33**	**9.27**	**0.79 ± 0.22**	**12.9 B**
RU10-SIA1-SB006	RU10-SIA1-SB006 (6-8)	10/15/07	6 - 8		**0.133 T**	**3.1**	**153 B**	**0.548 T**	**5.05 T**	**0.349 T**	**9.72 B**	**4.6**	**9.59**	**14**	**8.42**	**0.77 ± 0.21**	**10.2 B**
RU10-SIA1-SB007	RU10-SIA1-SB007 (4-6)	10/17/07	4 - 6		<1	**3.71**	**153**	**0.63 T**	**8.07 T**	**0.308 T**	**10.1 B**	**5.15**	**9.18 B**	<5	**9.07**	**0.83 ± 0.23**	**18.9**
RU10-SIA1-SB008	RU10-SIA1-SB008 (6-8)	10/17/07	6 - 8		<1	**3.58**	**121**	**0.658 T**	**4.32 T**	**0.657 T**	**10.9 B**	**5.18**	**10.7 B**	**9.8**	**9.57**	**0.83 ± 0.23**	**10.8**
RU10-SIA1-SB009	RU10-SIA1-SB009 (7-9)	10/16/07	7 - 9		<1	**3.47**	**105 B**	**0.483 T,J**	**4.13 T,J+**	**0.348 T**	**9.18 B**	**4.49**	**7.67**	**8.4**	**7.82**	**0.69 ± 0.2**	**9.28 J,B**
RU10-SIA1-SB010	RU10-SIA1-SB010 (8-10)	10/16/07	8 - 10		<1	**3.64**	**128 B**	**0.514 T,J**	**5.34 T,J+**	**0.349 T**	**9.46 B**	**4.65**	**8.15**	**24**	**8.11**	**0.78 ± 0.22**	**10.7 J,B**
RU10-SIA1-SB010 CL	RU10-SIA1-SB210 (8-10)	10/16/07	8 - 10		<1	**3.95**	**137 B**	**0.546 T,J**	**5.85 T,J+**	**0.318 T**	**10.1 B**	**5.11**	**8.83**	**25**	**8.65**	**0.77 ± 0.21**	**11.5 J,B**
RU10-SIA1-SB011	RU10-SIA1-SB011 (8-10)	10/16/07	8 - 10		**0.136 T**	**3.7**	**132 B**	**0.604 T,J**	**7.48 T,J+**	**0.314 T**	**10.5 B**	**5.12**	**9.74**	**8.2**	**9.08**	**0.76 ± 0.21**	**11.7 J,B**
RU10-SIA1-SB012	RU10-SIA1-SB012 (7-9)	10/16/07	7 - 9		<1	**3.59**	**160 B**	**0.681 T,J**	**8.09 T,J**	**0.335 T**	**10.7 B**	**5.39**	**11.2**	**6.2**	**9.93**	**0.9 ± 0.24**	**15.4 J,B**
RU10-SIA1-SB013	RU10-SIA1-SB013 (8-10)	10/16/07	8 - 10		<1	**2.87**	**116 B**	**0.469 T,J**	**4.03 T,J**	**0.765 T**	**8.83 B**	**4.82**	**9.75**	**6.1**	**7.71**	**0.77 ± 0.22**	**8.19 J,B**
RU10-SIA1-SB014	RU10-SIA1-SB014 (5-7)	10/16/07	5 - 7		<1	**3.04**	**139 B**	**0.519 T**	**4.48 T**	**0.708 T**	**8.62 B**	**4.79**	**10.7**	<5	**8.15**	**0.76 ± 0.21**	**9.58 B**
RU10-SIA1-SB015	RU10-SIA1-SB015 (5-7)	10/16/07	5 - 7		<1	**3.45**	**132 B**	**0.613 T**	**5.8 T**	**0.35 T**	**10.2 B**	**5.09**	**9.5**	**12**	**9.1**	**0.75 ± 0.21**	**10.6 B**
RU10-SIA1-SB016	RU10-SIA1-SB016 (5-7)	10/16/07	5 - 7		<1	**3.46**	**153 B**	**0.551 T,J**	**5.01 T,J**	**0.876 T**	**10.3 B**	**5.91**	**11.1**	**12**	**9.04**	**0.88 ± 0.24**	**9.76 J,B**
RU10-SIA1-SB017	RU10-SIA1-SB017 (6-8)	10/15/07	6 - 8		<1	**3.35**	**123 B**	**0.552 T**	**4.66 T**	**0.885 T**	**11.9 B**	**5.7**	**9.83**	**16**	**8.11**	**0.82 ± 0.23**	**9.54 B**
RU10-SIA1-SB018	RU10-SIA1-SB018 (5-7)	10/15/07	5 - 7		<1	**3.29**	**134 B**	**0.534 T**	**5.06 T**	**0.383 T**	**9.33 B**	**4.78**	**9.7**	**6.8**	**13.2**	**0.76 ± 0.21**	**9.12 B**
RU10-SIA1-SB019	RU10-SIA1-SB019 (5-7)	10/15/07	5 - 7		<1	**3.12**	**112 B**	**0.52 T**	**3.8 T**	**0.291 T**	**8.82 B**	**4.69**	**8.26**	**6.4**	**8.02**	**0.76 ± 0.21**	**8.61 B**
RU10-SIA1-SB020	RU10-SIA1-SB020 (7-9)	10/15/07	7 - 9		<1	**2.96**	**117 B**	**0.497 T,J**	**4.73 T,J**	**0.417 T**	**8.6 B**	**4.76**	**8.29**	**8**	**8.02**	**0.77 ± 0.21**	**8.74 J,B**
RU10-SIA1-SB020 CL	RU10-SIA1-SB220 (7-9)	10/15/07	7 - 9		<1	**3.06**	**109 B**	**0.52 T**	**4.03 T**	**0.428 T**	**8.91 B**	**4.5**	**7.43**	<5	**7.8**	**0.77 ± 0.21**	**9.11 B**

µg/kg micrograms per kilogram.
mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
NA Not analyzed.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-23

PHOSSY WATER AND PRECIPITATOR SOLIDS INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

					Analyte	**Manganese**	**Mercury**	**Molybdenu**	**Nickel**	**Polonium-210**	**Selenium**	**Silver**	**Thallium**	**Uranium**	**Vanadium**	**Zinc**	**Phosphorus (P4)**
					Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**µg/kg**
					Background[b]	**482**	**0.16**	**2.15**	**15.5**	**3.58**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**	**NE**
					Commercial/Industrial Worker SSL	**23,500**	**340**	**5,670**	**6,450**	**269**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**	**22,700**
					Construction Worker SSL	**77,100**	**464**	**2,750**	**404**	**43.3**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**	**117,000**
					Utility Worker SSL	**1,000,000**	**6,030**	**35,800**	**5,250**	**563**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000[c]**	**1,000,000**
					SSL Protective of Groundwater[e]	**482[f]**	**2**	**81**	**130**	**3.58[f]**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**	**NE**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**	**Matrix**													
RU10-SIA1-SB001	RU10-SIA1-SB001 (0-2)	10/18/07	0 - 2	Soil		**2040**	**4.4 D,B**	**8.2 B**	**71.9**	**27.7 ± 4.3**	**9.21**	**6.86**	**0.84 T**	**43.8 B**	**402**	**1070 B**	**0.554 J-**
RU10-SIA1-SB002	RU10-SIA1-SB002 (0-2)	10/18/07	0 - 2	Soil		**713**	**2.2 D,B**	**5.02 B**	**43.6**	**14.3 ± 2.3**	**6.53**	**6.9**	**0.726 T**	**17.4 B**	**176**	**855 B**	<0.5 UJ
RU10-SIA1-SB003	RU10-SIA1-SB003 (0-2)	10/18/07	0 - 2	Soil		**280**	**0.33 D,T,B**	**0.908 T,UB**	**21.6**	**2.61 ± 0.56**	**2.47**	**1.22**	**0.288 T**	**2.93 B**	**33.3**	**418 B**	<0.5 UJ
RU10-SIA1-SB004	RU10-SIA1-SB004 (0-2)	10/18/07	0 - 2	Soil		**2000**	**8.5 D,J,B**	**6.37 B**	**68**	**37.5 ± 5.7**	**7.92**	**26.1**	**1.37**	**27.6 B**	**283**	**3020 D,B**	<0.5 UJ
RU10-SIA1-SB005	RU10-SIA1-SB005 (8-10)	11/07/07	8 - 10	Soil		**423**	**0.0099 T**	**0.349 T,UB**	**12.4**	**0.69 ± 0.21**	<2	**0.0574 T**	**0.175 T**	**0.577 T,B**	**15.9**	**45 B**	<0.5
RU10-SIA1-SB006	RU10-SIA1-SB006 (6-8)	10/15/07	6 - 8	Soil		**395**	**0.015 T,B**	**0.294 T**	**11.6**	**0.42 ± 0.17**	<2	**0.0666 T**	**0.218 T**	**0.909 T,B**	**13.3**	**39.2 B**	<0.5 UJ
RU10-SIA1-SB007	RU10-SIA1-SB007 (4-6)	10/17/07	4 - 6	Soil		**406**	**0.028 T**	**0.485 T,UB**	**12.9**	**0.46 ± 0.18**	<2	**0.0456 T**	**0.15 T**	**0.827 T,B**	**15.1**	**41.1 B**	<0.5
RU10-SIA1-SB008	RU10-SIA1-SB008 (6-8)	10/17/07	6 - 8	Soil		**474**	**0.019 T**	**0.448 T,UB**	**13.1**	**0.73 ± 0.26**	<2	**0.0766 T**	**0.227 T**	**0.816 T,B**	**15.3**	**50.1 B**	<0.5
RU10-SIA1-SB009	RU10-SIA1-SB009 (7-9)	10/16/07	7 - 9	Soil		**331**	**0.013 T,B**	**0.301 T**	**11.7**	**0.63 ± 0.21**	<2	**0.114 T**	**0.122 T**	**0.701 T,B**	**14.3**	**34 B**	<0.5
RU10-SIA1-SB010	RU10-SIA1-SB010 (8-10)	10/16/07	8 - 10	Soil		**332**	**0.014 T,B**	**0.408 T**	**12.1**	**0.69 ± 0.22**	<2	<1	**0.12 T**	**0.738 T,B**	**15.5**	**40 B**	<0.5
RU10-SIA1-SB010 CL	RU10-SIA1-SB210 (8-10)	10/16/07	8 - 10	Soil		**368**	**0.013 T,B**	**0.407 T**	**12.7**	**0.48 ± 0.19**	<2	<1	**0.126 T**	**0.774 T,B**	**16.2**	**40.1 B**	<0.5
RU10-SIA1-SB011	RU10-SIA1-SB011 (8-10)	10/16/07	8 - 10	Soil		**402**	**0.016 T,B**	**0.379 T**	**12.9**	**0.96 ± 0.29**	<2	**0.051 T**	**0.14 T**	**0.784 T,B**	**16**	**42.7 B**	<0.5
RU10-SIA1-SB012	RU10-SIA1-SB012 (7-9)	10/16/07	7 - 9	Soil		**450**	**0.017 T,B**	**0.267 T**	**13.4**	**0.59 ± 0.2**	<2	**0.0614 T**	**0.143 T**	**0.673 T,B**	**16.1**	**47 B**	<0.5
RU10-SIA1-SB013	RU10-SIA1-SB013 (8-10)	10/16/07	8 - 10	Soil		**362**	**0.014 T,B**	**0.258 T**	**11.4**	**0.48 ± 0.17**	<2	**0.0826 T**	**0.155 T**	**0.767 T,B**	**13.1**	**35.4 B**	<0.5
RU10-SIA1-SB014	RU10-SIA1-SB014 (5-7)	10/16/07	5 - 7	Soil		**351**	**0.028 T,B**	**0.268 T**	**11.9**	**0.47 ± 0.17**	<2	**0.139 T**	**0.203 T**	**0.832 T,B**	**13.4**	**40.1 B**	<0.5
RU10-SIA1-SB015	RU10-SIA1-SB015 (5-7)	10/16/07	5 - 7	Soil		**414**	**0.013 T,B**	**0.3 T**	**12.2**	**0.6 ± 0.19**	<2	<1	**0.128 T**	**0.675 T,B**	**15.6**	**42.9 B**	<0.5
RU10-SIA1-SB016	RU10-SIA1-SB016 (5-7)	10/16/07	5 - 7	Soil		**599**	**0.017 T,B**	**0.374 T**	**13.3**	**0.66 ± 0.2**	<2	**0.0756 T**	**0.141 T**	**1.04 B**	**14.6**	**44.6 B**	<0.5
RU10-SIA1-SB017	RU10-SIA1-SB017 (6-8)	10/15/07	6 - 8	Soil		**468**	**0.044 B**	**0.316 T**	**11.8**	**0.54 ± 0.2**	<2	**0.087 T**	**0.255 T**	**1.53 B**	**14.3**	**39.6 B**	<0.5 UJ
RU10-SIA1-SB018	RU10-SIA1-SB018 (5-7)	10/15/07	5 - 7	Soil		**374**	**0.014 T,B**	**0.275 T**	**12**	**0.59 ± 0.2**	<2	**0.0562 T**	**0.12 T**	**0.711 T,B**	**13.4**	**39.9 B**	<0.5 UJ
RU10-SIA1-SB019	RU10-SIA1-SB019 (5-7)	10/15/07	5 - 7	Soil		**359**	**0.011 T,B**	**0.299 T**	**11.8**	**0.55 ± 0.21**	<2	**0.0531 T**	**0.107 T**	**0.649 T,B**	**13.1**	**35.5 B**	<0.5 UJ
RU10-SIA1-SB020	RU10-SIA1-SB020 (7-9)	10/15/07	7 - 9	Soil		**373**	**0.026 T,B**	**0.299 T**	**11.9**	**0.57 ± 0.19**	<2	**0.0744 T**	**0.242 T**	**0.834 T,B**	**12.8**	**35.8 B**	<0.5
RU10-SIA1-SB020 CL	RU10-SIA1-SB220 (7-9)	10/15/07	7 - 9	Soil		**351**	**0.015 T,B**	**0.272 T**	**11.4**	**0.44 ± 0.17**	<2	**0.086 T**	**0.171 T**	**0.856 T,B**	**13.3**	**35 B**	<0.5 UJ

µg/kg micrograms per kilogram.
mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
NA Not analyzed.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis
a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-24

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 10
(IWW POND AND DITCH)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	2.E-05	As	1.E-05	As	1.E-06	As	1.E-07	-
Dermal Absorption	3.E-06	As	NA	-	1.E-07	-	3.E-08	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	6.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*3.E-05*	*As, Cd*	*1.E-05*	*As*	*7.E-05*	*Cd, As*	*5.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Ra-226, Pb-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Po-210**	**3.E-05**	**Pb-210, Po-210**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	5	Cd	3	Cd	10	Cd	0.7	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.2	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.05	-	NA	-	13	Cd	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**6**	**Cd**	**3**	**Cd**	**23**	**Cd**	**2**	**Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-25

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 11
(EQUIPMENT AREA SOUTH OF CALCINERS)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*		*BScr*		*BScr*		*BScr*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, U-238**	**4.E-04**	**Ra-226, Pb-210**	**3.E-05**	**Ra-226, Pb-210**	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-26

SHOP-RELATED SOLVENTS IVESTIGATION AREAS
DETECTION SUMMARY TABLE[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	**2-Butanone (MEK)**	**TCE**
				Units	**µg/kg**	**µg/kg**
				Commercial/Industrial Worker SSL[b]	**26,000,000**	**100**
				Construction Worker SSL[b]	**14,000,000**	**400**
				Utility Worker SSL[b]	**27,000,000**	**1,000**
				SSL Protective of Groundwater[c]	**91,000**	**60**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**			
RU12-SIA1-SB019	RU12-SIA1-SB019 (2)	07/23/07	2		<9.9	**1.5 T**
RU12-SIA1-SB019	RU12-SIA1-SB019 (4)	07/23/07	4		<11	**1.1 T**
RU12-SIA1-SB019	RU12-SIA1-SB019 (10)	07/23/07	10		<10	**1.4 T**
RU12-SIA1-SB020 CL	RU12-SIA1-SB220 (2)	07/24/07	2		<11	**1.1 T**
RU12-SIA1-SB020	RU12-SIA1-SB220 (4)	07/24/07	4		<9.9	**1.9 T**
RU12-SIA1-SB020 CL	RU12-SIA1-SB220 (10)	07/24/07	10		<11	**1.4 T**
RU12-SIA1-SB022	RU12-SIA1-SB022 (2)	07/24/07	2		<10	**1.7 T**
RU12-SIA1-SB022	RU12-SIA1-SB022 (4)	07/24/07	4		<11	**1.3 T**
RU12-SIA1-SB022	RU12-SIA1-SB022 (10)	07/24/07	10		<11	**1.9 T**
RU12-SIA1-SB023	RU12-SIA1-SB023 (4)	07/24/07	4		<11 UJ	**1.5 T,J-**
RU12-SIA1-SB023	RU12-SIA1-SB023 (6)	07/24/07	6		<12	**1.3 T**
RU12-SIA1-SB023	RU12-SIA1-SB023 (10)	07/24/07	10		**6.1 T**	**1.4 T**
RU12-SIA1-SB023	RU12-SIA1-SB023 (14)	07/24/07	14		<11	**1.4 T**
RU12-SIA1-SB024	RU12-SIA1-SB024 (3.5)	07/25/07	3.5		<11	**2.5 T**
RU12-SIA1-SB024	RU12-SIA1-SB024 (5.5)	07/25/07	5.5		<12	**1.6 T**
RU12-SIA1-SB024	RU12-SIA1-SB024 (10)	07/25/07	10		<11	**1.3 T**
RU12-SIA1-SB024	RU12-SIA1-SB024 (13.5)	07/25/07	13.5		<12	**1.2 T**
RU12-SIA1-SB026	RU12-SIA1-SB026(1.5)	07/24/07	1.5		<10	**4.7 T**
RU12-SIA1-SB026	RU12-SIA1-SB026(3.5)	07/24/07	3.5		<10	**1.4 T**
RU12-SIA1-SB026	RU12-SIA1-SB026(10)	07/24/07	10		<13	**1.2 T**
RU12-SIA1-SB027	RU12-SIA1-SB027(2)	08/01/07	2		<13	**4.2 T**
RU12-SIA1-SB027	RU12-SIA1-SB027(4)	08/01/07	4		<10	**5.1 T**
RU12-SIA1-SB027	RU12-SIA1-SB027(10)	08/01/07	10		<12	**1.3 T**
RU12-SIA1-SB028	RU12-SIA1-SB028 (10)	07/25/07	10		<12	**0.92 T**
RU12-SIA1-SB031	RU12-SIA1-SB031(2)	08/01/07	2		<11 UJ	**4.2 TJ-**
RU12-SIA1-SB031	RU12-SIA1-SB031(4)	08/01/07	4		<11 UJ	**1.7 TJ-**
RU12-SIA1-SB036	RU12-SIA1-SB036 (3)	07/25/07	3		<11	**1.9 T**
RU12-SIA1-SB036	RU12-SIA1-SB036 (5)	07/25/07	5		<15 D	**1.2 T,D**
RU12-SIA1-SB037	RU12-SIA1-SB037 (10)	07/25/07	10		<13	**0.95 T**
RU20-SIA2-SB020 CL	RU20-SIA2-SB220(10)	07/11/07	10		**6.0 T**	<5.7

SSL Soil screening level
a For the complete data summary, refer to Appendix D of this report samples were collected at RUs 12 and 20.
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil* Screening Levels for Superfund Sites EPA (2002), supplemented with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
µg/kg micrograms per kilogram.
ft feet
Bold Bolded result indicates positively identified compound.
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UJ Potential low bias, estimated reporting limit
J- Data are estimated, potentially biased low due to associated quality control data.
TCE Trichloroethene
CL Colocated sample for blind replicate analysis

TABLE 4-27

FUELS INVESTIGATION AREAS
VOLATILE ORGANIC COMPOUNDS DETECTION SUMMARY[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	**Benzene**	**Ethyl-benzene**	**Toluene**	**Xylenes, Total**
				Units	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
				Commercial/Industrial Worker SSL[b]	**2,000**	**390,000**	**650,000**	**300,000**
				Construction Worker SSL[b]	**5,000**	**390,000**	**650,000**	**300,000**
				Utility Worker SSL[b]	**17,000**	**400,000**	**650,000**	**300,000**
				SSL Protective of Groundwater[b]	**30**	**13,000**	**12,000**	**220,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**					
RU12-SIA1-SB016	RU12-SIA1-SB016 (2)	07/23/07	2		<5.3	<5.3	**0.89 T**	<5.3
RU12-SIA1-SB036	RU12-SIA1-SB036 (13)	07/25/07	13		<5.7	<5.7	**1.8 T**	**0.93 T**
RU12-SIA2-SB006	RU12-SIA2-SB006(3)	08/07/07	3		**1.3 T**	<5.4	**2.2 T**	**0.92 T**
RU12-SIA2-SB007	RU12-SIA2-SB007(4)	08/07/07	4		<6.0	<6.0	**1.1 T**	**1.8 T**
RU20-SIA1-SB005	RU20-SIA1-SB005 (4)	06/19/07	4		<5.6	<5.6	**12**	<5.6
RU20-SIA1-SB005	RU20-SIA1-SB005 (10)	06/19/07	10		<5.4	<5.4	**5.8**	<5.4
RU20-SIA1-SB010	RU20-SIA1-SB010 (10)	06/20/07	10		<5.2	<5.2	**5.0 T**	<5.2
RU20-SIA1-SB030	RU20-SIA1-SB030(7.5)	06/28/07	7.5		<5.8	<5.8	**1.0 T**	**4.3 T**
RU20-SIA2-SB010	RU20-SIA2-SB10(3)	07/10/07	3		<5.4	<5.4	**0.72 T**	**1.4 T**
RU20-SIA2-SB014	RU20-SIA2-SB014(2)	07/02/07	2		**1.0 T**	<5.3	**0.87 T**	<5.3
RU20-SIA2-SB025	RU20-SIA2-SB025(2)	06/29/07	2		<6.1	**3.0 T**	**59**	**13**
RU20-SIA2-SB025	RU20-SIA2-SB025(4)	06/29/07	4		<5.5	<5.5	**2.1 T**	<5.5
RU20-SIA2-SB026	RU20-SIA2-SB026(4)	06/29/07	4		<5.7	<5.7	**0.76 T**	<5.7
RU20-SIA2-SB030	RU20-SIA2-SB030(5)	07/02/07	5		<5.6	<5.6	**2.3 T**	<5.6

SSL Soil screening level
a For the complete data summary, refer to Appendix D of this report.
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* EPA (2002), supplemented with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
µg/kg micrograms per kilogram.
Bold Bolded result indicates positively identified compound.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE 4-28

FUEL INVESTIGATION AREAS
POLYNUCLEAR AROMATIC HYDROCARBONS DETECTION[a] SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 5)

				Analyte	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				Commercial/Industrial Worker SSL[b]	37,000,000	180,000,000	2,000	200	2,000	18,000,000	23,000	230,000	24,000,000	24,000,000	12,000,000	18,000,000	18,000,000
				Construction Worker SSL[b]	260,000,000	1,000,000,000	41,000	4,000	41,000	13,000,000	410,000	4,100,000	170,000,000	170,000,000	260,000,000	13,000,000	130,000,000
				Utility Worker SSL[b]	1,000,000,000	1,000,000,000	340,000	34,000	340,000	110,000,000	3,400,000	34,000,000	1,000,000,000	1,000,000,000	1,000,000,000	110,000,000	100,000,000
				SSL Protective of Groundwater[b]	570,000	12,000,000	2,000	8,000	5,000	110,000,000	49,000	160,000	4,300,000	560,000	59,000	840,000	4,200,000
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU12-SIA1-SB002	RU12-SIA1-SB002 (4)	07/19/07	4		<6.1	<6.1	**1.5 T**	**1.6 T**	**1.9 T**	**1.5 T**	**1.8 T**	**2.1 T**	**2.6 T**	<6.1	0.64 TUB	**1.9 T**	**2.3 T**
RU12-SIA1-SB005	RU12-SIA1-SB005 (2)	07/19/07	2		<6.0	<6.0	**0.38 T**	<6.0	<6.0	<6.0	**0.44 T**	**0.54 T**	**0.6 T**	<6.0	<6.0	**0.57 T**	**0.59 T**
RU12-SIA1-SB006	RU12-SIA1-SB006 (3)	07/19/07	3		<5.8	<5.8	**0.6 T**	<5.8	<5.8	<5.8	<5.8	**1.8 T**	**0.42 T**	<5.8	<5.8	**1.1 T**	**0.73 T**
RU12-SIA1-SB007	RU12-SIA1-SB007 (4)	07/19/07	4		<5.7	**1.0 T**	**0.84 T**	**1.0 T**	**1.2 T**	**1.7 T,J-**	**1.4 T**	**1.3 T**	**1.1 T**	<5.7	0.37 TUB	**0.94 T**	**1.2 T**
RU12-SIA1-SB008	RU12-SIA1-SB008(2)	07/20/07	2		<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	**1.3 T**	<5.9	<5.9
RU12-SIA1-SB008	RU12-SIA1-SB008(10)	07/20/07	10		<5.3	<5.3	<5.3	<5.3	**0.62 T**	**0.58 T,J+**	<5.3	**0.49 T**	<5.3	<5.3	<5.3	<5.3	**0.7 T**
RU12-SIA1-SB011	RU12-SIA1-SB011(4)	07/20/07	4		<5.5	<5.5	<5.5	**0.63 T**	**0.92 T**	**1.3 T,J+**	<5.5	**0.47 T**	<5.5	<5.5	<5.5	<5.5	<5.5
RU12-SIA1-SB012	RU12-SIA1-SB012(6)	07/20/07	6		<5.5	<5.5	**1.6 T**	**2.5 T**	**3.0 T**	**3.4 T,J+**	**1.3 T**	**2.1 T**	**2.6 T**	<5.5	**0.61 T**	**2.1 T**	**2.8 T**
RU12-SIA1-SB012 CL	RU12-SIA1-SB212(6)	07/20/07	6		<5.5	<5.5	**0.46 T**	<5.5	**0.65 T**	**0.89 T,J-**	**0.81 T**	**0.97 T**	**0.45 T**	<5.5	<5.5	**0.49 T**	**0.87 T**
RU12-SIA1-SB012	RU12-SIA1-SB012(10)	07/20/07	10		<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	**0.48 T**	<5.3	<5.3
RU12-SIA1-SB013	RU12-SIA1-SB013(2)	07/20/07	2		<6.1	<6.1	<6.1	<6.1	<6.1	**0.61 T,J+**	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1
RU12-SIA1-SB014	RU12-SIA1-SB014(1.5)	07/20/07	1.5		<5.9	<5.9	<5.9	<5.9	<5.9	**0.57 T,J+**	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9
RU12-SIA1-SB014	RU12-SIA1-SB014(3.5)	07/20/07	3.5		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	**0.66 T**	<6.0
RU12-SIA1-SB015	RU12-SIA1-SB015(2)	07/20/07	2		<5.7	<5.7	**0.38 T**	**0.48 T**	**0.77 T**	**0.83 T,J+**	<5.7	**0.63 T**	**0.41 T**	<5.7	<5.7	**0.4 T**	**0.54 T**
RU12-SIA1-SB017	RU12-SIA1-SB017 (2)	07/23/07	2		<5.6	<5.6	**0.99 T**	**1.6 T,J-**	**3.1 T,J-**	**4.8 T,J-**	**1.2 T,J-**	**1.8 T**	**1.1 T**	<5.6	<5.6	**2.2 T**	**1.5 T**
RU12-SIA1-SB017	RU12-SIA1-SB017 (4)	07/23/07	4		<5.3	**0.77 T**	**4.4 T,J-**	**8.1 J-**	**17 J-**	**15 J-**	**5.7 J-**	**8.1 J-**	**3.4 T**	<5.3	**1.7 T**	**4.6 T**	**3.8 T**
RU12-SIA1-SB018	RU12-SIA1-SB018(2)	07/20/07	2		<5.4	<5.4	**0.61 T**	**0.69 T**	**1.1 T**	**1.0 T,J-**	**0.75 T**	**1.6 T**	**0.67 T**	<5.4	<5.4	**0.78 T**	**0.9 T**
RU12-SIA1-SB018	RU12-SIA1-SB018(10)	07/20/07	10		<5.8	<5.8	<5.8	<5.8	<5.8	**0.69 T,J+**	<5.8	**0.44 T**	<5.8	<5.8	<5.8	<5.8	<5.8
RU12-SIA1-SB019	RU12-SIA1-SB019 (2)	07/23/07	2		<5.8	<5.8	<5.8	**0.65 T**	**0.79 T**	<5.8	**0.39 T**	**0.75 T**	**0.34 T**	<5.8	<5.8	<5.8	<5.8
RU12-SIA1-SB027	RU12-SIA1-SB027(2)	08/01/07	2		<5.8	<5.8	<5.8	**1.6 T,J+**	**0.6 T,J+**	<5.8	<5.8	<5.8	**0.43 T**	<5.8	<5.8	<5.8	<5.8
RU12-SIA1-SB027	RU12-SIA1-SB027(4)	08/01/07	4		<5.5	<5.5	<5.5	<5.5	**0.81 T**	**0.79 T**	<5.5	**0.62 T**	**0.66 T**	<5.5	<5.5	**0.43 T**	**0.54 T**
RU12-SIA1-SB030 CL	RU12-SIA1-SB230(8)	08/01/07	8		<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	<5.3 UJ	**0.38 T,J-**	<5.3 UJ	<5.3 UJ
RU12-SIA1-SB030 CL	RU12-SIA1-SB230(10)	08/01/07	10		<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	**0.61 T,J-**	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	**1.0 T,J-**	<5.5 UJ
RU12-SIA1-SB030	RU12-SIA1-SB030(16)	08/01/07	16		<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	<5.5 UJ	**0.48 T,J-**	<5.5 UJ
RU12-SIA1-SB031	RU12-SIA1-SB031(4)	08/01/07	4		<5.7 UJ	<5.7 UJ	**0.42 T,J-**	**0.87 T,J-**	**1.0 T,J-**	**1.2 T,J-**	**0.53 T,J-**	**0.58 T,J-**	**0.43 T,J-**	<5.7 UJ	<5.7 UJ	<5.7 UJ	**0.83 T,J-**
RU12-SIA1-SB038	RU12-SIA1-SB038(4)	08/01/07	4		<5.7	<5.7	**1.3 T**	**1.1 T**	**1.6 T**	**1.0 T**	**0.72 T**	**1.5 T**	**2.6 T**	<5.7	**0.48 T**	**2.3 T**	**2.1 T**
RU12-SIA1-SB038	RU12-SIA1-SB038(10)	08/01/07	10		<5.5	<5.5	**0.54 T**	**1.4 T**	**1.6 T**	**2.1 T**	**0.74 T**	**0.9 T**	**0.44 T**	<5.5	<5.5	**0.48 T**	**0.69 T**
RU12-SIA1-SB042	RU12-SIA1-SB042(5.5)	08/01/07	5.5		<5.6	<5.6	**0.58 T**	**0.84 T**	**1.1 T**	**0.97 T**	<5.6	**0.95 T**	**0.75 T**	<5.6	<5.6	**0.57 T**	**1.1 T**
RU12-SIA1-SB042	RU12-SIA1-SB042(13.5)	08/01/07	13.5		<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	**0.34 T**	<5.3	<5.3
RU12-SIA2-SB001	RU12-SIA2-SB001(5)	08/07/07	5		<5.4	<5.4	<5.4	**1.9 T,J**	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4
RU12-SIA2-SB001	RU12-SIA2-SB001(7)	08/07/07	7		<5.4	<5.4	<5.4	**2.2 T,J**	<5.4	<5.4	<5.4	<5.4	**0.42 T**	<5.4	<5.4	**0.43 T**	**0.4 T**
RU12-SIA2-SB001	RU12-SIA2-SB001(10)	08/07/07	10		<5.3	<5.3	<5.3	**2.7 T,J**	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
RU12-SIA2-SB001	RU12-SIA2-SB001(15)	08/07/07	15		<5.4	<5.4	<5.4	**2.0 T,J**	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4
RU12-SIA2-SB002	RU12-SIA2-SB002(3)	08/01/07	3		<5.4	<5.4	**0.66 T**	**1.1 T,J+**	**2.1 T,J+**	**1.1 T**	**0.47 T**	**1.0 T**	**0.9 T**	<5.4	<5.4	<5.4	**0.82 T**
RU12-SIA2-SB002	RU12-SIA2-SB002(5)	08/01/07	5		<5.9	<5.9	<5.9	**2.0 T,J+**	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9
RU12-SIA2-SB002	RU12-SIA2-SB002(13)	08/01/07	13		<5.3	<5.3	<5.3	**1.8 T,J+**	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
RU12-SIA2-SB003	RU12-SIA2-SB003(2)	08/01/07	2		<5.3	<5.3	<5.3	**2.4 T,J+**	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
RU12-SIA2-SB003	RU12-SIA2-SB003(4)	08/01/07	4		<5.6	<5.6	<5.6	**2.3 T,J+**	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
RU12-SIA2-SB003	RU12-SIA2-SB003(10)	08/01/07	10		<5.2	<5.2	<5.2	**2.1 T,J+**	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2

TABLE 4-28

FUEL INVESTIGATION AREAS
POLYNUCLEAR AROMATIC HYDROCARBONS DETECTION[a] SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 5)

				Analyte	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				Commercial/Industrial Worker SSL[b]	37,000,000	180,000,000	2,000	200	2,000	18,000,000	23,000	230,000	24,000,000	24,000,000	12,000,000	18,000,000	18,000,000
				Construction Worker SSL[b]	260,000,000	1,000,000,000	41,000	4,000	41,000	13,000,000	410,000	4,100,000	170,000,000	170,000,000	260,000,000	13,000,000	130,000,000
				Utility Worker SSL[b]	1,000,000,000	1,000,000,000	340,000	34,000	340,000	110,000,000	3,400,000	34,000,000	1,000,000,000	1,000,000,000	1,000,000,000	110,000,000	100,000,000
				SSL Protective of Groundwater[b]	570,000	12,000,000	2,000	8,000	5,000	110,000,000	49,000	160,000	4,300,000	560,000	59,000	840,000	4,200,000
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU12-SIA2-SB004	RU12-SIA2-SB004(7)	08/07/07	7		<5.6	<5.6	**1.1 T**	**1.5 T**	**2.3 T**	**2.4 T**	**0.68 T**	**1.7 T**	**1.4 T**	<5.6	<5.6	**2.4 T**	**2.9 T**
RU12-SIA2-SB005	RU12-SIA2-SB005(4)	08/07/07	4		<5.4	<5.4	<5.4	**1.5 T,J**	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4
RU12-SIA2-SB005	RU12-SIA2-SB005(6)	08/07/07	6		<5.3	<5.3	<5.3	**2.0 T,J**	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
RU12-SIA2-SB005	RU12-SIA2-SB005(10)	08/07/07	10		<5.5	**0.66 T**	**2.2 T**	**1.6 T,J**	**2.0 T,J**	<5.5	**0.59 T**	**2.4 T**	**5.0 T**	<5.5	<5.5	**2.6 T**	**4.9 T**
RU12-SIA2-SB005	RU12-SIA2-SB005(14)	08/07/07	14		<5.6	<5.6	<5.6	**2.2 T,J**	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
RU12-SIA2-SB006	RU12-SIA2-SB006(3)	08/07/07	3		**1.1 T**	**3.2 T**	**27**	**33 J**	**65 J**	**27 J**	**19**	**32**	**37**	**1.5 T**	**3.1 T**	**16**	**28**
RU12-SIA2-SB006	RU12-SIA2-SB006(5)	08/07/07	5		<5.4	<5.4	<5.4	**1.8 T,J**	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4
RU12-SIA2-SB006	RU12-SIA2-SB006(10)	08/07/07	10		<5.5	<5.5	<5.5	**1.6 T,J**	<5.5	<5.5	<5.5	<5.5	**0.41 T**	<5.5	<5.5	<5.5	<5.5
RU12-SIA2-SB006	RU12-SIA2-SB006(13)	08/07/07	13		<5.6	<5.6	<5.6	**2.8 T,J**	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
RU12-SIA2-SB007	RU12-SIA2-SB007(4)	08/07/07	4		<5.5	<5.5	**2.0 T**	**2.6 T,J**	**5.0 T,J**	**2.1 T,J**	**1.2 T**	**3.0 T**	**3.5 T**	<5.5	**0.87 T**	**2.2 T**	**2.5 T**
RU12-SIA2-SB007	RU12-SIA2-SB007(6)	08/07/07	6		<5.3	<5.3	<5.3	**2.2 T,J**	<5.3	<5.3	<5.3	<5.3	**0.79 T**	<5.3	<5.3	<5.3	**0.71 T**
RU12-SIA2-SB007	RU12-SIA2-SB007(10)	08/07/07	10		<5.6	<5.6	<5.6	**2.7 T,J**	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
RU12-SIA2-SB007	RU12-SIA2-SB007(14)	08/07/07	14		<5.1	<5.1	<5.1	**1.8 T,J**	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1
RU12-SIA2-SB008	RU12-SIA2-SB008(7)	08/07/07	7		<5.6	**0.8 T**	**4.2 T**	**4.1 T**	**6.2**	**2.8 T**	**2.6 T**	**6.6**	**5.7**	<5.6	**0.51 T**	**3.5 T**	**6.3**
RU12-SIA2-SB008	RU12-SIA2-SB008(10)	08/07/07	10		<5.2	**0.58 T**	**3.1 T**	**2.5 T,J**	**3.6 T,J**	**0.97 T,J**	**0.99 T**	**3.4 T**	**4.4 T**	<5.2	<5.2	**2.1 T**	**4.9 T**
RU12-SIA2-SB008	RU12-SIA2-SB008(15)	08/07/07	15		<5.2	<5.2	<5.2	**2.9 T,J**	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
RU20-SIA1-SB009	RU20-SIA1-SB009 (5.5)	06/20/07	5.5		<5.5	<5.5	**0.48 T**	<5.5	<5.5	<5.5	<5.5	**0.59 T**	<5.5	<5.5	<5.5	**0.59 T**	**0.76 T**
RU20-SIA1-SB009	RU20-SIA1-SB009 (10)	06/20/07	10		<5.8	**0.77 T**	**4.9 T**	**3.4 T**	**1.9 T**	**1.7 T**	<5.8	**6.2**	**1.4 T**	<5.8	**0.36 T**	**5.4 T**	**6.8**
RU20-SIA1-SB011	RU20-SIA1-SB011 (4)	06/20/07	4		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.47 T**	<5.7	<5.7	<5.7	<5.7	<5.7
RU20-SIA1-SB015	RU20-SIA1-SB015(3)	06/22/07	3		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	**0.47 T**	<5.6
RU20-SIA1-SB015	RU20-SIA1-SB015(10)	06/22/07	10		<5.7	<5.7	**0.93 T**	**0.7 T**	**0.63 T**	<5.7 UJ	<5.7	**2.4 T**	**0.53 T**	<5.7	<5.7	**5.0 T**	**2.7 T**
RU20-SIA1-SB016	RU20-SIA1-SB016(5)	06/22/07	5		<5.8	<5.8	**2.1 T**	**2.3 T**	**3.3 T**	**2.0 T**	**1.2 T**	**2.3 T**	**2.7 T**	<5.8	<5.8	**0.64 T**	**2.7 T**
RU20-SIA1-SB016	RU20-SIA1-SB016(10)	06/22/07	10		**1.9 T**	**1.5 T**	**51**	**73**	**98**	**58**	**35**	**57**	**51**	<5.5	**1.5 T**	**6.7**	**53**
RU20-SIA1-SB017	RU20-SIA1-SB017(4.5)	06/22/07	4.5		<6.2	<6.2	**0.79 T**	**1.1 T**	**1.6 T**	**1.1 T**	**0.49 T**	**1.0 T**	**0.93 T**	<6.2	<6.2	<6.2	**0.95 T**
RU20-SIA1-SB020	RU20-SIA1-SB020(4)	06/22/07	4		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	**0.48 T**
RU20-SIA1-SB020	RU20-SIA1-SB020(6)	06/22/07	6		<5.9	<5.9	<5.9	<5.9	<5.9	<5.9 UJ	<5.9	<5.9	**0.59 T**	<5.9	<5.9	<5.9	**0.47 T**
RU20-SIA1-SB020	RU20-SIA1-SB020(10)	06/22/07	10		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0 UJ	<6.0	**0.98 T**	**0.94 T**	<6.0	<6.0	<6.0	**0.51 T**
RU20-SIA1-SB020 CL	RU20-SIA1-SB220(10)	06/22/07	10		<6.0	<6.0	**1.3 T**	**1.8 T**	**2.9 T**	**1.5 T,J-**	**2.3 T**	**3.0 T**	**2.7 T**	<6.0	<6.0	**0.65 T**	**1.8 T**
RU20-SIA1-SB020	RU20-SIA1-SB020(14)	06/22/07	14		<6.2	<6.2	<6.2	<6.2	<6.2	<6.2 UJ	<6.2	<6.2	<6.2	<6.2	<6.2	**0.6 T**	<6.2
RU20-SIA1-SB021	RU20-SIA1-SB021(3)	06/22/07	3		**1800 D**	**2600 D**	**77000 D**	**160000 D**	**190000 D**	**150000 DJ+**	**63000 D**	**110000 D**	**63000 D**	**910 D**	**1700 D**	**10000 TD**	**75000 D**
RU20-SIA1-SB021	RU20-SIA1-SB021(5)	06/22/07	5		**3.6 T**	**5.1 T**	**110**	**180**	**200**	**210 J-**	**150**	**140**	**130**	**1.4 T**	**3.1 T**	**26**	**130**
RU20-SIA1-SB021	RU20-SIA1-SB021(10)	06/22/07	10		<5.4	<5.4	<5.4	<5.4	<5.4	**3.7 T,J-**	<5.4	<5.4	**0.57 T**	<5.4	<5.4	<5.4	**0.58 T**
RU20-SIA1-SB021	RU20-SIA1-SB021(13)	06/22/07	13		<6.0	<6.0	**1.5 T**	**1.8 T**	**2.2 T**	**1.6 T,J-**	**2.2 T**	**1.8 T**	**1.9 T**	<6.0	<6.0	<6.0	**1.8 T**
RU20-SIA1-SB022	RU20-SIA1-SB022(13)	06/22/07	13		<5.6	<5.6	**0.56 T**	<5.6	**0.87 T**	<5.6 UJ	**0.72 T**	**1.2 T**	**0.81 T**	<5.6	<5.6	**0.75 T**	**1.0 T**
RU20-SIA1-SB023	RU20-SIA1-SB023(4.5)	06/22/07	4.5		**17**	**23**	**440 D**	**620 D**	**880 D**	**540 DJ+**	**260 D**	**560 D**	**540 D**	**6.4**	**12**	**120**	**540 D**
RU20-SIA1-SB024	RU20-SIA1-SB024(2)	06/28/07	2		**2.1 T**	**1.0 T**	**7.1**	**8.2**	**4.4 T**	**4.4 T,J-**	<5.7	**20**	**3.4 T**	**1.9 T**	**0.36 T**	**38**	**20**
RU20-SIA1-SB024	RU20-SIA1-SB024(10)	06/28/07	10		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	<5.6	**0.79 T**	<5.6
RU20-SIA1-SB025	RU20-SIA1-SB025(10)	06/25/07	10		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	**0.42 T**	<5.6
RU20-SIA1-SB027	RU20-SIA1-SB027(4.5)	06/25/07	4.5		<2900 D	**290 TD**	**6700 D**	**11000 D**	**13000 D**	**8900 D**	**6200 D**	**9900 D**	**7800 D**	<2900 D	**180 TD**	**1600 TD**	**8100 D**

TABLE 4-28

FUEL INVESTIGATION AREAS
POLYNUCLEAR AROMATIC HYDROCARBONS DETECTION[a] SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 5)

				Analyte	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				Commercial/Industrial Worker SSL[b]	37,000,000	180,000,000	2,000	200	2,000	18,000,000	23,000	230,000	24,000,000	24,000,000	12,000,000	18,000,000	18,000,000
				Construction Worker SSL[b]	260,000,000	1,000,000,000	41,000	4,000	41,000	13,000,000	410,000	4,100,000	170,000,000	170,000,000	260,000,000	13,000,000	130,000,000
				Utility Worker SSL[b]	1,000,000,000	1,000,000,000	340,000	34,000	340,000	110,000,000	3,400,000	34,000,000	1,000,000,000	1,000,000,000	1,000,000,000	110,000,000	100,000,000
				SSL Protective of Groundwater[b]	570,000	12,000,000	2,000	8,000	5,000	110,000,000	49,000	160,000	4,300,000	560,000	59,000	840,000	4,200,000
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU20-SIA1-SB027	RU20-SIA1-SB027(14.5)	06/25/07	14.5		<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	**0.39 T**	<5.5	<5.5	**0.44 T**	<5.5
RU20-SIA1-SB028	RU20-SIA1-SB028(6)	06/25/07	6		<5.5	<5.5	**0.43 T**	**0.89 T**	**1.5 T**	**1.4 T**	**0.49 T**	**0.58 T**	**0.33 T**	<5.5	<5.5	<5.5	**0.48 T**
RU20-SIA1-SB028	RU20-SIA1-SB028(10)	06/25/07	10		<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	**0.41 T**	<6.1	<6.1	<6.1	<6.1
RU20-SIA1-SB028	RU20-SIA1-SB028(16)	06/25/07	16		<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	**0.49 T**	<6.1
RU20-SIA1-SB029	RU20-SIA1-SB029(2)	06/28/07	2		<5.4	<5.4	**0.55 T**	<5.4	<5.4	<5.4 UJ	<5.4	**1.5 T**	<5.4	<5.4	<5.4	**2.3 T**	**1.3 T**
RU20-SIA1-SB030	RU20-SIA1-SB030(5.5)	06/28/07	5.5		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	**0.36 T**	**0.73 T**	<5.6
RU20-SIA1-SB030 CL	RU20-SIA1-SB230(5.5)	06/28/07	5.5		<5.4	**0.47 T**	**1.2 T**	**0.83 T**	<5.4	<5.4 UJ	<5.4	**2.8 T**	**0.74 T**	<5.4	**0.81 T**	**7.1**	**3.8 T**
RU20-SIA1-SB030	RU20-SIA1-SB030(7.5)	06/28/07	7.5		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	<5.6	**0.42 T**	<5.6
RU20-SIA1-SB030 CL	RU20-SIA1-SB230(7.5)	06/28/07	7.5		**16 TD**	**17 TD**	**23 TD**	**16 TD**	**8.1 TD**	<56 D,UJ	<56 D	**52 TD**	**12 TD**	**24 TD**	**6.9 TD**	**200 D**	**78 D**
RU20-SIA1-SB031	RU20-SIA1-SB031 (5.0)	06/26/07	5		<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	**1.1 T**	<5.5	<5.5	<5.5	<5.5	**1.1 T**
RU20-SIA1-SB035	RU20-SIA1-SB035(2)	06/28/07	2		<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	<5.4	**0.39 T**	<5.4
RU20-SIA1-SB036	RU20-SIA1-SB036(3.5)	06/27/07	3.5		<5.8	**0.71 T**	**34**	**20**	**8.9**	**8.5**	<5.8	**72**	**2.8 T**	**1.4 T**	<5.8	**9.7**	**46**
RU20-SIA1-SB036	RU20-SIA1-SB036(13.5)	06/27/07	13.5		**2.1 T,J-**	**1.4 T,J-**	**13 J-**	**8.7 J-**	**4.1 T,J-**	**4.9 T,J-**	<5.7 UJ	**26 J-**	**2.8 T,J-**	**3.2 T,J-**	**0.59 T,J-**	**17 J-**	**24 J-**
RU20-SIA1-SB037	RU20-SIA1-SB037 (8)	06/26/07	8		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	**2.0 T**	<6.0	<6.0	<6.0	**4.6 T**
RU20-SIA1-SB037	RU20-SIA1-SB037 (10)	06/26/07	10		<5.6	<5.6	<5.6	<5.6	<5.6	**1.4 T**	<5.6	<5.6	**1.8 T**	<5.6	<5.6	**0.71 T**	**3.9 T**
RU20-SIA1-SB038	RU20-SIA1-SB038 (11)	06/26/07	11		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**1.1 T**	<5.8	<5.8	<5.8	**0.42 T**	<5.8
RU20-SIA1-SB038	RU20-SIA1-SB038 (13)	06/26/07	13		<5.8	<5.8	**0.51 T**	<5.8	**0.84 T**	<5.8	**0.45 T**	**0.88 T**	<5.8	<5.8	<5.8	<5.8	<5.8
RU20-SIA1-SB039	RU20-SIA1-SB039 (8)	06/26/07	8		<5.9	<5.9	**0.53 T**	<5.9	**1.3 T**	<5.9	**0.52 T**	**0.72 T**	**0.71 T**	<5.9	<5.9	<5.9	**0.68 T**
RU20-SIA1-SB040	RU20-SIA1-SB040(4)	06/27/07	4		<6.2	<6.2	<6.2	**0.87 T**	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2
RU20-SIA1-SB041	RU20-SIA1-SB041(6)	06/27/07	6		<6.2	<6.2	<6.2	**1.1 T**	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2
RU20-SIA1-SB041	RU20-SIA1-SB041(8)	06/27/07	8		<5.9	<5.9	<5.9	**1.0 T**	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9
RU20-SIA2-SB002	RU20-SIA2-SB002(5.5)	08/20/07	5.5		<5.6	<5.6	<5.6	<5.6	<5.6	**0.66 T,J**	<5.6	<5.6	**0.43 T**	<5.6	<5.6	**0.48 T**	**0.86 T**
RU20-SIA2-SB003	RU20-SIA2-SB003(14)	08/21/07	14		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	**0.46 T**
RU20-SIA2-SB004	RU20-SIA2-SB004(2)	07/10/07	2		<5.2 UJ	<5.2 UJ	<5.2 UJ	<5.2 UJ	<5.2 UJ	<5.2 UJ	<5.2 UJ	**0.67 T,J-**	**0.69 T,J-**	<5.2 UJ	**0.38 T,J-**	**0.52 T,J-**	**0.63 T,J-**
RU20-SIA2-SB010 CL	RU20-SIA2-SB210(3)	07/10/07	3		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.43 T**	**0.41 T**
RU20-SIA2-SB011	RU20-SIA2-SB011(5)	07/10/07	5		<6.1	**0.53 T**	**0.62 T**	**0.77 T**	**1.0 T**	<6.1	**0.92 T**	**1.8 T**	**0.76 T**	<6.1	<6.1	<6.1	**4.2 T**
RU20-SIA2-SB014	RU20-SIA2-SB014(2)	07/02/07	2		<5.4	<5.4	<5.4	<5.4	<5.4	<5.4 UJ	<5.4	<5.4	**0.73 T,J+**	<5.4	**0.39 T**	<5.4	<5.4
RU20-SIA2-SB021	RU20-SIA2-SB021(5)	06/29/07	5		<5.4	**1.0 T**	**0.59 T**	**0.77 T**	**1.3 T**	**1.0 T,J+**	<5.4	**1.6 T**	**0.88 T**	<5.4	<5.4	**0.51 T**	**1.1 T**
RU20-SIA2-SB022	RU20-SIA2-SB022(3)	06/29/07	3		<6.1	<6.1	<6.1	**1.1 T**	**1.4 T**	**3.1 T,J-**	**1.2 T**	**0.93 T**	**0.48 T,J+**	<6.1	**0.52 T**	**0.64 T**	**0.76 T,J+**
RU20-SIA2-SB025	RU20-SIA2-SB025(2)	06/29/07	2		<5.8	<5.8	**0.98 T**	<5.8	<5.8	<5.8 UJ	<5.8	**2.0 T**	**0.62 T,J+**	<5.8	<5.8	**1.2 T**	**1.9 T,J+**
RU20-SIA2-SB025	RU20-SIA2-SB025(4)	06/29/07	4		<6.1	<6.1	<6.1	<6.1	<6.1	<6.1 UJ	<6.1	**1.1 T**	<6.1	<6.1	<6.1	<6.1	**1.1 T,J+**
RU20-SIA2-SB026	RU20-SIA2-SB026(2)	06/29/07	2		<6.3	<6.3	<6.3	<6.3	<6.3	**1.7 T,J+**	<6.3	**1.6 T**	<6.3	<6.3	<6.3	<6.3	<6.3
RU20-SIA2-SB028	RU20-SIA2-SB028(10)	06/28/07	10		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**0.44 T**	<5.8	<5.8
RU20-SIA2-SB030	RU20-SIA2-SB030(3)	07/02/07	3		<6.0	**0.49 T**	**0.91 T**	**1.6 T**	**2.7 T**	**3.0 T**	**0.79 T**	**2.3 T**	**1.4 T**	<6.0	<6.0	**0.91 T**	**1.9 T**
RU20-SIA2-SB030	RU20-SIA2-SB030(5)	07/02/07	5		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	**0.43 T**	<6.0
RU20-SIA1-SB044	RU20-SIA1-SB044(4)	11/29/07	4		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.49 T**	<5.7	<5.7
RU20-SIA1-SB044	RU20-SIA1-SB044(14)	11/29/07	14		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.51 T**	<5.7	<5.7
RU20-SIA1-SB045	RU20-SIA1-SB045(6)	11/29/07	6		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	**0.42 T**	<6.0	<6.0
RU20-SIA1-SB045	RU20-SIA1-SB045(8)	11/29/07	8		<5.8	<5.8	<5.8	<5.8	<5.8	**0.51 T**	<5.8	<5.8	**0.8 T**	<5.8	**3.7 T**	**0.88 T**	**1.1 T**

TABLE 4-28

FUEL INVESTIGATION AREAS
POLYNUCLEAR AROMATIC HYDROCARBONS DETECTION[a] SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 5)

				Analyte	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				Commercial/Industrial Worker SSL[b]	37,000,000	180,000,000	2,000	200	2,000	18,000,000	23,000	230,000	24,000,000	24,000,000	12,000,000	18,000,000	18,000,000
				Construction Worker SSL[b]	260,000,000	1,000,000,000	41,000	4,000	41,000	13,000,000	410,000	4,100,000	170,000,000	170,000,000	260,000,000	13,000,000	130,000,000
				Utility Worker SSL[b]	1,000,000,000	1,000,000,000	340,000	34,000	340,000	110,000,000	3,400,000	34,000,000	1,000,000,000	1,000,000,000	1,000,000,000	110,000,000	100,000,000
				SSL Protective of Groundwater[b]	570,000	12,000,000	2,000	8,000	5,000	110,000,000	49,000	160,000	4,300,000	560,000	59,000	840,000	4,200,000
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU20-SIA1-SB045	RU20-SIA1-SB045(10)	11/29/07	10		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.63 T**	<5.7	<5.7
RU20-SIA1-SB045	RU20-SIA1-SB045(16)	11/29/07	16		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**0.54 T**	<5.8	<5.8
RU20-SIA1-SB046	RU20-SIA1-SB046(7)	11/30/07	7		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**0.56 T**	<5.8	<5.8
RU20-SIA1-SB046	RU20-SIA1-SB046(10)	11/30/07	10		<5.7	<5.7	<5.7	<5.7 UJ	<5.7	<5.7 UJ	<5.7	<5.7	<5.7	<5.7	**1.6 T**	<5.7	<5.7
RU20-SIA1-SB046	RU20-SIA1-SB046(15)	11/30/07	15		<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	**1.4 T**	<5.5	**0.36 T**	<5.5	<5.5
RU20-SIA1-SB047	RU20-SIA1-SB047(6)	11/30/07	6		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.48 T**	<5.7	<5.7
RU20-SIA1-SB047	RU20-SIA1-SB047(10)	11/30/07	10		<5.6	<5.6	**0.96 T**	**0.94 T**	**1.2 T,J**	**1.1 T**	**1.5 T**	**1.4 T**	**1.4 T**	<5.6	**9.4**	**1.5 T**	**1.4 T**
RU20-SIA1-SB047	RU20-SIA1-SB047(16)	11/30/07	16		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	**0.4 T**	<5.6	<5.6
RU20-SIA1-SB048	RU20-SIA1-SB048(8)	11/30/07	8		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**0.41 T**	**0.48 T**	<5.8	**0.55 T**	**0.47 T**	**0.56 T**
RU20-SIA1-SB048	RU20-SIA1-SB048(10)	11/30/07	10		<5.8	<5.8	<5.8	<5.8 UJ	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	**0.81 T**	<5.8	<5.8
RU20-SIA1-SB048	RU20-SIA1-SB048(16)	11/30/07	16		<5.8	<5.8	<5.8	<5.8 UJ	<5.8 UJ	<5.8 UJ	<5.8 UJ	<5.8	<5.8	<5.8	**0.45 T**	<5.8	<5.8
RU20-SIA1-SB049	RU20-SIA1-SB049(5)	11/30/07	5		<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	**0.36 T**	<5.6	<5.6
RU20-SIA1-SB049	RU20-SIA1-SB049(7)	11/30/07	7		<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	**0.43 T**	**0.38 T**	<5.9	<5.9	<5.9	<5.9
RU20-SIA1-SB049	RU20-SIA1-SB049(10)	11/30/07	10		<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	**0.44 T**	<5.7	<5.7
RU20-SIA1-SB049	RU20-SIA1-SB049(15)	11/30/07	15		<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	**0.42 T**	<5.9	<5.9
RU20-SIA1-SB050	RU20-SIA1-SB050(5.5)	11/30/07	5.5		<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	**0.37 T**	<5.6	<5.6
RU20-SIA1-SB050 CL	RU20-SIA1-SB250(5.5)	11/30/07	5.5		<5.7	<5.7	<5.7	<5.7 UJ	<5.7	<5.7 UJ	<5.7	<5.7	<5.7	<5.7	**0.48 T**	<5.7	<5.7
RU20-SIA1-SB050	RU20-SIA1-SB050(7.5)	11/30/07	7.5		<5.7	<5.7	<5.7	<5.7 UJ	<5.7	<5.7 UJ	<5.7	<5.7	<5.7	<5.7	**0.39 T**	<5.7	<5.7
RU20-SIA1-SB050	RU20-SIA1-SB050(10)	11/30/07	10		<5.7	<5.7	<5.7	<5.7 UJ	<5.7	<5.7 UJ	<5.7	<5.7	<5.7	<5.7	**0.49 T**	<5.7	<5.7
RU20-SIA1-SB050 CL	RU20-SIA1-SB250(10)	11/30/07	10		<5.6	<5.6	<5.6	<5.6 UJ	<5.6	<5.6 UJ	<5.6	<5.6	<5.6	<5.6	**0.4 T**	<5.6	<5.6
RU20-SIA1-SB050	RU20-SIA1-SB050(15.5)	11/30/07	15.5		<5.7	<5.7	<5.7	<5.7 UJ	<5.7	<5.7 UJ	<5.7	<5.7	<5.7	<5.7	**0.64 T**	<5.7	<5.7
RU20-SIA1-SB051	RU20-SIA1-SB051(15)	12/03/07	15		<5.2	<5.2	<5.2	<5.2	<5.2	**0.44 T**	<5.2 UJ	<5.2	**0.58 T**	<5.2	<5.2	<5.2	**0.48 T**
RU20-SIA1-SB052	RU20-SIA1-SB052(16.5)	12/03/07	16.5		<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0 UJ	<6.0	<6.0	<6.0	**0.39 T**	<6.0	<6.0
RU20-SIA1-SB053	RU20-SIA1-SB053(6)	12/03/07	6		<6.0	<6.0	**0.55 T**	**0.5 T,J**	**0.98 T,J**	**0.73 T**	<6.0 UJ	**0.83 T**	**0.87 T**	<6.0	**0.74 T**	**0.69 T**	**0.84 T**
RU20-SIA1-SB053	RU20-SIA1-SB053(8)	12/03/07	8		<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1 UJ	<6.1	<6.1	<6.1	**0.39 T**	<6.1	<6.1
RU20-SIA1-SB054	RU20-SIA1-SB054(4)	12/03/07	4		<5.3	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3 UJ	<5.3	<5.3	<5.3	**0.36 T**	<5.3	<5.3
RU20-SIA1-SB054	RU20-SIA1-SB054(6)	12/03/07	6		<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1 UJ	<6.1	<6.1	<6.1	**0.41 T**	<6.1	<6.1
RU20-SIA1-SB054	RU20-SIA1-SB054(10)	12/03/07	10		<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2 UJ	<6.2	<6.2	<6.2	**0.39 T**	<6.2	<6.2
RU20-SIA1-SB054	RU20-SIA1-SB054(14)	12/03/07	14		<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3 UJ	<6.3	<6.3	<6.3	**0.78 T**	<6.3	<6.3
RU20-SIA1-SB055	RU20-SIA1-SB055(6)	12/03/07	6		<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8 UJ	<5.8	<5.8	<5.8	**0.42 T**	<5.8	<5.8
RU20-SIA1-SB055	RU20-SIA1-SB055(10)	12/03/07	10		<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2 UJ	<6.2	<6.2	<6.2	**0.38 T**	<6.2	<6.2
RU20-SIA1-SB055	RU20-SIA1-SB055(14)	12/03/07	14		<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5 UJ	<5.5	<5.5	<5.5	**0.41 T**	<5.5	<5.5
RU20-SIA1-SB057	RU20-SIA1-SB057(3)	12/04/07	3		<5.4	<5.4	**0.91 T,J-**	**1.4 T,J-**	**2.1 T,J**	**2.0 T**	**0.58 T,J-**	**1.2 T,J-**	**0.53 T,J-**	<5.4	<5.4	<5.4	**0.59 T,J-**
RU20-SIA1-SB058	RU20-SIA1-SB058(4)	12/04/07	4		<6.1	<6.1 UJ	<6.1	<6.1 UJ	<6.1	<6.1	<6.1 UJ	<6.1	**0.93 T**	<6.1	<6.1	**0.48 T**	**0.83 T**
RU20-SIA1-SB059	RU20-SIA1-SB059(2)	12/04/07	2		<6.0	<6.0	**0.82 T,J-**	**0.92 T,J-**	**1.6 T,J**	**1.3 T**	**0.46 T,J-**	**1.0 T,J-**	**0.86 T,J-**	<6.0	<6.0	<6.0	**0.93 T,J-**
RU20-SIA1-SB059	RU20-SIA1-SB059(4)	12/04/07	4		<5.7	<5.7	**0.49 T,J-**	**0.53 T,J-**	**0.95 T,J**	**0.77 T**	**0.34 T,J-**	**0.58 T,J-**	**0.52 T,J-**	<5.7	<5.7	<5.7	**0.56 T,J-**
RU20-SIA1-SB059	RU20-SIA1-SB059(10)	12/04/07	10		**2.2 T**	**2.7 T**	**45 J-**	**57 J-**	**80 J**	**59**	**25 J-**	**55 J-**	**59 J-**	<6.1	**1.8 T**	**13**	**59 J-**
RU20-SIA1-SB060 CL	RU20-SIA1-SB260(2)	12/04/07	2		<6.0	<6.0	<6.0 UJ	<6.0 UJ	<6.0	<6.0	<6.0 UJ	**1.6 T,J-**	<6.0 UJ	<6.0	**0.37 T**	<6.0	<6.0 UJ
RU20-SIA1-SB060 CL	RU20-SIA1-SB260(10)	12/04/07	10		<6.0	<6.0	<6.0 UJ	<6.0 UJ	<6.0	<6.0	<6.0 UJ	<6.0 UJ	<6.0 UJ	<6.0	**0.39 T**	<6.0	<6.0 UJ

TABLE 4-28

FUEL INVESTIGATION AREAS
POLYNUCLEAR AROMATIC HYDROCARBONS DETECTION[a] SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 5 of 5)

				Analyte	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
				Units	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
				Commercial/Industrial Worker SSL[b]	**37,000,000**	**180,000,000**	**2,000**	**200**	**2,000**	**18,000,000**	**23,000**	**230,000**	**24,000,000**	**24,000,000**	**12,000,000**	**18,000,000**	**18,000,000**
				Construction Worker SSL[b]	**260,000,000**	**1,000,000,000**	**41,000**	**4,000**	**41,000**	**13,000,000**	**410,000**	**4,100,000**	**170,000,000**	**170,000,000**	**260,000,000**	**13,000,000**	**130,000,000**
				Utility Worker SSL[b]	**1,000,000,000**	**1,000,000,000**	**340,000**	**34,000**	**340,000**	**110,000,000**	**3,400,000**	**34,000,000**	**1,000,000,000**	**1,000,000,000**	**1,000,000,000**	**110,000,000**	**100,000,000**
				SSL Protective of Groundwater[b]	**570,000**	**12,000,000**	**2,000**	**8,000**	**5,000**	**110,000,000**	**49,000**	**160,000**	**4,300,000**	**560,000**	**59,000**	**840,000**	**4,200,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**														
RU20-SIA1-SB062	RU20-SIA1-SB062(2)	12/04/07	2		<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	**0.65 T**	<6.3	<6.3	<6.3	**0.56 T,J+**

SSL Soil screening level
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
a For the complete data summary, refer to Appendix D of this report.
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* EPA (2002), supplemented with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
µg/kg micrograms per kilogram.
Bold Bolded result indicates positively identified compound.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
CL Colocated sample for blind replicate analysis
UB Analyte considered not detected based on associated blank data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
J+ Data are estimated, potentially biased high due to associated quality control data.
J- Data are estimated, potentially biased low due to associated quality control data.
UB Analyte considered not detected based on associated blank data.
UB Analyte considered not detected based on associated blank data.

TABLE 4-29

POLYCHLORINATED BIPHENYLS INVESTIGATION AREA
DETECTION SUMMARY TABLE[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

					Dichlor-biphenyls	Trichloro-biphenyls	Tetrachloro-biphenyls	Pentachloro-biphenyls	Hexachloro-biphenyls	Heptachloro-biphenyls	Octachloro-biphenyls
				Analyte	**Dichlor-biphenyls**	**Trichloro-biphenyls**	**Tetrachloro-biphenyls**	**Pentachloro-biphenyls**	**Hexachloro-biphenyls**	**Heptachloro-biphenyls**	**Octachloro-biphenyls**
				Units	**pg/g**	**pg/g**	**pg/g**	**pg/g**	**pg/g**	**pg/g**	**pg/g**
				Commercial/Industrial Worker SSL[b]	**24,000,000**	**24,000,000**	**24,000,000**	**800,000**	**800,000**	**800,000**	**800,000**
				Construction Worker SSL[b]	**420,000,000**	**420,000,000**	**420,000,000**	**15,000,000**	**15,000,000**	**15,000,000**	**15,000,000**
				Utility Worker SSL[b]	**3,400,000,000**	**3,400,000,000**	**3,400,000,000**	**120,000,000**	**120,000,000**	**120,000,000**	**120,000,000**
				SSL Protective of Groundwater[c]	**900,000**	**900,000**	**900,000**	**900,000**	**900,000**	**900,000**	**900,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**								
RU12-SIA3-SB001	RU12-SIA3-SB001(2.5)	08/08/07	2.5		<200	<200	<200	<200	<200	**280 J-**	<200
RU12-SIA3-SB002	RU12-SIA3-SB002(2.5)	08/08/07	2.5		<210	<210	<210	**260**	**220**	<210	<210
RU12-SIA3-SB003	RU12-SIA3-SB003(5.0)	08/08/07	5		<230 D	<230 D	<230 D	**2100 D**	**3300 D**	**710 D**	<230 D
RU12-SIA3-SB003	RU12-SIA3-SB003(7.5)	08/08/07	7.5		<230 D	<230 D	<230 D	**840 D**	**1100 D**	**240 D**	<230 D
RU12-SIA3-SB003	RU12-SIA3-SB003(10)	08/08/07	10		<230 D	<230 D	<230 D	**290 D**	**520 D**	<230 D	<230 D
RU12-SIA3-SB007	RU12-SIA3-SB007(5.0)	08/08/07	5		<210	<210	<210	<210	**760**	**300**	<210
RU12-SIA3-SB019	RU12-SIA3-SB019 (2.5)	07/30/07	2.5		**560**	**470**	**2800**	**3500**	**1500**	**270**	<210
RU12-SIA3-SB021	RU12-SIA3-SB021 (7.5)	07/30/07	7.5		<230	<230	**1700**	**910**	<230	<230 UJ	<230
RU12-SIA3-SB023	RU12-SIA3-SB023 (0)	07/30/07	0		<210 D	<210	**2900 D**	**5300 D**	**2300 D**	**290 D**	<210 D
RU12-SIA3-SB028	RU12-SIA3-SB028 (7.5)	07/27/07	7.5		**2100**	**2000**	**6800**	**4900**	**3100 D**	**1400 D**	<210
RU12-SIA3-SB029	RU12-SIA3-SB029 (2.5)	07/27/07	2.5		<210 D	<210 D	<210 D	**770 D**	**3700 D**	**4000 D**	**750 D**
RU12-SIA3-SB030	RU12-SIA3-SB030 (0)	07/27/07	0		**770**	**1700**	**2200**	**970**	<200	<200 UJ	<200
RU12-SIA3-SB031	RU12-SIA3-SB031 (7.5)	07/27/07	7.5		<210	<210	**270**	**610**	<210	<210 UJ	<210

SSL Soil screening level
a For the complete data summary, refer to Appendix D of this report.
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil* Screening Levels for Superfund Sites EPA (2002), supplemented with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
ft feet
pg/g picograms per gram
Bold Bolded result indicates positively identified compound.
D Sample dilution required for analysis; reported values reflect the dilution.
J- Data are estimated, potentially biased low due to associated quality control data.

TABLE 4-30

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 12***
(FORMER RP AREA AND MOBILE SHOP)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As, Cd*	*5.E-05*	*As*	*8.E-05*	*Cd, As*	*6.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226, K-40
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Cd**	**3.E-05**	**Pb-210, Cd**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	7	Cd, V	4	Cd, V	12	Cd, V	0.9	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.3	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.08	-	NA	-	16	Cd, Ni	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**140**	**P4, Cd**	**77**	**P4, Cd**	**54**	**P4, Cd**	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when "smoke" became apparent due to the irritant effect of the acid aerosol which comprises the "smoke". This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

*** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-31

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 13***
(POND 8S RECOVERY PROCESS AND METAL SCRAP PREPARATION AREA)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As, Cd*	*5.E-05*	*As*	*8.E-05*	*Cd, As*	*6.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226, K-40
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Cd**	**3.E-05**	**Pb-210, Cd**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	6	Cd	3	Cd	11	Cd, As	0.8	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.3	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.06	-	NA	-	13	Cd	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**139**	**P4, Cd**	**76**	**P4, Cd**	**50**	**P4, Cd**	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when "smoke" became apparent due to the irritant effect of the acid aerosol which comprises the "smoke". This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

*** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 6)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				Background[b]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1
				Commercial/Industrial Worker SSL	454	7.7[c]	61,700	645	223,000	860	1,000,000d	553	42,000	68,100	800[f]
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[f]
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000d	679	286,000	430,000	800[f]
				SSL Protective of Groundwater[e]	5	7.7[g]	1,600	63	450	8	38	630	9,400	12,000	800[f]
Location Identification	Field Sample Identification	Date Collected	Depth (ft)												
RU15-SIA1-SB001	RU15-SIA1-SB001 (5)	11/28/07	5		0.336 T	4.84	133	0.585 T	9.65 T,J-	11	34.6 B	4.08	13.8	<5	7.51
RU15-SIA1-SB001	RU15-SIA1-SB001 (10)	11/28/07	10		<1	4.13	118	0.459 T	5.72 T,J-	0.773 T	13 B	4.44	8.49	6.2	8.07
RU15-SIA1-SB001	RU15-SIA1-SB001 (20)	11/28/07	20		<1	4.43	106	0.507 T	4.67 T,J-	0.286 T	11.9 B	4.77	8.38	13	7.9
RU15-SIA1-SB001	RU15-SIA1-SB001 (30)	11/28/07	30		<1	3.26	87.4	0.46 T	3.99 T,J-	0.984 T	10 B	3.5	7	15	5.25
RU15-SIA1-SB001	RU15-SIA1-SB001 (40)	11/28/07	40		0.168 T	4.75	132	0.551 T	6.74 T,J-	2.7	18.2 B	4.63	10.1	5.1	7.36
RU15-SIA1-SB002	RU15-SIA1-SB002 (20.5)	11/16/07	20.5		<1	4.13	109	0.464 T	6.69 T	0.305 T	9.17 B	4.09	7.36	<5	7.66
RU15-SIA1-SB002	RU15-SIA1-SB002 (30)	11/16/07	30		0.132 T	4.06	120	0.51 T	4.65 T	0.297 T	11.5 B	4.8	8.81	<5	8.01
RU15-SIA1-SB003	RU15-SIA1-SB003 (10)	11/19/07	10		<1	3.88	124	0.496 T	4.78 T	0.283 T	10.7 B	4.31	8.11 B	<5	7.87
RU15-SIA1-SB003	RU15-SIA1-SB003 (20)	11/19/07	20		0.132 T	4.05	133	0.503 T	3.97 T	0.633 T	13.1 B	4.76	9.01 B	<5	8.71
RU15-SIA1-SB003	RU15-SIA1-SB003 (30)	11/19/07	30		0.16 T	3.87	114	0.646 T	3.48 T	0.402 T	14.3 B	5.62	9.66 B	<5	9.61
RU15-SIA1-SB003	RU15-SIA1-SB003 (40)	11/20/07	40		0.146 T	2.2	95.4	0.49 T	2.61 T	0.324 T	7.32 B	3.55	5.82 B	<5	5.36
RU15-SIA1-SB003	RU15-SIA1-SB003 (50)	11/20/07	50		<1 UJ	2.76	91.2 J	0.467 T	<10	0.19 T	8.57 B	3.56	6.28 B	<5	5.41
RU15-SIA1-SB003	RU15-SIA1-SB003 (60)	11/20/07	60		0.157 T	1.92	93.8	0.441 T	<10	0.204 T	8.64 B	3.43	5.75 B	<5	4.35
RU15-SIA1-SB003	RU15-SIA1-SB003 (70)	11/20/07	70		<1	2.81	114	0.581 T	3.8 T	0.406 T	7.75 B	3.85	7.32 B	<5	6.68
RU15-SIA1-SB003	RU15-SIA1-SB003 (80)	11/20/07	80		0.173 T	1.73	103	0.508 T	<10	0.191 T	8.68 B	3.78	6.3 B	<5	5.38
RU15-SIA1-SB004	RU15-SIA1-SB004 (39)	11/15/07	39		0.139 T	3.55	122	0.424 T	4.62 T	0.29 T	9.41 B	4.14	7.45	<5	7.61
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (39)	11/16/07	39		0.249 T	5.57	239	0.461 T	7.25 T	5.03	18.5 B	3.91	8.63	11	7.38
RU15-SIA1-SB004	RU15-SIA1-SB004 (50)	11/15/07	50		<1 UJ	3.91	122	0.471 T	4.92 T	0.278 T	11 B	4.55	8.62	<5	8.16
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (50)	11/16/07	50		<1	3.93	125	0.473 T	6.09 T	0.279 T	11.4 B	4.62	8.51	<5	8.26
RU15-SIA1-SB004	RU15-SIA1-SB004 (60)	11/15/07	60		<1	3.64	107	0.541 T	4.07 T	0.289 T	11.4 B	4.81	8.35	<5	8.08
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (60)	11/16/07	60		<1	3.99	125	0.558 T	4.25 T	0.319 T	12.6 B	5.27	9.72	<5	8.87
RU15-SIA1-SB004	RU15-SIA1-SB004 (70)	11/15/07	70		0.207 T	3.87	122	0.564 T	4.44 T	4.55	14.2 B	4.72	9.54	11	8.54
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (70)	11/16/07	70		<1	3.61	107	0.531 T	4.34 T	1.06	12.1 B	4.73	8.81	<5	7.97
RU15-SIA1-SB004	RU15-SIA1-SB004 (80)	11/15/07	80		0.365 T	3.57	86	0.514 T	3.3 T	13	21.6 B	3.52	9.55	19	6.37
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (80)	11/16/07	80		<1	2.34	92.4	0.495 T	3.2 T	1.29	9.09 B	3.86	6.47	<5	6.26
RU15-SIA1-SB004	RU15-SIA1-SB004 (90)	11/15/07	90		<1	2.5	99.6	0.621 T	2.4 T	1.19	10.7 B	4.84	7.41	6	7.21
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (90)	11/16/07	90		0.417 T	4.58	81.1	0.505 T	3.48 T	18.3	24.7 B	3.47	10.3	14	7.05
RU15-SIA1-SB005	RU15-SIA1-SB005 (27)	11/19/07	27		0.171 T	5.83	154	0.518 T	9.24 T	0.444 T	10.9 B	4.41	7.6 B	8.8	7.73
RU15-SIA1-SB005	RU15-SIA1-SB005 (40)	11/19/07	40		<1	4.07	119	0.483 T	3.63 T	0.323 T	11.3 B	4.53	8.78 B	<5	8.02
RU15-SIA1-SB005	RU15-SIA1-SB005 (50)	11/19/07	50		<1	3.81	118	0.536 T	4.34 T	0.298 T	12.5 B	4.93	9.14 B	<5	8.3
RU15-SIA1-SB005	RU15-SIA1-SB005 (60)	11/19/07	60		<1	3.75	99.7	0.438 T	3.77 T	0.269 T	10.4 B	4.22	7.8 B	<5	6.96
RU15-SIA1-SB005	RU15-SIA1-SB005 (70)	11/19/07	70		0.146 T	1.43	44.5	0.373 T	<10	0.0877 T	1.72 B	1.28	4.01 B	<5	3.37
RU15-SIA1-SB005	RU15-SIA1-SB005 (80)	11/19/07	80		0.134 T	1.63	46.5	0.401 T	<10	0.0977 T	2.82 B	1.46	4.62 B	<5	2.53
RU16-SIA1-SB001	RU16-SIA1-SB001 (25)	11/09/07	25		<1	4.23	117	0.492 T	4.37 T	0.431 T	11.3 B	4.68	9.24 B	9.3	8.39
RU16-SIA1-SB004	RU16-SIA1-SB004 (9)	11/08/07	9		<1	4.03	124	0.51 T	3.64 TJ+	0.403 T	10.7 B	4.83	10.8 B	6.6	8.57
RU16-SIA1-SB005	RU16-SIA1-SB005 (14)	11/13/07	14		0.958 T	6.2	141	0.612 T	13.9	26	50.9 B	4.51	14.2 B	360 D	9.44
RU16-SIA1-SB005	RU16-SIA1-SB005 (20)	11/13/07	20		<1	3.96	132	0.48 T	3.95 T	0.508 T	19.7 B	4.74	10 B	20	8.21
RU16-SIA1-SB006	RU16-SIA1-SB006 (1.5)	11/13/07	1.5		<1	4.01	161	0.411 T	5.35 T	0.358 T	8.19 B	4.09	5.52 B	6.9	6.72
RU16-SIA1-SB006	RU16-SIA1-SB006 (10)	11/13/07	10		<1	3.66	139	0.444 T	3.95 T	0.272 T	9.05 B	4.28	7.85 B	<5	7.99
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (14)	11/27/07	14		0.177 T	4.27	130	0.503 T	6.88 T	1.57	11.4 B	4.39	8.38 B	26	8.2
RU16-SIA1-SB006	RU16-SIA1-SB006 (20)	11/13/07	20		<1	3.93	121	0.48 T	4.06 T	0.399 T	11.1 B	4.62	8.68 B	24	8.42
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (20)	11/27/07	20		0.258 TJ-	4.23	130	0.518 T	7.15 T	3.45 J+	13.5 B	4.45	8.6 J,B	130 J+	8.27
RU16-SIA1-SB006	RU16-SIA1-SB006 (30)	11/13/07	30		<1	3.74	136	0.54 T	4.95 T	0.71 T	12.5 B	5.13	9.19 B	27	8.65
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (30)	11/27/07	30		0.152 T	3.84	121	0.581 T	4.95 T	0.402 T	12.9 B	5.15	9.16 B	25	8.53

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 6)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead
				Analyte											
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				Background[b]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1
				Commercial/Industrial Worker SSL	454	7.7[c]	61,700	645	223,000	860	1,000,000d	553	42,000	68,100	800[f]
				Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[f]
				Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000d	679	286,000	430,000	800[f]
				SSL Protective of Groundwater[e]	5	7.7[g]	1,600	63	450	8	38	630	9,400	12,000	800[f]
RU16-SIA1-SB006	RU16-SIA1-SB006 (40)	11/13/07	40		<1	3.81	126	0.503 T	4.35 T	0.525 T	11.4 B	4.6	8.09 B	23	7.8
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (40)	11/27/07	40		0.245 T	4.03	132	0.554 T	5.53 T	1.82	13.1 B	4.7	8.65 B	66	8.15
RU16-SIA1-SB006	RU16-SIA1-SB006 (50)	11/13/07	50		0.336 T	3.4	105	0.639 T	5.3 T	7.5	14.5 B	3.44	7.17 B	190	6.34
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (50)	11/27/07	50		0.998 T	3.67	112	0.678 T	8.26 T	14.6	19.9 B	3.77	7.73 B	310 D	7.11
RU16-SIA1-SB006	RU16-SIA1-SB006 (60)	11/13/07	60		<1	3.58	121	0.689 T	3.8 T	0.632 T	10.8 B	5.05	9.23 B	20	8.26
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (60)	11/27/07	60		0.181 T	3.73	131	0.716 T	6.29 T	2.26	12.4 B	4.76	9.31 B	91	7.98
RU16-SIA1-SB006	RU16-SIA1-SB006 (70)	11/13/07	70		<1	2.35	155	0.665 T	3.76 T	0.284 T	8.91 B	4.57	8.55 B	7.1	8.06
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (70)	11/27/07	70		<1	2.57	145	0.68 T	5.79 T	0.354 T	10.3 B	4.43	8.61 B	14	7.61
RU16-SIA1-SB006	RU16-SIA1-SB006 (80)	11/13/07	80		<1	1.8	137	0.568 T	2.78 T	0.555 T	8.16 B	4.46	6.67 B	22	6.66
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (80)	11/27/07	80		0.227 T	2.61	129	0.658 T	5.95 T	3.55	12.8 B	4.86	8.23 B	170	6.96
RU16-SIA1-SB006	RU16-SIA1-SB006 (90)	11/13/07	90		<1	2.16	106	0.63 T	3.33 T	0.801 T	8.67 B	4	8.13 B	22	6.93
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (90)	11/27/07	90		<1	2.23	98.3	0.61 T	3.74 T	1.26	9.9 B	4.09	7.24 B	85	6.34
RU16-SIA1-SB006	RU16-SIA1-SB006 (100)	11/13/07	100		<1 UJ	2.77	115 J-	0.478 T	2.72 T	0.269 T	10 B	4.66	7.18 J,B	6.8	7.42
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (100)	11/27/07	100		<1	2.53	106	0.543 T	3.72 T	0.433 T	9.18 B	4.24	6.77 B	23	7.24
RU16-SIA1-SB006	RU16-SIA1-SB006 (110)	11/13/07	110		<1	0.892 T	125	1.46	3.33 T	0.177 T	12.7 B	8.46	11.8	14 J-	15.2
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (110)	11/27/07	110		0.132 T	1.43	138	1.66	6 T	3.65	13.7 B	7.3	13.9 B	170	17.6
RU16-SIA1-SB006	RU16-SIA1-SB006 (120)	11/13/07	120		<1	1.05	63.2	1.39	3.51 T	0.181 T	19.6 B	10.8	15.2	17	15.9
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (120)	11/27/07	120		<1	3.25	119	1.06	4.04 T	1.74	15.6 B	11.1	15.9 B	85	16.4
RU16-SIA1-SB006	RU16-SIA1-SB006 (130)	11/13/07	130		<1	0.859 T	74.4	1.29	4.02 T	0.19 T	19.6 B	17.2	19	12	22.3
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (130)	11/27/07	130		0.478 T	2.45	187	1.29	7.48 T	10.6	26.8 B	10	17 B	230 D	17.1
RU16-SIA1-SB006	RU16-SIA1-SB006 (140)	11/13/07	140		<1	3.92	502	1.44	4.36 T	0.625 T	13.6 B	7.56	11.8	19	14.8
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (140)	11/27/07	140		0.195 T	1.61	204	1.31	5.7 T	2.93	16.3 B	19.1	14.5 B	110	18.2
RU16-SIA1-SB006	RU16-SIA1-SB006 (150)	11/13/07	150		<1	3.11	162	1.01	3.97 T	0.236 T	13.5 B	6.99	11.2	12	12.2
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (150)	11/27/07	150		0.139 T	0.996 T	167	0.854 T	4.72 T	1.52	12.2 B	5.72	9.18 B	73	9.73
RU16-SIA1-SB006	RU16-SIA1-SB006 (157)	11/13/07	157		<1	1.74	146	1.24	3.13 T	0.242 T	12.6 B	10.3	12	<5	16.1
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (156)	11/27/07	156		<1	1.61	193	0.936 T	3.75 T	0.253 T	11.4 B	6.06	10.4 B	13	10.8
RU16-SIA1-SB007	RU16-SIA1-SB007 (14)	11/14/07	14		<1	4.66	133	0.481 T	9.82 T	0.313 T	9.96 B	4.22	8.03	5.8	8.02
RU16-SIA1-SB007	RU16-SIA1-SB007 (20)	11/14/07	20		0.586 T	4.79	142	0.588 T	11.6	12.2	18.3 B	4.67	9.35	140	8.96
RU16-SIA1-SB007	RU16-SIA1-SB007 (30)	11/14/07	30		0.793 T	3.98	116	0.601 T	10.5	13.7	15.4 B	3.64	7.83	140	6.98
RU16-SIA1-SB007	RU16-SIA1-SB007 (40)	11/14/07	40		<1 UJ	3.15	90 J-	0.552 T	3.64 T	0.386 T	7.62 B	3.66	5.98	12 J-	5.48
RU16-SIA1-SB007	RU16-SIA1-SB007 (50)	11/14/07	50		0.136 T	3.53	120	0.63 T	6.07 T	0.419 T	8.78 B	4.07	6.53	16	5.96
RU16-SIA1-SB007	RU16-SIA1-SB007 (60)	11/14/07	60		<1	2.64	91.3	0.554 T	3.79 T	0.201 T	7.11 B	3.54	5.9	8.3	5.73
RU16-SIA1-SB007	RU16-SIA1-SB007 (70)	11/14/07	70		<1	2.68	147	0.596 T	4.2 T	0.597 T	8.35 B	4.35	6.95	24	7.35
RU16-SIA1-SB007	RU16-SIA1-SB007 (80)	11/14/07	80		<1	2.29	165	1.26	5.41 T	0.166 T	8.79 B	4.16	8.81	15	9.07
RU16-SIA1-SB007	RU16-SIA1-SB007 (90)	11/14/07	90		<1	0.578 T	26	0.365 T	<10	0.0524 T	2.87 B	0.775 T	2.48	9.2	3.65
RU16-SIA1-SB007	RU16-SIA1-SB007 (100)	11/14/07	100		<1	0.997 T	130	0.941 T	3.1 T	0.114 T	10 B	4.69	7.01	9.7	5.64
RU16-SIA1-SB007	RU16-SIA1-SB007 (110)	11/14/07	110		<1	1.89	236	1.41	6.63 T	0.148 T	8 B	6.37	8.31	14	12.4
RU16-SIA1-SB007	RU16-SIA1-SB007 (120)	11/14/07	120		<1	1.53	184	1.28	4.45 T	0.15 T	10.3 B	6.71	8.28	14	10.4
RU16-SIA1-SB007	RU16-SIA1-SB007 (130)	11/15/07	130		<1	0.315 T	26	0.282 T	<10	0.0644 T	2.6 B	1.34	2.79	6.4	3.52
RU16-SIA1-SB007	RU16-SIA1-SB007 (140)	11/15/07	140		<1	0.362 T	47	0.468 T	<10	<1	2.19 B	1.23	2.4 B	<5	5.33
RU16-SIA1-SB007	RU16-SIA1-SB007 (150)	11/15/07	150		<1	0.537 T	94	0.741 T	<10	0.0876 T	5.58 B	2.95	6.04 B	<5	7.07
RU16-SIA1-SB007	RU16-SIA1-SB007 (156)	11/15/07	156		<1	0.351 T	41.1	0.106 T	<10	<1	4.43 B	2.51	3.58 B	<5	1.46
RU16-SIA1-SB008	RU16-SIA1-SB008 (10)	11/08/07	10		<1	4.67	150	0.468 T	10.8 J+	0.363 T	9.01 B	4.1	8.32 B	6.3	7.9
RU16-SIA1-SB008	RU16-SIA1-SB008 (20)	11/08/07	20		0.45 T	4.95	119	0.51 T	9.61 TJ+	12	19 B	4.37	10.1 B	90	8.45
RU16-SIA1-SB008	RU16-SIA1-SB008 (30)	11/08/07	30		<1	4.62	124	0.511 T	4.73 TJ+	0.6 T	7.88 B	3.18	6.51 B	21	5.41
RU16-SIA1-SB008	RU16-SIA1-SB008 (40)	11/08/07	40		<1	3.21	113	0.514 T	3.99 TJ+	0.592 T	7.69 B	3.65	6.58 B	14	6.49

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 6)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead
				Analyte											
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[b]	**2.2**	**7.7**	**188**	**1**	**12.8**	**1.9**	**27.5**	**7.6**	**12.6**	**600**	**29.1**
				Commercial/Industrial Worker SSL	**454**	**7.7[c]**	**61,700**	**645**	**223,000**	**860**	**1,000,000d**	**553**	**42,000**	**68,100**	**800[f]**
				Construction Worker SSL	**104**	**14.6**	**8,360**	**61**	**5,210**	**81.3**	**551,000**	**52.2**	**22,000**	**33,000**	**800[f]**
				Utility Worker SSL	**1,360**	**173**	**109,000**	**792**	**67,800**	**1,060**	**1,000,000d**	**679**	**286,000**	**430,000**	**800[f]**
				SSL Protective of Groundwater[e]	**5**	**7.7[g]**	**1,600**	**63**	**450**	**8**	**38**	**630**	**9,400**	**12,000**	**800[f]**
RU16-SIA1-SB008	RU16-SIA1-SB008 (50)	11/08/07	50		**0.138 T**	**3.35**	**115**	**0.654 T**	**3.97 T**	**0.565 T**	**11.2 B**	**4.33**	**8.21 B**	**12**	**7.05**
RU16-SIA1-SB008	RU16-SIA1-SB008 (60)	11/08/07	60		<1	**0.941 T**	**95.1**	**0.926 T**	**2.6 T**	**0.128 T**	**14.6 B**	**12.4**	**14.3 B**	**6.5**	**18.6**
RU16-SIA1-SB008	RU16-SIA1-SB008 (70)	11/08/07	70		<1	**0.51 T**	**120**	**1.34**	<10	**0.114 T**	**12.8 B**	**10**	**14.5 B**	**5.8**	**17.3**
RU16-SIA1-SB008	RU16-SIA1-SB008 (80)	11/08/07	80		<1	**0.851 T**	**169**	**1.51**	**2.64 T**	**0.296 T**	**15.6 B**	**9.99**	**19.9 B**	**6.3**	**20.2**
RU16-SIA1-SB008	RU16-SIA1-SB008 (90)	11/08/07	90		<1	**0.551 T**	**96.5**	**1.08**	<10	**0.0769 T**	**16.1 B**	**11.8**	**17.4 B**	<4.9	**17.6**
RU16-SIA1-SB008	RU16-SIA1-SB008 (100)	11/08/07	100		<1	**1**	**121**	**2.16**	**3.3 T**	**0.129 T**	**12.7 B**	**6.35**	**13.8 B**	**5.3**	**15.5**
RU16-SIA1-SB008	RU16-SIA1-SB008 (110)	11/08/07	110		<1	**0.736 T**	**281**	**1.19**	**3.17 T**	**0.221 T**	**11.7 B**	**8.93**	**12.3 B**	<5	**17.7**
RU16-SIA1-SB008	RU16-SIA1-SB008 (120)	11/08/07	120		<1	**0.803 T**	**171**	**0.936 T**	<10	**0.255 T**	**10 B**	**7.39**	**7.99 B**	<5	**10.9**
RU16-SIA1-SB008	RU16-SIA1-SB008 (130)	11/08/07	130		<1	**0.338 T**	**65.8**	**0.612 T**	<10	**0.109 T**	**4.5 B**	**3.56**	**4.47 B**	<5	**5.8**
RU16-SIA1-SB008	RU16-SIA1-SB008 (140)	11/08/07	140		**0.233 T**	**22.1**	**39.9**	**0.24 T**	<10	**0.176 T**	**3.24 B**	**2.57**	**9.13 B**	**5.9 J-**	**9.43**
RU16-SIA1-SB008	RU16-SIA1-SB008 (150)	11/08/07	150		<1	**0.206 T**	**27.5**	**0.128 T**	<10	**0.112 T**	**1.37 B**	**0.629 T**	**1.15 B**	<5	**1.81**
RU16-SIA1-SB008	RU16-SIA1-SB008 (157)	11/08/07	157		<1	**0.323 T**	**32.2**	**0.122 T**	<10	**0.105 T**	**1.29 B**	**0.778 T**	**0.962 T,B**	<5	**1.7**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to a soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased hihg, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a Leaching potential investigations were conducted in soils underlying the following solids during the SRI: 1) RU 15 - Oversized Ore, Used Electrodes, Baghouse Dust and 2) RU 16 - Calciner Solids.
b background from EMF ROD (EPA/541/R-98/034), Table 11
c default to background because the Site Worker SSL is less than background
d default to 1E+06 because SSL is greater than 1E+06
e A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
f SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
g default to background because the SSL potective of groundwater is less than background

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 6)

					Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
				Analyte											
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[b]	**16.1**	**482**	**0.16**	**2.15**	**15.5**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**22,700**	**23,500**	**340**	**5,670**	**6,450**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**
				Construction Worker SSL	**11,900**	**77,100**	**464**	**2,750**	**404**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**
				Utility Worker SSL	**155,000**	**1,000,000**	**6,030**	**35,800**	**5,250**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000d**
				SSL Protective of Groundwater[e]	**4,200**	**482[g]**	**2**	**81**	**130**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**												
RU15-SIA1-SB001	RU15-SIA1-SB001 (5)	11/28/07	5		**12**	**322**	**0.014 T**	**0.921 T**	**16.2**	<2	**0.408 T**	**0.233 T**	**8**	**59.4**	**104 B**
RU15-SIA1-SB001	RU15-SIA1-SB001 (10)	11/28/07	10		**9.53**	**387**	**0.013 T**	**0.458 T**	**11.8**	<2	**0.0844 T**	**0.133 T**	**1.5**	**20.9**	**46.1 B**
RU15-SIA1-SB001	RU15-SIA1-SB001 (20)	11/28/07	20		**9.86**	**370**	**0.0094 T**	**0.423 T**	**12.3**	<2	<1	**0.119 T**	**0.906 T**	**17.8**	**37.8 B**
RU15-SIA1-SB001	RU15-SIA1-SB001 (30)	11/28/07	30		**7.7**	**267**	**0.011 T**	**0.958 T**	**8.37**	<2	**0.0476 T**	**0.0912 T**	**1.1**	**17**	**45.2 B**
RU15-SIA1-SB001	RU15-SIA1-SB001 (40)	11/28/07	40		**13.5**	**308**	**0.016 T**	**0.788 T**	**13.4**	<2	**0.118 T**	**0.136 T**	**2.45**	**30.2**	**52.7 B**
RU15-SIA1-SB002	RU15-SIA1-SB002 (20.5)	11/16/07	20.5		**11**	**338**	**0.012 T**	**0.336 T**	**10.4 B**	<2	<1	**0.113 T**	**0.873 T**	**15.6**	**35.6 B**
RU15-SIA1-SB002	RU15-SIA1-SB002 (30)	11/16/07	30		**9.55**	**373**	**0.0074 T**	**0.354 T**	**12.3 B**	<2	<1	**0.107 T**	**1.04**	**16.3**	**36.3 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (10)	11/19/07	10		**8.89**	**358**	**0.011 T**	0.447 T,UB	**11**	<2	**0.0874 T**	**0.132 T**	**0.869 T,B**	**16.2**	**39.1 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (20)	11/19/07	20		**9.69**	**374**	**0.011 T**	0.562 T,UB	**12.4**	<2	**0.105 T**	**0.167 T**	**1.04 B**	**18.8**	**46.4 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (30)	11/19/07	30		**11**	**457**	**0.0086 T**	0.504 T,UB	**13.8**	<2	**0.0726 T**	**0.159 T**	**0.736 T,B**	**20.5**	**44.4 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (40)	11/20/07	40		**5.43**	**356**	**0.0062 T**	**1.13 B**	**6**	<2	**0.0566 T**	**0.105 T**	**0.73 T,B**	**13.5**	**40.8 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (50)	11/20/07	50		**6.5**	**310**	**0.0055 T**	**1.11 B**	**7.42**	<2	<1	**0.0967 T**	**0.745 TJ,B**	**12.6**	**35.2 J,B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (60)	11/20/07	60		**4.82**	**292**	**0.0038 T**	**1.25 B**	**6.24**	<2	**0.0567 T**	**0.0795 T**	**0.779 T,B**	**14.6**	**38.4 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (70)	11/20/07	70		**8.98**	**390**	**0.0072 T**	**0.807 T,B**	**7.55**	<2	**0.0466 T**	**0.133 T**	**0.739 T,B**	**14.7**	**39.9 B**
RU15-SIA1-SB003	RU15-SIA1-SB003 (80)	11/20/07	80		**5.79**	**360**	**0.0071 T**	**1.19 B**	**7.04**	<2	**0.0478 T**	**0.12 T**	**0.604 T,B**	**14.6**	**40.6 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (39)	11/15/07	39		**10.2**	**357**	**0.01 T**	**0.342 T**	**10.3 B**	<2	<1	**0.159 T**	**0.769 T**	**14.1**	**36.7 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (39)	11/16/07	39		**11.6**	**297**	**0.015 T**	**0.952 T**	**13 B**	<2	**0.344 T**	**0.181 T**	**2.38**	**34.5**	**79.1 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (50)	11/15/07	50		**8.97**	**355**	**0.009 T**	**0.373 T**	**11.4 B**	<2	<1	**0.115 T**	**0.989 T**	**15.6**	**38.9 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (50)	11/16/07	50		**9.13**	**353**	**0.0092 T**	**0.493 T**	**11.6 B**	<2	<1	**0.115 T**	**1.19**	**16.2**	**39.8 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (60)	11/15/07	60		**9.96**	**387**	**0.0072 T**	**0.271 T**	**12.1 B**	<2	<1	**0.12 T**	**0.734 T**	**16.5**	**39.2 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (60)	11/16/07	60		**10.6**	**425**	**0.0075 T**	**0.269 T**	**13.4 B**	<2	<1	**0.128 T**	**0.752 T**	**17.8**	**42.6 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (70)	11/15/07	70		**9.95**	**397**	**0.024 T**	**0.644 T**	**12.6 B**	<2	**0.293 T**	**0.159 T**	**1.23**	**21.7**	**79.2 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (70)	11/16/07	70		**9.83**	**381**	**0.0098 T**	**0.417 T**	**12.1 B**	<2	**0.0909 T**	**0.117 T**	**0.813 T**	**17.8**	**48.3 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (80)	11/15/07	80		**5.97**	**319**	**0.037**	**1.81**	**13 B**	**0.867 T**	**0.428 T**	**0.169 T**	**3.17**	**38.9**	**108 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (80)	11/16/07	80		**6.42**	**371**	<0.033	**0.754 T**	**7.74 B**	<2	**0.0745 T**	**0.0955 T**	**0.785 T**	**15.4**	**49.3 B**
RU15-SIA1-SB004	RU15-SIA1-SB004 (90)	11/15/07	90		**7.76**	**384**	**0.012 T**	**0.432 T**	**9.92 B**	<2	<1	**0.124 T**	**0.884 T**	**16.5**	**41.8 B**
RU15-SIA1-SB004 CL	RU15-SIA1-SB204 (90)	11/16/07	90		**6.35**	**311**	**0.031 T**	**1.97**	**14.3 B**	**0.914 T**	**0.968 T**	**0.206 T**	**3.31**	**41.1**	**190 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (27)	11/19/07	27		**13.8**	**302**	**0.016 T**	0.613 T,UB	**11.4**	<2	**0.0722 T**	**0.211 T**	**0.975 T,B**	**21.6**	**35 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (40)	11/19/07	40		**9.25**	**373**	**0.0094 T**	0.502 T,UB	**11.6**	<2	**0.0747 T**	**0.142 T**	**0.818 T,B**	**16.4**	**38.3 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (50)	11/19/07	50		**10**	**381**	**0.0088 T**	0.47 T,UB	**12.8**	<2	**0.0913 T**	**0.141 T**	**0.797 T,B**	**17.7**	**38.1 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (60)	11/19/07	60		**9.3**	**347**	**0.01 T**	0.414 T,UB	**10.4**	<2	**0.0748 T**	**0.123 T**	**0.748 T,B**	**15.8**	**31.2 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (70)	11/19/07	70		**5.14**	**231**	**0.0019 T**	**1.74 B**	**1.67**	<2	**0.0543 T**	**0.0362 T**	**0.857 T,B**	**5.31**	**35.7 B**
RU15-SIA1-SB005	RU15-SIA1-SB005 (80)	11/19/07	80		**2.96**	**171**	**0.00085 T**	**2.28 B**	**1.36**	<2	**0.0767 T**	**0.0292 T**	**0.784 T,B**	**7.46**	**48.4 B**
RU16-SIA1-SB001	RU16-SIA1-SB001 (25)	11/09/07	25		**9.34 B**	**383**	**0.021 T**	0.584 T,UB	**12.2**	<2	**0.0981 T**	**0.159 T**	**0.976 T,B**	**16.2**	**37.6 B**
RU16-SIA1-SB004	RU16-SIA1-SB004 (9)	11/08/07	9		**9.48 B**	**390**	**0.013 T**	0.72 T,UB	**12.3**	<2	**0.0819 T**	**0.268 T**	**0.862 T,B**	**15.2**	**39.3 B**
RU16-SIA1-SB005	RU16-SIA1-SB005 (14)	11/13/07	14		**12.2 B**	**335**	**0.58**	**4.12**	**19.8**	**40.5**	**0.931 T**	**9.59**	**6.25**	**80.4**	**207 B**
RU16-SIA1-SB005	RU16-SIA1-SB005 (20)	11/13/07	20		**9.54 B**	**367**	**0.022 T**	**0.573 T**	**13.5**	**1.08 T**	**0.0806 T**	**0.295 T**	**0.991 T**	**25.5**	**38.8 B**
RU16-SIA1-SB006	RU16-SIA1-SB006 (1.5)	11/13/07	1.5		**10.3 B**	**274**	**0.029 T**	**0.564 T**	**9.83**	**1.24 T**	<1	**0.15 T**	**0.551 T**	**15.1**	**29.2 B**
RU16-SIA1-SB006	RU16-SIA1-SB006 (10)	11/13/07	10		**8.83 B**	**366**	**0.018 T**	**0.224 T**	**13.3**	<2	<1	**0.118 T**	**0.757 T**	**13.7**	**38 B**
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (14)	11/27/07	14		**9.53**	**370**	**0.028 T,B**	**0.517 T**	**11.5**	**2.41**	**0.152 T**	**0.428 T**	**0.894 T,B**	**16.9**	**61.3 B**
RU16-SIA1-SB006	RU16-SIA1-SB006 (20)	11/13/07	20		**8.86 B**	**372**	**0.024 T**	**0.355 T**	**11.8**	<2	<1	**0.133 T**	**0.854 T**	**15.4**	**41.7 B**
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (20)	11/27/07	20		**10.1**	**357**	**0.051 J+,B**	**0.713 T**	**12.1**	**4.3 J**	**0.339 T**	**0.496 T**	**1.06 B**	**20.8**	**77.8 J,B**
RU16-SIA1-SB006	RU16-SIA1-SB006 (30)	11/13/07	30		**11 B**	**409**	**0.021 T**	**0.443 T**	**13.3**	<2	**0.079 T**	**0.148 T**	**1.08**	**17.9**	**44.1 B**
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (30)	11/27/07	30		**10.7**	**402**	0.014 T,UB	**0.409 T**	**13.4**	<2	**0.0818 T**	**0.162 T**	**0.84 T,B**	**18.7**	**40.6 B**

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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					Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
				Analyte											
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				Background[b]	16.1	482	0.16	2.15	15.5	1.36	1.9	0.27	NA	45.4	52.8
				Commercial/Industrial Worker SSL	22,700	23,500	340	5,670	6,450	5,670	5,670	77.2	3,400	7,950	340,000
				Construction Worker SSL	11,900	77,100	464	2,750	404	2,750	2,750	374	491	3,500	165,000
				Utility Worker SSL	155,000	1,000,000	6,030	35,800	5,250	35,800	35,800	4,870	6,390	45,500	1,000,000d
				SSL Protective of Groundwater[e]	4,200	482[g]	2	81	130	5	34	0.7	900	6,000	12,000
RU16-SIA1-SB006	RU16-SIA1-SB006 (40)	11/13/07	40		11.2 B	395	0.016 T	0.46 T	10.7	<2	<1	0.144 T	0.821 T	17.5	38.4 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (40)	11/27/07	40		12	366	0.025 T,B	0.503 T	12.1	1.65 T	0.184 T	0.256 T	0.83 T,B	20	51.8 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (50)	11/13/07	50		8.65 B	331	0.18	1.31	9.1	17	0.317 T	2.17	1.78	24.5	88.4 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (50)	11/27/07	50		9.31	349	0.31 B	1.67	12.4	13.4	0.989 T	1.43	1.64 B	31.6	189 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (60)	11/13/07	60		10.9 B	400	0.021 T	0.326 T	11.9	<2	<1	0.267 T	0.751 T	16.7	40.7 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (60)	11/27/07	60		11.8	390	0.048 B	0.733 T	11.2	1.93 T	0.19 T	0.337 T	0.92 T,B	19.7	62 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (70)	11/13/07	70		12.4 B	387	0.011 T	<1	10.4	<2	<1	0.158 T	0.605 T	12.3	36.2 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (70)	11/27/07	70		12.6	370	0.017 T,UB	0.218 T	10.3	<2	<1	0.164 T	0.635 T,B	14.9	35 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (80)	11/13/07	80		7.9 B	483	0.025 T	0.199 T	8.62	<2	<1	0.251 T	0.612 T	12.6	31 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (80)	11/27/07	80		10.4	419	0.068 B	0.802 T	10.3	3.53	0.286 T	0.53 T	0.816 T,B	21.2	74.6 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (90)	11/13/07	90		9.13 B	412	0.02 T	0.288 T	9.04	1.72 T	<1	0.375 T	0.843 T	12.9	41.8 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (90)	11/27/07	90		8.04	406	0.032 T,B	0.786 T	8.59	1.35 T	0.133 T	0.265 T	0.716 T,B	16.4	51.8 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (100)	11/13/07	100		9.07 B	394	0.0099 T	0.178 T	12.3	<2	<1	0.114 T	0.722 T	14.8	32.6 B
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (100)	11/27/07	100		8.93	425	0.015 T,UB	0.294 T	10.7	<2	<1	0.163 T	0.899 T,B	14.4	32.5 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (110)	11/13/07	110		17.7	236	0.015 T	<1	16.6	<2	<1	0.197 T	0.742 T,B	13.1	62
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (110)	11/27/07	110		17.8	313	0.1 B	0.247 T	13.9	4.16	0.35 T	0.589 T	0.826 T,B	17	86.7 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (120)	11/13/07	120		21.5	308	0.023 T	<1	21.2	<2	<1	0.314 T	0.702 T,B	14.6	62.3
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (120)	11/27/07	120		18.3	617	0.056 B	0.323 T	23.9	1.91 T	0.16 T	0.377 T	0.66 T,B	17.6	68.2 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (130)	11/13/07	130		16.2	223	0.022 T	<1	24	<2	<1	0.255 T	4.4 B	49.4	64.5
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (130)	11/27/07	130		19	440	0.21 B	0.919 T	23.8	12	0.858 T	1.24	2.02 B	47.7	187 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (140)	11/13/07	140		20.4	1190	0.022 T	0.227 T	16	<2	<1	0.609 T	0.756 T,B	15.9	54.1
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (140)	11/27/07	140		21	763	0.065 B	0.336 T	18.9	2.49	0.226 T	0.655 T	0.917 T,B	17	78.6 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (150)	11/13/07	150		18.9	227	0.017 T	0.341 T	11.8	<2	<1	0.185 T	1.48 B	15.3	45.7
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (150)	11/27/07	150		16.9	352	0.036 B	0.187 T	11	1.64 T	0.145 T	0.363 T	0.795 T,B	17	55.1 B
RU16-SIA1-SB006	RU16-SIA1-SB006 (157)	11/13/07	157		17	162	0.023 T	<1	15.1	<2	<1	0.315 T	1.11 B	21.1	51.3
RU16-SIA1-SB006 CL	RU16-SIA1-SB206 (156)	11/27/07	156		18.1	338	0.017 T,UB	<1	11.4	<2	<1	0.21 T	1.05 B	21.1	41.4 B
RU16-SIA1-SB007	RU16-SIA1-SB007 (14)	11/14/07	14		9.12	360	0.015 T	1.05	10.7	<2	0.0719 T	0.202 T	0.758 T,B	15.2	38.6
RU16-SIA1-SB007	RU16-SIA1-SB007 (20)	11/14/07	20		12.3	355	0.18	1.07	13.4	11	0.469 T	1.9	1.39 B	26.1	184
RU16-SIA1-SB007	RU16-SIA1-SB007 (30)	11/14/07	30		10.7	306	0.22	1.23	10.1	14.6	0.558 T	2.15	1.7 B	23.8	210
RU16-SIA1-SB007	RU16-SIA1-SB007 (40)	11/14/07	40		7.81	384	0.011 T	0.671 T	7.29	<2	0.0462 T	0.142 T	0.757 T,B	15.1	35.3
RU16-SIA1-SB007	RU16-SIA1-SB007 (50)	11/14/07	50		10.7	330	0.012 T	0.559 T	7.74	<2	0.0538 T	0.193 T	0.906 T,B	17.9	37
RU16-SIA1-SB007	RU16-SIA1-SB007 (60)	11/14/07	60		7.93	362	0.012 T	0.554 T	6.44	<2	<1	0.112 T	0.79 T,B	15.5	33
RU16-SIA1-SB007	RU16-SIA1-SB007 (70)	11/14/07	70		8.24	412	0.018 T	0.881 T	8.6	<2	0.062 T	0.204 T	1.09 B	15.2	40.2
RU16-SIA1-SB007	RU16-SIA1-SB007 (80)	11/14/07	80		10.4	217	0.015 T	0.289 T	8.66	<2	0.0547 T	0.242 T	1.32 B	13.8	32.9
RU16-SIA1-SB007	RU16-SIA1-SB007 (90)	11/14/07	90		2.3	47.2	0.0051 T	0.188 T	1.85	<2	<1	0.0733 T	0.257 T,B	7.61	13
RU16-SIA1-SB007	RU16-SIA1-SB007 (100)	11/14/07	100		4.7	145	0.0098 T	0.173 T	6.98	<2	0.0467 T	0.111 T	0.533 T,B	13.7	27.6
RU16-SIA1-SB007	RU16-SIA1-SB007 (110)	11/14/07	110		13.4	237	0.087	<1	10.8	<2	0.0458 T	0.205 T	0.75 T,B	17.7	29.1
RU16-SIA1-SB007	RU16-SIA1-SB007 (120)	11/14/07	120		7.67	285	0.026 T	<1	9.49	<2	<1	0.234 T	0.76 T,B	17.7	33.5
RU16-SIA1-SB007	RU16-SIA1-SB007 (130)	11/15/07	130		2.68	77.8	0.0048 T	<1	1.94	<2	<1	0.0528 T	0.199 T,UB	7.26	12
RU16-SIA1-SB007	RU16-SIA1-SB007 (140)	11/15/07	140		2.73 B	39.6	0.0041 T	<1	1.51	<2	<1	0.0298 T	0.336 T	6.24	12.1 B
RU16-SIA1-SB007	RU16-SIA1-SB007 (150)	11/15/07	150		5.25 B	72.1	0.02 T	<1	4.32	<2	<1	0.0586 T	0.54 T	9.34	17.4 B
RU16-SIA1-SB007	RU16-SIA1-SB007 (156)	11/15/07	156		0.893 T,B	160	0.015 T	0.101 T	2.94	<2	<1	0.0323 T	0.224 T	12.6	21.6 B
RU16-SIA1-SB008	RU16-SIA1-SB008 (10)	11/08/07	10		9.82 B	347	0.014 T	1.34 UB	10.3	1.14 T	0.0732 T	0.172 T	0.699 T,B	14.4	36.9 B
RU16-SIA1-SB008	RU16-SIA1-SB008 (20)	11/08/07	20		11.5 B	349	0.11	1.54 B	15.1	23.8	0.377 T	2.68	3.01 B	34.2	121 B
RU16-SIA1-SB008	RU16-SIA1-SB008 (30)	11/08/07	30		9.82 B	257	0.024 T	0.834 T,UB	7.15	1.35 T	0.0812 T	0.34 T	0.801 T,B	12.7	37 B
RU16-SIA1-SB008	RU16-SIA1-SB008 (40)	11/08/07	40		8.22 B	364	0.013 T	0.632 T,UB	7.88	0.901 T	0.0639 T	0.303 T	0.731 T,B	13.4	37.5 B

TABLE 4-32

LEACHING POTENTIAL INVESTIGATION AREAS[a]
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
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					Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
				Analyte											
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[b]	**16.1**	**482**	**0.16**	**2.15**	**15.5**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**22,700**	**23,500**	**340**	**5,670**	**6,450**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**
				Construction Worker SSL	**11,900**	**77,100**	**464**	**2,750**	**404**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**
				Utility Worker SSL	**155,000**	**1,000,000**	**6,030**	**35,800**	**5,250**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000d**
				SSL Protective of Groundwater[e]	**4,200**	**482[g]**	**2**	**81**	**130**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**
RU16-SIA1-SB008	RU16-SIA1-SB008 (50)	11/08/07	50		**9.81 B**	**368**	**0.016 T**	0.667 T,UB	**10.8**	<2	**0.0547 T**	**0.245 T**	**0.891 T,B**	**14.5**	**39.6 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (60)	11/08/07	60		**16.5 B**	**435**	**0.015 T**	0.0982 T,UB	**20.4**	<2	<1	**0.245 T**	**0.688 T,B**	**8.99**	**55.3 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (70)	11/08/07	70		**14.3 B**	**294**	**0.019 T**	0.122 T,UB	**18.3**	<2	<1	**0.189 T**	**1.16 B**	**33.3**	**56.1 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (80)	11/08/07	80		**14.5 B**	**586**	**0.027 T**	0.163 T,UB	**24.3**	<2	**0.0486 T**	**0.321 T**	**1.9 B**	**15.9**	**63.9 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (90)	11/08/07	90		**10.9 B**	**86.9**	**0.024 T**	0.124 T,UB	**17.5**	<2	<1	**0.254 T**	**3.62 B**	**18.8**	**58.2 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (100)	11/08/07	100		**13.8 B**	**102**	**0.022 T**	0.094 T,UB	**15.4**	<2	<1	**0.282 T**	**1.54 B**	**15**	**56.9 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (110)	11/08/07	110		**18.1 B**	**428**	**0.022 T**	<1	**14.1**	<2	<1	**0.183 T**	**0.983 T,B**	**14.5**	**55 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (120)	11/08/07	120		**7.69 B**	**366**	**0.02 T**	0.162 T,UB	**10.5**	<2	**0.0478 T**	**0.203 T**	**0.845 T,B**	**24.7**	**34.9 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (130)	11/08/07	130		**4.85 B**	**117**	**0.0074 T**	0.418 T,UB	**5.52**	<2	<1	**0.067 T**	**0.492 T,B**	**9.94**	**28.6 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (140)	11/08/07	140		**3.89 B**	**84.2**	**0.013 T**	**20.6 B**	**2.06**	<2	**0.196 T**	**0.0749 T**	**2.82 B**	**5.91**	**16.5 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (150)	11/08/07	150		**1.04 B**	**39.7**	**0.0094 T**	0.177 T,UB	**1.02**	<2	<1	**0.0341 T**	0.148 T,UB	**4.67**	**7.21 B**
RU16-SIA1-SB008	RU16-SIA1-SB008 (157)	11/08/07	157		**0.697 T,B**	**74.4**	**0.011 T**	0.26 T,UB	**0.982 T**	<2	<1	**0.0407 T**	0.164 T,UB	**2.88**	**6.96 B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to a soil screening level (SSL)
B Analyte detected in an associated blank.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased hihg, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a Leaching potential investigations were conducted in soils underlying the following solids during the SRI: 1) RU 15 - Oversized Ore, Used Electrodes, Baghouse Dust and 2) RU 16 - Calciner Solids.
b background from EMF ROD (EPA/541/R-98/034), Table 11
c default to background because the Site Worker SSL is less than background
d default to 1E+06 because SSL is greater than 1E+06
e A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
f SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
g default to background because the SSL potective of groundwater is less than background

TABLE 4-33

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 15
(OVERSIZE ORE, USED ELECTRODE, BAGHOUSE DUST AREA)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	9.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	5.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	7.E-06	Benzo(a)pyrene	5.E-07	-
Dermal Absorption	8.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	NA	-	3.E-06	-	6.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-07	-	NA	-	7.E-06	Cd	5.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*2.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*5.E-05*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*2.E-05*	*Benzo(a)pyrene*	*2.E-06*	
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, K-40	6.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-04	Po-210, Pb-210	1.E-04	Po-210, Pb-210	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-06	Po-210	NA	-	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Total ROPC Lifetime Incremental Cancer Risk	*2.E-03*	*Ra-226, K-40*	*7.E-04*	*Ra-226, K-40*	*7.E-05*	*Po-210, Ra-226*	*6.E-06*	*Po-210, Ra-226*
Total Lifetime Incremental Cancer Risk	**2.E-03**	**Ra-226, K-40**	**8.E-04**	**Ra-226, Po-210**	**9.E-05**	**Po-210, Ra-226**	**7.E-06**	**Po-210, Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	5	Tl	3	Tl	2	Cd, Tl	0.1	-
Dermal Absorption	0.1	-	NA	-	0.1	-	0.03	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.008	-	NA	-	1	Cd	0.1	-
Total Incremental Non-Cancer Hazard Quotient	**5**	**Tl**	**3**	**Tl**	**3**	**Cd, Tl**	**0.3**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-34

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 16 (CALCINER SOLIDS STOCKPILE)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	3.E-06	As	2.E-06	As	2.E-07	-	2.E-08	-
Dermal Absorption	6.E-07	-	NA	-	2.E-08	-	5.E-09	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	6.E-07	-	NA	-	7.E-06	Cd	5.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*4.E-06*	*As*	*2.E-06*	*As*	*7.E-06*	*Cd*	*5.E-07*	
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, K-40	5.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-04	Po-210, Pb-210	1.E-04	Po-210, Pb-210	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-06	Po-210	NA	-	2.E-05	Po-210, Pb-210	2.E-06	Po-210
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, K-40*	*7.E-04*	*Ra-226, Po-210*	*7.E-05*	*Po-210, Ra-226*	*5.E-06*	*Po-210, Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, K-40**	**7.E-04**	**Ra-226, Po-210**	**7.E-05**	**Po-210, Ra-226**	**6.E-06**	**Po-210, Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	5	Tl	3	Tl	2	Cd, Tl	0.1	-
Dermal Absorption	0.1	-	NA	-	0.1	-	0.03	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.01	-	NA	-	1	Cd	0.1	-
Total Incremental Non-Cancer Hazard Quotient	**5**	**Tl**	**3**	**Tl**	**3**	**Cd, Tl**	**0.3**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-35

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 19
(SLAG PILE, BULL ROCK PILE)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	3.E-06	As	2.E-06	As	2.E-07	-	2.E-08	-
Dermal Absorption	6.E-07	-	NA	-	2.E-08	-	5.E-09	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	Cd	1.E-07	-
Total COPC Lifetime Incremental Cancer Risk	*4.E-06*	*As*	*2.E-06*	*As*	*2.E-06*	*Cd*	*2.E-07*	
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, U-238	5.E-04	Ra-226, U-238	3.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	6.E-05	Pb-210, Ra-226	4.E-05	Pb-210, Ra-226	5.E-06	Pb-210	4.E-07	-
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	3.E-07	-	NA	-	3.E-06	Pb-210, Ra-226	3.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, Pb-210*	*5.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*3.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, Pb-210**	**5.E-04**	**Ra-226, Pb-210**	**4.E-05**	**Ra-226, Pb-210**	**3.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	0.1	-	0.1	-	0.2	-	0.02	-
Dermal Absorption	0.03	-	NA	-	0.03	-	0.007	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.002	-	NA	-	0.3	-	0.02	-
Total Incremental Non-Cancer Hazard Quotient	**0.2**	**-**	**0.1**	**-**	**1**	**-**	**0.05**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-36

COKE-RELATED PAH INVESTIGATION AREAS
DETECTION SUMMARY[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

					Benzo(a)-anthracene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Naphthalene	Pyrene
				Analyte	**Benzo(a)-anthracene**	**Benzo(b)-fluoranthene**	**Benzo(k)-fluoranthene**	**Chrysene**	**Fluoranthene**	**Naphthalene**	**Pyrene**
				Units	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
				Commercial/Industrial Worker SSL[b]	**2,000**	**2,000**	**23,000**	**230,000**	**24,000,000**	**12,000,000**	**18,000,000**
				Construction Worker SSL[b]	**41,000**	**41,000**	**410,000**	**4,100,000**	**170,000,000**	**260,000,000**	**130,000,000**
				Utility Worker SSL[b]	**340,000**	**340,000**	**3,400,000**	**34,000,000**	**1,000,000,000**	**1,000,000,000**	**1,000,000,000**
				SSL Protective of Groundwater[c]	**2,000**	**5,000**	**49,000**	**160,000**	**4,300,000**	**59,000**	**4,200,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**								
RU20-SIA3-SB001	RU20-SIA3-SB001 (10-12)	08/17/07	10 - 12		<5.7 UJ	<5.7 UJ	<5.7 UJ	<5.7 UJ	<5.7 UJ	**0.38 TJ-**	<5.7 UJ
RU20-SIA3-SB004	RU20-SIA3-SB004 (12-14)	08/17/07	12 - 14		<5.6 UJ	<5.6 UJ	**0.34 TJ-**	<5.6 UJ	<5.6 UJ	**0.38 TJ-**	<5.6 UJ
RU20-SIA3-SB006	RU20-SIA3-SB006 (10-12)	08/17/07	10 - 12		<5.8 UJ	<5.8 UJ	<5.8 UJ	**0.77 TJ-**	1.1 TUJ	**0.66 TJ-**	1.2 TUJ
RU20-SIA3-SB010	RU20-SIA3-SB010(5-7)	08/20/07	5 - 7		<5.4	<5.4	<5.4	<5.4	<5.4	**0.92 T**	<5.4
RU20-SIA3-SB011	RU20-SIA3-SB011(9-11)	08/20/07	9 - 11		**1.4 T**	<5.7	<5.7	**1.7 T**	**1.5 TJ+**	**0.94 T**	**1.7 TJ+**
RU20-SIA3-SB012	RU20-SIA3-SB012(9-11)	08/20/07	9 - 11		<6.3	<6.3 UJ	<6.3 UJ	<6.3	**1.2 TJ+**	<6.3	**1.1 TJ+**
RU20-SIA3-SB018	RU20-SIA3-SB018(5-7)	08/20/07	5 - 7		**1.4 T**	<5.3	<5.3	**1.5 T**	**1.5 TJ+**	**0.44 T**	**1.6 TJ+**
RU20-SIA3-SB020 CL	RU20-SIA3-SB220(5-7)	08/20/07	5 - 7		**1.3 T**	**1.2 TJ**	<5.7	**1.4 T**	**1.8 TJ+**	**0.36 T**	**2.1 TJ+**

SSL Soil screening level
a For the complete data summary, refer to Appendix D of this report. Samples were collected at RU 20 coke handling and storage area (RU 20 SIA3). These samples were used as both a specific investigation area (SIA) and a coke reference area investigation (RAI).
b SSLs developed using the methods presented in EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites EPA (2002), supplemented* with current toxicological data.
c The SSLs protective of groundwater incorporate a dilution-attenuation factor of 20.
µg/kg micrograms per kilogram.
ft feet
Bold Bolded result indicates positively identified compound.
J- Data are estimated, potentially biased low, due to associated quality control data.
J+ Data are estimated, potentially biased high due to associated quality control data.
PAH Polynuclear aromatic hydrocarbons
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UJ Potential low bias, possible false negative.

TABLE 4-36

COKE-RELATED PAH INVESTIGATION AREAS
DETECTION SUMMARY[a]
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

				Analyte	Benzo(a)-anthracene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Fluoranthene	Naphthalene	Pyrene
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				Commercial/Industrial Worker SSL[b]	2,000	2,000	23,000	230,000	24,000,000	12,000,000	18,000,000
				Construction Worker SSL[b]	41,000	41,000	410,000	4,100,000	170,000,000	260,000,000	130,000,000
				Utility Worker SSL[b]	340,000	340,000	3,400,000	34,000,000	1,000,000,000	1,000,000,000	1,000,000,000
				SSL Protective of Groundwater[c]	2,000	5,000	49,000	160,000	4,300,000	59,000	4,200,000
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**								

CL Co-located sample for blind replicate analysis

TABLE 4-37

COKE-RELATED METALS INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium
				Analyte	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Copper**	**Lead**	**Lithium**
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[a]	**2.2**	**7.7**	**188**	**1**	**12.8**	**1.9**	**27.5**	**7.6**	**12.6**	**29.1**	**16.1**
				Commercial/Industrial Worker SSL	**454**	**7.7[b]**	**61,700**	**645**	**223,000**	**860**	**1,000,000[c]**	**553**	**42,000**	**800[e]**	**22,700**
				Construction Worker SSL	**104**	**14.6**	**8,360**	**61**	**5,210**	**81.3**	**551,000**	**52.2**	**22,000**	**800[e]**	**11,900**
				Utility Worker SSL	**1,360**	**173**	**109,000**	**792**	**67,800**	**1,060**	**1,000,000[c]**	**679**	**286,000**	**800[e]**	**155,000**
				SSL Protective of Groundwater[d]	**5**	**7.7[b]**	**1,600**	**63**	**450**	**8**	**38**	**630**	**9,400**	**800[e]**	**4,200**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**												
RU20-SIA4-SB001	RU20-SIA4-SB001 (4)	09/13/07	4		**0.903 T**	**3.18**	**130**	0.613 TUB	**8.4 T**	0.308 TUB	**11.9 B**	**4.23 B**	**8.48**	**7.93**	**12.6 B**
RU20-SIA4-SB001	RU20-SIA4-SB001 (6)	09/13/07	6		**0.219 T**	**3.14**	**134**	0.616 TUB	**7.5 T**	0.276 TUB	**10.4 B**	**4.28 B**	**8.13**	**7.75**	**11.7 B**
RU20-SIA4-SB001	RU20-SIA4-SB001 (14)	09/13/07	14		<1	**3.22**	**99.4**	0.623 TUB	**6.52 T**	0.472 TUB	**11.5 B**	**4.64 B**	**9.17**	**8.73**	**9.9 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (3)	09/13/07	3		**0.734 T**	**2.72**	**111**	0.513 TUB	**5.15 T**	0.272 TUB	**9.24 B**	**3.78 B**	**6.19**	**6.85**	**9.91 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (5)	09/13/07	5		**0.51 T**	**3.01**	**122**	0.585 TUB	**6.77 T**	0.393 TUB	**10.9 B**	**4.15 B**	**7.86**	**7.77**	**11.7 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (13)	09/13/07	13		<1	**3.66**	**140**	0.707 TUB	**6.75 T**	0.362 TUB	**12.4 B**	**5.2 B**	**11.5**	**10.2**	**11.1 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (3)	09/13/07	3		**0.39**	**3.09**	**130**	0.596 TUB	**6.92 T**	0.29 TUB	**11.4 B**	**4.44 B**	**8.41**	**7.87**	**11.2 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (5)	09/13/07	5		<1	**3.29**	**139**	0.644 TUB	**8.32 T**	0.374 TUB	**12.3 B**	**4.82 B**	**9.72**	**9.09**	**12.5 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (13)	09/13/07	13		<1	**4.01**	**122**	0.69 TUB	**5.25 T**	0.38 TUB	**11.1 B**	**5.18 B**	**10.7**	**10.2**	**10.5 B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
B Analyte detected in an associated blank.
UB Analyte considered not detected based on associated blank data.
SSL Soil screening level

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-37

COKE-RELATED METALS INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

					Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
				Analyte										
				Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
				Background[a]	**482**	**0.16**	**2.15**	**15.5**	**1.36**	**1.9**	**0.27**	**NA**	**45.4**	**52.8**
				Commercial/Industrial Worker SSL	**23,500**	**340**	**5,670**	**6,450**	**5,670**	**5,670**	**77.2**	**3,400**	**7,950**	**340,000**
				Construction Worker SSL	**77,100**	**464**	**2,750**	**404**	**2,750**	**2,750**	**374**	**491**	**3,500**	**165,000**
				Utility Worker SSL	**1,000,000**	**6,030**	**35,800**	**5,250**	**35,800**	**35,800**	**4,870**	**6,390**	**45,500**	**1,000,000[c]**
				SSL Protective of Groundwater[d]	**482[f]**	**2**	**81**	**130**	**5**	**34**	**0.7**	**900**	**6,000**	**12,000**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**											
RU20-SIA4-SB001	RU20-SIA4-SB001 (4)	09/13/07	4		**368**	**0.0063 T**	**0.824 T**	**11.1**	<2	0.114 TUB	0.22 TUB	**1.07 B**	**16.6**	**37.7 B**
RU20-SIA4-SB001	RU20-SIA4-SB001 (6)	09/13/07	6		**347**	**0.0059 T**	**0.41 T**	**10.8**	<2	0.0807 TUB	0.162 TUB	**0.538 TB**	**15.1**	**34.7 B**
RU20-SIA4-SB001	RU20-SIA4-SB001 (14)	09/13/07	14		**388**	**0.0091 T**	**0.454 T**	**12**	<2	0.122 TUB	0.159 TUB	**0.864 TB**	**16.2**	**42.4 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (3)	09/13/07	3		**353**	**0.0048 T**	**0.505 T**	**8.91**	<2	0.0601 TUB	0.126 TUB	**0.499 TB**	**13.8**	**31.5 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (5)	09/13/07	5		**399**	**0.0076 T**	**0.573 T**	**10.5**	<2	0.101 TUB	0.137 TUB	**0.52 TB**	**15.2**	**38.5 B**
RU20-SIA4-SB002	RU20-SIA4-SB002 (13)	09/13/07	13		**466**	**0.0095 T**	**0.503 T**	**13.1**	<2	0.121 TUB	0.178 TUB	**0.648 TB**	**17.7**	**51.4 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (3)	09/13/07	3		**398**	**0.0062 T**	**0.587 T**	**10.9**	<2	0.0943 TUB	0.151 TUB	**0.953 TB**	**15.9**	**34.4 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (5)	09/13/07	5		**442**	**0.0084 T**	**0.61 T**	**12.4**	<2	0.116 TUB	0.156 TUB	**0.581 TB**	**16**	**43.6 B**
RU20-SIA4-SB003	RU20-SIA4-SB003 (13)	09/13/07	13		**462**	**0.01 T**	**0.424 T**	**12.9**	<2	0.113 TUB	0.163 TUB	**0.614 TB**	**16.4**	**49.4 B**

mg/kg milligrams per kilogram.
Bold Bolded result indicates positively identified compound.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
B Analyte detected in an associated blank.
UB Analyte considered not detected based on associated blank data.
SSL Soil screening level

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background

TABLE 4-38

COKE-RELATED TCLP SVOC INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	1,4-Dichloro-benzene	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2,4-Dinitro-toluene	2-Methylphenol (o-Cresol)	Hexachloro-benzene	Hexachloro-butadiene	Hexachloro-ethane	m,p-Cresol	Nitro-benzene	Pentachloro-phenol	Pyridine
				Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				MCL	7.5	400.0	2.0	0.13	200.0	0.13	0.5	3.0	200	2.0	100.0	5.0
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**													
RU20-SIA5-SS001	RU20-SIA5-SS001	08/21/07	0		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
RU20-SIA5-SS002	RU20-SIA5-SS002	08/21/07	0		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
RU20-SIA5-SS003	RU20-SIA5-SS003	08/21/07	0		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1
RU20-SIA5-SS004	RU20-SIA5-SS004	08/21/07	0		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1

mg/l milligrams per liter.
MCL Maximum concentration level
TCLP Toxicity characteristic leaching procedure
SVOCS Semi-volatile organic compounds

TABLE 4-39

COKE-RELATED METALS TCLP INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

				Analyte	**Arsenic**	**Barium**	**Cadmium**	**Chromium**	**Mercury**	**Lead**	**Selenium**	**Silver**
				Units	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
				MCL	**5**	**100.0**	**1.0**	**5.0**	**0.2**	**1.0**	**1.0**	**5.0**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**									
RU20-SIA5-SS001	RU20-SIA5-SS001	08/21/07	0		<0.1	0.39 T,UB	0.027 T,UB	0.021 T,UB	<0.002	<0.03	<0.05	<0.1
RU20-SIA5-SS002	RU20-SIA5-SS002	08/21/07	0		<0.1	0.27 T,UB	0.019 T,UB	0.019 T,UB	**0.00018 T**	<0.03	<0.05	<0.1
RU20-SIA5-SS003	RU20-SIA5-SS003	08/21/07	0		<0.1	0.36 T,UB	0.02 T,UB	0.008 T,UB	<0.002	<0.03	<0.05	<0.1
RU20-SIA5-SS004	RU20-SIA5-SS004	08/21/07	0		<0.1	0.34 T,UB	0.015 T,UB	0.012 T,UB	**0.00029 T**	<0.03	<0.05	<0.1

mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
MCL Maximum concentration level
TCLP Toxicity characteristic leaching procedure

TABLE 4-40a

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 20
(FORMER BANNOCK PAVING AREA)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario									
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker		Off-Site Resident	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk										
COCs										
Incidental Soil Ingestion	9.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	5.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	7.E-06	Benzo(a)pyrene	5.E-07	-	NA	-
Dermal Absorption	7.E-05	Benzo(a)pyrene, Dibenz(a,h)anthracene	NA	-	3.E-06	Benzo(a)pyrene	6.E-07	-	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	Ni	2.E-07	-	5.E-08	-
Total COPC Lifetime Incremental Cancer Risk	*2.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*5.E-05*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*1.E-05*	*Benzo(a)pyrene, Cd*	*1.E-06*		*5.E-08*	
ROCs										
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226	NA	-
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-	NA	-
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	Ra-226	2.E-07	-	5.E-08	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*		*2.E-06*	*Ra-226*	*5.E-08*	
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, Benzo(a)pyrene**	**5.E-04**	**Ra-226, Benzo(a)pyrene**	**4.E-05**	**Ra-226, Benzo(a)pyrene**	**3.E-06**	**Ra-226**	**1.E-07**	**-**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient										
COCs										
Incidental Soil Ingestion	1	V	1	V	2	V	0.1	-	NA	-
Dermal Absorption	0.004	-	NA	-	0.0001	-	0.00003	-	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	0.02	-	NA	-	3	Ni	0.2	-	0.005	-
Total Incremental Non-Cancer Hazard Quotient	**1**	**V**	**1**	**V**	**5**	**Ni, V**	**0.4**	**-**	**0.005**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-40b

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIAL AND FUEL RESIDUE IN THE FORMER BATCH PLANT AREA OF RU 20 (FORMER BANNACK PAVING AREA)

(Page 1 of 1)

Exposure Pathways	Exposure Scenario									
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker		Off-Site Resident	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk										
COCs										
Incidental Soil Ingestion	5.E-04	Benzo(a)pyrene, Benzo(b)fluoranthene	3.E-04	Benzo(a)pyrene, Benzo(b)fluoranthene	4.E-05	Benzo(a)pyrene, Benzo(b)fluoranthene	3.E-06	Benzo(a)pyrene	NA	-
Dermal Absorption	4.E-04	Benzo(a)pyrene, Benzo(b)fluoranthene	NA	-	2.E-05	Benzo(a)pyrene, Benzo(b)fluoranthene	4.E-06	Benzo(a)pyrene	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	3.E-07	-	NA	-	3.E-06	Cd	2.E-07	-	8.E-08	-
Total COPC Lifetime Incremental Cancer Risk	*1.E-03*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*3.E-04*	*Benzo(a)pyrene, Dibenz(a,h)anthracene*	*6.E-05*	*Benzo(a)pyrene, Cd*	*7.E-06*	*Benzo(a)pyrene*	*8.E-08*	
ROCs										
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226	NA	-
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-	NA	-
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	2.E-07	-	NA	-	2.E-06	Ra-226	2.E-07	-	5.E-08	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*		*2.E-06*	*Ra-226*	*5.E-08*	
Total Lifetime Incremental Cancer Risk	**2.E-03**	**Ra-226, Benzo(a)pyrene**	**7.E-04**	**Ra-226, Benzo(a)pyrene**	**8.E-05**	**Benzo(a)pyrene, Ra-226**	**9.E-06**	**Benzo(a)pyrene, Ra-226**	**1.E-07**	**-**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient										
COCs										
Incidental Soil Ingestion	1	V	1	V	2	V	0.1	-	NA	-
Dermal Absorption	0.02	-	NA	-	0.001	-	0.0002	-	NA	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-	NA	-
Fugitive Dust Inhalation	0.023	-	NA	-	3	Ni	0.2	-	0.005	-
Total Incremental Non-Cancer Hazard Quotient	**1**	**V**	**1**	**V**	**5**	**Ni, V**	**0.4**	**-**	**0.005**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-41

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 21 (OTHER ONSITE RAILSPURS)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Utility Worker	
	RME	Risk Drivers*
Lifetime Incremental Cancer Risk		
COCs		
Incidental Soil Ingestion	BScr	-
Dermal Absorption	BScr	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*	
ROCs		
External Exposure to Gamma Radiation	2.E-06	Ra-226
Incidental Soil Ingestion	2.E-07	-
Radon inhalation	BScr	-
Fugitive Dust Inhalation	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient		
COCs		
Incidental Soil Ingestion	BScr	-
Dermal Absorption	BScr	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-42

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 22b***
(OLD PONDS)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	7.E-06	Cd	NA	-	7.E-05	Cd, As	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As*	*5.E-05*	*As*	*8.E-05*	*Cd, As*	*6.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	2.E-03	Ra-226, K-40	7.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	3.E-06	Ra-226, K-40
Incidental Soil Ingestion	2.E-03	Pb-210, Po-210	1.E-03	Pb-210, Po-210	2.E-04	Pb-210, Po-210	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	8.E-06	Pb-210, Po-210	NA	-	8.E-05	Pb-210, Po-210	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*4.E-03*	*Pb-210, Ra-226*	*2.E-03*	*Pb-210, Ra-226*	*3.E-04*	*Pb-210, Po-210*	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**4.E-03**	**Pb-210, Ra-226**	**2.E-03**	**Pb-210, Ra-226**	**3.E-04**	**Pb-210, Cd**	**3.E-05**	**Pb-210, Cd**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	7	Cd, V	4	Cd, V	12	Cd, V	0.9	-
Dermal Absorption	1	Cd	NA	-	1	Cd	0.3	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.08	-	NA	-	16	Cd, Ni	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**140**	**P4, Cd**	**77**	**P4, Cd**	**54**	**P4, Cd**	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when “smoke” became apparent due to the irritant effect of the acid aerosol which comprises the “smoke”. This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

*** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-43

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 22c (RAILROAD SWALE)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	8.E-05	As	5.E-05	As	6.E-06	As	5.E-07	-
Dermal Absorption	2.E-05	As	NA	-	6.E-07	-	1.E-07	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	3.E-06	Cd	NA	-	3.E-05	Cd, As	2.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*1.E-04*	*As, Cd*	*5.E-05*	*As*	*4.E-05*	*Cd, As*	*3.E-06*	*Cd*
ROCs								
External Exposure to Gamma Radiation	1.E-03	Ra-226, K-40	5.E-04	Ra-226, K-40	3.E-05	Ra-226, K-40	2.E-06	Ra-226, K-40
Incidental Soil Ingestion	7.E-04	Pb-210, Po-210	4.E-04	Pb-210, Po-210	5.E-05	Pb-210, Po-210	4.E-06	Pb-210, Po-210
Radon inhalation	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	2.E-06	Pb-210, Po-210	NA	-	2.E-05	Pb-210, Po-210	2.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*2.E-03*	*Pb-210, Ra-226*	*9.E-04*	*Pb-210, Ra-226*	*1.E-04*	*Pb-210, Po-210*	*8.E-06*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**2.E-03**	**Ra-226, Pb-210**	**9.E-04**	**Ra-226, Pb-210**	**1.E-04**	**Pb-210, Ra-226**	**1.E-05**	**Pb-210, Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
Elemental Phosphorus (P4)**								
Incidental Soil Ingestion	132	P4	73	P4	25	P4	2	P4
Other COCs								
Incidental Soil Ingestion	3	Cd	1	Cd	5	Cd, As	0.4	-
Dermal Absorption	1	Cd	NA	-	0.5	-	0.1	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	0.03	-	NA	-	5	Cd	0.4	-
Total Incremental Non-Cancer Hazard Quotient	**135**	**P4, Cd**	**75**	**P4, Cd**	**36**	**P4, Cd**	**3**	**P4**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when "smoke" became apparent due to the irritant effect of the acid aerosol which comprises the "smoke". This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

TABLE 4-44

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 23 (ROAD SEGMENTS NOT WITHIN RU BOUNDARIES)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario	
	Maintenance Worker	
	RME	Risk Drivers*
Lifetime Incremental Cancer Risk		
COCs		
Incidental Soil Ingestion	NA	-
Dermal Absorption	NA	-
Inhalation of Volatiles	NA	-
Fugitive Dust Inhalation	NA	-
Total COPC Lifetime Incremental Cancer Risk		
ROCs		
External Exposure to Gamma Radiation	3.E-05	Ra-226
Incidental Soil Ingestion	NA	-
Radon inhalation	NA	-
Fugitive Dust Inhalation	NA	-
Total ROPC Lifetime Incremental Cancer Risk	*3.E-05*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**3.E-05**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient		
COCs		
Incidental Soil Ingestion	NA	-
Dermal Absorption	NA	-
Inhalation of Volatiles	NA	-
Fugitive Dust Inhalation	NA	-
Total Incremental Non-Cancer Hazard Quotient	**NA**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

TABLE 4-45

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO FILL MATERIALS IN RU 24**
(PLANT AREAS NOT WITHIN RU BOUNDARIES)
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario							
	Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker		Construction Worker		Utility Worker	
	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*	RME	Risk Drivers*
Lifetime Incremental Cancer Risk								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total COPC Lifetime Incremental Cancer Risk	*BScr*		*BScr*		*BScr*		*BScr*	
ROCs								
External Exposure to Gamma Radiation	9.E-04	Ra-226, U-238	4.E-04	Ra-226, U-238	2.E-05	Ra-226	2.E-06	Ra-226
Incidental Soil Ingestion	3.E-05	Pb-210, Ra-226	1.E-05	Pb-210, Ra-226	2.E-06	Pb-210	2.E-07	-
Radon inhalation	BScr		NA		BScr		BScr	-
Fugitive Dust Inhalation	2.E-07		NA		2.E-06	Ra-226	2.E-07	-
Total ROPC Lifetime Incremental Cancer Risk	*1.E-03*	*Ra-226, U-238*	*4.E-04*	*Ra-226, Pb-210*	*3.E-05*	*Ra-226, Pb-210*	*2.E-06*	*Ra-226*
Total Lifetime Incremental Cancer Risk	**1.E-03**	**Ra-226, U-238**	**4.E-04**	**Ra-226, Pb-210**	**3.E-05**	**Ra-226, Pb-210**	**2.E-06**	**Ra-226**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient								
COCs								
Incidental Soil Ingestion	BScr	-	BScr	-	BScr	-	BScr	-
Dermal Absorption	BScr	-	NA	-	BScr	-	BScr	-
Inhalation of Volatiles	BScr	-	NA	-	BScr	-	BScr	-
Fugitive Dust Inhalation	BScr	-	NA	-	BScr	-	BScr	-
Total Incremental Non-Cancer Hazard Quotient	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**	**BScr**	**-**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.
NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified
** Risks associated with exposure to underground piping formerly used to convey precipitator slurry or phossy water in this RU are evaluated separately.

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Southern Undeveloped Area	1S	554715.2277	444238.8884	6/21/2007	20	120	14.3	12.8	16.1	0.6
Southern Undeveloped Area	2S	554715.2277	444582.3277	6/21/2007	20	120	14.9	13.0	19.3	1.0
Southern Undeveloped Area	3S	554715.2277	444925.7671	6/21/2007	20	120	14.1	12.5	15.7	0.6
Southern Undeveloped Area	4S	554715.2277	445269.2064	6/21/2007	20	120	14.6	13.2	16.6	0.6
Southern Undeveloped Area	5S	554715.2277	445612.6458	6/21/2007	20	120	15.1	13.3	17.0	0.6
Southern Undeveloped Area	6S	554715.2277	445956.0851	6/21/2007	20	120	15.5	14.4	17.3	0.5
Southern Undeveloped Area	7S	554715.2277	446299.5245	6/21/2007	20	120	15.4	14.3	16.9	0.5
Southern Undeveloped Area	9S	555058.6671	444238.8884	6/21/2007	20	120	14.0	12.9	16.0	0.5
Southern Undeveloped Area	8S	554715.2277	446642.9638	6/21/2007	20	120	46.6	44.0	49.3	0.8
Southern Undeveloped Area	10S	555058.6671	444582.3277	6/21/2007	20	120	14.4	13.3	15.8	0.5
Southern Undeveloped Area	11S	555058.6671	444925.7671	6/21/2007	20	120	14.5	13.1	16.3	0.5
Southern Undeveloped Area	12S	555058.6671	445269.2064	6/21/2007	20	120	17.4	16.2	18.9	0.6
Southern Undeveloped Area	13S	555058.6671	445612.6458	6/21/2007	20	120	14.9	13.6	16.7	0.6
Southern Undeveloped Area	14S	555058.6671	445956.0851	6/21/2007	20	120	14.7	13.0	16.3	0.5
Southern Undeveloped Area	15S	555058.6671	446299.5245	6/21/2007	20	120	14.9	13.6	21.9	0.9
Southern Undeveloped Area	16S	555058.6671	446642.9638	6/21/2007	20	120	64.2	62.2	66.2	0.7
Southern Undeveloped Area	17S	555402.1064	444238.8884	6/27/2007	20	120	14.7	13.3	16.8	0.7
Southern Undeveloped Area	18S	555402.1064	444582.3277	6/27/2007	20	120	15.3	14.2	17.3	0.5
Southern Undeveloped Area	19S	555402.1064	444925.7671	6/27/2007	20	120	14.7	13.3	16.4	0.7
Southern Undeveloped Area	20S	555402.1064	445269.2064	6/27/2007	20	120	15.4	14.3	16.8	0.5
Southern Undeveloped Area	21S	555402.1064	445612.6458	6/27/2007	20	120	15.6	12.8	18.7	0.9
Southern Undeveloped Area	22S	555402.1064	445956.0851	6/27/2007	20	120	16.1	15.0	17.5	0.5
Southern Undeveloped Area	23S	555402.1064	446299.5245	6/27/2007	20.3	123	16.3	14.6	18.6	0.7
Southern Undeveloped Area	24S	555402.1064	446642.9638	6/21/2007	20	120	15.0	13.7	16.6	0.5
Southern Undeveloped Area	25S	555402.1064	446986.4032	6/21/2007	20	120	24.0	22.5	26.1	0.7
Southern Undeveloped Area	26S	555402.1064	447329.8425	6/21/2007	20	120	17.2	16.1	18.8	0.5
Southern Undeveloped Area	27S	555402.1064	447673.2819	6/21/2007	20	120	19.2	21.0	17.3	0.6
Southern Undeveloped Area	28S	555745.5458	444238.8884	6/26/2007	20	120	15.4	13.8	18.7	0.7
Southern Undeveloped Area	29S	555745.5458	444582.3277	6/26/2007	20	120	14.2	13.1	15.8	0.5
Southern Undeveloped Area	30S	555745.5458	444925.7671	6/26/2007	20	120	14.5	13.4	16.5	0.5
Southern Undeveloped Area	31S	555745.5458	445269.2064	6/27/2007	20	120	15.1	13.9	16.8	0.5

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Southern Undeveloped Area	32S	555745.5458	445612.6458	6/27/2007	20	120	14.9	13.0	17.0	0.7
Southern Undeveloped Area	33S	555745.5458	445956.0851	6/27/2007	20	120	14.8	13.3	16.7	0.6
Southern Undeveloped Area	34S	555745.5458	446299.5245	6/27/2007	20	120	21.1	19.5	24.6	0.7
Southern Undeveloped Area	35S	555745.5458	446642.9638	6/21/2007	20	120	16.9	15.6	18.3	0.5
Southern Undeveloped Area	36S	555745.5458	446986.4032	6/21/2007	20	120	16.2	14.8	18.0	0.5
Southern Undeveloped Area	37S	555745.5458	447329.8425	6/21/2007	20	120	18.9	17.2	20.7	0.6
Southern Undeveloped Area	38S	555745.5458	447673.2819	6/21/2007	20	120	17.8	16.6	19.8	0.5
Southern Undeveloped Area	39S	555745.5458	448016.7212	6/21/2007	20	120	47.2	45.6	48.9	0.6
Southern Undeveloped Area	40S	556088.9851	444238.8884	6/26/2007	20	120	14.1	12.9	16.2	0.6
Southern Undeveloped Area	41S	556088.9851	444582.3277	6/26/2007	20	120	14.6	13.0	16.3	0.6
Southern Undeveloped Area	42S	556088.9851	444925.7671	6/26/2007	20	120	16.0	14.7	19.1	0.9
Southern Undeveloped Area	43S	556088.9851	445269.2064	6/26/2007	20	120	15.5	13.8	20.0	1.0
Southern Undeveloped Area	44S	556088.9851	445612.6458	6/26/2007	20	120	15.2	13.3	18.0	0.8
Southern Undeveloped Area	45S	556088.9851	445956.0851	6/26/2007	20	120	16.2	14.6	19.1	0.7
Southern Undeveloped Area	46S	556088.9851	446299.5245	6/26/2007	20	120	18.4	16.3	20.6	0.8
Southern Undeveloped Area	47S	556088.9851	446642.9638	6/26/2007	20	120	20.1	18.7	22.0	0.7
Southern Undeveloped Area	48S	556088.9851	446986.4032	6/27/2007	20	120	15.7	17.0	14.6	0.5
Southern Undeveloped Area	49S	556088.9851	447329.8425	6/27/2007	20	120	16.8	15.0	19.7	0.8
Southern Undeveloped Area	50S	556088.9851	447673.2819	6/27/2007	20	120	16.9	15.5	20.1	0.6
Southern Undeveloped Area	51S	556432.4245	444238.8884	6/26/2007	20	120	15.0	13.6	17.7	0.7
Southern Undeveloped Area	52S	556432.4245	444582.3277	6/26/2007	20	120	15.2	13.6	16.9	0.5
Southern Undeveloped Area	53S	556432.4245	444925.7671	6/26/2007	20	120	14.4	13.2	16.3	0.6
Southern Undeveloped Area	54S	556432.4245	445269.2064	6/26/2007	20	120	15.0	13.5	17.1	0.6
Southern Undeveloped Area	55S	556432.4245	445612.6458	6/26/2007	20	120	15.8	14.1	18.2	0.5
Southern Undeveloped Area	56S	556432.4245	445956.0851	6/26/2007	20	120	16.0	14.8	19.8	0.6
Southern Undeveloped Area	57S	556432.4245	446299.5245	6/26/2007	20	120	22.2	17.0	23.3	0.7
Southern Undeveloped Area	58S	556432.4245	446642.9638	6/26/2007	20	120	21.6	20.0	23.2	0.6
Southern Undeveloped Area	59S	556432.4245	446986.4032	6/27/2007	20	120	15.7	13.6	18.9	0.8
Southern Undeveloped Area	60S	556432.4245	447329.8425	6/27/2007	20	120	16.4	14.6	19.3	0.8
Southern Undeveloped Area	61S	556432.4245	447673.2819	6/27/2007	20	120	17.2	15.8	18.6	0.5
Southern Undeveloped Area	62S	556775.8638	444238.8884	6/29/2007	20	120	15.2	13.8	17.3	0.5

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Southern Undeveloped Area	63S	556775.8638	444582.3277	6/29/2007	20	120	15.3	14.3	16.7	0.5
Southern Undeveloped Area	64S	556775.8638	444925.7671	6/29/2007	20	120	19.0	17.4	21.0	0.6
Southern Undeveloped Area	65S	556775.8638	445269.2064	6/29/2007	20	120	19.8	18.1	23.4	0.9
Southern Undeveloped Area	66S	556775.8638	445612.6458	6/28/2007	20	120	19.4	18.6	20.6	0.5
Southern Undeveloped Area	67S	556775.8638	445956.0851	6/28/2007	24	146	14.7	13.3	16.3	0.5
Southern Undeveloped Area	68S	556775.8638	446299.5245	6/28/2007	20	120	14.6	12.8	17.0	0.5
Southern Undeveloped Area	69S	556775.8638	446642.9638	6/27/2007	20	120	14.9	13.5	17.0	0.6
Southern Undeveloped Area	70S	556775.8638	446986.4032	6/27/2007	20	120	14.8	13.2	16.6	0.6
Southern Undeveloped Area	71S	556775.8638	447329.8425	6/27/2007	20	120	15.6	14.5	17.6	0.5
Southern Undeveloped Area	72S	556775.8638	447673.2819	6/27/2007	20	120	16.5	13.2	16.6	0.6
Southern Undeveloped Area	73S	556775.8638	448016.7212	6/27/2007	20	120	21.2	19.8	24.2	0.7
Southern Undeveloped Area	74S	557119.3031	444238.8884	6/29/2007	20:30	123	16.3	14.9	18.6	0.6
Southern Undeveloped Area	75S	557119.3031	444582.3277	6/29/2007	20	120	16.3	14.8	18.1	0.6
Southern Undeveloped Area	76S	557119.3031	444925.7671	6/29/2007	20	120	19.3	17.1	21.3	0.6
Southern Undeveloped Area	77S	557119.3031	445269.2064	6/29/2007	20	120	20.0	18.6	21.5	0.5
Southern Undeveloped Area	78S	557119.3031	445612.6458	6/29/2007	21:40	130	15.0	13.9	17.2	0.6
Southern Undeveloped Area	79S	557119.3031	445956.0851	6/28/2007	20	120	14.6	13.1	16.1	0.6
Southern Undeveloped Area	80S	557119.3031	446299.5245	6/28/2007	20	120	15.0	14.0	16.3	0.5
Southern Undeveloped Area	81S	557119.3031	446642.9638	6/27/2007	20	120	15.4	14.3	17.0	0.6
Southern Undeveloped Area	82S	557119.3031	446986.4032	6/27/2007	20	120	20.0	18.6	21.7	0.6
Southern Undeveloped Area	83S	557119.3031	447329.8425	6/27/2007	20	120	15.1	12.1	16.7	0.7
Southern Undeveloped Area	84S	557119.3031	447673.2819	6/27/2007	20	120	16.7	15.5	18.5	0.5
Southern Undeveloped Area	85S	557119.3031	448016.7212	6/27/2007	20	120	26.0	23.0	28.8	0.7
Southern Undeveloped Area	86S	557119.3031	448360.1606	6/28/2007	20	120	22.5	20.5	26.3	0.9
Southern Undeveloped Area	87S	557119.3031	448703.5999	6/28/2007	20	120	22.2	20.8	24.3	0.6
Southern Undeveloped Area	88S	557119.3031	449047.0393	6/28/2007	20	120	41.2	39.3	43.1	0.7
Southern Undeveloped Area	89S	557462.7425	446642.9638	6/28/2007	20	120	19.1	17.9	20.8	0.5
Southern Undeveloped Area	90S	557462.7425	446986.4032	6/28/2007	20	120	15.8	14.1	18.0	0.6
Southern Undeveloped Area	91S	557462.7425	447329.8425	6/28/2007	20	120	15.4	14.2	17.1	0.6
Southern Undeveloped Area	92S	557462.7425	447673.2819	6/28/2007	20	120	17.3	16.1	18.6	0.5
Southern Undeveloped Area	93S	557462.7425	448016.7212	6/28/2007	20	120	24.8	23.1	26.8	0.6

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Southern Undeveloped Area	94S	557462.7425	448360.1606	6/28/2007	20.33	123	21.3	20.1	23.2	0.6
Southern Undeveloped Area	95S	557462.7425	448703.5999	6/28/2007	20	120	22.9	21.4	24.9	0.7
Southern Undeveloped Area	96S	557462.7425	449047.0393	6/28/2007	20	120	20.9	19.4	23.8	0.8
Southern Undeveloped Area	97S	557806.1818	446642.9638	6/28/2007	20	120	30.6	29.0	32.1	0.6
Southern Undeveloped Area	98S	557806.1818	446986.4032	6/28/2007	20	120	15.8	14.5	17.7	0.5
Southern Undeveloped Area	99S	557806.1818	447329.8425	6/28/2007	20	120	36.1	34.6	37.9	0.6
Southern Undeveloped Area	100S	557462.7425	449390.4786	6/28/2007	20	120	16.1	15.1	18.6	0.6
Western Undeveloped Area	1W	546853.5518	447503.7158	6/15/2007	20	120	14.4	13.4	16.0	0.4
Western Undeveloped Area	2W	546853.5518	447819.8088	6/15/2007	20	120	13.7	12.2	15.1	0.5
Western Undeveloped Area	3W	546853.5518	448135.9018	6/15/2007	20	120	14.2	15.8	13.1	0.5
Western Undeveloped Area	4W	546853.5518	448451.9947	6/15/2007	20	120	13.7	12.8	14.9	0.4
Western Undeveloped Area	5W	546853.5518	448768.0877	6/15/2007	20	120	14.3	13.2	15.6	0.5
Western Undeveloped Area	6W	546853.5518	449084.1807	6/15/2007	20	120	14.3	11.9	17.7	0.9
Western Undeveloped Area	7W	546853.5518	449400.2736	6/15/2007	20	120	14.6	12.9	16.3	0.5
Western Undeveloped Area	8W	547169.6448	447187.6229	6/15/2007	20	120	26.9	24.9	36.0	1.3
Western Undeveloped Area	9W	547169.6448	447503.7158	6/15/2007	20	120	13.5	12.1	15.3	0.5
Western Undeveloped Area	10W	547169.6448	447819.8088	6/15/2007	20	120	14.1	12.8	15.5	0.5
Western Undeveloped Area	11W	547169.6448	448135.9018	6/15/2007	20	120	13.9	12.7	15.8	0.5
Western Undeveloped Area	12W	547169.6448	448451.9947	6/15/2007	20	120	13.6	12.5	14.8	0.5
Western Undeveloped Area	13W	547169.6448	448768.0877	6/15/2007	20	120	14.0	12.5	15.7	0.5
Western Undeveloped Area	14W	547169.6448	449084.1807	6/15/2007	20	120	13.7	12.6	14.9	0.4
Western Undeveloped Area	15W	547169.6448	449400.2736	6/15/2007	20	120	14.5	13.1	16.7	0.6
Western Undeveloped Area	16W	547485.7377	447187.6229	6/15/2007	20	120	14.5	13.0	19.9	0.8
Western Undeveloped Area	17W	547485.7377	447503.7158	6/15/2007	20	120	14.1	13.0	16.3	0.5
Western Undeveloped Area	18W	547485.7377	447819.8088	6/15/2007	20	120	14.0	12.8	15.8	0.5
Western Undeveloped Area	19W	547485.7377	448135.9018	6/15/2007	20	120	14.0	12.4	15.5	0.5
Western Undeveloped Area	20W	547485.7377	448451.9947	6/15/2007	20	120	13.9	23.7	15.2	0.5
Western Undeveloped Area	21W	547485.7377	448768.0877	6/15/2007	20	120	14.1	13.1	15.5	0.5
Western Undeveloped Area	22W	547485.7377	449084.1807	6/15/2007	20	120	14.4	13.1	16.1	0.5
Western Undeveloped Area	23W	547485.7377	449400.2736	6/15/2007	20	120	14.5	13.0	16.1	0.5
Western Undeveloped Area	24W	547485.7377	449716.3666	6/15/2007	20	120	14.8	13.7	16.0	0.5

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Western Undeveloped Area	25W	547801.8307	447187.6229	6/16/2007	20	120	15.5	13.9	18.4	0.8
Western Undeveloped Area	26W	547801.8307	447503.7158	6/18/2007	20	120	14.3	16.1	12.9	0.5
Western Undeveloped Area	27W	547801.8307	447819.8088	6/18/2007	20	120	14.3	13.1	15.8	0.5
Western Undeveloped Area	28W	547801.8307	448135.9018	6/15/2007	20	120	13.8	12.2	15.6	0.5
Western Undeveloped Area	29W	547801.8307	448451.9947	6/18/2007	20	120	14.6	13.1	22.5	0.9
Western Undeveloped Area	30W	547801.8307	448768.0877	6/18/2007	20	120	14.4	13.0	15.6	0.4
Western Undeveloped Area	31W	547801.8307	449084.1807	6/18/2007	20	120	14.4	12.6	16.1	0.6
Western Undeveloped Area	32W	547801.8307	449400.2736	6/18/2007	20	120	14.0	12.6	15.6	0.4
Western Undeveloped Area	33W	547801.8307	449716.3666	6/18/2007	20	120	15.2	13.8	17.4	0.5
Western Undeveloped Area	34W	548117.9237	447187.6229	6/16/2007	20	120	51.1	13.9	16.8	0.5
Western Undeveloped Area	35W	548117.9237	447503.7158	6/16/2007	21.5	128	14.5	11.8	16.6	0.6
Western Undeveloped Area	36W	548117.9237	447819.8088	7/18/2007	20	120	14.7	13.6	17.3	0.6
Western Undeveloped Area	37W	548117.9237	448135.9018	7/18/2007	20	120	15.2	13.8	18.1	0.8
Western Undeveloped Area	38W	548117.9237	448451.9947	7/18/2007	20	120	15.6	14.1	17.1	0.6
Western Undeveloped Area	39W	548117.9237	448768.0877	7/18/2007	20	120	15.6	14.4	18.4	0.7
Western Undeveloped Area	40W	548117.9237	449084.1807	7/18/2007	20	120	15.4	13.8	18.0	0.7
Western Undeveloped Area	41W	548117.9237	449400.2736	6/18/2007	20	120	13.8	12.8	15.1	0.5
Western Undeveloped Area	42W	548117.9237	449716.3666	6/18/2007	20	120	14.4	13.2	15.6	0.5
Western Undeveloped Area	43W	548434.0166	447187.6229	6/16/2007	20	120	16.0	14.5	19.3	0.9
Western Undeveloped Area	44W	548434.0166	447503.7158	6/16/2007	20	120	15.0	13.8	18.1	0.8
Western Undeveloped Area	45W	548434.0166	447819.8088	6/16/2007	20	120	14.1	10.0	16.0	NR
Western Undeveloped Area	46W	548434.0166	448135.9018	6/16/2007	20	120	13.5	12.1	14.9	0.5
Western Undeveloped Area	47W	548434.0166	448451.9947	6/16/2007	20	120	14.4	7.8	16.3	1.1
Western Undeveloped Area	48W	548434.0166	448768.0877	6/16/2007	20	120	14.1	12.3	15.8	0.5
Western Undeveloped Area	49W	548434.0166	449084.1807	6/16/2007	20	120	14.7	13.4	16.8	0.6
Western Undeveloped Area	50W	548434.0166	449400.2736	6/16/2007	20	120	14.1	13.2	15.8	0.5
Western Undeveloped Area	51W	548434.0166	449716.3666	6/16/2007	20	120	14.8	13.6	16.1	0.5
Western Undeveloped Area	52W	548434.0166	450032.4596	6/16/2007	20	120	18.5	17.3	20.4	0.6
Western Undeveloped Area	53W	548750.1096	447503.7158	6/16/2007	20	120	14.8	12.8	20.6	1.1
Western Undeveloped Area	54W	548750.1096	447819.8088	6/16/2007	20	120	14.4	12.8	16.5	0.5
Western Undeveloped Area	55W	548750.1096	448135.9018	6/16/2007	20	120	14.5	13.1	18.8	0.9

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Western Undeveloped Area	56W	548750.1096	448451.9947	6/16/2007	20	120	14.3	13.3	17.3	0.5
Western Undeveloped Area	57W	548750.1096	448768.0877	6/16/2007	20	120	15.1	13.6	18.7	0.8
Western Undeveloped Area	58W	548750.1096	449084.1807	6/16/2007	20	120	15.6	14.3	17.1	0.5
Western Undeveloped Area	59W	548750.1096	449400.2736	6/16/2007	20	120	20.0	18.7	22.0	0.6
Western Undeveloped Area	60W	548750.1096	449716.3666	6/16/2007	20	120	15.5	14.5	17.1	0.5
Western Undeveloped Area	61W	548750.1096	450032.4596	6/16/2007	20	120	16.6	15.0	20.1	0.7
Western Undeveloped Area	62W	549066.2026	447503.7158	6/13/2007	20	120	14.4	13.0	22.8	0.9
Western Undeveloped Area	63W	549066.2026	447819.8088	6/13/2007	20	120	13.7	12.5	15.2	0.5
Western Undeveloped Area	64W	549066.2026	448135.9018	6/13/2007	20	120	14.0	12.8	15.5	0.5
Western Undeveloped Area	65W	549066.2026	448451.9947	6/13/2007	20	120	14.0	12.8	15.5	0.5
Western Undeveloped Area	66W	549066.2026	448768.0877	6/13/2007	20	120	14.4	12.5	15.6	0.6
Western Undeveloped Area	67W	549066.2026	449084.1807	6/13/2007	20	120	14.8	13.4	16.3	0.6
Western Undeveloped Area	68W	549066.2026	449400.2736	6/13/2007	20	120	15.3	13.8	18.0	0.6
Western Undeveloped Area	69W	549066.2026	449716.3666	6/13/2007	20	120	16.3	14.6	18.1	0.5
Western Undeveloped Area	70W	549066.2026	450032.4596	6/13/2007	20	120	35.7	34.3	37.6	0.6
Western Undeveloped Area	71W	549382.2956	447503.7158	6/13/2007	20	120	14.6	13.3	25.3	1.1
Western Undeveloped Area	72W	549382.2956	447819.8088	6/13/2007	20	120	13.7	12.2	15.4	0.5
Western Undeveloped Area	73W	549382.2956	448135.9018	6/13/2007	20.17	121	13.8	12.5	15.8	0.5
Western Undeveloped Area	74W	549382.2956	448451.9947	6/13/2007	20	120	14.0	12.8	15.6	0.5
Western Undeveloped Area	75W	549382.2956	448768.0877	6/13/2007	20	120	33.3	14.0	35.5	2.7
Western Undeveloped Area	76W	549382.2956	449084.1807	6/13/2007	20	120	51.6	49.6	54.5	0.7
Western Undeveloped Area	77W	549698.3885	447819.8088	6/14/2007	20	120	15.2	14.1	16.5	0.5
Western Undeveloped Area	78W	549698.3885	448135.9018	6/14/2007	20	120	13.8	12.6	15.6	0.5
Western Undeveloped Area	79W	549698.3885	448451.9947	6/14/2007	20	120	14.0	12.7	16.3	0.5
Western Undeveloped Area	80W	549698.3885	448768.0877	6/14/2007	20	120	29.4	27.7	31.5	0.6
Western Undeveloped Area	81W	549698.3885	449084.1807	6/14/2007	20	120	53.0	51.2	55.5	0.8
Western Undeveloped Area	82W	550014.4815	448135.9018	6/14/2007	20	120	15.5	14.3	17.0	0.5
Western Undeveloped Area	83W	550014.4815	448451.9947	6/14/2007	20	120	14.4	13.0	16.1	0.5
Western Undeveloped Area	84W	550014.4815	448768.0877	6/13/2007	18.2	109	15.5	13.8	17.1	0.6
Western Undeveloped Area	85W	550014.4815	449084.1807	6/13/2007	20	120	51.4	49.1	53.3	0.7
Western Undeveloped Area	86W	550330.5745	448135.9018	6/14/2007	20	120	14.1	12.7	17.3	0.8

TABLE 4-46

PIC MEASUREMENTS
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho

Area	Field Location ID	Easting	Northing	Date	Measurement Time (minutes)	# of Points	Mean PIC Exposure (uR/hr)	Minimum PIC Exposure (uR/hr)	Maximum PIC Exposure (uR/hr)	Std Dev PIC Exposure (uR/hr)
Western Undeveloped Area	87W	550330.5745	448451.9947	6/13/2007	20	120	15.1	14.1	20.9	0.8
Western Undeveloped Area	88W	550330.5745	448768.0877	6/13/2007	20	120	27.0	13.3	29.9	1.4
Western Undeveloped Area	89W	550646.6674	448135.9018	6/14/2007	20	120	14.2	11.3	17.0	0.7
Western Undeveloped Area	90W	550646.6674	448451.9947	6/14/2007	20	120	14.6	13.3	16.1	0.6
Western Undeveloped Area	91W	550962.7604	448135.9018	6/14/2007	20	120	14.5	12.7	22.3	1.2
Western Undeveloped Area	92W	550962.7604	448451.9947	6/14/2007	20	120	14.6	13.3	16.1	0.5
Western Undeveloped Area	93W	551278.8534	448135.9018	6/14/2007	20	120	14.2	12.8	17.8	0.8
Western Undeveloped Area	94W	551278.8534	448451.9947	6/14/2007	20	120	14.4	13.4	16.3	0.6
Western Undeveloped Area	95W	551278.8534	448768.0877	6/14/2007	20	120	14.9	13.6	16.1	0.5
Western Undeveloped Area	96W	551594.9464	448451.9947	6/14/2007	20	120	14.4	13.0	16.3	0.7
Western Undeveloped Area	97W	551594.9464	448768.0877	6/14/2007	20	120	14.8	13.4	16.3	0.6
Western Undeveloped Area	98W	551594.9464	449084.1807	6/14/2007	20	120	15.6	13.8	18.6	0.6
Western Undeveloped Area	99W	551911.0393	448768.0877	6/14/2007	20	120	16.8	15.6	19.8	0.7
Western Undeveloped Area	100W	551911.0393	449084.1807	6/14/2007	20	120	41.2	39.5	44.9	0.8
Subsurface Slag	Slag TP001	555381.3730	451028.2610	7/25/2007	20	120	96.2	93.6	98.8	1.0
Subsurface Slag	Slag TP001 Dup	555381.3730	451028.2610	7/25/2007	20	120	95.6	93.8	99.0	0.9
Subsurface Slag	Slag TP002	555364.1090	450179.6580	7/25/2007	20	120	96.3	94.3	99.6	0.9
Subsurface Slag	Slag TP003	554811.0130	449537.4750	7/26/2007	20	120	87.2	85.0	90.2	1.0
Subsurface Slag	Slag TP004	556979.3980	451201.2980	7/26/2007	20	120	80.6	78.6	84.1	0.8
Subsurface Slag	Slag TP005	555600.9960	451139.4920	7/25/2007	20	120	92.8	90.6	94.9	0.9
Subsurface Ore	Ore TP001	556722.1840	452628.8600	7/26/2007	20	120	89.1	86.8	91.0	0.8
Subsurface Ore	Ore TP001 Dup	556722.1840	452628.8600	7/26/2007	20	120	89.0	86.1	92.2	0.9
Subsurface Ore	Ore TP002	556746.4690	452475.4170	7/26/2007	20	120	70.5	68.7	73.9	0.8
Subsurface Ore	Ore TP003	556940.0090	452637.3820	7/26/2007	20	120	88.0	85.8	90.1	0.8
Subsurface Ore	Ore TP004	556901.1140	452491.4880	7/26/2007	20	120	80.6	78.6	84.1	0.8
Subsurface Ore	Ore TP005	557062.1170	452496.3220	7/26/2007	20	120	86.4	84.5	89.1	0.8

Notes:
Coordinates in State Plane, Idaho East, NAD 83, feet

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PCDT ROADWAY INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 4)

				Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury	Molybdenum
			Analyte																
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg
			Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16	2.15
			Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340	5,670
			Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464	2,750
			Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030	35,800
			SSL Protective of Groundwater[d]	5	7.7[b]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2	81
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**																
PCDTREF-SIA1-SB001	PCDTREF-SIA1-SB001 (0-0	09/27/07	0 - 0.5	0.29 T,UB	**0.25 T,J**	**220 B**	**2.1**	**78 B**	**2.6 J,B**	**210 J,B**	**1.3 J**	**12 J**	**77**	**0.74 T,B**	**11.4 ± 2.8**	**30 B**	**140 J,B**	0.0027 T,UB	**0.95 T,J**
PCDTREF-SIA1-SB002	PCDTREF-SIA1-SB002 (0-0	09/27/07	0 - 0.5	0.33 T,UB	**0.34 T,J**	**200 B**	**1.9**	**91 B**	**3.3 J,B**	**210 J,B**	**2 J**	**14 J**	**59**	**0.81 T,B**	**9.6 ± 2.3**	**33 B**	**100 J,B**	0.0067 T,UB	**1.3 J**
PCDTREF-SIA1-SB003	PCDTREF-SIA1-SB003 (0-0	09/27/07	0 - 0.5	0.36 T,UB,J-	**0.21 T,J-**	**210 B**	**2.1**	**81 B**	**1.8 J,B**	**230 J,B**	**1.3 J-**	**15 J-**	**97 J-**	**0.58 T,B**	**10.1 ± 2.4**	**31 B**	**110 J,B**	0.0044 T,UB	**1.2 J-**
PCDTREF-SIA1-SB004	PCDTREF-SIA1-SB004 (0-0	09/27/07	0 - 0.5	0.4 T,UB	**0.16 T,J**	**200 B**	**2.1**	**85 B**	**2.6 J,B**	**220 J,B**	**1.3 J**	**14 J**	**79**	**0.79 T,B**	**9.5 ± 2.3**	**31 B**	**91 J,B**	0.0056 T,UB	**1.1 J**
PCDTREF-SIA1-SB005	PCDTREF-SIA1-SB005 (0-0	09/27/07	0 - 0.5	0.34 T,UB	**0.26 T,J**	**200 B**	**2.1**	**88 B**	**1.9 J,B**	**210 J,B**	**1.2 J**	**13 J**	**86**	**0.55 T,B**	**9.2 ± 2.2**	**31 B**	**99 J,B**	0.0053 T,UB	**1 J,B**
PCDTREF-SIA1-SB006	PCDTREF-SIA1-SB006 (0-0	09/27/07	0 - 0.5	0.42 T,UB	**0.35 T,J**	**200 B**	**1.9**	**90 B**	**5.9 J,B**	**230 J,B**	**1.3 J**	**17 J**	**79**	**1.8 B**	**10.8 ± 2.6**	**32 B**	**130 J,B**	0.0059 T,UB	**1.5 J,B**
PCDTREF-SIA1-SB007	PCDTREF-SIA1-SB007 (0-0	09/27/07	0 - 0.5	0.4 T,UB	**0.4 T,J**	**230 B**	**2.1**	**83 B**	**7.6 J,B**	**200 J,B**	**1.2 J**	**11 J**	**76**	**1.7 B**	**11.6 ± 2.8**	**31 B**	**160 J,B**	0.0032 T,UB	**1.4 J,B**
PCDTREF-SIA1-SB008	PCDTREF-SIA1-SB008 (0-0	09/27/07	0 - 0.5	0.39 T,UB	**0.28 T,J**	**220 B**	**2**	**80 B**	**8.8 J,B**	**190 J,B**	**1.1 J**	**10 J**	**86**	**2 B**	**11.8 ± 2.9**	**29 B**	**160 J,B**	**0.0074 T,B**	**0.7 T,J,B**
PCDTREF-SIA1-SB009	PCDTREF-SIA1-SB009 (0-0	09/27/07	0 - 0.5	0.28 T,UB	**0.31 T,J**	**200 B**	**2**	**97 B**	**3.6 J,B**	**200 J,B**	**1.1 J**	**12 J**	**83**	**0.9 T,B**	**10.4 ± 2.5**	**29 B**	**120 J,B**	0.0049 T,UB	**0.98 T,J,B**
PCDTREF-SIA1-SB010	PCDTREF-SIA1-SB010 (0-0	09/27/07	0 - 0.5	0.24 T,UB	**0.33 T,J**	**190 B**	**1.9**	**87 B**	**2.8 J,B**	**170 J,B**	**1.1 J**	**9.6 J**	**63**	**1.4 B**	**9.7 ± 2.3**	**29 B**	**120 J,B**	0.0059 T,UB	**0.58 T,J,B**
PCDTREF-SIA1-SB010 CL	PCDTREF-SIA1-SB210 (0-0	09/27/07	0 - 0.5	0.27 T,UB	**0.35 T,J**	**210 B**	**2**	**100 B**	**4.5 J,B**	**190 J,B**	**1.1 J**	**11 J**	**71**	**1.3 B**	**11 ± 2.7**	**29 B**	**130 J,B**	**0.008 T,B**	**0.66 T,J,B**
PCDT-SIA1-SB001	PCDT-SIA1-SB001 (0-0.5)	09/27/07	0 - 0.5	**1.3 B**	**0.78 T,J**	**200 B**	**1.9**	**110 B**	**28 J,B**	**360 J,B**	**1.8 J**	**29 J**	**91**	**6.9 B**	**14.9 ± 3.6**	**37 B**	**150 J,B**	**0.0086 T,B**	**4 J,B**
PCDT-SIA1-SB002	PCDT-SIA1-SB002 (0-0.5)	09/27/07	0 - 0.5	0.6 T,UB	**0.41 T,J**	**220 B**	**2.2**	**84 B**	**11 J,B**	**230 J,B**	**1.1 J**	**16 J**	**46**	**2.7 B**	**13.3 ± 3.2**	**28 B**	**150 J,B**	0.0046 T,UB	**1.7 J,B**
PCDT-SIA1-SB003	PCDT-SIA1-SB003 (0-0.5)	09/27/07	0 - 0.5	**1.9 B**	**0.52 T,J**	**180 B**	**1.8**	**84 B**	**7.5 J,B**	**510 J,B**	**2.3 J**	**70 J**	**64**	**2 B**	**10.5 ± 2.5**	**30 B**	**140 J,B**	**0.0065 T,B**	**6.2 J,B**
PCDT-SIA1-SB004	PCDT-SIA1-SB004 (0-0.5)	09/27/07	0 - 0.5	0.57 T,UB	**0.35 T,J**	**210 B**	**1.9**	**80 B**	**9.9 J,B**	**270 J,B**	**1.5 J**	**20 J**	**45**	**3.3 B**	**12 ± 2.9**	**30 B**	**150 J,B**	0.0051 T,UB	**2.3 J,B**
PCDT-SIA1-SB005	PCDT-SIA1-SB005 (0-0.5)	09/27/07	0 - 0.5	**0.98 T,B**	**0.66 T,J**	**190 B**	**1.7**	**76 B**	**13 J,B**	**310 J,B**	**2.1 J**	**34 J**	**66**	**4 B**	**11.1 ± 2.7**	**30 B**	**140 J,B**	**0.015 T,B**	**4.3 J,B**
PCDT-SIA1-SB006	PCDT-SIA1-SB006 (0-0.5)	09/27/07	0 - 0.5	0.59 T,UB	**0.4 T,J**	**200 B**	**1.8**	**78 B**	**8.4 J,B**	**290 J,B**	**1.5 J**	**25 J**	**56**	**2.3 B**	**10.6 ± 2.6**	**30 B**	**140 J,B**	0.0044 T,UB	**2.5 J,B**
PCDT-SIA1-SB007	PCDT-SIA1-SB007 (0-0.5)	09/27/07	0 - 0.5	**0.85 T,B**	**0.53 T,J**	**210 B**	**1.9**	**110 B**	**12 J,B**	**320 J,B**	**1.8 J**	**30 J**	**83**	**3.8 B**	**11.9 ± 2.9**	**38 B**	**160 J,B**	0.0046 T,UB	**3.5 J,B**
PCDT-SIA1-SB008	PCDT-SIA1-SB008 (0-0.5)	09/27/07	0 - 0.5	**1 B**	**0.77 T,J**	**210 B**	**1.8**	**92 B**	**33 J,B**	**270 J,B**	**1.7 J**	**25 J**	**73**	**7.6 B**	**14.4 ± 3.5**	**39 B**	**190 J,B**	**0.0084 T,B**	**2.7 J,B**
PCDT-SIA1-SB009	PCDT-SIA1-SB009 (0-0.5)	09/27/07	0 - 0.5	**1 B**	**1.3 J**	**200 B**	**1.6**	**100 B**	**22 J,B**	**270 J,B**	**2.4 J**	**26 J**	**74**	**9.4 B**	**11.1 ± 2.7**	**40 B**	**190 J,B**	**0.011 T,B**	**3.4 J,B**
PCDT-SIA1-SB010	PCDT-SIA1-SB010 (0-0.5)	09/27/07	0 - 0.5	**1.2 B**	**1.5 J**	**190 B**	**1.5**	**91 B**	**44 J,B**	**260 J,B**	**2.4 J**	**26 J**	**97**	**14 B**	**15.4 ± 3.7**	**34 B**	**190 J,B**	**0.016 T,B**	**3.3 J,B**
PCDT-SIA1-SB010 CL	PCDT-SIA1-SB210 (0-0.5)	09/27/07	0 - 0.5	**1.2 B**	**1.4 J**	**180 B**	**1.5**	**110 B**	**28 J,B**	**290 J,B**	**2.7 J**	**32 J**	**88**	**8.9 B**	**11.2 ± 2.7**	**40 B**	**160 J,B**	**0.018 T,B**	**4.1 J,B**

mg/kg milligrams per kilogram.
pCi/g picocuries per gram
ft feet
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to a soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a Background from EMF ROD (EPA/541/R-98/034), Table 11
b Default to background because the Site Worker SSL is less than background
c Default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f Default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-47

PCDT ROADWAY INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 4)

Analyte	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Fluoride	Lead	Lead-210	Lithium	Manganese	Mercury	Molybdenum
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg
Background[a]	2.2	7.7	188	1	12.8	1.9	27.5	7.6	12.6	600	29.1	3.03	16.1	482	0.16	2.15
Commercial/Industrial Worker SSL	454	7.7[b]	61,700	645	223,000	860	1,000,000[c]	553	42,000	68,100	800[e]	3.03[b]	22,700	23,500	340	5,670
Construction Worker SSL	104	14.6	8,360	61	5,210	81.3	551,000	52.2	22,000	33,000	800[e]	7.44	11,900	77,100	464	2,750
Utility Worker SSL	1,360	173	109,000	792	67,800	1,060	1,000,000[c]	679	286,000	430,000	800[e]	96.7	155,000	1,000,000	6,030	35,800
SSL Protective of Groundwater[d]	5	7.7[b]	1,600	63	450	8	38	630	9,400	12,000	800[e]	3.03[f]	4,200	482[f]	2	81

J- Data are estimated, potentially biased low, due to associated quality control data.

TABLE 4-47

PCDT ROADWAY INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 4)

					Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
				Analyte											
				Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
				Background[a]	15.5	3.58	20.5	3.88	1.36	1.9	0.27	NA	3.88	45.4	52.8
				Commercial/Industrial Worker SSL	6,450	269	20.5[b]	3.88[b]	5,670	5,670	77.2	3,400	3.88[b]	7,950	340,000
				Construction Worker SSL	404	43.3	20.5[b]	3.88[b]	2,750	2,750	374	491	21	3,500	165,000
				Utility Worker SSL	5,250	563	136	12	35,800	35,800	4,870	6,390	267	45,500	1,000,000[c]
				SSL Protective of Groundwater[d]	130	3.58[g]	20.5[g]	3.88[f]	5	34	0.7	900	3.88[f]	6,000	12,000
Location Identification	Field Sample Identification	Date Collected	Depth (ft)												
PCDTREF-SIA1-SB001	PCDTREF-SIA1-SB001 (0-0	09/27/07	0 - 0.5		12 J	13.1 ± 2.1 B	4.7 ± 1.8	26.8 ± 4.8	6.1 J	1.3 J	0.12 T	80 B	32.7 ± 5.5	190 J,B	35 J,B
PCDTREF-SIA1-SB002	PCDTREF-SIA1-SB002 (0-0	09/27/07	0 - 0.5		15 J	10.4 ± 1.7 B	5.4 ± 2.3	18.2 ± 3.3	8 J	1.2 J	0.12 T	72 B	34.8 ± 6 J-	200 J,B	37 J,B
PCDTREF-SIA1-SB003	PCDTREF-SIA1-SB003 (0-0	09/27/07	0 - 0.5		14 J-	10.5 ± 1.7 B	6.8 ± 2	21.6 ± 3.9	8.7 J-	1.4 J-	0.076 T	90 B	37.9 ± 6.6	220 J,B	35 J-,B
PCDTREF-SIA1-SB004	PCDTREF-SIA1-SB004 (0-0	09/27/07	0 - 0.5		14 J	11.2 ± 1.9 B	7.4 ± 2.7	25.1 ± 4.5	9.2 J	1.5 J	0.13 T	91 B	36.7 ± 6.2	220 J,B	73 J,B
PCDTREF-SIA1-SB005	PCDTREF-SIA1-SB005 (0-0	09/27/07	0 - 0.5		13 J	11.5 ± 1.9 B	3.8 ± 2.2	28.9 ± 5.2	8.6 J	1.5 J	0.062 T	87	32.5 ± 5.5	200 J,B	34 J,B
PCDTREF-SIA1-SB006	PCDTREF-SIA1-SB006 (0-0	09/27/07	0 - 0.5		16 J	13.1 ± 2.1 B	7 ± 3.3	20.3 ± 3.7	6.2 J	1.9 J	0.12 T	73	29.8 ± 5.1	220 J,B	67 J,B
PCDTREF-SIA1-SB007	PCDTREF-SIA1-SB007 (0-0	09/27/07	0 - 0.5		10 J	14.8 ± 2.3 B	6.9 ± 3.2	15.3 ± 2.8	5.9 J	1.6 J	0.13 T	80	30.5 ± 5.2	190 J,B	76 J,B
PCDTREF-SIA1-SB008	PCDTREF-SIA1-SB008 (0-0	09/27/07	0 - 0.5		9.7 J	14.1 ± 2.2 B	6.7 ± 3.5	28.5 ± 5.1	5 J	1.7 J	0.13 T	76	32.5 ± 5.5	180 J,B	83 J,B
PCDTREF-SIA1-SB009	PCDTREF-SIA1-SB009 (0-0	09/27/07	0 - 0.5		12 J	12.4 ± 2 B	5.4 ± 2.9	14.2 ± 2.6	6.8 J	1.3 J	0.09 T	78	35 ± 5.9	200 J,B	45 J,B
PCDTREF-SIA1-SB010	PCDTREF-SIA1-SB010 (0-0	09/27/07	0 - 0.5		7.9 J	7.7 ± 1.6 B	6.9 ± 3.1	26.7 ± 4.8	6.2 J	1.1 J	0.097 T	70	31.4 ± 5.3	160 J,B	36 J,B
PCDTREF-SIA1-SB010 CL	PCDTREF-SIA1-SB210 (0-0	09/27/07	0 - 0.5		9.6 J	12.3 ± 2 B	7.8 ± 2.7	29.3 ± 5.3	6 J	1.4 J	0.13 T	75	33.3 ± 5.6	170 J,B	58 J,B
PCDT-SIA1-SB001	PCDT-SIA1-SB001 (0-0.5)	09/27/07	0 - 0.5		40 J	14.9 ± 2.6 B	6.7 ± 3.1	16.8 ± 3	3.2 J	4 J	0.43 T	65	25 ± 4.2	380 J,B	270 J,B
PCDT-SIA1-SB002	PCDT-SIA1-SB002 (0-0.5)	09/27/07	0 - 0.5		16 J	16.4 ± 2.6 B	5.1 ± 3	22.5 ± 4	3.2 J	3.4 J	0.17 T	72	25.8 ± 4.3	220 J,B	100 J,B
PCDT-SIA1-SB003	PCDT-SIA1-SB003 (0-0.5)	09/27/07	0 - 0.5		65 J	11.9 ± 1.9 B	5.4 ± 2.8	18.5 ± 3.3	5.3 J	5.2 J	0.12 T	66	27.7 ± 4.7	580 J,B	77 J,B
PCDT-SIA1-SB004	PCDT-SIA1-SB004 (0-0.5)	09/27/07	0 - 0.5		23 J	15.6 ± 2.5 B	6.8 ± 3.1	15.7 ± 2.8	3.3 J	2.5 J	0.16 T	70	26.5 ± 4.5	260 J,B	95 J,B
PCDT-SIA1-SB005	PCDT-SIA1-SB005 (0-0.5)	09/27/07	0 - 0.5		37 J	13.6 ± 2.2 B	8 ± 2.5	17.5 ± 3.2	3.4 J	3.7 J	0.19 T	56	24.5 ± 4.2	340 J,B	130 J,B
PCDT-SIA1-SB006	PCDT-SIA1-SB006 (0-0.5)	09/27/07	0 - 0.5		27 J	12.9 ± 2.1 B	9.5 ± 2.5	15.1 ± 2.7	3.8 J	3 J	0.13 T	64	26.4 ± 4.5	300 J,B	85 J,B
PCDT-SIA1-SB007	PCDT-SIA1-SB007 (0-0.5)	09/27/07	0 - 0.5		36 J	15 ± 2.3 B	7.3 ± 2.5	20.4 ± 3.7	3.8 J	3.3 J	0.21 T	69	27.5 ± 4.6	340 J,B	120 J,B
PCDT-SIA1-SB008	PCDT-SIA1-SB008 (0-0.5)	09/27/07	0 - 0.5		29 J	14.6 ± 2.5 B	7.9 ± 2.4	23 ± 4.2	3.8 J	3.8 J	0.48 T	64	27.5 ± 4.6	270 J,B	330 J,B
PCDT-SIA1-SB009	PCDT-SIA1-SB009 (0-0.5)	09/27/07	0 - 0.5		33 J	10 ± 1.8 B	8 ± 2.3	17.6 ± 3.2 J-	3.7 J	3.4 J	0.43 T	49	21.4 ± 3.7	270 J,B	270 J,B
PCDT-SIA1-SB010	PCDT-SIA1-SB010 (0-0.5)	09/27/07	0 - 0.5		33 J	15.9 ± 2.6 B	10.1 ± 2.3	9.8 ± 1.8	3.4 J	6.6 J	0.83 T	48	20.2 ± 3.5	260 J,B	620 J,B
PCDT-SIA1-SB010 CL	PCDT-SIA1-SB210 (0-0.5)	09/27/07	0 - 0.5		41 J	10 ± 1.8 B	5.8 ± 2.7	3.73 ± 0.71	4 J	4.6 J	0.52 T	50	23.3 ± 3.9	310 J,B	400 J,B

mg/kg milligrams per kilogram.
pCi/g picocuries per gram
ft feet
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to a soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.
CL Colocated sample for blind replicate analysis

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
e SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)
f default to background because the SSL protective of groundwater is less than background
g Default to background because insufficient data exist to derive an SSL protective of groundwater for this constituent.

TABLE 4-47

PCDT ROADWAY INVESTIGATION AREA
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 4)

Analyte	Nickel	Polonium-210	Potassium-40	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
Background[a]	15.5	3.58	20.5	3.88	1.36	1.9	0.27	NA	3.88	45.4	52.8
Commercial/Industrial Worker SSL	6,450	269	20.5[b]	3.88[b]	5,670	5,670	77.2	3,400	3.88[b]	7,950	340,000
Construction Worker SSL	404	43.3	20.5[b]	3.88[b]	2,750	2,750	374	491	21	3,500	165,000
Utility Worker SSL	5,250	563	136	12	35,800	35,800	4,870	6,390	267	45,500	1,000,000[c]
SSL Protective of Groundwater[d]	130	3.58[g]	20.5[g]	3.88[f]	5	34	0.7	900	3.88[f]	6,000	12,000

J- Data are estimated, potentially biased low, due to associated quality control data.

TABLE 4-48

PCDT ROADWAY INVESTIGATION AREAS STATISTICAL SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

	Units	Ref Area Normal?	Site Normal?	Variances Equal?	t-test Performed	t-test Result	WRS Result	BTV	BTV Method	Site Max	Site Max> BTV?	Overall Result
Antimony	NA	No	Yes	NA	None	NA	NA	NA	NA	NA		
Arsenic	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	0.46	Normal 95/90 UTL	1.45	yes	>BG
Barium	mg/kg	No	Yes	NA	None	NA	<=BG	235	Normal 95/90 UTL	220	no	<=BG
Beryllium	mg/kg	No	Yes	NA	None	NA	<=BG	2.1	Non-Parametric 95/90 UTL	2.2	yes	>BG
Boron	mg/kg	Yes	Yes	No	Satterthwaite	<=BG	NA	101	Normal 95/90 UTL	110	yes	>BG
Cadmium	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	9.9	Normal 95/90 UTL	36	yes	>BG
Chromium, Total	mg/kg	Yes	No	NA	None	NA	>BG	246	Normal 95/90 UTL	510	yes	>BG
Cobalt	mg/kg	No	Yes	NA	None	NA	>BG	2.0	Non-Parametric 95/90 UTL	2.55	yes	>BG
Copper	mg/kg	Yes	No	NA	None	NA	>BG	18	Normal 95/90 UTL	70	yes	>BG
Fluoride	mg/kg	Yes	Yes	Yes	Pooled	<=BG	NA	104	Normal 95/90 UTL	92.5	no	<=BG
Lead	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	2.4	Normal 95/90 UTL	11.45	yes	>BG
Lead-210	pCi/g	Yes	Yes	Yes	Pooled	>BG	NA	12.6	Normal 95/90 UTL	14.9	yes	>BG
Lithium	mg/kg	Yes	No	NA	None	NA	<=BG	34	Normal 95/90 UTL	40	yes	>BG
Manganese	mg/kg	No	No	NA	None	NA	>BG	181	Normal 95/90 UTL	190	yes	>BG
Mercury	mg/kg	No	Yes	NA	None	NA	NA	NA	NA	NA		
Molybdenum	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	1.7	Normal 95/90 UTL	6.2	yes	>BG
Nickel	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	18	Normal 95/90 UTL	65	yes	>BG
Polonium-210	pCi/g	Yes	Yes	Yes	Pooled	>BG	NA	16	Normal 95/90 UTL	16.4	yes	>BG
Potassium-40	pCi/g	Yes	Yes	Yes	Pooled	>BG	NA	9.1	Normal 95/90 UTL	9.5	yes	>BG
Radium-226	pCi/g	Yes	Yes	Yes	Pooled	<=BG	NA	36	Normal 95/90 UTL	23	no	<=BG
Selenium	mg/kg	Yes	No	NA	None	NA	<=BG	10	Normal 95/90 UTL	5.3	no	<=BG
Silver	mg/kg	Yes	Yes	No	Satterthwaite	>BG	NA	2.0	Normal 95/90 UTL	5.6	yes	>BG
Thallium	mg/kg	No	Yes	NA	None	NA	>BG	0.13	Non-Parametric 95/90 UTL	0.675	yes	>BG
Uranium	mg/kg	Yes	Yes	Yes	Pooled	<=BG	NA	97	Normal 95/90 UTL	72	no	<=BG
Uranium-238	pCi/g	Yes	Yes	Yes	Pooled	<=BG	NA	40	Normal 95/90 UTL	27.7	no	<=BG
Vanadium	mg/kg	Yes	No	NA	None	NA	>BG	242	Normal 95/90 UTL	580	yes	>BG
Zinc	mg/kg	Yes	No	NA	None	NA	>BG	91	Normal 95/90 UTL	510	yes	>BG

WRS	Wilcoxon Rank Sum
<=BG	less than or equal to the background value as listed in Table 1-5
>BG	greater than the background value as listed in Table 1-5
BTV	background threshold level
UTL	upper tolerance limit

TABLE 4-49

PRECIPITATOR DUST ROADWAY INVESTIGATION AREAS
SUMMARY TABLE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

				Analyte	**Lead-210**
				Units	**pCi/g**
				Background[a]	**3.03**
				Commercial/Industrial Worker SSL	**3.03[c]**
				Construction Worker SSL	**7.44**
				Utility Worker SSL	**96.7**
				SSL Protective of Groundwater[b]	**3.03[c]**
Location Identification	**Field Sample Identification**	**Date Collected**	**Depth (ft)**		
PRECIP1-SIA1-SB001	PRECIP1-SIA1-SB001 (0-0.5)	10/05/07	0 - 0.5		**5 ± 1.2**
PRECIP1-SIA1-SB002	PRECIP1-SIA1-SB002 (0-0.5)	10/05/07	0 - 0.5		**13.3 ± 3.2**
PRECIP1-SIA1-SB003	PRECIP1-SIA1-SB003 (0-0.5)	10/05/07	0 - 0.5		**16.9 ± 4.1**
PRECIP1-SIA1-SB004	PRECIP1-SIA1-SB004 (0-0.5)	10/05/07	0 - 0.5		**5.1 ± 1.2**
PRECIP1-SIA1-SB005	PRECIP1-SIA1-SB005 (0-0.5)	10/05/07	0 - 0.5		**7.3 ± 1.8**
PRECIP1-SIA1-SB006	PRECIP1-SIA1-SB006 (0-0.5)	10/05/07	0 - 0.5		**11.9 ± 2.9**
PRECIP1-SIA1-SB007	PRECIP1-SIA1-SB007 (0-0.5)	10/05/07	0 - 0.5		**15 ± 3.6**
PRECIP1-SIA1-SB008	PRECIP1-SIA1-SB008 (0-0.5)	10/05/07	0 - 0.5		**8.3 ± 2**
PRECIP1-SIA1-SB009	PRECIP1-SIA1-SB009 (0-0.5)	10/05/07	0 - 0.5		**8.4 ± 2**
PRECIP1-SIA1-SB010	PRECIP1-SIA1-SB010 (0-0.5)	10/05/07	0 - 0.5		**9 ± 2.2**
PRECIP1-SIA1-SB010 CL	PRECIP1-SIA1-SB210 (0-0.5)	10/05/07	0 - 0.5		**7.4 ± 1.8**
PRECIP2-SIA1-SB001	PRECIP2-SIA1-SB001 (0-0.5)	10/04/07	0 - 0.5		**15.3 ± 3.7**
PRECIP2-SIA1-SB002	PRECIP2-SIA1-SB002 (0-0.5)	10/04/07	0 - 0.5		**14.5 ± 3.5**
PRECIP2-SIA1-SB003	PRECIP2-SIA1-SB003 (0-0.5)	10/04/07	0 - 0.5		**15.2 ± 3.7**
PRECIP2-SIA1-SB004	PRECIP2-SIA1-SB004 (0-0.25)	10/04/07	0 - 0.25		**15.6 ± 3.8**
PRECIP2-SIA1-SB005	PRECIP2-SIA1-SB005 (0-0.5)	10/04/07	0 - 0.5		**16.1 ± 3.9**
PRECIP2-SIA1-SB006	PRECIP2-SIA1-SB006 (0-0.5)	10/04/07	0 - 0.5		**14.2 ± 3.4**
PRECIP2-SIA1-SB007	PRECIP2-SIA1-SB007 (0-0.5)	10/04/07	0 - 0.5		**13.6 ± 3.3**
PRECIP2-SIA1-SB008	PRECIP2-SIA1-SB008 (0-0.25)	10/04/07	0 - 0.25		**15.3 ± 3.7**
PRECIP2-SIA1-SB009	PRECIP2-SIA1-SB009 (0-0.5)	10/04/07	0 - 0.5		**15.2 ± 3.7 J-**
PRECIP2-SIA1-SB010	PRECIP2-SIA1-SB010 (0-0.5)	10/04/07	0 - 0.5		**13.9 ± 3.3**
PRECIP2-SIA1-SB010 CL	PRECIP2-SIA1-SB210 (0-0.5)	10/04/07	0 - 0.5		**13 ± 3.1**
PRECIP3-SIA1-SB001	PRECIP3-SIA1-SB001 (0-0.5)	10/04/07	0 - 0.5		**15.8 ± 3.8**
PRECIP3-SIA1-SB002	PRECIP3-SIA1-SB002 (0-0.5)	10/04/07	0 - 0.5		**16.6 ± 4**
PRECIP3-SIA1-SB003	PRECIP3-SIA1-SB003 (0-0.5)	10/04/07	0 - 0.5		**16.7 ± 4**
PRECIP3-SIA1-SB004	PRECIP3-SIA1-SB004 (0-0.5)	10/04/07	0 - 0.5		**16.9 ± 4.1**
PRECIP3-SIA1-SB005	PRECIP3-SIA1-SB005 (0-0.5)	10/04/07	0 - 0.5		**17.5 ± 4.2**
PRECIP3-SIA1-SB006	PRECIP3-SIA1-SB006 (0-0.5)	10/04/07	0 - 0.5		**17.5 ± 4.2**
PRECIP3-SIA1-SB007	PRECIP3-SIA1-SB007 (0-0.5)	10/04/07	0 - 0.5		**17 ± 4.1**
PRECIP3-SIA1-SB008	PRECIP3-SIA1-SB008 (0-0.5)	10/04/07	0 - 0.5		**16.2 ± 3.9**
PRECIP3-SIA1-SB009	PRECIP3-SIA1-SB009 (0-0.5)	10/04/07	0 - 0.5		**17.3 ± 4.2**
PRECIP3-SIA1-SB010	PRECIP3-SIA1-SB010 (0-0.5)	10/04/07	0 - 0.5		**16.7 ± 4**
PRECIP3-SIA1-SB010 CL	PRECIP3-SIA1-SB210 (0-0.5)	10/04/07	0 - 0.5		**16.3 ± 3.9**
PRECIP4-SIA1-SB001	PRECIP4-SIA1-SB001 (0-0.5)	10/04/07	0 - 0.5		**15.6 ± 3.8**
PRECIP4-SIA1-SB002	PRECIP4-SIA1-SB002 (0-0.3)	10/04/07	0 - 0.3		**14.3 ± 3.5**
PRECIP4-SIA1-SB003	PRECIP4-SIA1-SB003 (0-0.3)	10/04/07	0 - 0.3		**13.9 ± 3.4**
PRECIP4-SIA1-SB004	PRECIP4-SIA1-SB004 (0-0.5)	10/04/07	0 - 0.5		**14.1 ± 3.4**
PRECIP4-SIA1-SB005	PRECIP4-SIA1-SB005 (0-0.5)	10/04/07	0 - 0.5		**13.5 ± 3.3**
PRECIP4-SIA1-SB006	PRECIP4-SIA1-SB006 (0-0.5)	10/04/07	0 - 0.5		**14 ± 3.4**
PRECIP4-SIA1-SB007	PRECIP4-SIA1-SB007 (0-0.5)	10/04/07	0 - 0.5		**14.4 ± 3.5**
PRECIP4-SIA1-SB008	PRECIP4-SIA1-SB008 (0-0.5)	10/04/07	0 - 0.5		**13.8 ± 3.3**
PRECIP4-SIA1-SB009	PRECIP4-SIA1-SB009 (0-0.5)	10/04/07	0 - 0.5		**13.5 ± 3.3**
PRECIP4-SIA1-SB010	PRECIP4-SIA1-SB010 (0-0.5)	10/04/07	0 - 0.5		**14.2 ± 3.4**
PRECIP4-SIA1-SB010 CL	PRECIP4-SIA1-SB210 (0-0.5)	10/04/07	0 - 0.5		**13.8 ± 3.3**

TABLE 4-49

PRECIPITATOR DUST ROADWAY INVESTIGATION AREAS
SUMMARY TABLE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

				Analyte	**Lead-210**
				Units	**pCi/g**
				Background[a]	**3.03**
				Commercial/Industrial Worker SSL	**3.03[c]**
				Construction Worker SSL	**7.44**
				Utility Worker SSL	**96.7**
				SSL Protective of Groundwater[b]	**3.03[c]**
PRECIP5-SIA1-SB001	PRECIP5-SIA1-SB001 (0-1)	10/04/07	0 - 1		**11.7 ± 2.8**
PRECIP5-SIA1-SB002	PRECIP5-SIA1-SB002 (0-1.5)	10/04/07	0 - 1.5		**14.3 ± 3.4**
PRECIP5-SIA1-SB003	PRECIP5-SIA1-SB003 (0-1.5)	10/04/07	0 - 1.5		**13.6 ± 3.3**
PRECIP5-SIA1-SB004	PRECIP5-SIA1-SB004 (0-1.5)	10/04/07	0 - 1.5		**14.2 ± 3.4**
PRECIP5-SIA1-SB005	PRECIP5-SIA1-SB005 (0-1)	10/04/07	0 - 1		**18.7 ± 4.5**
PRECIP5-SIA1-SB006	PRECIP5-SIA1-SB006 (0-0.5)	10/04/07	0 - 0.5		**13.8 ± 3.3**
PRECIP5-SIA1-SB007	PRECIP5-SIA1-SB007 (0-0.5)	10/04/07	0 - 0.5		**15.4 ± 3.7**
PRECIP5-SIA1-SB008	PRECIP5-SIA1-SB008 (0-1)	10/04/07	0 - 1		**11.6 ± 2.8**
PRECIP5-SIA1-SB009	PRECIP5-SIA1-SB009 (0-1.5)	10/04/07	0 - 1.5		**11.8 ± 2.8**
PRECIP5-SIA1-SB010	PRECIP5-SIA1-SB010 (0-1)	10/04/07	0 - 1		**13.8 ± 3.3**
PRECIP5-SIA1-SB010 CL	PRECIP5-SIA1-SB210 (0-1)	10/04/07	0 - 1		**14.3 ± 3.5**
PRECIP6-SIA1-SB001	PRECIP6-SIA1-SB001 (0-1.5)	10/04/07	0 - 1.5		**6.1 ± 1.5**
PRECIP6-SIA1-SB002	PRECIP6-SIA1-SB002 (0-2)	10/04/07	0 - 2		**5.9 ± 1.4**
PRECIP6-SIA1-SB003	PRECIP6-SIA1-SB003 (0-2)	10/04/07	0 - 2		**8.6 ± 2.1**
PRECIP6-SIA1-SB004	PRECIP6-SIA1-SB004 (0-1.5)	10/04/07	0 - 1.5		**6.7 ± 1.6**
PRECIP6-SIA1-SB005	PRECIP6-SIA1-SB005 (0-1.5)	10/04/07	0 - 1.5		**11.5 ± 2.8**
PRECIP6-SIA1-SB006	PRECIP6-SIA1-SB006 (0-2)	10/04/07	0 - 2		**6.5 ± 1.6**
PRECIP6-SIA1-SB007	PRECIP6-SIA1-SB007 (0-2)	10/04/07	0 - 2		**7.1 ± 1.7**
PRECIP6-SIA1-SB008	PRECIP6-SIA1-SB008 (0-1.5)	10/04/07	0 - 1.5		**7 ± 1.7**
PRECIP6-SIA1-SB009	PRECIP6-SIA1-SB009 (0-2)	10/04/07	0 - 2		**6.5 ± 1.6**
PRECIP6-SIA1-SB010	PRECIP6-SIA1-SB010 (0-2)	10/04/07	0 - 2		**6.8 ± 1.7**
PRECIP6-SIA1-SB010 CL	PRECIP6-SIA1-SB210 (0-2)	10/04/07	0 - 2		**9.1 ± 2.2**
PRECIP7-SIA1-SB001	PRECIP7-SIA1-SB001 (0-0.25)	10/08/07	0 - 0.25		**13 ± 3.1**
PRECIP7-SIA1-SB002	PRECIP7-SIA1-SB002 (0-0.25)	10/08/07	0 - 0.25		**11.9 ± 2.9**
PRECIP7-SIA1-SB003	PRECIP7-SIA1-SB003 (0-0.25)	10/08/07	0 - 0.25		**13 ± 3.1**
PRECIP7-SIA1-SB004	PRECIP7-SIA1-SB004 (0-0.25)	10/08/07	0 - 0.25		**18.2 ± 4.4**
PRECIP7-SIA1-SB005	PRECIP7-SIA1-SB005 (0-0.25)	10/08/07	0 - 0.25		**17.3 ± 4.2**
PRECIP7-SIA1-SB006	PRECIP7-SIA1-SB006 (0-0.25)	10/08/07	0 - 0.25		**16.7 ± 4**
PRECIP7-SIA1-SB007	PRECIP7-SIA1-SB007 (0-0.25)	10/08/07	0 - 0.25		**17.7 ± 4.3**
PRECIP7-SIA1-SB008	PRECIP7-SIA1-SB008 (0-0.25)	10/08/07	0 - 0.25		**19.8 ± 4.8 J+**
PRECIP7-SIA1-SB009	PRECIP7-SIA1-SB009 (0-0.25)	10/08/07	0 - 0.25		**18.7 ± 4.5**
PRECIP7-SIA1-SB010	PRECIP7-SIA1-SB010 (0-0.25)	10/08/07	0 - 0.25		**18.2 ± 4.4**
PRECIP7-SIA1-SB010 CL	PRECIP7-SIA1-SB210 (0-0.25)	10/08/07	0 - 0.25		**19.8 ± 4.8**

pCi/g picocuries per gram
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to soil screening level (SSL)
J+ Data are estimated, potentially biased high, due to associated quality control data.
J- Data are estimated, potentially biased low, due to associated quality control data.
a Background from EMF ROD (EPA/541/R-98/034), Table 11
b A dilution-attenuation factor (DAF) of 20 is incorporated into the SSLs protective of groundwater
c Default to background because the corresponding SSL is less than background
CL Colocated sample for blind replicate analysis

TABLE 4-50

PRECIPITATOR DUST ROADWAY INVESTIGATION AREAS STATISTICAL SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Sample ID	Normal?	Variances Equal?	t-test Performed	t-test result	WRS Result	Outliers?	BTV	Max> BTV?
PRECIP1	Yes	Yes	Pooled	<=BG	NA	NA	NA	No
PRECIP2	Yes	No	Satterthwaite	<=BG	NA	NA	NA	No
PRECIP3	Yes	No	Satterthwaite	<=BG	NA	NA	NA	No
PRECIP4	No	NA	None	NA	<=BG	NA	NA	No
PRECIP5	Yes	Yes	Pooled	<=BG	NA	NA	NA	No
PRECIP6	No	NA	None	NA	<=BG	NA	NA	No
PRECIP7	Yes	NA	NA	NA	NA	No	23.2	NA

<=BG less than or equal to the reference road segment (PRECIP7)
WRS Wilcoxon Rank Sum
BTV Background Threshold Level

Table 4-51(a)
Underground Piping, Sumps and Structures Summary Table
For RU 1 (See Figure I1 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure or Piping	Probable Residual Constituents	Reference Dwg No.
14	**Drinking Water**	**4-inch**	**Underground**	**5 - 8**	**HDPE**	**In Use - training center**	**N/A**	**Good**	**N/A**	**38177, 40980**
15	Plant Water	12-inch	Underground	8 - 10	Ductile Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
16	Plant Water	8-inch	Underground	8 - 10	Cast Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
18	Natural Gas	2-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	40158, 395528
20	Precipitator Slurry	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids and P4	40158, 396892
21	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids and P4	40158, 396892
40	Fire Main	6-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
41	Fire Main	8-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160, 40291
42	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	**N/A**	**Assumed good**	**Phossy solids, P4 and dirt**	**35745**
43	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	**N/A**	**Assumed good**	**Phossy solids, P4 and dirt**	**Field Locate**
44	Drinking Water	4-inch	Underground	5	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
45	Plant Water	6-inch	Underground	6 - 7	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
46	Plant Water	8-inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40159
47	Furnace Transformer Oil	6-inch	Underground	5	Transite	Abandoned in Place	N/A	Assumed good	Transformer oil	32768, 40159
48	Industrial Wastewater	4-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
49	Industrial Wastewater	6-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
50	Industrial Wastewater	8-inch	Underground	5 - 7	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
51	Industrial Wastewater	12-inch	Underground	5 - 8	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40160
52	Industrial Wastewater	18-inch	Underground	6 - 8	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40160
53	Phossy Water	18-inch	Underground	8 - 10	Carbon Steel	Abandoned in Place	N/A	Unknown	Phossy solids and P4	40159
54	**Storm Drain Line**	**16-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	**N/A**	**Assumed good**	**Phossy solids, P4 and dirt**	**40157**
66	Storm Drain from Kiln Building to slag pit	10-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Assumed good	Phossy solids, P4 and dirt	40159
97	Furnace Transformer Oil	8-inch	Underground	4 - 5	Transite	Abandoned in place	N/A	Assumed good	Transformer oil	32768, 40159
98	Furnace Transformer Oil	4-inch	Underground	4 - 5	Transite	Abandoned in place	N/A	Assumed good	Transformer oil	32768, 40159
99	Steam Condensate Wastewater	4-inch	Underground	3 - 4	Cast Iron	Abandoned in place	N/A	Assumed good	Water	40156
100	Steam Condensate Wastewater	3-inch	Underground	3 - 4	Cast Iron	Abandoned in place	N/A	Assumed good	Water	40156
F26	Pelletizer Building Substation Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6-8 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F27	Nodule Fines Substation Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F28	Screen House Foundations		Below Grade	4	Reinforced Concrete	Abandoned in Place	10-12 inches / heavy steel rebar	good, backfilled to grade with shale	None	Aerial Map Locate
F29	Fce Substation and Lime Storage Fnds		At Grade		Reinforced Concrete	Abandoned in Place	12 inch/ standard steel rebar	Intact at grade	None	Aerial Map Locate
F30	Furnace Building Foundation		Below Grade	4 - 15	Reinforced Concrete	Abandoned in Place	12-36 inches / heavy steel rebar	fair to good, partially backfilled w/ silica	None	Aerial Map Locate
F31	Deaerator Tank Foundation		Below Grade	2 - 3	Reinforced Concrete	Backfilled with silica	10-12 inches / heavy steel rebar	good, backfilled to grade with silica	None	Aerial Map Locate
F32	Boiler House Foundation		Below Grade	2 - 3	Reinforced Concrete	Backfilled with silica	6-8 inches / standard steel rebar	good, backfilled to grade with silica	None	Aerial Map Locate
F33	Phos Dock Foundation		Below Grade	10 - 12	Reinforced Concrete	Backfilled with silica	6-12 inches / std to heavy steel rebar	good, backfilled to grade with silica	None	Aerial Map Locate
F41	Secondary Condenser Area Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6-8 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F75	No. 4 Furnce Operator Office		At Grade		Reinforced Concrete	Abandoned in place	4 inches / standard steel mesh	Intact at grade	None	Aerial Map Locate
S1	Phossy Water Sump	10,000 gal	Underground	6 - 8	Stainless Steel	Abandoned in Place	N/A	Assumed good	None - sump pumped and deconned @ closure	40159
S2	Fce Building Phophorus Storage Sumps	Varies	Below Grade	6 - 8	Reinforced Concrete	Backfilled with silica	N/A	good, backfilled to grade with silica	None - sump lining removed and deconned @ closure	395530
S3	Phos Dock Sumps	Varies	Below Grade	10 - 12	Reinforced Concrete	Backfilled with silica	N/A	good, backfilled to grade with silica	None - sump lining removed and deconned @ closure	399200
S4	Secondary Condenser Area Phos Sump		Below Grade		Stainless Steel	Abandoned in Place	N/A	good, backfilled to grade with silica	None - sump lining removed and deconned @ closure	Field Locate
S8	Transformer Oil Drywell Sumps	8 ft. ID	Below Grade	10 - 12	Reinforced Concrete	Abandoned in place	N/A	Assumed good	Sump pumped at closure	32768, 40156

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(b)
Underground Piping, Sumps, and Structures Summary Table
for RU 2 (See Figure I2 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure or Piping	Probable Residual Constituents	Reference Dwg No.
23.1	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids and P4	40159, 396892
24	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids and P4	34960, 40158, 40159
25.1	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids and P4	40159, 396892
40	Fire Main	6-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
41	Fire Main	8-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160, 40291
44	Drinking Water	4-inch	Underground	5	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
45	Plant Water	6-inch	Underground	6 - 7	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
49	Industrial Wastewater	6-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
50	Industrial Wastewater	8-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
63	Industrial Wastewater	12-inch	Underground	5 - 7	Reinforced Concrete	Abandoned in place	N/A	Assumed good	Industrial wastewater	40159, 40160
66	Storm Drain from Kiln Building to slag pit	10-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Assumed good	Phossy solids, P4 and dirt	40159
69	Phosphorus Recovery Line	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	P4	40159, 40749, 40851
70	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids and P4	40159
79	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids and P4	40159, As-Built Surveys
80	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids and P4	40159, As-Built Surveys
81	Precipitator Slurry	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids and P4	40749, As-Built Surveys
83	Slag Pit Dewatering	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, Precipitator solids and P4	40749, As-Built Surveys
84	Slag Pit Dewatering	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, Precipitator solids and P4	As-Built Surveys
F40	Pelletizer Building Foundation		Below Grade	2 - 4	Reinforced Concrete	Abandoned in Place	6-10 inches / std to heavy steel rebar	Good, backfilled to grade with silica	None	Aerial Map Locate
F57	V3700 (NOSAP) Secondary Containment		Below Grade	2	Reinforced Concrete	Abandoned in place	6 inches / standard wire mesh	Good, backfilled to grade with silica	None, containment deconned at closure	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(c)
Underground Piping, Sumps, and Structures Summary Table
For RU 3 (See Figure I3 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
40	Fire Main	6-Inch	Underground	8	Cast Iron	Abandoned in Place	N/A	Assumed good	Plant Water	40157, 40159, 40160
42	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	N/A	**Assumed good**	**Phossy solids, P4 and dirt**	**35745**
43	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	N/A	**Assumed good**	**Phossy solids, P4 and dirt**	**Field Locate**
54	**Storm Drain Line**	**16-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	N/A	**Assumed good**	**Phossy solids, P4 and dirt**	**40157**
F34	Maintenance Building Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6-8 inches / Std. Steel Reinforcement	Intact at grade	None	Aerial Map Locate
F35	Paint Shop Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6 inches / Std. Steel Reinforcement	Intact at grade	None	Aerial Map Locate
F36	P4 Decon Building Foundations		Below Grade	5	Reinforced Concrete	Abandoned in Place	6-8 inches / Std. Steel Reinforcement	Good, backfilled to grade w/ silica	None, structure deconned at closing	Aerial Map Locate
F37	Sattellite Storage Pad Foundation		At Grade		Reinforced Concrete	Abandoned in Place	6 inches / Std. Steel Reinforcement	Intact at grade	None	Aerial Map Locate
F38	Fire House Foundations		At Grade		Reinforced Concrete	Abandoned in Place	6 inches / Std. Steel Reinforcement	Intact at grade	None	Aerial Map Locate
F39	Propane Tank Foundations		At Grade		Reinforced Concrete	Abandoned in Place	6 inches / Std. Steel Reinforcement	Intact at grade	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. still in use.

Table 4-51(d)
Underground Piping, Sumps, and Structures Summary Table
For RU 4 (See Figure I3 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure or Piping	Probable Residual Constituents	Reference Dwg No.
14	**Drinking Water**	**4-inch**	**Underground**	**5 - 8**	**HDPE**	**In Use - training center**	**N/A**	**Good**	**N/A**	**38177, 40980**
15	Plant Water	12-inch	Underground	8 - 10	Ductile Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
16	Plant Water	8-inch	Underground	8 - 10	Cast Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
87	**Drinking Water**	**1.5-inch**	**Underground**	**4**	**Copper**	**In Use - Training Building**	**N/A**	**Good**	**N/A**	**398366**
88	Natural Gas	1-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	398366
89	**Telephone**		**Underground**	**1**		**In Use - Training Building**	**N/A**	**Good**	**None**	**398366**
90	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	**N/A**	**Assumed good**	**Phossy solids, P4 and dirt**	**40157**
91	**Sanitary Sewer Line**	**4-inch**	**Underground**	**4**	**PVC**	**In Use - Training Building**	**N/A**	**Assumed good**	**Sanitary Sewage**	**398366**
92	**Sanitary Sewer Line**	**8-inch**	**Underground**	**4 - 6**	**Reinforced Concrete**	**In Use - Training Building**	**N/A**	**Assumed good**	**Sanitary Sewage**	**40156**
94	Sanitary Sewer Line	8-inch	Underground	4 - 6	HDPE	Abandoned in place	N/A	Assumed good	Sanitary Sewage	41739, Field Locate
95	Sanitary Sewer Line	8-inch	Underground	4 - 6	Reinforced Concrete	Abandoned in place	N/A	Assumed good	Sanitary Sewage	Field Locate
96	Sanitary Sewer Line	4-inch	Underground	4 - 6	Cast Iron	Abandoned in place	N/A	Assumed good	Sanitary Sewage	41056, Field Locate
99	Steam Condensate Wastewater	4-inch	Underground	3 - 4	Cast Iron	Abandoned in place	N/A	Assumed good	Water	40156
100	Steam Condensate Wastewater	3-inch	Underground	3 - 4	Cast Iron	Abandoned in place	N/A	Assumed good	Water	40156
F76	Phos Office Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F77	Lab and Mining Lab Foundation		Below Grade	8	Reinforced Concrete	Backfilled with Silica and Abandoned	4-6 inches / standard steel rebar	Good, backfilled to grade with silica	None	Aerial Map Locate
F78	Administration Building Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F79	Lunch Room Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F80	Burden and Data Processing Foundation		Below Grade	8	Reinforced Concrete	Backfilled with Silica and Abandoned	4-6 inches / standard steel rebar	Good, backfilled to grade with silica	None	Aerial Map Locate
F81	Security, Change Room & C.U. Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inches / standard steel rebar	Intact at grade	None	Aerial Map Locate
F82	**Traning Building Foundation**		**At Grade**		**Reinforced Concrete**	**In Use - Training Building**	**4 inches / standard wire mesh**	**Intact at grade**	**None**	**Aerial Map Locate**
S7	Sanitary Sewer Septic Tank	5000 gal.	Below Grade	6 - 8	Reinforced Concrete	Abandoned in place	N/A	Intact in place	Sanitary Sewage	40156

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(e)
Underground Piping, Sumps, and Structures Summary Table
For RU 5 (See Figure I3 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
101	Chemical Waste Drain Line	4-inch	Underground	4	Ductile Iron	Abandoned in place	N/A	Assumed good	Quality control lab wastes	41739
S10	Chemical Waste Drain Sump	Unknown	Below Grade	Unknown	Reinforced Concrete	Abandoned in place	Unknown	Assumed good	Quality control lab wastes	41739
Items in **bold** denote piping, structures, etc. that are still in use.										

Table 4-51(f)
Underground Piping, Sumps, and Structures Summary Table
For RU 7 (See Figure I5 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
37	Industrial Wastewater Culvert	48-inch	Underground	2	Reinforced Concrete	Abandoned in Place	Class III Wire Mesh	Assumed good	None	396691, Field Locate
39	Industrial Wastewater Culvert	36-inch	Underground	2	Reinforced Concrete	Abandoned in Place	Class III Wire Mesh	Assumed good	None	35731
F11	Reclaimer Turn-over Pit Foundations		Below Grade	4	Reinforced Concrete	Abandoned in Place	6-inch / standard steel rebar	Good, backfilled to grade with silica	Shale	Aerial Map Locate
F12	Reclaimer Rail Foundations		Below Grade	3	Reinforced Concrete	Abandoned in Place	30-inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F13	Reclaimer Transfer Car Foundations		Below Grade	3	Reinforced Concrete	Abandoned in Place	30-inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F13.1	East Dozer Trap Foundation		Below Grade	6 - 8	Reinforced Concrete	Abandoned in Place	8-10-inch / heavy steel rebar	Intact at grade	Shale	Aerial Map Locate
F14	East Shale Tower Foundation		Below Grade	4	Reinforced Concrete	Abandoned in Place	8-10-inch / heavy steel rebar	Intact at grade	Shale	Aerial Map Locate
F15	Shale Screening and Crushing Foundation		Below Grade	4	Reinforced Concrete	Abandoned in Place	12-16-inch / heavy steel rebar	Intact at grade	Shale	Aerial Map Locate
F16	West Shale Tower Foundation		Below Grade	4	Reinforced Concrete	Abandoned in Place	8-10-inch / heavy steel rebar	Intact at grade	Shale	Aerial Map Locate
F17	Old Rail Car Shale Unloading Hopper		Below Gr, Tunnel	12	Reinforced Concrete	Abandoned in Place	8-10-inch / heavy steel rebar	Intact in place	Shale and stormwater	Aerial Map Locate
F18	Shale Car Dumper Foundation		Below Gr, Tunnel	35	Reinforced Concrete	Not in Use, but Available	12-16-inch / heavy steel rebar	Intact in place	Shale and stormwater	Aerial Map Locate
F19	Shale Transfer Conveyor Tunnel		Below Gr, Tunnel	12	Reinforced Concrete	Not in Use, but Available	18-24-inch / heavy steel rebar	Intact in place	Shale and stormwater	Field Locate
F20	Shale Operator Office Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4-inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F21	C-2/C-5 Conveyor Foundation		Below Grade	8	Reinforced Concrete	Abandoned in Place	12-16-inch / heavy steel rebar	Intact in place	None	Aerial Map Locate
F22	B-327 Conveyor Tunnel		Below Gr, Tunnel	8	Reinforced Concrete	Abandoned in Place	12-16-inch / heavy steel rebar	Intact in place	Shale	Aerial Map Locate
F23	Nodule Fines Storage Dome Foundation		Below Gr, Ring Fdn	5	Reinforced Concrete	Abandoned in Place	8-10-inch / heavy steel rebar	Good, backfilled to grade with shale	Shale	Aerial Map Locate
F24	Rail Car Coke Unloading Hopper		Below Gr, Tunnel	8	Reinforced Concrete	Abandoned in Place	18-24-inch / heavy steel rebar	Intact in place	Coke	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(g)
Underground Piping, Sumps, and Structures Summary Table
For RU 8 (See Figure I5 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
40	Fire Main	6-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
41	Fire Main	8-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160, 40291
44	Drinking Water	4-inch	Underground	5	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
45	Plant Water	6-inch	Underground	6 - 7	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
48	Industrial Wastewater	4-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
49	Industrial Wastewater	6-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
50	Industrial Wastewater	8-inch	Underground	4 -6	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
55	Power for Excess CO Combustor		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
58	Power for No. 1 Calciner		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
59	Power for No. 1 Calciner, Waste Water Tmt.		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
60	Power for No. 1 Calciner		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
61	Power for No. 2 Calciner		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
62	Power for Calciner Control Room		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	40159, 40160
63	Industrial Wastewater	12-inch	Underground	4 - 6	Reinforced Concrete	Abandoned in place	Class III wire mesh	Assumed good	Industrial wastewater	40159, 40160
64	Industrial Wastewater	10-inch	Underground	5 - 7	Carbon Steel	Abandoned in place	N/A	Assumed good	Industrial wastewater	40159, 40160
65	Industrial Wastewater	16-inch	Underground	6 - 8	HDPE	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40160, 303052
66	Storm Drain from Kiln Building to slag pit	10-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Assumed good	Phossy solids, P4 and dirt	40159
67	Natural Gas	6-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Assumed good	None	303248, 40160
68	Calciner Carbon Monoxide (CO) Lines	14-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Unknown	P4	40160, 41478
71	Treated Calciner Wastewater (to ponds)	10-inch	Underground	3 - 5	HDPE	Abandoned in place	N/A	Assumed good	Calciner solids	393172, 41463
72	Return Calciner Wastewater (from ponds)	10-inch	Underground	3 - 5	HDPE	Abandoned in place	N/A	Assumed good	Calciner solids	393172, 41463
F42	Kiln Building Foundation		Below Grade	5	Reinforced Concrete	Abandoned in Place	12-36 inch / heavy steel rebar	good, backfilled to grade with silica	None	Aerial Map Locate
F45	Number 1 Calciner Area Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4-6 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F46	Nodule Fines Foundation		At Grade		Reinforced Concrete	Abandoned in Place	8-10 inch / heavy steel rebar	Intact at grade	Nodule fines	Aerial Map Locate
F48	Number 2 Calciner Area Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4-6 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F49	Calciner Scrubber Foundation		Below Grade	5	Reinforced Concrete	Abandoned in Place	48-60 inch / heavy steel rebar	good, backfilled to grade with silica	None	Aerial Map Locate
F50	East End Electrical Substation		At Grade		Reinforced Concrete	Abandoned in Place	4-6 inch / standard wire mesh	good, backfilled to grade with silica	None	Aerial Map Locate
F54	Calciner Control Room Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4-inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F54.1	Wastewater Treatment Foundation		Below Grade	4	Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	good, backfilled to grade with silica	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(h)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 9 (See Figure I5 in Appendix 5)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
33	Industrial Wastewater - Gravity Drain	15-inch	Underground	8 - 15	Reinforced Concrete	Abandoned in Place	N/A	Assumed good	Industrial Wastewater	36538
34	Industrial Wastewater - Gravity Drain	24-inch	Underground	8 - 12	Reinforced Concrete	Abandoned in Place	N/A	Assumed good	Industrial Wastewater	36538
35	Industrial Wastewater - Pressurized Return	12-inch	Underground	5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial Wastewater	36538
65	Industrial Wastewater	16-inch	Underground	8 - 12	HDPE	Abandoned in Place	N/A	Assumed good	Industrial Wastewater	40160, 303052
F51	Excess CO Combustor Foundation		At Grade		Reinforced Concrete	Abandoned in Place	12-inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F53	Nodule Reclaim Tunnel		Below Grade	6 - 8	Reinforced Concrete	Abandoned in Place	12-inch / heavy steel rebar	good, backfilled to grade with silica	Nodules	Aerial Map Locate
F8	Silica Unloading Foundation		At Grade		Reinforced Concrete	Abandoned in place	10-inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F9	Silica Unloading Transformer Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	4-inch / standard wire mesh	good, backfilled to grade with silica	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(i)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 11 (See Figure I6 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
19	Natural Gas	4-inch	Underground	4	Malleable Iron	Abandoned in place	N/A	Assumed good	None	35751-2, 395528
55	Power for Excess CO Combustor		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160
56	Power for Calciner Scrubber Substation		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160
57	Power for LDR Treatment Plant		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160, As Builts
F7	Furnace Demolition Cleanup Foundation		At Grade		Reinforced Concrete	Abandoned in place	8-10 inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(j)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 12 (See Figure I4 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
14	**Drinking Water**	**4-inch**	**Underground**		**HDPE**	**In Use - training center**	**N/A**	**Good**	**None**	**38177, 40980**
15	Plant Water	12-inch	Underground	8 - 10	Ductile Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
18	Natural Gas	2-inch	Underground	3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	40158, 395528
19	Natural Gas	4-inch	Underground	4	Malleable Iron	Abandoned in place	N/A	Assumed good	None	35751-2, 395528
20	Precipitator Slurry	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40158, 396892
21	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40158, 396892
26	LDR Fire Main - Never Placed in Service	6-inch	Underground	6	Ductile Iron	Abandoned in place	N/A	Assumed good	None	As-Built Surveys
57	Power for LDR Treatment Plant		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160, As Builts
69	Phosphorus Recovery Line	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	P4	40159, 40749, 40851
73	Power from Don Sub to West End Sub		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	36723, As-Built Surveys
76	Power for LDR Control Room and Lab		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	As-Built Surveys
77	Temporary Power for LDR Area		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	As-Built Surveys
78	Precipitator Slurry	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	41740, As-Built Surveys
79	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40159, As-Built Surveys
80	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40159, As-Built Surveys
81	Precipitator Slurry	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40749, As-Built Surveys
82	Oil and Grease Line	?	Underground	4	Carbon Steel	Abandoned in place	N/A	Unknown	Oil and grease	41740
83	Slag Pit Dewatering	6-inch	Underground	2 - 4	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, Precipitator solids, P4	40749, As-Built Surveys
84	Slag Pit Dewatering	6-inch	Underground	2 - 4	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, Precipitator solids, P4	As-Built Surveys
85	LDR Process Lines (3) - Never Put into Service	6&8- inch	Underground	4	Carbon Steel	Abandoned in place	N/A	Assumed good	None	As-Built Surveys
86	LDR Process Lines (3) - Never Put into Service	6&8- inch	Underground	4	Carbon Steel	Abandoned in place	N/A	Assumed good	None	As-Built Surveys
F61	LDR Secondary Containment Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact in place	None	Aerial Map Locate
F62	LDR Process Tank Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	10-12 inch / heavy steel rebar	Intact in place	None	Aerial Map Locate
F63	LDR Process Tank Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	10-12 inch / heavy steel rebar	Intact in place	None	Aerial Map Locate
F64	LDR Process Building Foundation		Below Grade	2	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact in place	None	Aerial Map Locate
F65	LDR Secondary Containment Foundation		Below Grade	2	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact in place	None	Aerial Map Locate
F66	LDR Cooling Tower Foundation		Below Grade	5	Reinforced Concrete	Abandoned in place	60 inch / heavy steel rebar	Intact in place	None	Aerial Map Locate
F67	LDR Recycle Tank Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	10-12 inch / heavy steel rebar	Intact in place	None	Aerial Map Locate
F68	LDR Lab and Control Room Foundation		Below Grade	2	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact in place	None	Aerial Map Locate
F69	LDR Offgas Stack Foundation		Below Grade	5	Reinforced Concrete	Abandoned in place	24 inch / heavy steel reinforcement	Intact in place	None	Aerial Map Locate
F70	LDR Phos Acid Loadout Foundation		Below Grade	2	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact in place	None	Aerial Map Locate
F70.1	LDR Electrical Substation Foundations		At Grade	2	Reinforced Concrete	Abandoned in place	8-10 inch / standard steel rebar	Intact at grade	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(k)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 13 (See Figure I4 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
F6	Pond 8S Recovery Foundations		At Grade		Reinforced Concrete	Abandoned in place	4-6 inches / std wire mesh and steel rebar	Intact at grade	none, deconned during closure	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(l)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 20 (See Figure I6 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
17	Natural Gas	1-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	395528
18	Natural Gas	2-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	40158, 395528
19	Natural Gas	4-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	35751-2, 395528
29	**Drinking Water**	**1-inch**	**Underground**	**4**	**Galvanized Iron**	**In Use - Scale House**	**N/A**	**Assumed good**	**Water**	**395528**
F1	Coke Dryer Settling Pond Foundation		Below Grade	3 - 5	Reinforced Concrete	Abandoned in place	6-8 inch / standard steel rebar	good, backfilled to grade w/ slag	Coke	Aerial Map Locate
F2	Coke Dryer Foundation		Below Grade	2 - 3	Reinforced Concrete	Abandoned in place	6-8 inch / standard steel rebar	good, backfilled to grade w/ slag	Coke	Aerial Map Locate
F2.1	Coke Dryer Unloading Foundation		Below Grade	8	Reinforced Concrete	Abandoned in place	12-16 inch / heavy steel rebar	good, backfilled to grade w/ slag	Coke	Aerial Map Locate
F3	Bannock Shop Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Intact in place	None	Aerial Map Locate
F4	Bannock Scale House Foundations		At Grade		Reinforced Concrete	Abandoned in place	4 inch / standard wire mesh	Intact in place	None	Aerial Map Locate

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(m)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 22b (See Figure I6 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
18	Natural Gas	2-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	40158, 395528
20	Precipitator Slurry	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40158, 396892
21	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40158, 396892
22	Power	2400 V	Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	A&E SK 0047-6
23	Slag Pit Deswatering	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, Phossy solids, P4	Field Locate, As-builts
24	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	34960, 40158, 40159
25	Slag Pit Deswatering	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, Phossy solids, P4	Field Locate, As-builts
27	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	396892
73	Power from Don Sub to West End Sub		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / None	Assumed good	None	36723, As-Built Surveys
F5.1	Pipe Bridge Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	18 inch / heavy steel rebar	Assumed good	None	301748, Aerial Map
F58	Mobile Equipment Shop Foundation		Below Grade	3	Reinforced Concrete	Abandoned in place	6-12 inch / heavy steel rebar or wire mesh	Assumed good	None	Aerial Map Locate
F59	Mobile Equipment Wash Pad		At Grade		Reinforced Concrete	Abandoned in place	12 inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F6	Pond 8S Recovery Foundations		At Grade		Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Intact at grade	None, deconned at closure	Aerial Map Locate
F60	Waste Oil/Non-hazardous Storage Pad		At Grade		Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
S5	Mobile Shop Grease Pit Sump		Below Grade	6	Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Assumed good	None, deconned at closure	41740
8	**Power**	**480 V**	**Underground**	**2 - 3**	**Direct Burial**	**In Use - Pond 15**	**N/A**	**Good**	**N/A**	**Bechtel 160-E-215**
9	**Power**	**480 V**	**Underground**	**2 - 3**	**Direct Burial**	**In Use - Ph IV Ponds**	**N/A**	**Good**	**N/A**	**Bechtel 270-E-215**

Items in **bold** denote piping, structures, etc. that are still in use.

Table 4-51(n)
Underground Piping, Sumps, and Structures Inventory Summary Table
For RU 24 (See Figures 2, 3, 4, 5, 6 in Appendix I)
Supplemental Remedial Investigation
FMC Corporation, Pocatello, Idaho

ID No.	Utility Type	Size	Kind	Approx. Depth Below Grade (feet)	Construction Material	Current Status	Thickness / Reinforcement of Structure	Condition of Structure	Probable Residual Constituents	Reference Dwg No.
10	**Power**	**220 V**	**Underground**	**2 - 3**	**Direct Burial**	**In Use - Pond 9E**	**N/A**	**Good**	**None**	**300642, A&E Locate**
11	**Power**	**480 V**	**Underground**	**3**	**Rigid Conduit**	**In Use - Well No. 3**	**N/A**	**Good**	**None**	**A&E SK 2025-03**
12	**Power - Idaho Power Company**	**12.5 kV**	**Underground**	**3**	**Rigid Conduit**	**In Use - IPCo Xfrmr**	**N/A**	**Good**	**None**	**IPCo Locate**
13	**Drinking Water / Plant Water**	**10-inch**	**Underground**	**8 - 10**	**Cast Iron**	**In Use - Scalehouse and Training Center**	**N/A**	**Good**	**Water**	**40980**
14	**Drinking Water**	**4-inch**	**Underground**	**4 - 5**	**HDPE**	**In Use - training center**	**N/A**	**Good**	**Water**	**38177, 40980**
15	Plant Water	12-inch	Underground	8 - 10	Ductile Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
16	Plant Water	8-inch	Underground	8 - 10	Cast Iron	Not In Use - Valves Closed	N/A	Assumed good	Water	40980
18	Natural Gas	2-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	40158, 395528
19	Natural Gas	4-inch	Underground	2 - 3	Malleable Iron	Abandoned in place	N/A	Assumed good	None	35751-2, 395528
20	Precipitator Slurry	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40158, 396892
21	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40158, 396892
23.1	Phossy Water	6-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40159, 396892
24	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	34960, 40158, 40159
25.1	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40159, 396892
28	**Drinking Water / Plant Water**	**8-inch**	**Underground**	**8 - 10**	**Cast Iron**	**In Use - Scale House**	**N/A**	**Good**	**Water**	**40980, 395528**
30	**Natural Gas Pipeline - El Paso Nat. Gas**	**6-inch**	**Underground**	**4 - 6**	**Carbon Steel**	**In Use - JR Simplot Feed**	**N/A**	**Good**	**None**	**392293, 396584**
31	**Natural Gas Pipeline - El Paso Nat. Gas**	**4-inch**	**Underground**	**4 - 6**	**Carbon Steel**	**In Use - JR Simplot Feed**	**N/A**	**Good**	**None**	**392293, 396584**
33	Industrial Wastewater - Gravity Drain	15-inch	Underground	8 - 15	Reinforced Concrete	Abandoned in Place	N/A	Assumed good	Industrial wastewater	36538
34	Industrial Wastewater - Gravity Drain	24-inch	Underground	8 - 12	Reinforced Concrete	Abandoned in Place	N/A	Assumed good	Industrial wastewater	36538
35	Industrial Wastewater - Pressurized Return	12-inch	Underground	5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	36538
36	Industrial Wastewater Ditch (Now filled in)		At Grade		NA	Backfilled with silica	N/A	N/A	Industrial wastewater	Aerial Map Locate
37	Industrial Wastewater Culvert	48-inch	Underground	2	Reinforced Concrete	Abandoned in Place	N/A	Assumed good	Industrial wastewater	396691, Field Locate
38	Power (to frmr natural gas regulator shack)		Underground	2 - 3	NA	Abandoned in Place	N/A	Unknown	None	Field Locate
41	Fire Main	8-Inch	Underground	8 - 10	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160, 40291
44	Drinking Water	4-inch	Underground	5	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
45	Plant Water	6-inch	Underground	6 - 7	Cast Iron	Abandoned in Place	N/A	Assumed good	Water	40157, 40159, 40160
49	Industrial Wastewater	6-inch	Underground	4 - 5	Carbon Steel	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40157, 40159, 40160
56	Power for Calciner Scrubber Substation		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160
57	Power for LDR Treatment Plant		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	40159, 40160, As Builts
63	Industrial Wastewater	12-inch	Underground	5 - 7	Reinforced Concrete	Abandoned in place	N/A, Class III wire mesh	Assumed good	Industrial wastewater	40159, 40160
65	Industrial Wastewater	16-inch	Underground	6 - 8	HDPE	Abandoned in Place	N/A	Assumed good	Industrial wastewater	40160, 303052
67	Natural Gas	6-inch	Underground	3 - 5	Carbon Steel	Abandoned in place	N/A	Assumed good	None	303248, 40160
69	Phosphorus Recovery Line	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	P4	40159, 40749, 40851
70	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40159
71	Treated Calciner Wastewater (to ponds)	10-inch	Underground	4 - 5	HDPE	Abandoned in place	N/A	Assumed good	Calciner solids	393172, 41463
72	Return Calciner Wastewater (from ponds)	10-inch	Underground	4 - 5	HDPE	Abandoned in place	N/A	Assumed good	Calciner solids	393172, 41463
73	Power from Don Sub to West End Sub		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	36723, As-Built Surveys
74	Power for West End and Admin Buildings		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	36723, As-Built Surveys
74.1	Power for Phos Storage and Loadout		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	41739, As-Built Surveys
74.2	Power for Well No. 4 and West End		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	36723, As-Built Surveys
75	Power for Nitrogen Plant Area		Underground	4	Rigid Conduit in Red Conc.	Abandoned in place	Unknown / none	Assumed good	None	41739, As-Built Surveys
78	Precipitator Slurry	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	41740, As-Built Surveys
79	Phossy Water	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Phossy solids, P4	40159, As-Built Surveys
80	Precipitator Slurry	3-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40159, As-Built Surveys
81	Precipitator Slurry	4-inch	Underground	2 - 3	Carbon Steel	Abandoned in place	N/A	Unknown	Precipitator solids, P4	40749, As-Built Surveys
85	LDR Process Lines (3) - Never Put into Service	6&8- inch	Underground	4	Carbon Steel	Abandoned in place	N/A	Assumed good	None	As-Built Surveys
86	LDR Process Lines (3) - Never Put into Service	6&8- inch	Underground	4	Carbon Steel	Abandoned in place	N/A	Assumed good	None	As-Built Surveys
90	**Storm Drain Line**	**15-inch**	**Underground**	**5 - 8**	**Reinforced Concrete**	**In Use - Site Drainage**	**N/A, Class III wire mesh**	**Assumed good**	**Phossy solids, P4 and dirt**	**40157**
92	**Sanitary Sewer Line**	**8-inch**	**Underground**	**4 - 6**	**Reinforced Concrete**	**In Use - Training Building**	**N/A**	**Assumed good**	**Sanitary sewage**	**40156**
93	**Sanitary Sewer Line**	**8-inch**	**Underground**	**4 - 6**	**HDPE**	**In Use - Training Building**	**N/A**	**Assumed good**	**Sanitary sewage**	**395810**
94	Sanitary Sewer Line	8-inch	Underground	4 - 6	HDPE	Abandoned in place	N/A	Assumed good	Sanitary sewage	41739, Field Locate
95	Sanitary Sewer Line	8-inch	Underground	4 - 6	Reinforced Concrete	Abandoned in place	N/A	Assumed good	Sanitary sewage	Field Locate
96	Sanitary Sewer Line	4-inch	Underground	4 - 6	Cast Iron	Abandoned in place	N/A	Assumed good	Sanitary sewage	41056, Field Locate
F10	Industrial Wastewater Pump Station Fdn		Below Grade	3	Reinforced Concrete	Abandoned in place	6-8 inch / standard steel rebar	Good, backfilled to grade w/ silica	None	22689
F25	Proportioning Building Foundations		Below Grade	2 - 3	Reinforced Concrete	Abandoned in Place	6-8 inch / standard steel rebar	Good, backfilled to grade w/ silica	None	Aerial Map Locate
F43	Fire System Pump House Foundation		Below Grade	3	Reinforced Concrete	Abandoned in Place	4-6 inch / standard wire mesh	Good, backfilled to grade w/ silica	None	Aerial Map Locate
F44	Plant Water Standpipe foundation		At Grade		Reinforced Concrete	Abandoned in Place	5 feet / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F47	Calciner Scrubber Substation Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4 feet / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F5	Contractor Office Trailer Foundations		At Grade		Reinforced Concrete	Abandoned in place	4 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F52	Natural Gas Regulation Shed Foundation		At Grade		Reinforced Concrete	Abandoned in Place	4 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F55	West End Electrical Sub-station		At Grade		Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F56	Nitrogen Generation/Storage Foundation		At Grade		Reinforced Concrete	Abandoned in place	4-6 inch / standard wire mesh	Intact at grade	None	Aerial Map Locate
F72	Transformer Storage Area Foundations		At Grade		Reinforced Concrete	Abandoned in place	12 inch / heavy steel rebar	Intact at grade	None	Aerial Map Locate
F73	Hollow Core Electrode Foundation		At Grade		Reinforced Concrete	Abandoned in place	6-8 inch / standard steel rebar	Intact at grade	None	Aerial Map Locate
F74	**Chlorinator Building Foundation**		**Below Grade**	**4**	**Reinforced Concrete**	**In Use - Plant Water, Training Bld.**	**4 inch / standard wire mesh**	**Intact in place**	**None**	**Aerial Map Locate**
S6	Sanitary Sewer Septic Tank	7500 gal.	Below Grade	8	Reinforced Concrete	Abandoned in place	6 inch / standard wire mesh	Intact in place	Sanitary sewage	41739, 39532
S9	**Sanitary Sewer Septic Tank**	**2000 gal.**	**Below Grade**	**6**	**Reinforced Concrete**	**In Use - Training Building**	**4 inch / standard wire mesh**	**Intact in place**	**Sanitary sewage**	**398366, 36539**

Items in **bold** denote piping, structures, etc. that are still in use.

TABLE 4-52

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO PRECIPITATOR SLURRY UNDERGROUND PIPING
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario: Utility Worker	
	RME	Risk Drivers*
Lifetime Incremental Cancer Risk		
COCs		
Incidental Soil Ingestion	1.E-07	-
Dermal Absorption	3.E-08	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	5.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*5.E-06*	*Cd*
ROCs		
External Exposure to Gamma Radiation	2.E-06	K-40
Incidental Soil Ingestion	1.E-05	Pb-210, Po-210
Radon inhalation	BScr	-
Fugitive Dust Inhalation	6.E-06	Pb-210, Po-210
Total ROPC Lifetime Incremental Cancer Risk	*2.E-05*	*Pb-210, Po-210*
Total Lifetime Incremental Cancer Risk	**2.E-05**	**Pb-210, Po-210**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient		
Elemental Phosphorus (P4)**		
Incidental Soil Ingestion	2	P4
Other COCs		
Incidental Soil Ingestion	0.7	-
Dermal Absorption	0.2	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	1	Cd
Total Incremental Non-Cancer Hazard Quotient	**4**	**P4, Cd**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when “smoke” became apparent due to the irritant effect of the acid aerosol which comprises the “smoke”. This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

TABLE 4-53

SUMMARY OF POTENTIAL RISKS TO FUTURE RECEPTORS ASSOCIATED WITH EXPOSURE TO PHOSSY WATER UNDERGROUND PIPING
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Exposure Pathways	Exposure Scenario: Utility Worker	
	RME	Risk Drivers*
Lifetime Incremental Cancer Risk		
COCs		
Incidental Soil Ingestion	5.E-07	-
Dermal Absorption	1.E-07	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	2.E-06	Cd
Total COPC Lifetime Incremental Cancer Risk	*3.E-06*	*Cd*
ROCs		
External Exposure to Gamma Radiation	7.E-08	-
Incidental Soil Ingestion	4.E-06	Pb-210
Radon inhalation	BScr	-
Fugitive Dust Inhalation	2.E-06	Pb-210
Total ROPC Lifetime Incremental Cancer Risk	*6.E-06*	*Pb-210*
Total Lifetime Incremental Cancer Risk	**8.E-06**	**Pb-210**
Incremental Chronic and Subchronic Non-Cancer Hazard Quotient		
Elemental Phosphorus (P4)**		
Incidental Soil Ingestion	2	P4
Other COCs		
Incidental Soil Ingestion	0.4	-
Dermal Absorption	0.1	-
Inhalation of Volatiles	BScr	-
Fugitive Dust Inhalation	0.4	-
Total Incremental Non-Cancer Hazard Quotient	**3**	**P4**

Notes:

Bscr = COC/ROC concentrations associated with fill/source materials within this RU are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 1 for each exposure pathway are identified.

** The P4 chronic and sub-chronic hazard quotients are based on a soil concentration of 3,000 mg/kg, the estimated maximum soil concentration at which P4 oxidation under cold conditions may potentially occur without the generation of a visually apparent "smoke". At concentrations greater than 3,000 mg/kg, incidental ingestion of P4 contaminated soil by workers would be unlikely to occur since they would vacate the area when “smoke” became apparent due to the irritant effect of the acid aerosol which comprises the “smoke”. This action would thereby eliminate the potential for long-term worker exposure. An acute hazard could occur if workers were to encounter highly concentrated levels of P4 in the soil column which begins to burn freely (see Section 5.1.4.3). Specifically, combustion of phosphorus generates a visible and irritating acid aerosol and dermal contact could result in third degree thermal burns and secondary toxicity from phosphorus absorbed at the burn wound.

TABLE 4-54

FILL CHARACTERIZATION INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 5)

					Analyte	Antimony	Antimony EPA Split	Arsenic	Arsenic EPA Split	Barium	Barium EPA Split	Beryllium	Beryllium EPA Split	Boron	Boron EPA Split	Cadmium	Cadmium EPA Split	Chromium
					Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					Background[a]	2.2	2.2	7.7	7.7	188	188	1	1	12.8	12.8	1.9	1.9	27.5
					Commercial/Industrial Worker SSL	454	454	7.7[b]	7.7[b]	61,700	61,700	645	645	223,000	223,000	860	860	1,000,000[c]
					Construction Worker SSL	104	104	14.6	14.6	8,360	8,360	61	61	5,210	5,210	81.3	81.3	551,000
					Utility Worker SSL	1,360	1,360	173	173	109,000	109,000	792	792	67,800	67,800	1060	1060	1,000,000[c]
Location Identification	**Field Sample Identification**	**Alternate Field Identification**	**Date Collected**	**Depth (ft)**														
RU7-SIA1-SB001	RU7-SIA1-SB001	RU 7 composite	10/31/07	0-2		**6.73**	**7.34**	**14.5**	**18.6**	**79.4**	**115**	**1.68**	**1.71**	**39.9**	NA	**125**	**132**	**699 B**
RU16-SIA1-SB004a	RU16-SIA1-SB004a	southern boring location	10/31/07	0 - 3		**20.1**	**21.4**	**13**	**43.5**	**85.6**	**120**	**1.3**	**1.66**	**104**	NA	**399**	**432**	**411 B**
RU16-SIA1-SS001	RU16-SIA1-SS001	southern surface location	10/31/07	0-0.5		**36.6**	**39.8**	<1	**80.2**	**106**	**129**	**1.36**	**1.77 T**	**125**	NA	**583**	**707**	**318 B**
RU16-SIA1-SS002	RU16-SIA1-SS002	northern surface location	10/31/07	0-0.5		**10.2**	NA	**14.3**	NA	**232**	NA	**0.955 T**	NA	**33.5**	NA	**218**	NA	**420 B**
RU22b-SIA1-SB001	RU22B-SIA1-SB001	F025B	10/31/07	10 - 14		**20.4**	**30.3**	**7.05**	**7.66 T**	**143**	**333**	**0.935 T**	**1.42**	**25.7**	NA	**672**	**847**	**51.6 B**
RU22b-SIA1-SS001	RU22B-SIA1-SS001 (0-1)	Pond 10S composite	11/01/07	0 - 1		**120**	**138**	**32.2**	**37.3**	**113**	**119**	**1.21**	**1.32**	**169**	NA	**5350 D,J**	**5740**	**338 B**
RU22b-SIA1-SS002	RU22B-SIA1-SS002 (0-1)	B-2	11/01/07	0 - 1		**160**	**249**	**18.2**	**18.4**	**124**	**124**	**1.81**	**1.83**	**124**	NA	**5510 D**	**6430**	**272 B**
RU22b-SIA1-SS003	RU22B-SIA1-SS003 (0-1)	B-1	11/01/07	0 - 1		**65.6**	**69.8**	**21.9**	**23.4**	**136**	**148**	**1.2**	**1.43 T**	**151**	NA	**4120 D**	**4510**	**268 B**
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (8)	F056B	11/01/07	8		**84.8**	**67.5**	**57.9**	**11.5**	**172**	**258**	**1.63**	**1.66**	**73.3**	NA	**4750 D**	**3680**	**233 B**
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (10)	F056B	11/01/07	10		**162**	**254**	**19.6**	**19.2**	**171**	**271**	**1.67**	**1.56**	**103**	NA	**3370 D**	**3440**	**267 B**

mg/kg milligrams per kilogram.
pCi/g picocuries per gram
NA Not analyzed
Bold Bolded result indicates positively identified compound.
Shaded Shaded result indicates result or reporting limit greater than or equal to worker soil screening level (SSL)
B Analyte detected in an associated blank.
J Data are estimated due to associated quality control data.
J+ Data are estimated, potentially biased high, due to associated quality control data.
D Sample dilution required for analysis; reported values reflect the dilution
NE Not established
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.

a background from EMF ROD (EPA/541/R-98/034), Table 11
b default to background because the Site Worker SSL is less than background
c default to 1E+06 because SSL is greater than 1E+06
d SSLs for lead are based on the value cited by EPA's Adult Lead Methodology Workgroup as being protective at commercial/industrial sites (www.epa.gov/superfund/programs/lead/almfaq.htm)

TABLE 4-54

FILL CHARACTERIZATION INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 5)

					Analyte	Chromium EPA Split	Cobalt	Cobalt EPA Split	Copper	Copper EPA Split	Fluoride	Fluoride EPA Split	Lead	Lead EPA Split	Lead-210	Lead-210 EPA Split	Lithium	Lithium EPA Split
					Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g	mg/kg	mg/kg
					Background[a]	27.5	7.6	7.6	12.6	12.6	600	600	29.1	29.1	3.03	3.03	16.1	16.1
					Commercial/Industrial Worker SSL	1,000,000[c]	553	553	42,000	42,000	68,100	68,100	800[d]	800[d]	3.03[b]	3.03[b]	22,700	22,700
					Construction Worker SSL	551,000	52.2	52.2	22,000	22,000	33,000	33,000	800[d]	800[d]	7.44	7.44	11,900	11,900
					Utility Worker SSL	1,000,000[c]	679	679	286,000	286,000	430,000	430,000	800[d]	800[d]	96.7	96.7	155,000	155,000
Location Identification	**Field Sample Identification**	**Alternate Field Identification**	**Date Collected**	**Depth (ft)**														
RU7-SIA1-SB001	RU7-SIA1-SB001	RU 7 composite	10/31/07	0-2		**971**	**4.14**	**3.64 T**	**89 B**	**114**	**14 J-**	NA	**13.3**	**15.6**	**27.9 ± 6.7**	NA	**10.9**	NA
RU16-SIA1-SB004a	RU16-SIA1-SB004a	southern boring location	10/31/07	0 - 3		**519**	**2.68**	**2.83 T**	**44.3 B**	**59**	**1100 D**	NA	**21.2**	**27.6**	**28.6 ± 6.9**	NA	**14.3**	NA
RU16-SIA1-SS001	RU16-SIA1-SS001	southern surface location	10/31/07	0-0.5		**352**	**2.26**	**2.06 T**	**34.6 B**	**44.3**	**800 D**	NA	**30.1**	**38.1**	**34.1 ± 8.2**	NA	**7.49**	NA
RU16-SIA1-SS002	RU16-SIA1-SS002	northern surface location	10/31/07	0-0.5		NA	**3.48**	NA	**44.6 B**	NA	**1300 D**	NA	**46.4**	NA	**22.2 ± 5.3**	NA	**9.82**	NA
RU22b-SIA1-SB001	RU22B-SIA1-SB001	F025B	10/31/07	10 - 14		**70.5**	**3.59**	**3.92 T**	**29.1 B**	**32.1**	**300 D**	NA	**143**	**175**	**60 ± 15**	NA	**13.8**	NA
RU22b-SIA1-SS001	RU22B-SIA1-SS001 (0-1)	Pond 10S composite	11/01/07	0 - 1		**447**	**2.19**	**2.64 T**	**146 B**	**191**	**190**	NA	**760**	**874**	**570 ± 140**	NA	**21.7**	NA
RU22b-SIA1-SS002	RU22B-SIA1-SS002 (0-1)	B-2	11/01/07	0 - 1		**321**	**2.28**	**2.46 T**	**207 B**	**239**	**110**	NA	**859**	**984**	**470 ± 110**	NA	**11.8**	NA
RU22b-SIA1-SS003	RU22B-SIA1-SS003 (0-1)	B-1	11/01/07	0 - 1		**318**	**2.25**	**2.83 T**	**168 B**	**167**	**170**	NA	**634**	**774**	**400 ± 96**	NA	**11**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (8)	F056B	11/01/07	8		**343**	**4.08**	**2.95**	**176 B**	**124**	**290 D**	NA	**703**	**761**	**401 ± 96**	NA	**5.18**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (10)	F056B	11/01/07	10		**378**	**1.7**	**1.76 T**	**152 B**	**170**	**260 D**	NA	**1390**	**1380**	**480 ± 110**	NA	**4.33**	NA

mg/kg milligrams per kilogram.
pCi/g picocuries per gram
NA Not analyzed
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TABLE 4-54

FILL CHARACTERIZATION INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 5)

					Analyte	Manganese	Manganese EPA Split	Mercury	Mercury EPA Split	Molybdenum	Molybdenum EPA Split	Nickel	Nickel EPA Split	Polonium-210	Polonium-210 EPA Split
					Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	pCi/g
					Background[a]	482	482	0.16	0.16	2.15	2.15	15.5	15.5	3.58	3.58
					Commercial/Industrial Worker SSL	23,500	23,500	340	340	5,670	5,670	23,500	23,500	269	269
					Construction Worker SSL	77,100	77,100	464	464	2,750	2,750	77,100	77,100	43.3	43.3
					Utility Worker SSL	1,000,000	1,000,000	6,030	6,030	35,800	35,800	1,000,000	1,000,000	563	563
Location Identification	**Field Sample Identification**	**Alternate Field Identification**	**Date Collected**	**Depth (ft)**											
RU7-SIA1-SB001	RU7-SIA1-SB001	RU 7 composite	10/31/07	0-2		**132**	**214**	**0.63 D,J+,B**	**0.398**	**21.6 B**	NA	**166**	**203**	**30.3 ± 4.7**	NA
RU16-SIA1-SB004a	RU16-SIA1-SB004a	southern boring location	10/31/07	0 - 3		**112**	**144**	**6.7 D,B**	**3.90**	**24.9 B**	NA	**89.2**	**109**	**458 ± 65**	NA
RU16-SIA1-SS001	RU16-SIA1-SS001	southern surface location	10/31/07	0-0.5		**109**	**129**	**13 D,B**	**6.58**	**37.3 B**	NA	**41.2**	**49.6**	**45.8 ± 6.8**	NA
RU16-SIA1-SS002	RU16-SIA1-SS002	northern surface location	10/31/07	0-0.5		**131**	NA	**11 D,B**	NA	**24.3 B**	NA	**43.9**	NA	**31.3 ± 4.6**	NA
RU22b-SIA1-SB001	RU22B-SIA1-SB001	F025B	10/31/07	10 - 14		**244**	**284**	**0.018 T,B**	**0.0077 T**	1.24 UB	NA	**18.2**	**20.6**	**72.3 ± 10**	NA
RU22b-SIA1-SS001	RU22B-SIA1-SS001 (0-1)	Pond 10S composite	11/01/07	0 - 1		**189**	**215**	**0.019 T,B**	**0.0092**	**10.7 B**	NA	**77.7**	**99.1**	**740 ± 110**	NA
RU22b-SIA1-SS002	RU22B-SIA1-SS002 (0-1)	B-2	11/01/07	0 - 1		**324**	**360**	**0.02 T,B**	**0.007**	**6.71 B**	NA	**61.1**	**68.2**	**589 ± 84**	NA
RU22b-SIA1-SS003	RU22B-SIA1-SS003 (0-1)	B-1	11/01/07	0 - 1		**246**	**296**	**0.053 J+,B**	**0.0221**	**8.26 B**	NA	**67.6**	**83.9**	**491 ± 71**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (8)	F056B	11/01/07	8		**475**	**408**	**0.088 B**	**0.0389**	**26 B**	NA	**114**	**44.8**	**482 ± 69**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (10)	F056B	11/01/07	10		**479**	**1720**	**0.018 T,B**	**0.0071**	**22.2 B**	NA	**28.5**	**34.7**	**583 ± 83**	NA

mg/kg milligrams per kilogram.
pCi/g picocuries per gram
NA Not analyzed
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TABLE 4-54

FILL CHARACTERIZATION INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 4 of 5)

					Analyte	Potassium-40	Potassium-40 EPA Split	Radium-226	Radium-226 EPA Split	Selenium	Selenium EPA Split	Silver	Silver EPA Split	Thallium	Thallium EPA Split	Uranium	Uranium EPA Split
					Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					Background[a]	20.5	20.5	3.88	3.88	1.36	1.36	1.9	1.9	0.27	0.27	NA	NA
					Commercial/Industrial Worker SSL	20.5[b]	20.5[b]	3.88[b]	3.88[b]	5,670	5,670	5,670	5,670	77.2	77.2	3,400	3,400
					Construction Worker SSL	20.5[b]	20.5[b]	3.88[b]	3.88[b]	2,750	2,750	2,750	2,750	374	374	491	491
					Utility Worker SSL	136	136	12.3	12.3	35,800	35,800	35,800	35,800	4,870	4,870	6,390	6,390
Location Identification	**Field Sample Identification**	**Alternate Field Identification**	**Date Collected**	**Depth (ft)**													
RU7-SIA1-SB001	RU7-SIA1-SB001	RU 7 composite	10/31/07	0-2		**5 ± 2.1**	**7.33 ± 0.91**	**22.7 ± 4.1**	**33.5 ± 4**	**36.2**	**46.2**	**6.32**	**6.17**	**2.22**	**4.17**	**101 B**	NA
RU16-SIA1-SB004a	RU16-SIA1-SB004a	southern boring location	10/31/07	0 - 3		**32.3 ± 6.8 J+**	**35.3 ± 4.1**	**17.4 ± 3.2**	**<1.2**	**1050**	**1240**	**9.24**	**9.92**	**64.6**	**142**	**54.4 B**	NA
RU16-SIA1-SS001	RU16-SIA1-SS001	southern surface location	10/31/07	0-0.5		**24.2 ± 4.5 J+**	**27.6 ± 3.2**	**6.5 ± 1.2**	**11.1 ± 1.4**	**2510 D**	**2710**	**15.9**	**17.4**	**340**	**357**	**27.2 B**	NA
RU16-SIA1-SS002	RU16-SIA1-SS002	northern surface location	10/31/07	0-0.5		**30 ± 6.6 J+**	NA	**6.5 ± 1.2**	NA	**230**	NA	**26.9**	NA	**15**	NA	**24.8 B**	NA
RU22b-SIA1-SB001	RU22B-SIA1-SB001	F025B	10/31/07	10 - 14		**22.5 ± 4 J+**	**19.2 ± 2.2**	**3.61 ± 0.69**	**7.37 ± 0.96**	**11.9**	**13.8**	**61.9**	**83.6**	**9.31**	**13.8**	**1.81 B**	NA
RU22b-SIA1-SS001	RU22B-SIA1-SS001 (0-1)	Pond 10S composite	11/01/07	0 - 1		**69 ± 13 J+**	**71.8 ±8.3**	**9.7 ± 1.8**	**12.2 ± 1.6**	**42**	**42.5**	**53.5**	**266**	**6.6**	**130**	**8.14 B**	NA
RU22b-SIA1-SS002	RU22B-SIA1-SS002 (0-1)	B-2	11/01/07	0 - 1		**36.3 ± 8.6 J+**	**37.7 ± 4.4**	**13.5 ± 2.5**	**19.3 ± 2.4**	**60.1**	**77.7**	**53.9**	**226**	**30.8**	**152**	**7.23 B**	NA
RU22b-SIA1-SS003	RU22B-SIA1-SS003 (0-1)	B-1	11/01/07	0 - 1		**56.9 ± 8.5 J+**	**56.3 ± 6.5**	**10.3 ± 1.9**	**15 ± 1.9**	**43.5**	**48.5**	**53.9**	**200**	**20**	**96.5**	**11.4 B**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (8)	F056B	11/01/07	8		**14.1 ± 5.7 J+**	**23.7 ± 2.8**	**12 ± 2.2**	**22.3 ± 2.7**	**50.5**	**62.2**	**51.2**	**247**	**41.3**	**59.3**	**11.4 B**	NA
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (10)	F056B	11/01/07	10		**26.3 ± 7.2 J+**	**29.1 ± 3.4**	**12 ± 2.2**	**18.3 ± 2.3**	**62.4**	**71.6**	**53.2**	**252**	**7.14**	**97.4**	**5.79 B**	NA

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TABLE 4-54

FILL CHARACTERIZATION INVESTIGATION
SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 5 of 5)

					Analyte	**Uranium-238**	**Uranium-238 EPA Split**	**Vanadium**	**Vanadium EPA Split**	**Zinc**	**Zinc EPA Split**	**Gross Alpha**	**Gross Alpha EPA Split**	**Gross Beta**	**Gross Beta EPA Split**
					Units	**pCi/g**	**pCi/g**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**
					Background[a]	**3.88**	**3.88**	**45.4**	**45.4**	**52.8**	**52.8**	**NE**	**NE**	**NE**	**NE**
					Commercial/Industrial Worker SSL	**3.88[b]**	**3.88[b]**	**7,950**	**7,950**	**340,000**	**340,000**	**NE**	**NE**	**NE**	**NE**
					Construction Worker SSL	**20.6**	**20.6**	**3,500**	**3,500**	**165,000**	**165,000**	**NE**	**NE**	**NE**	**NE**
					Utility Worker SSL	**267**	**267**	**45,500**	**45,500**	**1,000,000[c]**	**1,000,000[c]**	**NE**	**NE**	**NE**	**NE**
Location Identification	**Field Sample Identification**	**Alternate Field Identification**	**Date Collected**	**Depth (ft)**											
RU7-SIA1-SB001	RU7-SIA1-SB001	RU 7 composite	10/31/07	0-2		**35.3 ± 6**	**35.8 ± 5**	**1040**	**1130**	**1240 B**	**1690**	**194 ± 32**	**114+/-32**	**116 ± 19**	**142+/-17**
RU16-SIA1-SB004a	RU16-SIA1-SB004a	southern boring location	10/31/07	0 - 3		**17.9 ± 3.1**	**17.5 ± 2.4**	**621**	**687**	**2700 D,B**	**3320**	**126 ± 21**	**81.2+/-26**	**114 ± 19**	**129+/-16**
RU16-SIA1-SS001	RU16-SIA1-SS001	southern surface location	10/31/07	0-0.5		**8.9 ± 1.6**	**7.72 ± 1.2**	**381**	**396**	**4810 D,B**	**5130**	**81 ± 14**	**77.3+/-25**	**86 ± 14**	**104+/-13**
RU16-SIA1-SS002	RU16-SIA1-SS002	northern surface location	10/31/07	0-0.5		**8.3 ± 1.5**	NA	**440**	NA	**1170 B**	NA	**84 ± 14**	NA	**77 ± 13**	NA
RU22b-SIA1-SB001	RU22B-SIA1-SB001	F025B	10/31/07	10 - 14		**1.28 ± 0.34**	**1.18 ± 0.47**	**43.7**	**56.8**	**14800 D,B**	**14300**	**53.5 ± 10**	**143+/-39**	**79 ± 13**	**120+/-15**
RU22b-SIA1-SS001	RU22B-SIA1-SS001 (0-1)	Pond 10S composite	11/01/07	0 - 1		**4.1 ± 1.1**	**3.66 ± 1.1**	**298**	**391**	**84500 D,J,B**	**72100**	**270 ± 44**	**347+/-78**	**730 ± 120**	**867+/-89**
RU22b-SIA1-SS002	RU22B-SIA1-SS002 (0-1)	B-2	11/01/07	0 - 1		**2.74 ± 0.76**	**4.27 ± 1.2**	**224**	**254**	**81700 D,B**	**81200**	**165 ± 27**	**305+/-70**	**612 ± 98**	**661+/-69**
RU22b-SIA1-SS003	RU22B-SIA1-SS003 (0-1)	B-1	11/01/07	0 - 1		**4 ± 1**	**4.9 ± 1.1**	**237**	**323**	**69200 D,B**	**64100**	**158 ± 26**	**188+/-46**	**584 ± 93**	**568+/-59**
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (8)	F056B	11/01/07	8		**3.67 ± 0.91**	**3.32 ± 1.1**	**198**	**264**	**75200 D,B**	**55400**	**190 ± 31**	**300+/-69**	**474 ± 76**	**561+/-59**
RU22b-SIA1-TP002	RU22B-SIA1-TP002 (10)	F056B	11/01/07	10		**3.03 ± 0.79**	**2.38 ± 0.92**	**175**	**248**	**74400 D,B**	**79200**	**157 ± 26**	**303+/-69**	**650 ± 100**	**694+/-52**

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TABLE 4-55

COMPARISON OF INORGANIC AND RADIONUCLIDE CONCENTRATIONS IN HISTORICAL AND SRI FILL MATERIALS AT THE FMC PLANT SITE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 3)

		Raw Ore					Slag				
		SRI Data		Historical Data		SRI	SRI Data		Historical Data		SRI
	Units	Minimum	Maximum	Minimum	Maximum	EPC	Minimum	Maximum	Minimum	Maximum	EPC
Antimony	mg/kg	6.73	6.73	NA	NA	--	0.24	1.9	NA	NA	--
Arsenic	mg/kg	14.5	14.5	14.6	14.6	14.6	0.16	1.5	NA	NA	--
Barium	mg/kg	79.4	79.4	105	105	--	180	230	214	254	--
Beryllium	mg/kg	1.68	1.68	1.9	1.9	--	1.5	2.2	1.8	2.1	--
Boron	mg/kg	39.9	39.9	74.3	74.3	--	76	110	67.5	97.8	--
Cadmium	mg/kg	125	125	77.8	77.8	125	1.8	44	1.2	32.4	--
Chromium	mg/kg	699	699	822	822	--	170	510	172	290	--
Cobalt	mg/kg	4.14	4.14	0.87	0.87	--	1.1	2.4	1.2	1.6	--
Copper	mg/kg	89 B	89 B	104	104	--	9.6	70	10.9	17.9	--
Fluoride	mg/kg	14 J-	14 J-	13200	13200	--	45	97	12400	17800	--
Lead	mg/kg	13.3	13.3	12.1	12.1	--	0.55	14	5.6	6	--
Lead-210	pCi/g	27.9	27.9	1.7	31.9	36.3	5	19.8	0.69	16.7	13
Lithium	mg/kg	10.9	10.9	NA	NA	--	28	40	16.5	19.5	--
Manganese	mg/kg	132	132	122	122	--	91	190	114	205	--
Mercury	mg/kg	0.63	0.63	NA	NA	--	0.0027	0.016	NA	NA	--
Molybdenum	mg/kg	21.6	21.6	15	15	--	0.58	6.2	2.4	2.5	--
Nickel	mg/kg	166	166	126	126	--	7.9	65	3.8	11.9	--
Polonium-210	pCi/g	30.3	30.3	19.4	25.2	--	7.7	16.4	2.4	23.7	--
Potassium-40	pCi/g	5	5	10.9	10.9	--	3.8	10.1	8.09	10.9	--
Radium-226	pCi/g	22.7	22.7	14	53	29.6	9.8	28.9	22.8	40	25.1
Selenium	mg/kg	36.2	36.2	6.1	6.1	--	3.2	9.2	2.8	6.9	--
Silver	mg/kg	6.32	6.32	5.1	5.1	--	1.1	6.6	2.3	4.9	--
Thallium	mg/kg	2.22	2.22	NA	NA	--	0.062	0.83	NA	NA	--
Uranium	mg/kg	101	101	NA	NA	--	48	91	NA	NA	--
Uranium-238	pCi/g	35.3	35.3	20	26	27.5	20.2	37.9	18.6	30.7	29.3
Vanadium	mg/kg	1040	1040	996	996	--	160	580	150	250	--
Zinc	mg/kg	1240	1240	991	991	--	34	620	36.4	450	--
Gross Alpha	pCi/g	194	194	NA	NA	--	NA	NA	NA	NA	--
Gross Beta	pCi/g	116	116	NA	NA	--	NA	NA	NA	NA	--

Notes:
NA - Not Analyzed
EPC - Exposure Point Concentration

TABLE 4-55

COMPARISON OF INORGANIC AND RADIONUCLIDE CONCENTRATIONS IN HISTORICAL AND SRI FILL MATERIALS AT THE FMC PLANT SITE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 3)

		Precipitator Solids					Phossy Solids				
		SRI Data		Historical Data		SRI	SRI Data		Historical Data		SRI
	Units	Minimum	Maximum	Minimum	Maximum	EPC	Minimum	Maximum	Minimum	Maximum	EPC
Antimony	mg/kg	65.6	162	54.6	54.6	146	20.4	20.4	37.2	189	194
Arsenic	mg/kg	18.2	57.9	17.1	17.1	44.6	7.05	7.05	20.4	256	180
Barium	mg/kg	113	172	50.8	50.8	--	143	143	18.7	48.8	--
Beryllium	mg/kg	1.2	1.81	0.37	0.37	--	0.935	0.935	0.19	0.35	--
Boron	mg/kg	73.3	169	136	136	--	25.7	25.7	30.4	79.6	--
Cadmium	mg/kg	3370	5510	2410	2410	5240	672	672	1100	2040	2010
Chromium	mg/kg	233	338	192	192	--	51.6	51.6	71.6	133	--
Cobalt	mg/kg	1.7	4.08	6.6	6.6	--	3.59	3.59	0.74	3.1	--
Copper	mg/kg	146	207	75.4	75.4	--	29.1	29.1	41.7	74.9	--
Fluoride	mg/kg	110	290	16100	16100	--	300	300	8600	17100	--
Lead	mg/kg	634	1390	338	338	1007	143	143	185	386	--
Lead-210	pCi/g	400	570	0.782	1370	1140	60	60	204	465	409
Lithium	mg/kg	4.33	21.7	9	9	--	13.8	13.8	8.7	9.9	--
Manganese	mg/kg	189	479	52	52	--	244	244	37.9	80.8	--
Mercury	mg/kg	0.018	0.088	0.82	0.82	--	0.018	0.018	0.23	0.74	--
Molybdenum	mg/kg	6.71	26	6.6	6.6	--	1.24	1.24	3.7	7.1	--
Nickel	mg/kg	28.5	114	26.5	26.5	--	18.2	18.2	16.2	17.6	--
Polonium-210	pCi/g	482	740	440	750	657	72.3	72.3	NA	NA	72.3
Potassium-40	pCi/g	14.1	69	50.7	176	152	22.5	22.5	13.1	27.4	27.4
Radium-226	pCi/g	9.7	13.5	7.5	13	11.3	3.61	3.61	NA	NA	--
Selenium	mg/kg	42	62.4	45.3	45.3	--	11.9	11.9	10.8	49.6	--
Silver	mg/kg	51.2	53.9	218	218	--	61.9	61.9	106	199	--
Thallium	mg/kg	6.6	41.3	39.4	39.4	--	9.31	9.31	9.4	26	--
Uranium	mg/kg	5.79	11.4	NA	NA	--	1.81	1.81	NA	NA	--
Uranium-238	pCi/g	2.74	4.1	8.36	8.36	6.39	1.28	1.28	0.694	4.98	--
Vanadium	mg/kg	175	298	169	169	--	43.7	43.7	42.9	93.4	--
Zinc	mg/kg	69200	84500	21400	21400	--	14800	14800	10400	26600	--
Gross Alpha	pCi/g	157	270	NA	NA	--	53.5	53.5	NA	NA	--
Gross Beta	pCi/g	474	730	NA	NA	--	79	79	NA	NA	--

Notes:
NA - Not Analyzed
EPC - Exposure Point Concentration

TABLE 4-55

COMPARISON OF INORGANIC AND RADIONUCLIDE CONCENTRATIONS IN HISTORICAL AND SRI FILL MATERIALS AT THE FMC PLANT SITE
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 3)

		Calciner Pond Solids				
		SRI Data		Historical Data		SRI
	Units	Minimum	Maximum	Minimum	Maximum	EPC
Antimony	mg/kg	10.2	36	59.2	59.2	--
Arsenic	mg/kg	4.03	14.3	NA	NA	14.3
Barium	mg/kg	85.6	232	94.6	94.6	--
Beryllium	mg/kg	0.955	1.36	1.3	1.3	--
Boron	mg/kg	33.5	125	2640	2640	--
Cadmium	mg/kg	218	583	426	426	538
Chromium	mg/kg	318	420	531	531	--
Cobalt	mg/kg	2.26	3.48	1.7	1.7	--
Copper	mg/kg	34.6	44.6	58.9	58.9	--
Fluoride	mg/kg	800	1300	NA	NA	1300
Lead	mg/kg	21.2	46.4	30.9	30.9	--
Lead-210	pCi/g	22.2	34.1	1.7	8.4	34.1
Lithium	mg/kg	7.49	14.3	NA	NA	--
Manganese	mg/kg	109	131	91.8	91.8	--
Mercury	mg/kg	6.7	13	0.31	0.31	--
Molybdenum	mg/kg	24.3	37.3	32.5	32.5	--
Nickel	mg/kg	41.2	89.2	79	79	--
Polonium-210	pCi/g	31.3	458	18	18	458
Potassium-40	pCi/g	24.2	32.3	70.4	70.4	70.4
Radium-226	pCi/g	6.5	17.4	0.34	0.9	17.4
Selenium	mg/kg	230	2510	3.8	3.8	--
Silver	mg/kg	9.24	26.9	25.1	25.1	--
Thallium	mg/kg	0.268	340	NA	NA	340
Uranium	mg/kg	24.8	54.4	NA	NA	--
Uranium-238	pCi/g	8.3	17.9	17.5	17.5	17.9
Vanadium	mg/kg	381	621	607	607	--
Zinc	mg/kg	1170	4810	6000	6000	--
Gross Alpha	pCi/g	81	126	NA	NA	--
Gross Beta	pCi/g	77	114	NA	NA	--

Notes:
NA - Not Analyzed
EPC - Exposure Point Concentration

Section 5

SUMMARY CONCLUSIONS, UPDATED CSM AND RECOMMENDATIONS

5.1 INTRODUCTION

The *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA, 1988) states that the RI, after a thorough scoping process and review of available information, is the mechanism for collecting data to characterize site conditions; determine the nature of the waste; assess risk to human health and the environment; and conduct treatability studies as necessary. The RI objective is to characterize the study area to a sufficient extent to determine the need for remedial action and support the identification and evaluation of remedial options with respect to their performance, cost, protectiveness and other regulatory criteria. The scoping process conducted here examined the sampling results from the 1996 EMF RI as they pertain to the FMC Plant Site, and is embodied in the FMC *Scoping and Planning Memo* and the *RI Update Memo.* The results of that planning are encapsulated in the *SRI Work Plan*, where FMC Plant Site data gaps are systematically explained and the procedures are described for the SRI.

The EPA Guidance clearly states that the objective of the RI process is not the unattainable goal of removing all uncertainty, but rather to gather information sufficient to support an informed risk management decision regarding the appropriate site remedy. Additionally, RI data are to be used to further confirm and/or refine the CSM.

This section summarizes the accomplishments of the SRI against these goals and recommends a path forward in the CERCLA process. The FMC Plant CSM is also reviewed and updated in this section. It should be noted that consistent with the prior planning and scoping work leading up to this effort, it was determined that most site data gaps were related to soils and fill at the FMC Plant Site. Consistent with the *SRI Work* Plan, groundwater throughout the FMC Plant OU and soil conditions at FMC properties north of Highway 30 are not the subject of this SRI report. Those instead will be addressed in current conditions reports that review historical data and data collected subsequent to the EMF RI report. Those reports will be submitted separately to EPA for review. Where soils and/or fill have been determined to contain constituents at concentrations that represent a risk to groundwater, this report notes those determinations, but does not assess their potential groundwater impacts. Those potential impacts are addressed in the separate *GWCRR*.

Section 5.2 below sets forth the SRI conclusions for individual RUs, RU groups, and Other Studies under the following headings: Nature and Extent of Contamination, Risk to Human Health and the Environment, and Information to Support the Supplemental Feasibility Study (SFS). A summary of the conclusions is also presented in Table 5-1. The CSM is presented in Section 5.3. Section 5.4 presents the recommendations based on the combined investigation findings.

5.2 CONCLUSIONS

5.2.1 RU 1 and RU 2 – Furnace Building, Phos Dock, Secondary Condenser, and Slag Pit

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this Report regarding RU 1 and RU 2 provide sufficient information to characterize the nature and extent of contamination associated with the fill material and incidental source materials in these RUs. The types of fill materials were identified through perimeter soil borings and review of operational records and process descriptions. The identified fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. These fill materials were characterized based on analyses of each of these fill types from samples collected elsewhere on the FMC Plant Site where the same fill type is found.

Elemental phosphorus (P4) is known to be present in the subsurface in these RUs and can spontaneously combust when exposed to air, creating an unacceptable acute hazard to sampling personnel. Thus borings were drilled and samples collected around the perimeter rather than within these RUs to gain further information about the type, depth and volume of predominant fill materials and to confirm the lateral limits of potential elemental phosphorus in the shallow subsurface associated with past operations. The quantity of elemental phosphorus was estimated as described in Section 4 and its maximum extent has been bound. Piping and underground structures in these RUs, as well as the materials they likely contained, have been inventoried and designated on maps of these RUs.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers associated with exposure to residual fill materials exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in these RUs exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) exceed ROD RAOs for select incidental fill materials present in RUs 1 and 2. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

Lastly, the presence of P4 beneath RUs 1 and 2 represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

Risk to the environment, specifically groundwater, has resulted from the downward migration of liquid P4 to the water table and some limited downgradient movement of P4 in the groundwater

capillary fringe. A more detailed discussion of groundwater associated with the entire FMC Plant OU is presented in the *GWCCR*.

Information to Support the SFS. The nature and extent of contamination associated primarily with P4 and fill material at this RU and the risks posed to human health and the environment have been sufficiently bound to evaluate remedial alternatives. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.2 RU 8 – Former Kiln Scrubber Ponds and Calciners

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report for RU 8 provide generally sufficient information to characterize the nature and extent of contamination associated with the waste and fill materials in this RU. The types of fill materials were identified through boundary (i.e., perimeter) sampling and through review of operational records and process descriptions. The identified fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. Table 4-2 identifies residual kiln pond solids, which are similar to calciner pond solids, as a potential source material incidental to the predominant fill materials in RU 8. The Supplemental HHRA conservatively assumed that all of the fill and source materials listed in Table 4-2 were present in RU 8. These fill materials were characterized based on analyses of each of these fill types from samples collected elsewhere on the FMC Plant Site where the same fill type is found.

While delineation of fill and impacted soils in this RU was completed for nine (9) of the 14 perimeter borings, five (5) of the delineation borings did not extend fully beyond the impacted areas, as shown on Figure 4-9. As described below, additional delineation (e.g., step-out borings) will be required for this RU later in the CERCLA process either during the SFS evaluations or during the remedial design and remedial action. For the purpose of the SFS evaluations, conservative boundary assumptions outside of the perimeter borings will be used to assess remedial technologies.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 8 and states the presumption that these include process-related piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in the Supplemental HHRA and are discussed in Section 5.2.11 below. The piping and underground structures at this RU, as well as the materials they likely contained, have been inventoried and designated on maps to assist with the SFS process.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers, associated with exposure to residual fill materials, exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in this RU exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures

via other pathways (i.e., ingestion and inhalation) only exceed ROD RAOs for select incidental fill materials. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

Risk to the environment, specifically groundwater, is due to the presence of former unlined ponds in this RU that operated with a standing hydraulic head. Under a sustained head, there is a potential of subsurface contaminant migration to groundwater. A more detailed discussion of groundwater associated with the entire FMC Plant OU is presented in the *GWCCR*

Information to Support the SFS. The nature and extent of contamination associated with fill and impacted soils at this RU and the risks posed to human health and the environment have been largely bound and are sufficiently bound to evaluate remedial alternatives. Additional step-out borings may ultimately be required for lateral delineation of the kiln pond solids and impacted soils, given that five of the fourteen original SRI borings exceeded one or more SSLs. However, the SFS remedial alternatives evaluation is currently feasible given that later stages of the CERCLA process will sufficiently define the additional lateral extent of impact beyond these five borings. Remedial design and remedial action activities can adequately delineate the extent of contamination (and therefore the extent of remedial action) taking into account historical information, RI data, SRI data, and further delineation/confirmation sampling as appropriate. Conservative assumptions regarding the additional area/volume of impact would allow evaluation of remedial alternatives, and those assumptions could be verified later in the CERCLA process. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.3 RU 13 – Pond 8S Recovery Process and Metal Scrap Preparation Area

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report regarding RU 13 provide generally sufficient information to characterize the nature and extent of contamination associated with the fill materials, incidental source materials, impacted soils, and P4 in this RU. The types of fill materials were identified through visual inspections of the borings that were drilled through the fill to collect samples of the underlying native soil, and through review of operational records and process descriptions. These fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. These fill materials have been characterized based on multiple analyses of these same fill materials from samples where they occur elsewhere on the FMC Plant Site. The Supplemental HHRA conservatively assumed that all of the fill and source materials listed in Table 4-2 were present in RU 13. While SFS logging of fill and sampling of native soils was completed in this RU, all four composite SFS soil samples were collected from impacted soils. Those borings did not extend fully beyond the impacted areas, as shown on Figure 4-16. As described below, additional step-out borings could be accomplished later in the CERCLA process either during the SFS evaluations or during the remedial design and remedial action that will be necessary for this RU.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 13 and states the presumption that these include precipitator slurry and phossy water-related piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in the Supplemental HHRA and are discussed in Section 5.2.11 below. The piping and underground structures at this RU, as well as the materials they likely contained, have been inventoried and designated on maps to assist with the SFS process.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers, associated with exposure to residual fill materials, exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in this RU exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) only exceed ROD RAOs for select incidental fill materials present in RU 13. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

Lastly, the presence of P4 beneath RU 13 represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

Risk to the environment, specifically groundwater, is possible due to the presence of pond-related sediments at this RU. While this RU was not operated with a standing hydraulic head, there is a potential for subsurface contaminant migration to groundwater from leaching of the pond sediments. A more detailed discussion of groundwater associated with the entire FMC Plant OU is presented in the *GWCCR*.

Information to Support the SFS. The nature and extent of contamination associated with fill materials, incidental source materials, P4, and impacted soils at this RU and the risks posed to human health and the environment have been largely bound and are sufficiently bound to evaluate remedial alternatives. Additional step-out borings may ultimately be required for delineation of these materials where several of the original SRI borings exceeded one or more SSLs. However, the SFS remedial alternatives evaluation is currently feasible given that later stages of the CERCLA process sufficiently define the additional lateral extent of impact beyond these borings. Remedial design remedial action activities can adequately delineate the extent of contamination (and therefore the extent of remedial action) taking into account historical information, RI data, SRI data, and further delineation/confirmation sampling as appropriate. Conservative assumptions regarding the additional area/volume of impact would allow evaluation of remedial alternatives, and those assumptions could be verified later in the CERCLA process. The process to evaluate remedial alternatives, to be described in the SFS

work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.4 RU 15 and RU 16 – Oversized Ore, Used Electrodes, Baghouse Dust Area, and Calciner Solids Stockpile

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report regarding RUs 15 and 16 provide sufficient information to characterize the nature and extent of contamination associated with the fill materials and incidental source materials in these RUs. The types of fill materials were identified through visual inspections of the borings that were drilled through the fill to collect samples of the underlying native soil, and through review of operational records and process descriptions. These fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. The fill materials have been characterized based on multiple analyses of these same fill materials from samples where they occur elsewhere on the FMC Plant Site. The Supplemental HHRA conservatively assumed that all of the fill and source materials listed in Table 4-2 were present in these RUs.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers, associated with exposure to residual fill materials, exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in these RUs exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) also exceed ROD RAOs for predominant fill materials in RU 16; however, ingestion and inhalation risks only exceed ROD RAOs for select incidental fill materials present in RU 15. For RU 15, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA for RU 15.

Risk to the environment, specifically groundwater, is potentially indicated as shown on Figures 4-17 and 4-18 due to historic use of calciner solids as fill in these areas. The calciner solids had significant moisture content when placed in RU 16. These materials are associated with the potential subsurface migration of contaminants to groundwater. A more detailed discussion of groundwater associated with the entire FMC Plant OU is provided in the *GWCCR.*

Information to Support the SFS. The nature and extent of contamination associated with fill and incidental source materials at these RUs and the risks posed to human health and the environment have been bound and are sufficient to evaluate remedial alternatives. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.5 RU 17, 18, and 19b – Construction Debris Landfill, Current Solid Waste Landfill, and Former Solid Waste Landfill

FMC ceased production of elemental phosphorus from phosphate ore at its Pocatello facility in December 2001. This led EPA and FMC to enter into an AOC in October 2003 for a Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) at the FMC Plant OU. The AOC was driven primarily by EPA's conclusion that additional investigations and evaluations were needed in the plant areas that had been actively operated at the time of the RI/FS, but where operations were terminated with the plant shutdown. As stated in the EPA-approved *Scoping and Planning Memorandum*, "The guidance document titled *Presumptive Remedy for CERCLA Municipal Landfill Sites (EPA 1993)* will be utilized as guidance for investigation and/or remedy selection at RUs 17 (Recyclable Material Landfill – SWMU # 89), 18 (Current Solid Waste Landfill – SWMU # 45), and portions of 19 (Former Solid Waste Landfill – SWMU # 44)."

Consistent with the *Scoping and Planning Memorandum*, the Presumptive Remedy for CERCLA Municipal Solid Waste Landfill (MSWLF) Sites was applied to RUs 17, 18 and 19. Section 2.1.2 of the *RI Update Memo* provides a discussion of the elements of the MSWLF Presumptive Remedy and its applicability to these plant landfills. Further, consistent with EPA's *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills* (EPA, 1996), and EPA's *Presumptive Remedies: CERCLA Landfill Caps RI/FS Data Collection Guide* (*EPA's Landfill Data Collection Guide*; EPA, 1995) the conceptual site model (CSM) for these RUs was evaluated in detail in the *RI Update Memo*. Both of these EPA documents recommend streamlining the RI/FS process by presuming that exposure to landfill contents could pose an unacceptable risk to human health and the environment if these sites were available for unrestricted use. These guidance documents recommend relying on existing information and data regarding the operation and contents of the landfill to the extent possible, rather than attempting to characterize the landfill contents through field investigation.

In Section 6.0 of the *RI Update Memo* (the Application of the data quality objective (DQO) process to Remediation Units), the DQO process was applied to all RUs in the FMC Plant Site OU. In subsection 6.1.3., the former landfills were evaluated in detail using the DQO process. That text was supported by figures 6-16 to 6-21 and tables 6-3 to 6-6, consistent with the protocol outlined in *EPA's Landfill Data Collection Guide*. Based on the information presented in Section 6.0 of the *RI Update Memo*, the 2007 *SRI Work Plan* did not call for additional soil and groundwater investigations for RUs 17 and 18 and the former landfill area of RU 19. Instead the approach taken was to presume that exposure to the contents of the former landfills could pose unacceptable risks and that the SFS would need to evaluate containment remedies (e.g., capping) for these landfills to minimize infiltration through the wastes that are left in place. Section 6.1.3 of the *RI Update Memo* and its associated figures and tables are provided in Appendix L to this SRI Report.

The information previously provided in the *RI Update Memo* has been summarized in the following sections, using the format employed generally in this *SRI Report*, i.e., subsections entitled as follows: Nature and Extent of Contamination; Risks to Human Health and the Environment; and Information to Support the SFS.

Nature and Extent of Contamination. The following six technical areas pertinent to landfills, as defined in *EPA's Landfill Data Collection Guide*, are provided for RUs 17, 18 and 19 in Appendix L: 1) Waste Area Delineation, 2) Slope Stability and Settlement, 3) Gas Generation/Migration, 4) Existing Cover Assessment, 5) Surface Water Run-On/Run-off Management, and 6) Clay Sources. Consistent with the EPA process for application of the Presumptive Remedy, further investigation of RUs 17, 18, and the former landfill area of RU 19 was not performed during SRI for the following reasons:

- An analysis performed and documented in the *RI Update Memo* (see Appendix L) concluded that the most effective way of dealing with these landfills was through *EPA's Landfill Presumptive Remedy* guidance;
- The depth of slag in RU 19 precludes investigation of materials buried within the slag pile; and
- Two borings at RUs 18 and 19 did not encounter groundwater down to bedrock (see groundwater discussion below).

Background information and any investigations that have been conducted at each of these landfills are discussed below. Figure 5-1 depicts the locations of these RUs within the former active FMC plant site. For this landfill discussion only, RU 19 (the combined slag and bullrock piles) is subdivided into the following areas:

- RU 19 includes the slag pile (excluding the bullrock pile, the former landfill, and the area containing the buried railcars);
- RU 19a includes the bullrock pile within which no landfill activities were performed;
- RU 19b includes the former plant landfill area in the southwestern corner of the slag pile;
- RU 19c includes the area where 21 railcars are buried within the slag pile.

History of Landfill Operations. The attached Table 5-2 summarizes each landfill's operation and history of waste disposal (including the time period over which it operated), the wastes deposited in each, and the estimated quantities of waste disposed where there is supporting information available. Table 5-2 also notes the sources of historical information that were used to summarize the individual landfill operations and wastes disposed. This information is a summary of previous EPA requests for information on the FMC plant landfills (provided to the EPA in 1991 and again in 1998). Both of these landfill information submittals were the basis for the information presented in the *RI Update Memo*.

RU 17 - The Construction Debris Landfill (CDLF) – RU 17 is an area that was used as a landfill from 1981 until 2002, shortly after the plant shutdown. RU 17 is approximately 8 acres in size, and the depth of waste burial is estimated to range from approximately 2 to 32 feet below current grade. Portions of RU 17 are covered with approximately six inches of soil and slag, but other areas have not yet been covered. The CDLF was used only for the disposal of non-RCRA regulated solid wastes from plant construction and demolition projects. The largest volume of

solid waste placed in RU 17 consisted of materials from furnace digout/rebuild projects, which generated a waste stream consisting of approximately 2,600 tons of furnace process internals (calcined ore, coke, carbon, silica, slag, and ferrophos). Incidental quantities of other non-RCRA regulated wastes (such as concrete, rocks, IWW sediments, and baghouse dust) generated during maintenance, construction, and demolition projects also would have been disposed in RU 17, but these would be present in very low proportion to the furnace feed materials. The COCs associated with these landfilled materials are discussed in Section 1.3.3. and Section 4 of this report and specifically listed in Tables 4-3 and 4-4. Although the baghouse dust is not specifically described in these sections and tables, it contains essentially the same constituents (COPC/COCs) as ore. The baghouses (and resulting collected dust) were associated with air emission control systems on the ore, nodule (calcined ore), and burden (calcined ore plus silica plus coke) material handling systems. Similarly, the IWW sediments consisted primarily of windblown ore and silica from the material handling areas surrounding the IWW pond. The IWW water also contained incidental quantities of burden dust that became entrained in the IWW water during its use in the cooling water jackets on the furnaces. The ore, silica and incidental burden dust settled in the IWW pond and was periodically dredged out of the pond.

Sampling was not conducted to characterize the wastes that had been disposed in this landfill during the SRI, in keeping with the *EPA's Landfill Data Collection Guide*. The information developed and presented in the *RI Update Memo* and in the SRI Report instead focuses on the physical conditions and boundaries of the landfill to facilitate evaluation of potential future containment remedies.

RU 18 - The New Solid Waste Landfill (SWLF) – RU 18 began operation in 1980 and continues to be used on a limited basis to the present day. RU 18 is approximately 9 acres in size, and the depth of waste burial is estimated to range from approximately 1½ to 22 feet below current grade. Most of RU 18 is covered with between 1½ and 4 feet of slag with only a small area in the northeast corner of the SWLF remaining open for receipt of minor amounts of non-RCRA regulated trash generated during ongoing site O&M activities. Since its first use in 1980, RU 18 has been used solely for disposal of non-RCRA regulated wastes, the largest component of which was office wastes (approximately 5,200 tons). Estimated quantities of other non-RCRA regulated industrial wastes placed in the SWLF included:

- Approximately 300 tons of Andersen Filter Media (AFM) from 1980 until 1992. The Anderson scrubbers at the plant were designed and operated primarily to control particulate emissions. Anderson scrubbers were used in the furnace building as emission controls on slag tapping and at the phosphorus dock to control emissions from P4 handling, storage and railcar loading. The furnace Anderson scrubbers generated a much greater volume of spent AFM than the phosphorus dock Anderson scrubber. The furnace AFM contained particulate material from slag tapping and would be expected to contain essentially the same COPC/COCs as slag. The phosphorus dock AFM primarily scrubbed phosphorus pentoxide (P2O5), the oxidation product of P4, and could be expected to contain primarily phosphate (orthophosphate) and some incidental unoxidized P4;

- Approximately seven (7) tons of double-bagged asbestos-containing wastes (in a separate designated cell) from 1980 until 2005;

- Approximately 1,500 tons of Pond Closure Decant Treatment (PCDT) lime filter cake from 2004 to 2005. During the operation of the PCDT system, the lime filter cake was routinely analyzed for site-related metals and radionuclides. The results showed that the PCDT filter cake was uniformly and without exception below RCRA TCLP limits and RCRA Universal Treatment Standard levels, and radionuclides were essentially undetected; and,

- Approximately 21.5 tons of spent carbon from 2005 to 2008 (from the Pond 16S gas extraction treatment system). Based on FMC's characterization sampling and analysis, the spent carbon from the treatment of phosphine gas at Pond 16S does not exhibit any hazardous waste characteristics. Sampling and analysis of the spent carbon by TCLP indicates no heavy metal COCs above their TCLP limits.

RU 19b – The Former Solid Waste Landfill – RU 19b is located within the southwestern corner of the slag pile (RU 19) and was operated as the plant landfill from the inception of plant operations in 1949 to approximately 1980, when the new SWLF (RU 18) was opened. Slag disposal continued within RU 19 until shortly after plant operations ceased in December 2001 and thus the slag covering in RU 19b also continued to increase until cessation of operations. RU 19b covers an area approximately 20.3 acres and rises to a maximum of 144 feet above the original grade (including the covering slag), with variable slopes ranging from nearly flat to greater than a 1:1 slope. It is estimated that the non-slag, landfilled material in RU 19b is covered with 50 to >100 feet of slag.

Approximately 9,900 tons of non-slag solid wastes were disposed of in RU 19b including:

- Office wastes – office and lunchroom solid wastes (approximately 6,000 tons);

- Industrial wastes - asbestos wastes, spent solvents, and oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, fluid-bed dryer wastes (approximately 210 tons);

- AFM from 1978 until 1980 (approximately 72 Tons); and

- Furnace digout/rebuild wastes (approximately 3,600 tons).

Spent solvents potentially generated from mobile equipment maintenance and the plant laboratory and associated solvent COPCs are discussed in Sections 1.5.3.1 and 1.5.3.2 of the SRI Report. Oily residues potentially generated from mobile equipment maintenance, specifically fuel related VOCs and PAHs that might have been incidentally incorporated into lubricating and/or hydraulic fluid residues, are discussed in Section 1.5.3.3 of the SRI Report. Transformer oil and potential PCBs are discussed in Section 1.5.3.5 of the SRI Report. Kiln scrubber solids and associated COCs are described in Section 4.8.1 of the Draft SRI Report. As described in that section, the kiln scrubber solids COCs are presumed to be the same as for calciner solids.

The fluid bed dryer (FBD) was constructed at the plant in 1974 and used to dry and oxidize P4 contained in precipitator slurry from the furnaces to produce a saleable fertilizer product. Due to operational difficulties, the FBD ceased operating in the late 1980s and the unit was eventually

dismantled to clear that area of the plant for other operations. The FBD wastes would contain essentially the same COPCs/COCs as precipitator dust (e.g., metals and radionuclides) including P4. However, the P4 concentrations in FBD waste would not be expected to cause burning or smoking due to its oxidation within the FBD process.

RU 19c – Railcar Disposal Area in Slag Pile – RU 19c is located near the center of the slag pile (RU 19) and was used one time in 1964 for the disposal of railcar tanks (with the trucks removed) containing phosphorus sludge. This area is approximately 2.7 acres in size and is buried under 100+ feet of slag. Section 6 of the *RI Update Memo* provides a discussion of the buried railcar tanks and indicates that an assumption was made that these railcar tanks contained 50 to 75% capacity of phosphorus sludge when buried, resulting in a range of 1,000 to 2,000 tons of P4 buried in the slag pile within the railcars. However, a July 1, 1981 memo from an FMC employee (the Phosphorus Area Supervisor) has since been identified that indicates that the sludge was "unloaded" from the railcar tanks with the intention of "cleaning" the emptied railcars for scrap metal sales. Due to safety concerns, the sludge could not be totally "cleaned" from 21 railcars, which were then taken to the south end of the slag pile (in 1964) and buried with clay and then slag. A copy of this memo is attached in Appendix L. The memo does not specify the quantity or depth (thickness) of clay fill placed over the railcars. This indicates that the previously calculated range of P4 sludge mass buried in the railcars in RU 19c (1,000 to 2,000 tons) should be considered a worst case estimate. Based upon the currently available information, as little as 200 tons could have been buried if it is assumed that the cars contained only 10% sludge, which seems reasonable if the railcars were "unloaded" prior to disposal.

In either case, FMC proposes that it is inappropriate to apply the same *Presumptive Remedy for CERCLA Municipal Landfill Sites* guidance for RU 19c, as is planned for RUs 17, 18, and 19b. This is apparent as the burial of 21 railcars containing P4 sludge is not comparable to the management of a municipal solid waste landfill or the other landfills on the FMC Plant OU. Therefore, RU 19c will be evaluated separately from the RU 17, 18 and 19b landfills in the SFS, along with all other RUs for which remedial technologies will be thoroughly reviewed during the SFS process. As such, RU 19c is not represented on Table 5-2.

Previous Landfill Investigation Findings. During FMC's 1990 RCRA Facility Assessment (FMC, 1991), monitoring well boring 138, located downgradient of the RU 18 landfill, was advanced to 168 feet bgs after encountering weathered tuff at 140 feet. No groundwater was encountered in this boring and thus no well could be constructed to monitor groundwater. Boring F027B drilled during the RI (BEI, 1996) encountered weathered tuff at 138 feet bgs and, as previously experienced at boring 138, did not encounter groundwater. Soil samples were collected at 10-foot intervals to 120 feet and analyzed for inorganic, radiological, and volatile and semi-volatile organic parameters. Analyses of the soil samples taken from this borehole indicate little to no EMF effects with regard to inorganic or radiological parameters. Refer to Figure 5-1 for the locations of these soil borings.

Other than zinc (53.4 mg/kg at the surface and 55.2 mg/kg at 110 feet bgs, compared to a representative level of 52.8 mg/kg), no trace metals were detected above their representative levels. However, the detected levels for zinc are far below the SSLs for workers and for protection of groundwater. In addition to metals, neither fluoride nor total phosphorus were detected above their representative levels (as presented in Table 4.2.1-2 of the *EMF RI Report*).

Also, none of the gross alpha and gross beta results obtained from sample intervals in F027B were above their representative levels (as presented in Table 4.2.1-2 of the *EMF RI Report*).

There were a number of organic compounds detected in a random fashion at very low levels within the F027B borehole (i.e., much below their individual SSLs). The full text from the EMF RI Report (BEI, 1996) that describes the organic results for boring F027B is provided below:

> "One semivolatile compound was detected in the 60-foot soil sample: bis (2ethylhexyl)phthalate at 25 mg/kg. Since it was not detected in any other sample and is a recognized artifact in sample handling and analysis, its presence in this sample is assumed to be an artifact of the handling procedures. A number of volatile organics were reported in various soil horizons at very low levels. All of them, except ethylbenzene (0.003 mg/kg in the surficial sample and 0.002 mg/kg in the 100-foot sample), are associated with laboratory contamination. They include carbon disulfide (0.001 to 0.002 mg/kg), 2-butanone (0.018 in the surficial sample and 0.0175 in the 130-foot sample), toluene (0.002 to 0.175 mg/kg), xylenes (0.005 to 0.016 mg/kg), and acetone (0.087 to 0.380 mg/kg). The toluene range was much narrower than appeared, in that the 0.175 mg/kg sample was surficial and the remaining samples all contained less than 0.005 mg/kg. The acetone samples were frequently accompanied by a laboratory qualifier (B) signifying that the laboratory blank was also contaminated with acetone. Given the random occurrence of the volatiles and their low concentrations in the samples, there does not appear to be a measurable volatile organic problem in the soils taken from this borehole."

These soil samples were collected and analyzed and the results validated consistent with the EPA-approved RI/FS Work Plan and Sampling and Analysis Plans. The EMF RI Report includes a summary of the data validation and usability assessment in Appendix J (Precision, Accuracy, Representativeness, Comparability, and Completeness (PARCC) report) and Appendix W (validated EMF RI facility source and soil investigation results database files). A review of the validated volatile organic results reported as detected for the soil samples from boring F027B is summarized below:

- The reported detected organic compounds 2-butanone, acetone, bis(2-ethylhexyl)phthalate, and toluene were detected in laboratory method blank samples associated with analyses of these soil samples. The laboratory blank contamination was detected at levels that led to elevated undetected concentrations in the same range (concentration) as those samples reported as detected for these compounds.

- The reported detected organic compounds carbon disulfide and ethylbenzene were identified and quantified below the reporting limit and near the method detection limit (MDL) resulting in "J" flagging as estimated. Carbon disulfide was reported as detected below the reporting limit (RL) in only 3 of the 14 samples and undetected in 10 of 14 samples. Ethylbenzene was reported as detected below the RL in only 2 of the 14 samples and undetected in 12 of 14 samples.

- Only the reported detected results for total xylenes for the 0-foot soil sample interval is above the RL, the other 3 reported detects are at or below the RL, and 10 of the 14 soil samples were reported undetected at the RL of 0.005 and 0.006 mg/kg.

RU 19 has not had a boring installed within its footprint for sample collection because of the difficulty of drilling through the slag, and the fact that slag is the primary material disposed of in the area and is the most widespread waste that will be addressed in the supplemental feasibility study (SFS). During 1990, monitoring well 106 was installed north of the eastern slag pile. Well 106 was completed in the upper aquifer zone in a saturated gravel horizon above the rhyolite bedrock encountered at approximately 135 feet bgs. Well 105, adjacent to Well 106, was intended to be completed in the deeper aquifer zone. However, a deeper aquifer zone was not encountered within the rhyolite or thin, interbedded silty sand (173 to 180 feet bgs) within the rhyolite to a total depth of 185 feet bgs in boring 105. For this reason the boring was plugged and abandoned.

The SRI findings presented in Section 4.0 of this report regarding RU 19 provide sufficient information to characterize the nature and extent of contamination associated with the fill material, incidental source materials, and landfilled materials in this RU. The types of fill materials were identified through review of SRI borings, operational records, and process descriptions. The identified fill types (surface, subsurface, and incidental) are described in Section 4 and are shown in Table 4-2 of this document. The composition of these fill materials was characterized based on analyses of each of these fill types from samples collected elsewhere at the FMC Plant Site where the same fill type is found. Elemental phosphorus (P4) could be present in the subsurface associated with the railcars that were historically buried in RU 19c (refer to Figure 5-1). Landfilled materials are located in the southwestern corner of the slag pile (identified as RU 19b) and underlie the slag. Additionally, samples collected across the slag pile and bullrock pile areas of RU 19 indicate that radon flux from these areas does not represent a hazard.

The primary uncertainty associated with potential sources of organic compounds within RU 18 and the old plant landfill RU 19b is the total mass, i.e., concentration and volume, of the materials that contained organics. Although there is no specific documentation regarding the concentration and volume of organic compound-containing wastes disposed in the landfills, these wastes were incidental to the overall plant process (e.g., maintenance and laboratory related) rather than a primary waste associated with plant production. As described in Section 1.5.3 of the SRI Report, the plant operations such as mobile equipment maintenance and the plant laboratory that generated the organic compound-containing wastes and the underlying organic COPC/COCs have been documented. In addition, the physical setting (footprint and depth of landfills), site geology and hydrogeology, climate including precipitation, and temporal bounds to placement of material are well understood and documented.

Groundwater Impacts. As discussed above, groundwater was not encountered at the two borings advanced at the downgradient margin of RU 18 (dry hole for Well 138 and boring F027B). No borings or monitoring wells have been installed directly downgradient from RU 17 or within the footprint of RU 19 (or RU 19b), due to accessibility and technical (drilling) issues presented by the slag piles. During the EMF RI, no volatile organic or semi-volatile compounds were detected in groundwater samples collected from Well 106, which is located downgradient of RU 19, or in other wells generally located downgradient from RUs 17, 18 and 19.

In May 2005, as part of ongoing SRI/SFS discussions with EPA, FMC sampled wells downgradient from RUs 17, 18 and 19, including wells 106, 116, 143, 158, 167, and 183, for

volatile and semi-volatile compounds, arsenic, cadmium, selenium, potassium, ammonia, chloride, fluoride, nitrate, orthophosphate, and sulfate. Refer to Figure 5-1 for the location of these monitoring wells and inferred groundwater flow direction in this area of the FMC Plant OU. For more complete information on groundwater flow and the results of past sampling events, refer to the *GWCCR.*

The only organics detected in groundwater samples collected from these wells were dimethylphthalate and carbon disulfide. Dimethylphthalate, a common plasticizer and laboratory contaminant, was detected in wells 106, 116, 143, and 183 at very low levels, ranging from 0.03 mg/L to 0.014 mg/L, far below the comparative value of 370 mg/L. Carbon disulfide was detected only in Well 167, at 0.0041 mg/L, far below its comparative value of 1.0 mg/L.

As described in Section 5.0 of the *GWCCR*, all of these wells with the exception of Well 106 are within the footprint of or proximal to identified groundwater impact source areas (refer to Figure 5-1). Monitoring wells located downgradient from RU 19, including wells 116 and 167, are impacted by former Pond 8S and other old phossy ponds within RU22b. Wells 158 and 183 are located downgradient of the bull rock pile and slag pile and upgradient from former Pond 8S. However, these wells are in sufficiently close proximity to former Pond 8S (within about 100 feet of the pond area) to be potentially affected by releases from that pond. The average concentrations of sulfate and selenium at Well 183 are slightly higher than their representative concentrations, but none of the other indicator parameters (specific conductance, potassium, chloride, total phosphorus/orthophosphate and arsenic) are above their representative concentrations (see Table 4.2-12 in the *GWCCR*). Similarly, the average concentrations of potassium and sulfate (and specific conductance) in Well 158 are higher than their representative concentrations, but none of the other indicator parameters (chloride, total phosphorus/orthophosphate, arsenic and selenium) are above their representative concentrations.

Well 143 is located downgradient of the Slag Pile (RU 19) and is also downgradient from, and appears to be impacted by, the former unlined calciner ponds (RU 14) and potentially other EMF-impacted groundwater in the joint fenceline / calciner ponds area. Any potential groundwater impact from the slag pile at Well 143 cannot be differentiated from the joint fence line area / calciner pond impact observed at this well.

Well 106 is located immediately downgradient from the slag pile (RU 19) and is not downgradient from either the old phossy ponds (RU 22b) or the joint fenceline area / calciner ponds. Due to its location, Well 106 likely is the best well for assessing potential groundwater impacts from RU 19b. During the May 2005 sampling round, the potassium and sulfate concentrations in Well 106 slightly exceeded the representative concentrations (refer to Table 4.2-10A in the *GWCCR*), but none of the other indicator parameters (chloride, total phosphorus /orthophosphate, arsenic and selenium) were above their representative concentrations.

Boring logs and/or well construction diagrams for the borings / wells described in this section are available in the *EMF RI Report* and *GWCCR*. A detailed description of the geology and hydrogeology of the site, including the area of the landfill RUs is presented in the EMF RI and the *GWCCR*. As summarized above, FMC attempted to install a well at the RU 18 landfill and did not encounter alluvial or bedrock groundwater to a depth of (at least) 168 feet bgs. However, there are no borings or wells proximal to or within RU 17 and RUs 19b and 19c to determine

whether or not alluvial or bedrock groundwater is present in these areas. Therefore, there is some uncertainty regarding the presence of and, if present, exact flow direction of groundwater beneath RU 17 and RU 19b and 19c.

In summary, there is a limited potential for migration of constituents from RU 18 to impact groundwater, based on the finding that groundwater is not present beneath this unit to a depth of at least 168 feet bgs. Although there have been no deep subsurface investigations specific to RU 17 and RUs 19b and 19c, there is no indication that migration of constituents from these landfill areas has led to discernable landfill-specific (primarily organic compounds) impacts to groundwater at wells located along the downgradient margin of RU 19. As a component of the EPA's Presumptive Remedy for Municipal Landfill guidance document, long-term groundwater monitoring specific to RU 17 and RUs 19b and 19c will be evaluated during the SFS.

Risk to Human Health and the Environment. A quantitative evaluation of risks to hypothetical future workers from exposure to non-landfill materials in RU 19 (i.e., slag and bullrock) was performed as part of the Supplemental HHRA. This evaluation was conducted using conservative assumptions to bound potential risks to hypothetical future worker receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

The Supplemental HHRA also qualitatively evaluated potential risks to hypothetical future workers from exposure to fill and waste materials managed within plant landfills in RUs 17, 18, and 19b, and from wastes associated with the railcars disposed of in RU 19c. The wastes historically managed within each of the landfill RUs are documented in Table 5-2.

As shown in Table 5-2, RU 17 was used for the disposal of non-hazardous wastes, primarily construction/demolition debris. However, furnace debris with potentially elevated metal, radionuclide and PAH concentrations (associated with the calcined ore, coke, slag, and ferrophos)) was also disposed of in RU 17. In addition, slag with elevated metal and radionuclide levels, covers some portions of RU 17. Therefore, to the extent that slag and furnace debris are present within the 0-to 10 foot bgs interval, there is the potential for hypothetical future workers to be exposed to chemical and radiological COCs above a level of health concern in this RU.

Relatively small amounts of wastes containing constituents of potential concern were historically placed in RU 18. Specifically, metals, radionuclides and P4 associated with AFM, and asbestos containing materials (ACM) were historically disposed of in this RU. In addition, slag with elevated metal and radionuclide levels covers the surface of RU 18. Therefore, to the extent that AFM, ACM and slag are present within the 0-to-10 feet bgs interval there is the potential for hypothetical future workers to be directly exposed to related COCs above a level of health concern in this RU.

The same wastes placed in RU 18, potentially containing elevated metal, radionuclide, P4 and asbestos levels, were also historically disposed of in RU 19b. In addition, furnace debris, spent solvents, oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, and fluid-bed dryer wastes, potentially containing elevated metal, radionuclide, P4, VOC, SVOC, and PCB levels, were also disposed of in RU 19b. However, due to the depth of burial (> 10

feet), direct worker exposure to COCs within wastes managed in RU 19b is not considered plausible unless site conditions change in a way that brings the wastes significantly nearer to the ground surface. Instead, hypothetical future workers in this RU would only be exposed to slag within the 0-10 ft bgs interval. Consequently, the quantitative risks to workers projected for the slag pile (RU 19) in Section 4 are also applicable to RU 19b.

Similar to RU 19b, while elevated P4 concentrations are likely associated with the railcars buried by slag in RU 19c, the depth at which they are covered (100+ feet) is too great for hypothetical future workers in this area to be directly exposed unless site conditions change in a way that brings the wastes significantly nearer to the ground surface. Also, while P4 could potentially react with any residual water in the railcars to form phosphine, it is not considered plausible that hypothetical future workers could be exposed to phosphine gas from this potential source. Instead, any generated phosphine would be expected to break down very quickly in the subsurface via initial sorption followed by biotic and abiotic oxidation (ATSDR, 1997; ATSDR, 2002). Consequently, the quantitative risks to workers projected for the slag pile (RU 19) in Section 4 are also applicable to RU 19c.

In summary, potential future outdoor workers could be directly exposed to chemical and radiological constituents above a level of health concern associated with surficial slag and several wastes historically managed in RUs 17 and 18. By contrast, due to the large depth of slag burial, risks to future workers in RUs 19b and 19c correspond to those associated with the entire slag pile (RU 19) unless site conditions change in a way that brings the wastes significantly nearer to the ground surface. Finally, current groundwater data from wells located along the downgradient margin of RU 19 do not indicate discernable landfill-specific (primarily organic compounds) impacts to groundwater at the FMC Plant Operable Unit. Thus, there is no indication that additional excess risk, i.e., risk above the incremental risk already identified for FMC-impacted groundwater within the FMC Plant OU, due to leaching of COCs from wastes disposed of in RUs 17, 18, 19b and 19c would result from exposure to groundwater downgradient of the landfills and railcar disposal area.

Information to Support the SFS. The nature and extent of contamination and the corresponding risks posed to human health and the environment associated with materials landfilled in RUs 17, 18 and 19b, and the railcars disposed of in RU 19c, have been sufficiently bound to evaluate remedial alternatives. The process to evaluate remedial alternatives is described in the *SFS Work Plan* (MWH 2008a) and is consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.6 RU 22b – Old Ponds

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report regarding RU 22b provide generally sufficient information to characterize the nature and extent of contamination associated with the fill materials, incidental source materials, P4, and impacted soils at this RU. The types of fill materials were identified through perimeter sampling and through review of operational records and process descriptions. The identified fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. The Supplemental HHRA conservatively assumed that all of the identified fill and source materials in Table 4-2 were present in RU 22b. These fill materials have been characterized

based on analyses of each of these fill types from samples collected elsewhere on the FMC Plant Site where the same fill type is found.

While delineation of fill and impacted soils in this RU was completed for 16 of the 22 perimeter borings, eight (8) of those delineation borings did not extend fully beyond the impacted areas, as shown on Figure 4-25. As described below, additional step-out borings could be accomplished later in the CERCLA process either during the SFS evaluations or during the remedial design and remedial action that will be necessary for this RU.

In addition to the fill materials, Table 4-2 also references the underground piping located in RU 22b and states the presumption that these include precipitator slurry and phossy water-related piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in the Supplemental HHRA and are discussed in Section 5.2.11 below. The piping and underground structures at this RU, as well as the materials they likely contained, have been inventoried and designated on maps to assist with the SFS process.

Additionally, samples collected across RU 22b indicate that radon flux from the old ponds does not represent a hazard.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers, associated with exposure to residual fill materials, exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in this RU exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) only exceed ROD RAOs for select incidental fill materials present in RU 22b. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

Lastly, the presence of P4 beneath RU 22b represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

Risk to the environment, specifically groundwater, is possible due to the presence of former unlined ponds in this RU that operated with a standing hydraulic head. Under a sustained head, there is a potential of subsurface contaminant migration to groundwater. A more detailed discussion of groundwater associated with the entire FMC Plant OU is presented in the *GWCCR*.

Information to Support the SFS. The nature and extent of contamination associated with fill and impacted soils at this RU and the risks posed to human health and the environment have been largely bound and are sufficiently bound to evaluate remedial alternatives. Additional step-

out borings may ultimately be required for delineation of old phossy pond solids and impacted soils where eight (8) of the 22 original SRI borings exceeded one or more SSLs. However, the SFS evaluation of alternatives is currently feasible given that later stages of the CERCLA process sufficiently define the additional lateral extent of impact beyond these eight (8) borings. Remedial design remedial action activities can adequately delineate the extent of contamination (and therefore the extent of remedial action) taking into account historical information, RI data, SRI data, and further delineation/confirmation sampling as appropriate. Conservative assumptions regarding the additional area/volume of impact would allow evaluation of remedial alternatives, and those assumptions could be verified later in the CERCLA process. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.7 RU 22c – Railroad Swale

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report for RU 22c provide sufficient information to characterize the nature and extent of contamination associated with the fill materials, incidental source materials including P4 in this RU. The types of fill materials were identified through visual inspections that were drilled through the fill to collect samples of the underlying native soil, and through review of operational records and process descriptions. These fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. These fill materials have been characterized based on multiple analyses of these same fill materials from samples where they occur elsewhere on the FMC Plant Site.

Elemental phosphorus (P4) is known to be present in the subsurface in this RU and can spontaneously combust when exposed to air, creating an unacceptable acute hazard to sampling personnel. As a result, no samples were collected directly from RU 22c. Instead, trenches and borings were made to visually define the lateral extent of P4 to gain further information about the type, depth and volume of predominant fill materials and to confirm the lateral limits of potential P4 in the shallow subsurface associated with past operations at this RU.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, risks to potential future workers, associated with exposure to residual fill materials, exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in this RU exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) only exceed ROD RAOs for select incidental fill materials present in RU 22c. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

Lastly, the presence of P4 beneath RU 22c represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

Information to Support the SFS. The nature and extent of contamination associated primarily with P4 and fill at this RU and risks posed to human health and the environment have been sufficiently bound to evaluate remedial alternatives. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.8 Other RUs

Nature and Extent of Contamination. SRI findings for the remaining RUs, where P4 is not present and where ponds were never located, are presented in Section 4 for:

- RU 3 - Receiving Stores, Paint Shop and P_4 Decon
- RU 4 - Office Buildings and Training Center
- RU 5 - Lab and Old Drainfield
- RU 6 - Former Long-Term Phos Storage Tanks
- RU 7 - Shale Unload, Crushing and Stockpile
- RU 9 - Silica Stockpiles and Former Kiln Scrubber Overflow Pond
- RU 10 - IWW Pond and Ditch
- RU 11 - Equipment Area South of Calciners
- RU 20 - Former Bannock Paving Area
- RU 21 - Other On-site Railspurs
- RU 23 - Road Segments not within RU Boundaries
- RU 24 - Plant Areas not within RU Boundaries

These findings indicate that sufficient information has been collected to characterize the nature and extent of contamination associated with the fill materials in these RUs. The types of fill materials were identified through visual inspection of borings that were drilled through the fill to collect samples of the underlying native soils, and through review of operational records and process descriptions. These fill types (surface, subsurface, and incidental) are described in Section 4 and are enumerated in Table 4-2. The characteristics of these fill materials have been determined based on multiple analyses of these same fill materials from samples where they occur elsewhere on the FMC Plant Site.

In addition to the fill materials, Table 4-2 also references the underground piping located in RUs 3, 12 and 24 and states the presumption that these include precipitator slurry and phossy water-related piping that could contain residual P4 and other materials. Potential risks associated with these presumed source materials are separately evaluated in the Supplemental HHRA and are discussed in Section 5.2.11 below. The piping and underground structures at these RUs, as well as the materials they likely contained, have been inventoried and designated on maps to assist with the SFS process.

Other special investigations at RUs 4, 5, 12, and 20 determined that 1) organic constituents (i.e., lab and shop-related solvents, fuel related VOCs and PAHs, coke PAHs, and PCBs), 2) phossy water constituents and 3) radon flux are not of concern in any of these RUs. Targeted soil samples were collected from primarily native materials in these RUs and the results indicate that none of the above organic constituents were elevated in native soils, with the exception of RU 20. In RU 20, fuel-related PAHs were elevated in native soil from three borings as discussed in Section 4. However, a phase two investigation bounded the nature and extent of the fuel-related impacts.

Results from native soil samples collected at RUs 3, 6, and 10 for phossy water constituents indicated that these constituents were not detected in soils. In addition, samples collected across RUs 7, 19, and 22b indicated that radon flux from the ore pile, the slag pile, and the old phossy ponds does not represent a hazard.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, with the exception of RUs 21 and 23, risks to potential future workers associated with exposure to residual fill materials exceed several of the RAOs specified in the 1998 ROD. Specifically, risks from chronic exposure to the fill materials predominantly present in these RUs exceed the ROD RAO for the external exposure to gamma radiation pathway. Risks from chronic and subchronic exposures via other pathways (i.e., ingestion and inhalation) only exceed ROD RAOs for select incidental fill materials present in several of these RUs. However, given that the fill materials driving risks via these alternate pathways are incidental in nature, it is unlikely that a potential future receptor would be continuously and exclusively exposed to just those specific fill materials. Thus, actual risks via the ingestion and inhalation pathways are likely to be significantly lower than estimated in the bounding Supplemental HHRA.

With respect to RUs 21 and 23, risks to potential future workers (utility workers in RU 21 and maintenance workers in RU 23) associated with exposure to residual fill materials do not exceed the 1998 ROD RAOs.

The concentrations of contaminants in native soils beneath the fill materials in these RUs do not exceed conservative screening levels and thus do not pose a risk of migration to groundwater.

Information to Support the SFS. The nature and extent of contamination associated with fill in RUs 3, 4, 5, 6, 7, 9, 10, 11, 12, 20, 21, 23 and 24 and the risks posed to human health and the

environment have been sufficiently bound to evaluate remedial alternatives in the supplemental FS. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.9 Other Studies – Southern and Western Undeveloped Areas

Nature and Extent of Contamination. The SRI findings presented in Section 4 of this report regarding the southern undeveloped area (SUA) and western undeveloped area (WUA) indicate that sufficient information has been collected to characterize the nature and extent of potential COCs/ROCs in these areas.

The PIC measurement results verify the EPA 1987 Aerial Gamma Survey for both the SUA and WUA. Anomalous elevated readings in these areas appear to be the result of a combination of factors including disturbed areas, shine, slag roadways, and outcrops. The pattern of the elevated readings is not indicative of aerial deposition. Disregarding the elevated readings due to disturbed areas and roadways, the range of gamma dose rate values is at or near the mean historically established background exposure rates. The disturbed areas with slag, as well as the slag roadways, will be evaluated with other RUs such as RU 19 and RU 23 during the SFS.

Risk to Human Health and the Environment. A screening ecological assessment of the SUA and WUA was performed and documented in Section 5 of the *RI Update Memo*. The ecological assessment, which is presented in Appendix B of this Report, found that risks to ecoreceptors in the undeveloped areas were only slightly above a hazard quotient of one for vanadium and marginally above the threshold for toxic effects relative to fluoride. The conservative nature of the vanadium assessment likely resulted in an overestimate of risk, particularly considering a site use factor of one was assumed for the species in which exceedances were estimated (e.g., coyote and pygmy rabbit) as well as the likely low bioavailability of vanadium due to alkalinity of regional soils.

While risks to human health in the SUA and WUA were not specifically evaluated in the SRI, 100 gamma dose rate measurements were taken in both the SUA and WUA using a PIC. Apart from some elevated readings (i.e., anomalies) caused by factors such as shine and the slag in the roadways, the gamma dose rates in these areas are within the range of historically established background levels. Thus, incremental cancer risks associated with gamma exposure would not exceed the 1998 ROD RAO for external exposure to gamma radiation.

Information to Support the SFS. The nature and extent of contamination associated with native soils in the SUA and the WUA and the risks posed to human health and the environment have been sufficiently bound to evaluate remedial alternatives. As described in Sections 4.22 and 4.23, where necessary, the incidental anomalies identified within the SUA and WUA will be addressed in developing the remedies for adjacent RUs in the SFS and remedial action process. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.10 Other Studies - PCDT and Precipitator/Phossy Solids on Roadways

Nature and Extent of Contamination. The SRI findings presented in Section 4 regarding slag roadways and asphalt with slag aggregate roadways that may have received PCDT water or

precipitator solids, both within and outside RU boundaries, indicate that sufficient information has been collected to characterize the nature and extent of contamination associated with these roadways.

Risk to Human Health and the Environment. Risks to human health have been calculated for RU 23, Road Segments not with RU Boundaries, using conservative assumptions. The Supplemental HHRA presented in Appendix J details these assumptions and the resulting bounding calculations of risks. In summary, risks to maintenance workers using the roadways to access other are of the site are below the 1998 ROD RAOs.

Information to Support the SFS. The nature and extent of contamination associated with roadways that may have received PCDT or precipitator solids have been sufficiently bound to evaluate remedial alternatives. The Supplemental HHRA has evaluated the risks that RU 23 roadways may pose to human health and the environment. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.11 Underground Piping

Nature and Extent of Contamination. In addition to the fill materials, Table 4-2 also references the underground piping located in RUs 1, 2, 3, 8, 12, 13, 22b and 24 and states the presumption that these include precipitator slurry and phossy water-related underground piping that could contain residual P4 and other materials. This is shown on Figure 4-34. Potential risks associated with these presumed source materials are separately evaluated in the Supplemental HHRA and are summarized herein. The piping and underground structures at these RUs, as well as the materials they are presumed to contain, have been inventoried and located on maps to assist with the SFS process.

Risk to Human Health and the Environment. A Supplemental HHRA was performed using conservative assumptions to bound risks to potential future receptors. The Supplemental HHRA report, which details the methods, assumptions and findings of the bounding assessment, is included as Appendix J.

In summary, incremental non-cancer risks via the soil ingestion pathway, which are associated with assumed prolonged exposure to non-smoking P4 at a concentration of 3,000 mg/kg, exceed the 1.0 hazard index RAO specified in the 1998 ROD. Risks to utility workers from exposure to other COCs/ROCs associated with leaks from underground precipitator slurry and/or phossy water pipelines are below the 1E-04 and the 1.0 hazard index RAOs specified in the 1998 ROD. However, the potential presence of residual P4 in underground piping also represents an unacceptable acute hazard to potential future receptors due to the potential for P4 to spontaneously combust, potentially causing burns and forming phosphoric acid aerosols to which receptors beyond this area could also be exposed.

Information to Support the SFS. The nature and extent of contamination associated with the underground piping and the risks posed to human health and the environment have been sufficiently bound to evaluate remedial alternatives. The process to evaluate remedial

alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

5.2.12 EPA Designation of Principal Threat Waste (EPA letter dated February 11, 2009)

EPA has designated underground piping containing P4, where, in addition to toxicity and risk, its concentration and its presence in shallow soils where there is higher risk of exposure, will be considered principal threat waste. The SRI Report identifies the RUs or specified areas within RUs that are assumed to contain elemental phosphorus materials and an estimate of the volume of P4 within those RUs or specified areas within RUs that will be considered for source treatment in the SFS. As such, a remedial action objective (RAO) to address principal threat wastes will be developed and included in the SFS Work Plan.

5.3 UPDATE OF THE CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was initially prepared for the EMF Site in 1996. Section 5.0 of the *EMF RI Report* presented the CSM based upon the RI. The EMF Site study area was broadly defined by the EPA to include the adjacent FMC and Simplot phosphate ore processing facilities in Pocatello, Idaho; extensive portions of the Michaud Flats and Bannock Range in the vicinity of the processing facilities; nearby sections of the Portneuf River, which emerges from the Pocatello Valley onto Michaud Flats east of the facilities; and portions of the American Falls Reservoir.

Following the FMC plant shutdown in December 2001, it was necessary to update the CSM primarily for the former working areas of the FMC Plant Site south of Highway 30. The CSM was updated based on the *SRI/SFS AOC* which directed FMC in Task 1.2 to "update the CSM and identify working areas at the plant excluded from the ROD." In 2004, an *RI Update Memo* was prepared and approved in which tasks 1.2 through 1.5 of the AOC were completed. The following subsections provide an update of the 2004 FMC Plant OU CSM based on the SRI findings with respect to the following:

- Sources and COCs/ROCs
- Release mechanisms
- Exposure media
- Receptors and routes of exposure

Note that additional soil investigations were not performed at RUs 17 and 18 during the 2007 SRI (i.e., the landfill RUs) based on the information presented in the *RI Update Memo*. However, the CSM has been updated for these landfill RUs and the landfill in RU 19b (and the buried railcars in RU 19c) so that they can be carried into the SFS for the FMC Plant OU.

5.3.1 Update: Potential Sources

This section discusses potential sources, as identified during the SRI and based on process knowledge, that were not included in the original RI CSM or the 2004 CSM update for the FMC Plant OU. This section also discusses changes in the characterization of several potential sources that were included in these CSMs.

Residual Elemental Phosphorus (P4) from Former Spills and Process Leaks at P4 Production, Storage, and Handling Areas*:* The RI CSM in the EMF Site ROD recognized that phossy water and precipitator slurry containing P4 were managed in ponds over the course of plant operations (RUs 22a and 22b) and that phossy water spills from the phosphorus dock impacted the railroad swale (RU 22c). Residual P4 from former spills and process leaks at P4 production, storage, and handling areas (RUs 1 and 2) was identified as a potential source in the updated 2004 CSM.

During the SRI, P4 was observed (as evidenced by smoking) in soil borings advanced into the capillary fringe downgradient of the furnace building (to the northeast of RU 1), trenching within soils at the railroad swale (RU 22c), and borings advanced into soils at the former Pond 8S recovery process (RU 13). The original sources of the P4 identified in these areas are likely to have been the following:

- RUs 1 and 2: Furnace building and phos loading dock sumps and slag pit
- RU 13: Pond 8S recovery process and/or former phossy pond-related spills
- RU 22c: Spills and leaks from the phos loading dock that flowed through storm sewers or overland to the railroad swale

Specific P4 investigations were performed during the SRI for the receiving, stores, paint shop, and P4 decon area (RU 3), long-term P4 storage area (RU 6), and non-contact cooling water discharge ditch (RU-10). No P4 was observed or measured in soils within these areas and as a result, these RUs are not in the updated CSM Figure 5-1.

Based upon the underground piping inventory that the SRI developed, RUs 1, 2, 3, 8, 12, 13, 22b, and 24 were identified as potentially containing underground piping/sumps and structures (abandoned in place) that are presumed to contain COCs/ROCs (including P4) associated with process and waste streams. As a result, these RUs are in the updated CSM Figure 5-1. This inventory will be used during the detailed analysis of alternatives during the SFS.

RUs 18 and 19b have been added to the CSM figure because of site knowledge regarding disposal of Anderson filter media (AFM) that potentially contains small amounts of P4 in these landfills. RU 19c has also been added to the CSM as result of the buried rail cars within the slag pile that contain phossy sludge. Refer to Section 4.15 for a discussion of the history of RU 19.

Fugitive Particulate Emission Reductions: As updated in the 2004 CSM, FMC completed 13 Supplemental Environmental Projects (SEPs) during 1999-2001 pursuant to the *FMC RCRA Consent Decree* (entered July 13, 1999 [FMC, 1999]) that collectively reduced particulate emissions from on-going facility operations by approximately 80 percent. Moreover, emissions

from these sources as well as other sources evaluated during the RI were subsequently eliminated upon cessation of elemental phosphorus processing operations in December 2001. Consequently, FMC plant emissions associated with stacks and vents and operating areas were not identified as sources in the updated 2004 CSM. Since that time the plant process buildings, equipment, piping, stockpiles, and structures have been demolished down to ground level (with exception of the rotary railcar dumper in RU 7). In addition, with the completion of plant decommissioning and demolition activities, traffic within the FMC Plant Site and associated fugitive emissions have been greatly reduced. However, the current CSM recognizes that surface fill materials and contaminated surface soils (impacted by air deposition, mechanical mixing, or leaching/infiltration) remain as potential secondary sources.

Petroleum Underground Storage Tank Removal: During plant operation, the FMC Plant Site utilized numerous in-plant vehicles. These were typically fueled on site from underground tanks that stored diesel fuel and unleaded gasoline. Historically, there were a number of USTs on site for fuels and lubricants. However, these were either closed prior to or pursuant to the UST closure requirements (40 CFR Part 280 Subpart G). The final two underground storage tanks, maintained at the facility for diesel and gasoline fueling, were emptied and removed in August 2006. These two tanks were subject to the notification, design, monitoring and closure requirements of 40 CFR Part 280. With the removal and closure of these two petroleum USTs, there is no longer a potential primary source of petroleum release (other than mobile sources) at the FMC Plant Site.

Landfills: Table 5-2 provides a description of the wastes disposed in RUs 17, 18, and 19b and estimated volumes (where possible), in addition to descriptions of landfill operations and the history of waste disposal and current cover on each of these RUs.

RU 17, the construction debris landfill (CDLF), primarily received furnace feed and carbon materials from furnace rebuilds and digouts, in addition to incidental amounts of other construction debris from plant-improvement capital projects. The furnace debris would have contained elevated metal and radionuclide concentrations similar to the levels detected in ore and slag.

RU 18, the current SWLF, began operation concurrently with RU 17. It primarily received non-hazardous office wastes and non-hazardous industrial wastes (including PCDT lime filter cake, packaging wastes, baghouse filters, building materials, and spent carbon). RU 18 also has minor residual quantities of lubricants associated with empty drum carcasses that were crushed and landfilled, asbestos containing wastes, process equipment and PPE with minor amounts of P4, and AFM with potentially small amounts of P4.

RU 19b, the former plant SWLF, contains all the landfill wastes that were generated and disposed at the plant from plant startup in 1949 until approximately 1980, when the new plant landfills (RUs 17 and 18) were opened. Plant wastes were either recycled or disposed of in RU 19b. FMC personnel have indicated that the following hazardous materials may have been placed in the former solid waste landfill (based on process knowledge) - asbestos wastes, spent solvents, oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, fluid-bed dryer wastes, and AFM. In addition, 21 railcars containing phossy sludge were disposed of

in a separate area of the slag pile (designated as RU 19c) and were buried as slag disposal continued during the plant operation.

None of the organic COPCs associated with the landfilled wastes have been detected in the downgradient Well 106. However, the current CSM recognizes that landfill wastes including office trash, furnace feed and carbon, empty containers with residual COCs (potentially including VOCs and SVOCs), and metals, radionuclides, and fluoride remain as potential primary sources of subsurface soil contamination and potentially groundwater contamination. The updated site COC list can be found in Table 5-3 of this *SRI Report.*

5.3.2 Update: Potential Release Mechanisms

This section identifies 1) a release mechanism (process spills containing P4) identified during the SRI that was not described in the original RI CSM or the 2004 CSM update for the FMC Plant OU and 2) changes in the characteristics of several potential sources that were included in these CSMs.

Seepage/Percolation: The original EMF Site CSM identified seepage/percolation as a release mechanism associated with ponds and other waste management units, without classifying units with respect to whether they were operated with or without a sustained hydraulic head. The 2004 CSM update recognized seepage/percolation as a release mechanism associated with sources that operated with a sustained hydraulic head or had limited applied head. SRI findings of P4 in the capillary fringe (the vadose zone soil immediately above the groundwater) on the northeastern corner of RU 1 require an update to the CSM for seepage/percolation of P4 to groundwater and the lateral movement of P4 within groundwater. In addition, the landfills in RUs 17, 18 and 19b and the railcar disposal area (RU 19c) have been retained in Figure 5-2 as areas where precipitation infiltration/percolation is a primary COPC release mechanism.

The melting point of P4 is 44°C, so it will typically solidify and thus not flow as liquid in soil at ambient temperatures. Although P4 can supercool and remain a liquid under quiescent conditions, it would be expected that all P4 in soil at temperatures below 44°C has solidified by this time. P4 was typically handled in the phosphorus areas (RUs 1 and 2) as a liquid at temperatures between 60°C and 66 °C. Molten slag was tapped almost continuously into the slag pit for 50 years. As a result, heat from these operations transferred via convection into the underlying strata. With the ground being heated above the melting point of P4, any P4 released into the subsurface in the areas of RUs 1 and 2 could remain a liquid and mobile (i.e., moving downward through the vadose zone to groundwater) while within this thermal plume area.

It is also recognized that liquid P4 can evaporate and solid P4 can sublime to generate vapor P4, which would be expected to transport some distance within the vadose zone soils. Such transport of vapor P4 could present a exposure pathway to site utility and construction/utility workers working below grade at or near areas of soil P4 contamination and, to a lesser degree, site workers working above-ground in these areas. Therefore, vapor P4 has been included in the CSM as a potential release mechanism. However, it should be noted that 169 SRI soil samples were submitted to the laboratory for P4 analysis from areas where P4 was suspected of being present. All resulted in non-detects for P4 (with the exception of two very low level detects, consisting of one duplicate sample near RU 2 and one sample at RU 10). Based on these

findings, migration of vapor-phase P4 in shallow soil (e.g., 10 ft bgs, the depth of potential future utility and construction worker exposure to soils) beyond RUs 1 and 2 has not been observed.

The *RI Update Memo* identified RUs 1 and 2 as former P4 working areas in which P4 was likely to have been released to the subsurface, through either documented and suspected historic spills or leaks from process equipment such as P4 product sumps. RUs 1 and 2 are considered together because of their proximity, their potential as sources of P4, and the documented occurrence of P4 in the subsurface within their boundaries.

During the SRI, P4 was encountered (as evidenced by smoking) at boring locations RU1-SB004, RU1-SB004a, and RU1-SB005 (see Figure 4-2) at a depth of approximately 80 feet bgs (the capillary fringe), but not in the soils above this depth. The investigation did not extend below the groundwater interface and groundwater was not sampled as part of the SRI. Additional sampling further downgradient (borings SIA1-SB001, SIA1-SB002, SIA1-SB003, SIA1-SB004, SIA1-SB005, SIA1-SB006, and SIA1-SB007) indicated that P4 was not present in the capillary fringe approximately 500 feet downgradient of RU 1. Given that P4 was not encountered in the soil above 80 feet bgs, vertical migration of P4 from the surface (or near surface) to the capillary fringe at these locations is unlikely. Rather, the source was likely releases of P4 to the subsurface from process sumps within the furnace building or catch basins in the slag pit and within the predicted soil column 44 °C isotherm boundary. As P4 was released from these sources within the 44ºC isotherm, it was maintained above its melting temperature of 44ºC and moved downward through the vadose zone along the path of least resistance. The actual path through the vadose zone would be determined by the structure of the underlying soil layers and the soil temperature (i.e., higher soil temperatures would facilitate higher flow rates). As described in the *RI Update Memo* and the *GWCCR*, the groundwater temperature at well 108 exceeded 28°C (at its peak temperature), suggesting that groundwater with temperatures of greater than 44°C could have underlain the furnace building and slag pit (the most intense heat source), allowing horizontal migration of liquid and/or semi-solid particles of P4 at the groundwater interface (capillary fringe). Upon reaching areas where the vadose groundwater interface and groundwater was below 44ºC, the P4 may have been further transported downgradient with the capillary fringe as a suspended solid (colloidal, particle, or particle-sorbed state). As the suspended and dissolved P4 migrated downgradient in the groundwater, P4 collected in the capillary fringe soils immediately above the groundwater. The soil borings identified above, which did not have P4 present, define the maximum downgradient extent of P4 collection in the capillary fringe soils.

The depth to groundwater at wells 108 and 122 (proximally downgradient from RUs 1 and 2) has ranged from 84 to 89 feet bgs and 77 to 82 feet bgs, respectively, since the wells were installed in 1990. The measured depth to groundwater in these wells is consistent with the observed presence of P4 in soils overlying the shallow groundwater at approximately 80 feet bgs in borings RU1-SB004, RU1-SB005, and step-out boring RU1-SB004A (i.e., the P4 is located in the capillary fringe soil).

The presumed source and migration pathway of P4 from the furnace building, phos dock, secondary condenser and slag pit areas are consistent with historic information and previous investigations. Groundwater has been sampled and analyzed for P4 using Method 7580 at numerous locations across the site.

Based on the results of the initial EPA-led groundwater sampling and analysis for P4 in 1998 and subsequent sampling and analysis since that time, Wells 108 and 122 were the only wells where P4 was detected above the reporting limit in groundwater at the FMC Plant OU. Well 108 P4 results range from undetected (at 0.0002 mg/l) to 0.179 mg/l, while Well 122 P4 results range from undetected (at 0.0002 mg/l) to 0.007 mg/l (data through third quarter 2007). Both of these wells are proximally downgradient of the furnace building and near the cap delineation borings where P4 was encountered. In addition, no other SRI or historic soil boring and/or well logs, within or outside the FMC Plant OU, have recorded encountering P4 at depths greater than 10 feet bns.

Taken as a whole, this evidence suggests that the P4 source and mode of potential migration are as described above. This information is depicted in Figure 5-2 as a solid line from P4 sources via seepage/ percolation to underlying groundwater. The updated CSM recognizes this P4 release mechanism through the vadose zone and pathway to groundwater within and immediately downgradient of RUs 1 and 2.

Landfills. Precipitation infiltration and/or percolation of contaminants are the primary release mechanisms for the site landfills in RUs 17, 18, and 19b. Release mechanisms are described for these landfills in the *RI Update Memo* and in this report. The primary release mechanism identified in Figure 2-10 of the *RI Update Memo* and Figure 5-2 in this document is infiltration/percolation of precipitation through the landfill wastes to subsurface soils underlying these landfills. It then would be possible for COPCs to move vertically through precipitation infiltration into the underlying groundwater, if it exists beneath these landfills, and to be transported downgradient. However, organic COPCs have not been detected above comparative values in groundwater wells located downgradient of RU 19.

In RU 19c, P4 could potentially react with any residual water in the buried railcars to form phosphine. However, any generated phosphine would be expected to break down very quickly in the subsurface via initial sorption followed by biotic and abiotic oxidation (ATSDR, 1997; ATSDR, 2002). Thus, given the large depth at which the railcars are buried by slag (100+ feet), it is not considered plausible for phosphine to be released at the surface of RU 19c.

5.3.3 Update: Potential Exposure Media

This section updates the description of environmental media identified during the SRI that could be impacted by potential releases from sources within the FMC Plant Site that 1) were not addressed in the original RI CSM or the 2004 CSM update for the FMC Plant OU or 2) were included in these CSMs but whose characterization has changed based on the SRI findings. Refer to Figure 5-1 for the changes to the CSM based on the SRI finding discussed below.

Soil: Soil quality impacts that will be updated in the current CSM as a result of the SRI include:

- Migration of P4 from manufacturing, storing, and loading facilities within the soil column 44ºC isotherm in RUs 1 and 2 down to the capillary fringe soils, including capillary fringe soils downgradient (to the northeast of RU 1) for a distance up to approximately 500 feet.

- Numerous special investigations were conducted during the SRI for solvents, fuels, PCBs, and coke in RUs 4, 5, 12, 20. With the exception of three boring locations in RU 20 at the shallow native soil samples, no organic samples exceeded SSLs.

Air: Air quality impacts that will be updated in the current CSM as result of the SRI include:

- Radon emanation from feedstocks, byproducts, or waste materials containing radium-226 were measured in the ore stockpile area (RU 7), slag pile (RU 19), bull rock pile (RU 19a), former solid waste landfill (RU 19b) and in the former waste pond areas (RU 22b). While some radon emanation rates were measured to be slightly higher than background, the emanation rates were significantly lower than the UMTRCA guideline of 20 µR/hr. Radon emanation does not constitute an exposure pathway of concern for future workers.

- Inhalation of volatile organic vapors in RUs 4, 5, 12, and 20 is not an exposure pathway of concern, as special investigations in these areas during the SRI did not find organic samples above SSLs (with the exception of three borings in RU 20 that had shallow native soil samples exceeding SSLs).

Groundwater: Groundwater quality may have been impacted through the following release mechanisms:

- Migration of P4 from manufacturing, storing, and loading facilities within the soil column 44ºC isotherm in RUs 1 and 2 down to the capillary fringe soils and groundwater, including capillary fringe soils downgradient (to the northeast of RU 1) for a distance up to approximately 500 feet.

5.3.4 Update: Potential Receptors and Routes of Exposure

This section updates the potential receptors and routes of exposure identified during the SRI that could be affected by potential releases from sources within the FMC Plant Site. Potential receptors and routes of exposure are depicted in Figure 5-2.

***Potential Receptors*:**

- Commercial/Industrial Worker. Indoor office workers could be exposed to COCs/ROCs in dust generated from the erosion of surface soils. Outdoor workers could be exposed to COCs/ROCs in the upper two feet of soil. These receptors were previously identified in the *RI Update Memo.*

- Utility Worker. Utility workers performing excavation work for utility line installation could be exposed to COCs/ROCs in the upper 10 feet of soil. This receptor was previously identified in the *RI Update Memo.*

- Construction Worker. Construction workers, performing excavation work for construction purposes, could be exposed to COCs/ROCs in the upper 10 feet of soil. This receptor was previously identified in the *RI Update Memo.*

- Maintenance Worker. Future maintenance workers, performing work to maintain

specific areas of the site (e.g., capped ponds), could be exposed to COCs/ROCs present at the surface of existing roadways used to access their areas of work. This receptor was not identified in the *RI Update Memo*, but was added to the Supplemental HHRA.

- Off-Site (Nearby) Resident. Off-site residents, hypothetically located at the site boundary, could be exposed to COCs/ROCs in fugitive dust generated by wind erosion during non-construction periods, and fugitive dust generated by work activities during periods of construction. This receptor was previously identified in the *RI Update Memo.*

***Potential Routes of Exposure* (as identified in the *RI Update Memo*)**

- Via Ambient Air:
  - Direct inhalation of fugitive dust by outdoor site workers and offsite residents.
  - Direct inhalation of smoke (P2O5) by utility workers, construction workers or downwind receptors in the event that P4 is encountered during subsurface excavation at a concentration sufficient to spontaneously ignite.
  - Inhalation of radon released from the subsurface by outdoor workers.
  - Inhalation of volatile organic compounds (associated with solvents and fuels historically used in specific areas of the plant site) by outdoor workers.
- Via Soils:
  - External exposure to gamma radiation associated with decay of uranium-238 and its daughters and potassium-40 in soils, byproducts, and waste materials by outdoor workers.
  - Incidental ingestion of constituents in soils by outdoor and indoor workers.
  - Dermal absorption of constituents in soils by outdoor workers.
  - Direct dermal contact to P4 (and fire) by utility or construction workers in the event that P4 is encountered during subsurface excavation at a concentration sufficient to spontaneously combust.

As result of the SRI field work and evaluations, risks associated with exposure to COCs/ROCs under several of the identified routes were determined to be no greater than those associated with background exposure, or below conservative risk-based screening levels. As such, the following exposure pathways have been deemed to be of no further concern in the CSM:

- Inhalation of radon in ambient air does not appear to be a significant potential route of exposure. The SRI has shown radon emanation rates to be very low (at or near background), and significantly lower than the risk-based UMTRCA guideline of 20 pCi/m^2/second.

- Inhalation of volatile organic vapors in ambient air in RUs 4, 5, 12, and 20 does not appear to be a significant potential route of exposure. Special investigations in these areas during the SRI did not find volatile organic COPCs in any samples above SSLs.

- Via Groundwater and Surface Water/Sediment:

  Receptors and routes of exposure (i.e., incidental ingestion, dermal contact, and consumption of fish) associated with groundwater as well as surface water and sediment impacted by the discharge of impacted groundwater are addressed in the EMF Site ROD with respect to the Off-Plant Subarea. Consistent with the *SRI Work* Plan, groundwater throughout the FMC Plant OU and soil conditions at FMC properties north of Highway 30 are not the subject of this SRI report. Those instead will be addressed in current conditions reports that review historical data and data collected subsequent to the EMF RI report. Those reports will be submitted separately to EPA for review.

5.3.5 Update: Site-Related Constituents

This section updates the identification of site-related constituents associated with potential releases from sources within the FMC Plant OU. The updated COCs/ROCs evaluated in the current CSM based upon the SRI are shown in Table 5-3.

5.3.6 Current Conceptual Site Model

The current CSM, along with its associated notes, is presented in Figure 5-2. This CSM is a revised version of the 2004 CSM as updated by the SRI findings regarding current site conditions. The updated CSM reflects the recent changes at the FMC Plant Site based on these SRI findings, illustrates the fate and transport of contaminants from source areas to other media, and identifies which media are of principal concern with respect to potential current and future receptors and exposure pathways.

5.4 RECOMMENDATIONS

The information presented in the conclusion and CSM sections indicates that the nature and extent of contamination associated with fill and impacted soils at the majority of RUs have been largely bound and the risks posed to human health and the environment are sufficiently understood to allow the CERCLA process to proceed to the SFS. However, potential groundwater risks from a number of FMC Plant Site sources require a more detailed evaluation. Because groundwater characterization was not an element of the SRI Work Plan and thus was not conducted as part of the SRI, FMC will submit a separate report to EPA regarding current groundwater conditions at the FMC Plant OU to support the SFS.

Discussed below are the recommendations for further evaluation of the FMC Plant Site RUs in the SFS process. The following discussion groups the RUs by reference to the types of fill materials they contain or by other considerations.

RUs with Risks related to Fill, but Extent not Defined. For a group of RUs, the SRI did not completely define the extent of fill materials they contained. Thus, remedy evaluation in the SFS will be based upon more conservative assumptions, but does not preclude moving into the SFS

provided that the extent of contamination is defined at a later stage such as during remedial design. These RUs consist of the following:

- RU 8 - Former Kiln Scrubber Ponds and Calciners
- RU 13 - Pond 8S Recovery Process and Metal Scrap Preparation Area
- RU 22b - Old Ponds

RUs and Areas with Special Considerations. Another group of RUs contain special cases where other concerns such as potential impacts to groundwater or human health will require additional evaluation during the SFS process. The SRI information gathered regarding these special cases along with conservative assumptions provide sufficient information to evaluate these RUs during the SFS. These RUs consist of the following:

- **RUs 1 and 2 – Furnace Building, Phos Dock, Secondary Condenser, and Slag Pit -** At these RUs, there is a potential threat to human health and the environment related to P4 and residual fill. In addition, there is a potential threat to groundwater because P4 was found in the capillary fringe.
- **RUs 15 and 16 – Oversized Ore, Used Electrodes, Baghouse Dust Area, and Calciner Solids Stockpile -** At these RUs there is a potential risk to human health related to residual fill, especially with respect to the calciner solids at RU 16. There also is a potential threat to groundwater from calciner solid COCs because these solids were wet when they were placed at RU 16.
- **RU 22c - Railroad Swale -** At this RU, there is a potential acute risk to human health related to P4 and a secondary chronic worker risk related to residual fill.
- **Southern and Western Undeveloped Areas -** While potential risks to human health in the SUA and WUA were not specifically evaluated in the SRI, gamma radiation measurements showed that apart from elevated readings (i.e., anomalies) attributed to factors such as shine and slag in roadways the gamma dose rates in these areas are within the range of historically established background levels. Where necessary, the incidental anomalies identified within the SUA and WUA will be addressed in developing proposed remedies for adjacent RUs during the SFS and remedial design process.
- **Roadways** – Roadways throughout the FMC Plant Site are primarily constructed of fill material. In summary, risks to maintenance workers using the roadways to access other areas of the site are below the 1998 ROD RAOs.
- **Underground Piping** – Underground piping is found in many FMC Plant Site RUs as noted in Table 4-2 and depicted in drawing in Appendix I. As shown in Figure 4-34, some of this piping was used to convey process materials and thus may contain residual phossy solids or precipitator solids and associated P4. Specifically, residual phossy solids and precipitator solids may be contained in the underground piping at RUs 1, 2, 3, 12, 13, 22b and 24. Risks to potential future utility workers associated with exposure to

residual phossy solids or precipitator solids and the associated COCs (excluding P4) in underground piping do not exceed the 1998 ROD RAOs. However, there is a potential acute and sub-chronic risk to human health related to P4 in underground piping, and a secondary chronic worker risk related to residual fill. The underground piping in RUs 1, 2, 3, 8, 12, 13, 22b, and 24 nevertheless will require additional identification and evaluation in the SFS or remedial design process.

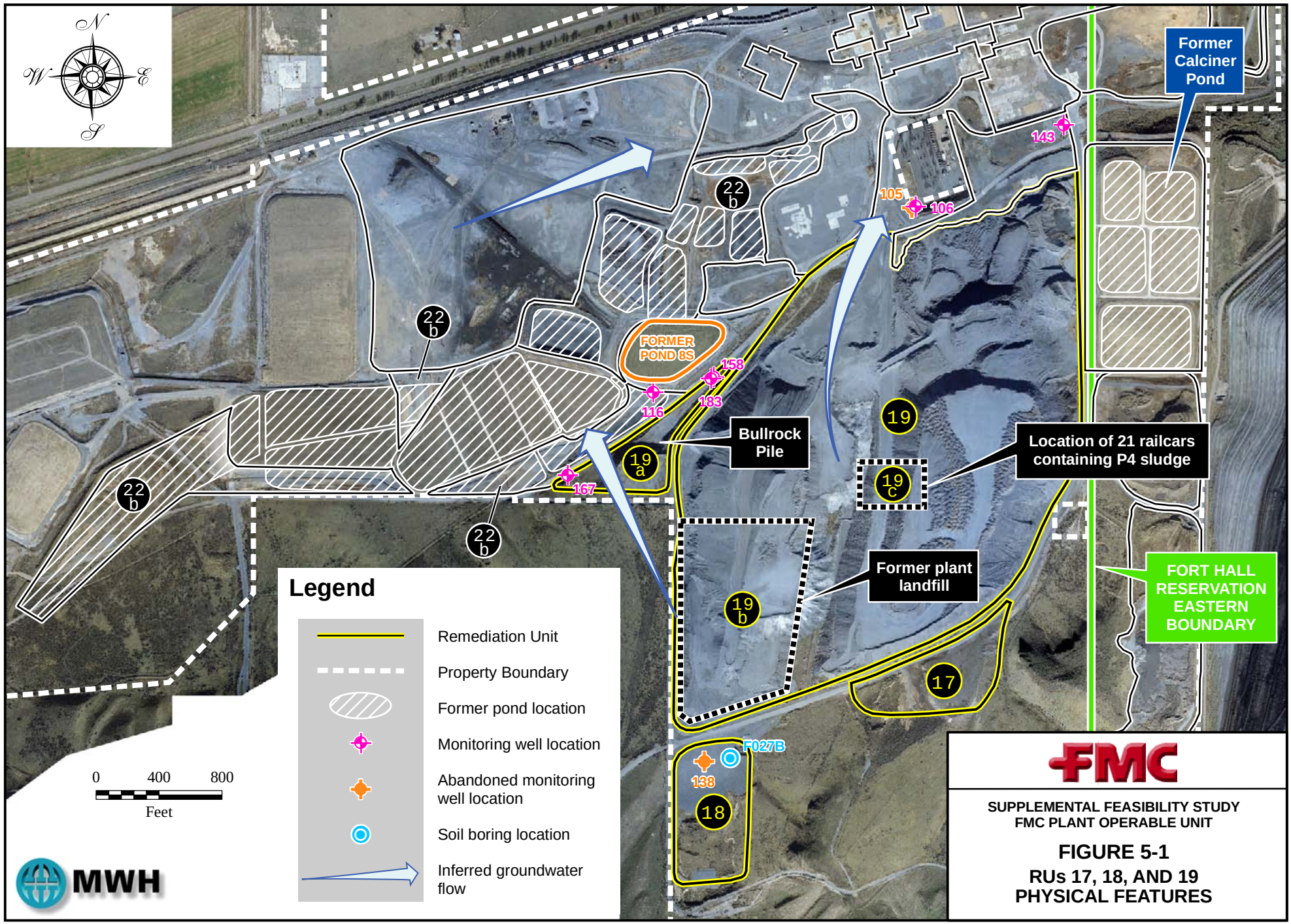
Other RUs. By far the largest group of RUs that will require evaluation in the SFS are those where residual fill material (surface, subsurface, and incidental as listed in Table 4-2) drives the human health risk in excess of the ROD RAOs. For the FMC Plant Site these RUs include the following:

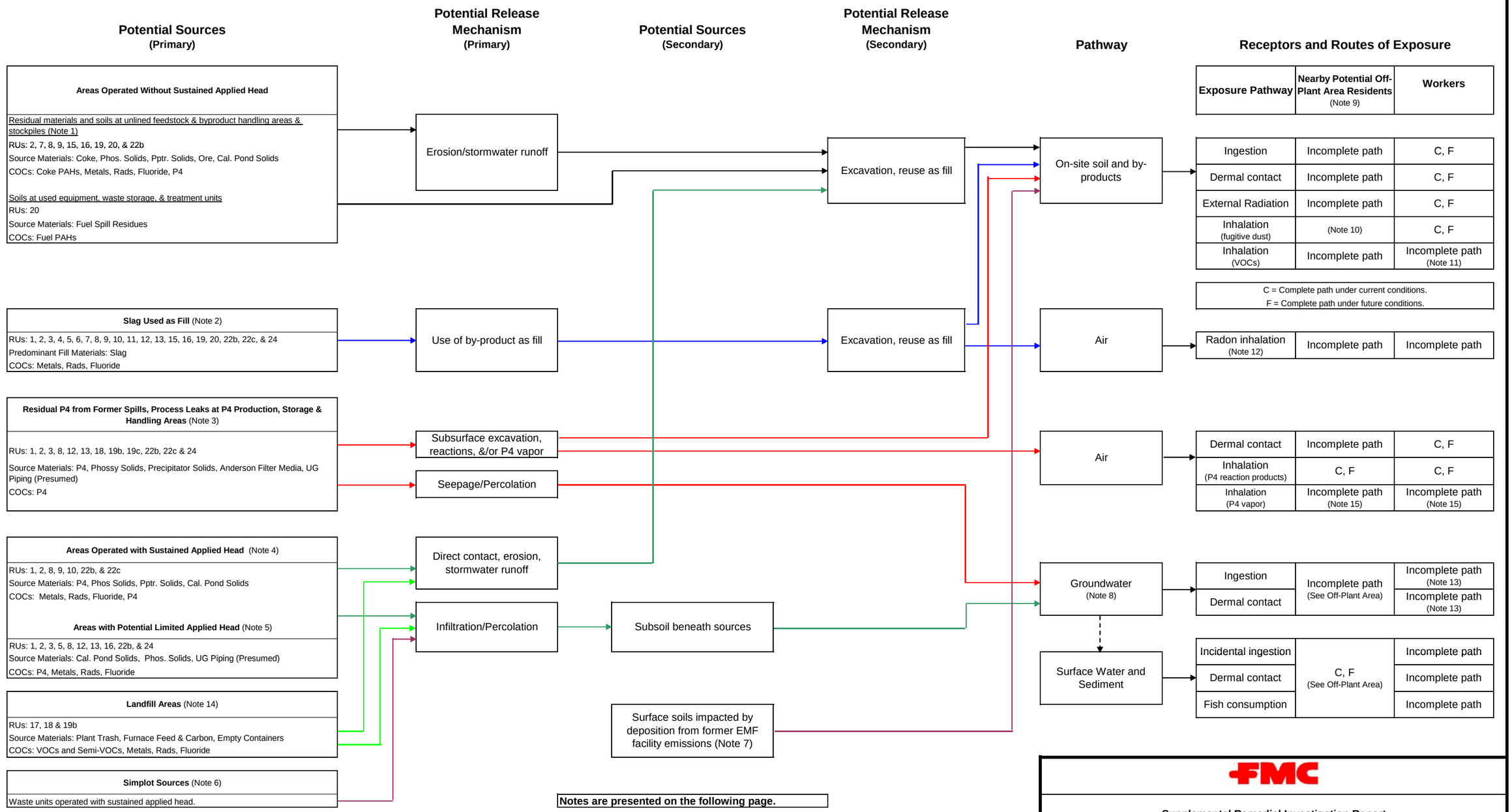
- RU 3 - Receiving Stores, Paint Shop and P_4 Decon
- RU 4 - Office Buildings and Training Center
- RU 5 - Lab and Old Drainfield
- RU 6 - Former Long-Term Phos Storage Tanks
- RU 7 - Shale Unload, Crushing and Stockpile
- RU 9 - Silica Stockpiles and Former Kiln Scrubber Overflow Pond
- RU 10 - IWW Pond and Ditch
- RU 11 - Equipment Area South of Calciners
- RU 12 - Former RP&S Area and Mobile Shop
- RU 20 - Former Bannock Paving Area
- RU 21 - Other On-site Railspurs
- RU 23 - Road Segments not within RU Boundaries
- RU 24 - Plant Areas not within RU Boundaries

With respect to RUs 21 and 23, risks to potential future workers (utility workers in RU 21 and maintenance workers in RU 23) associated with exposure to residual fill materials do not exceed the 1998 ROD RAOs.

There were other special investigations at several of these RUs for 1) organic constituents (i.e., lab and shop-related solvents, fuel related VOCs and PAHs, coke PAHs, and PCBs), 2) phossy water constituents and 3) radon. However, the SRI results indicated that these contaminants were not elevated in native soils and were not a concern at these RUs. The only exception is RU 20, where fuel PAHs were elevated in native soils. The extent of these PAHs was bounded by the SRI sampling and they will be addressed in the SFS.

FILE *Fig 5-01_RU 17_18_19_Physical Features_MOD1208.mxd 12/18/08*





Supplemental Remedial Investigation Report
FMC Plant Operable Unit
Figure 5-2
CONCEPTUAL SITE MODEL FOR POTENTIAL HUMAN EXPOSURE TO CONTAMINANTS

Note 0: Note that RUs under the RCRA Consent Decree (RU 22a) and IDEQ Voluntary Consent Order (RU 14) are not included in the CSM.

Note 1: Feedstock, waste piles, and by-products include ore and ore materials (i.e., bull rock [RU 19 and 15], calcined ore [RUs 8 and 9], & ore dust [RU 7]), slag (RUs 2 and 19), precipitator solids and phossy solids (RU 22b), ferrophos (RUs 20 and 22b), calciner solids (RUs 15 and 16), and coke (RU 20).

Note 2: Includes RUs where slag was observed to be one of the predominant fill materials within the RU.

Note 3: Includes all RUs where P4 was either observed or presumed during the SRI or based upon process knowledge and includes underground piping remaining in place that is presumed to contain precipitator slurry, phossy water, or CO.

Note 4: Includes areas where sustained hydraulic head was used, i.e., ponds, process sumps, water transport ditches, and liquid waste collection areas. RU 1 was added compared to the the 2004 CSM because of the furnace building sumps.

Note 5: These areas did not operate with a sustained hydraulic head in a manner similar to a pond. However, free liquids may have been present in the process/waste streams managed or disposed at the area. RUs 5 and 20 were removed from the 2004 CSM as a result of SRI findings. Includes underground piping left in place that would have carried process/waste streams with COCs, i.e., phossy water, precipitator slurry, or CO (containing P4).

Note 6: Potential sources at the Simplot facility are subject to the Simplot CERCLA RD/RA Consent Decree and applicable Clean Air Act standards. Evaluation of these sources, including development of remedial action objectives, is not within the scope of the Supplemental RI/FS for the FMC Plant OU.

Note 7: Includes potential depostion of historical emissions from the former FMC facility and historical and current emissions from the Simplot facility

Note 8: This pathway includes deposition of P4 in the capillary fringe immediately above the groundwater.

Note 9: Based upon the 1998 ROD definition of Off-Plant Areas (i.e., properties not owned by FMC or Simplot as of 1998). Future residential development of non-FMC owned areas adjacent to the FMC Plant Site is highly unlikely given that current and projected future zoning of this area is heavy industrial.

Note 10: Off-site residents might inhale fugitive dusts generated on-site as a result of wind erosion, traffic, or other on-site activities such as construction/maintenance.

Note 11: Based upon the 2007 SRI data, no volatile organic COPCs were detected above SSLs in any organic SIA.

Note 12: Radon flux measurements were taken during the 2007 SRI in areas with slag, ore and phossy/precipitator solids. Radon emanation rates were found to be at or below background, and significantly lower than the UMTRCA risk-based guidance level of 20 pCi/m2/second for outdoor workers. Radon sampling was performed in areas with slag, ore, and phossy/precipitator solids. Indoor exposure to radon is not a concern as future buildings on the FMC Plant Site are to be constructed with radon control measures, per the 1998 ROD.

Note 13: Exposure to COCs through the groundwater pathway is presumed to be incomplete through administrative controls and land use restrictions currently in place.

Note 14: For the purposes of landfill identification, RU 19 has been subdivided into four areas: RU 19 - the slag pile, RU 19a - the bullrock pile, RU 19b - the former plant solid waste landfill, and RU 19c - the 21 buried railcars containing P4 sludge.

Note 15: While liquid P4 may evaporate and solid P4 may sublime at ambient temperatures in soils containing P4, vapor P4 concentrations would not be expected to reach levels of concern in the soil or in ambient air surrounding the soil. It should also be noted that 169 soil samples were collected during the SRI near areas suspected of containing P4 and were submitted to the laboratory for P4 analysis. All resulted in non-detects for P4 (with the exception of two very low level detects, consisting of one duplicate sample near RU 2 and one sample at RU 10).

FMC

Notes for Figure 5-2

TABLE 5-1

CONCLUSION SUMMARY BY RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 3)

Location Remediation Unit Number, Name	Nature and Extent	Identified Risks	Supplemental Feasibility Study
RUs 1 and 2: Furnace Building, Phos Dock , Secondary Condenser and Slag Pit	Adequately bounded, no additional investigation needed	Future worker exposure to P4, fill and underground piping Migration of constituents (P4) to groundwater.	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 3: Receiving Stores, Paint Shop and P4 Decon	Adequately bounded, no additional investigation needed	Future worker exposure to fill and underground piping	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 4: Office Buildings and Training Center	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 5: Lab and Old Drainfield	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 6: Former Long-Term Phos Storage Tanks	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 7: Shale Unloading, Crushing and Stockpile	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 8: Former Kiln Scrubber Ponds and Calciners	Bounded, additional lateral delineation needed but could be performed during SFS or RD	Future worker exposure to fill and underground piping Migration of constituents to groundwater	Sufficient information to evaluate remedial alternatives, additional lateral delineation needed but could be performed during SFS or RD
RU 9: Silica Stockpiles and Former Kiln Scrubber Overflow Pond	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed

TABLE 5-1

CONCLUSION SUMMARY BY RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 3)

Location Remediation Unit Number, Name	Nature and Extent	Identified Risks	Supplemental Feasibility Study
RU 10: IWW Pond and Ditch	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 11: Equipment Area South of Calciners	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 12: Former RP&S Area and Mobile Shop	Adequately bounded, no additional investigation needed	Future worker exposure to P4, fill and underground piping	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 13: Pond 8S Recovery Process and Metal Scrap Preparation Area	Bounded, additional lateral delineation needed but could be performed during SFS or RD	Future worker exposure to P4, fill and underground piping Migration of constituents to groundwater	Sufficient information to evaluate remedial alternatives, additional lateral delineation needed but could be performed during SFS or RD
RU 15: Oversize Ore, Used Electrode, Baghouse Dust Area	Adequately bounded, no additional investigation needed	Future worker exposure to fill Migration of constituents to groundwater	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 16: Calciner Solids Stockpile	Adequately bounded, no additional investigation needed	Future worker exposure to fill Migration of constituents to groundwater	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 19: Slag Pile and Bullrock Pile	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 20: Former Bannock Paving Area	Adequately bounded, no additional investigation needed	Future worker exposure to fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 21: Other Onsite Railspurs	Adequately bounded, no additional investigation needed	None	Sufficient information to evaluate remedial alternatives, no additional investigation needed

TABLE 5-1

CONCLUSION SUMMARY BY RU
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 3 of 3)

Location Remediation Unit Number, Name	Nature and Extent	Identified Risks	Supplemental Feasibility Study
RU 22b: Old Phossy Ponds	Bounded, additional lateral delineation needed but could be performed during SFS or RD	Future worker exposure to P4, fill, and underground piping Migration of constituents to groundwater	Sufficient information to evaluate remedial alternatives, additional lateral delineation needed but could be performed during SFS or RD
RU 22c: Railroad Swale	Adequately bounded, no additional investigation needed	Future worker exposure to P4 and fill	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 23: Road Segments not within RU Boundaries	Adequately bounded, no additional investigation needed	None	Sufficient information to evaluate remedial alternatives, no additional investigation needed
RU 24: Plant Areas not within RU Boundaries	Adequately bounded, no additional investigation needed	Future worker exposure to fill and underground piping	Sufficient information to evaluate remedial alternatives, no additional investigation needed
Southern and Western Undeveloped Areas	Adequately bounded, no additional investigation needed	Future worker exposure to gamma radiation in isolated areas adjacent to RUs	Sufficient information to evaluate remedial alternatives, no additional investigation needed

Notes:
RD – Remedial Design
SFS – Supplemental Feasibility Study

TABLE 5-2
FMC PLANT LANDFILLS - SUMMARY INFORMATION

Landfill Name	RU Designation & SWMU #	Description of the Landfill Operation and History of Waste Disposal	Waste Contents and Quantity	Present Cover
Construction Debris Landfill (CDLF)	**RU 17** **SWMU # 89**	The CDLF is approximately 8 acres in size and is an area that was used as a landfill from 1981 until 2002, shortly after the plant shutdown. The CDLF was used for the disposal of non-hazardous construction/demolition debris. These wastes typically were generated during major construction projects at the plant and included wastes from furnace rebuilds or digouts. The CDLF was <u>not</u> intended for office trash, packaging materials; scrap metals, process waste streams, or liquid wastes. During a furnace outage (rebuilds and to a lesser extent during digouts) the follow materials might have been placed in the CDLF from this activity: 1) Furnace feed materials: ore nodules, coke, silica, refractory, slag, and ferrophos (approximately 162,000 pounds per outage would be placed in the CDLF) and 2) Carbon materials: carbon electrodes, carbon side wall brick, and carbon hearth blocks (approximately 148,000 pounds per outage would be placed in the CDLF). The documents reviewed indicated that some sediments from the Industrial Waste Water (IWW) Cooling Basin might have been placed in the CDLF, though typically the sediments were allowed to dry and left on the shore of the IWW basin as a berm. The CDLF may also have received baghouse dust (from furnace feed materials).	While the CDLF was not used exclusively for disposal of wastes generated during the furnace rebuilds and digouts, most of the documents found pertaining to the CDLF are instructions about the proper management of theses types of wastes. According to the persons interviewed, it is generally believed that the majority of material in the CDLF consists of wastes generated during furnace outage projects. Furnace outages were performed for digouts or rebuilds each year during the following periods: 1981-1983, 1985-1988, and 1990-1997. The following are the estimated volumes of waste generated and placed into the landfill over the life of the CDLF, based on this rebuild and digout schedule and the other miscellaneous wastes that were disposed there. • Furnace feed materials - approximately 1377 tons • Carbon Materials - approximately 1258 tons • Other concrete, rocks, and debris (from other FMC projects) - Unknown, but insignificant in comparison to the first two waste types listed above • IWW Sediments - Estimated at 350 tons • Baghouse Dust - Estimated at 330 tons	Portions of the CDLF are covered with approximately 6 inches of soil and slag, but other areas have no cover.
Current Solid Waste Landfill (SWLF)	**RU 18** **SWMU # 45**	The Current or "New" Solid Waste Landfill (SWLF) is approximately 9 acres in size and its footprint is roughly rectangular with the longest axis oriented north-south. The landfill began operation in 1980 and continues to be used on a limited basis through the present (2008). The current SWLF received most of its wastes from 1980 until 2002, shortly after closure of the plant. During the demolition of the plant in 2003 through 2006, the landfill was used for disposal of debris from the demolition. Presently, only a small area in the NE corner of the SWLF remains open. It receives trash such as packaging materials generated onsite. The SWLF consists of six landfill cells, each about 40 feet wide and 220 feet long. The landfill is divided into three areas from north to south. The northern two cells were used for disposal of used Andersen Scrubber filter media (AFM) and encompass the small area that remains in use for waste disposal. The center two cells were used for disposal of office trash, wood, and plastic wastes. The southern two cells were used for disposal of empty grease, oil, and antifreeze drums, which were crushed prior to disposal. Typically during plant operation, about 72,000 pounds of AFM, 400,000 pounds of office trash, and 14,000 pounds of empty, crushed drums were disposed in the landfill each year. Used oil was shipped offsite for recycling. Spent solvents were shipped offsite for disposal as RCRA-hazardous wastes. These wastes were sent for offsite disposal because used oil, spent solvents, and other liquid organic wastes were not placed in the SWLF. Minor amounts of these materials in the form of residuals in empy containers, however, were disposed in the landfill through the years. Approximately 1,500 tons of Pond Closure Decant Treatment (PCDT) lime filter cake was placed in the SWLF during 2004 and 2005. The PCDT system was operated during 2004 and 2005 to support completion of the RCRA pond closures and plant decommissioning. The lime filter cake was not a RCRA-regulated waste because it did not exhibit any characteristic, and specifically was below TCLP limits. It also was below non-wastewater UTS limits. Because it was not subject to RCRA regulation it was disposed in the SWLF. Spent carbon from the small phosphine gas extraction systems at Pond 16S also was disposed of in RU 18 from approximately 2005 to early 2008. This on-site disposal was stopped when the gas extraction and treatment system (GETS) began operating at Pond 16S. This spent carbon has been tested against RCRA characteristic limits and has been determined to be non-hazardous. Beginning with the commencement of GETS operation it has been disposed of offsite as a non-hazardous industrial waste. Approximately 43,000 pounds or 21.5 tons of spent carbon generated prior to GETS startup were disposed in the current SWLF. Typical disposal quantities (except for PCDT and spent carbon wastes) were taken from 1985 records.	The major waste types are listed below along with the total estimated quantities disposed over the life of the facility. This SWLF was used at the rates discussed in this section only through plant closure in December 2001. AFM was only disposed in the current SWLF from 1981 to the spring of 1990, at which time these wastes were no longer defined as Bevill-exempt. • Office wastes - including paper, food, packaging materials, spent toner cartridges, office equipment, etc - approximately 400,000 pounds/year through approximately 2006, or 5,200 total tons. • Industrial Wastes - primarily consisting of crushed empty drums and metal containers (14,000 pounds/year [from 1980 to 2002] or 154 tons) and PCDT lime filter cake (1,500 tons; non hazardous), but also including pallets, used baghouse filters (not dust), and unsalvageable building materials and equipment including bricks, wood, fiberglass, carpet, tile (non-asbestos), windows, concrete, non-hazardous refractory material, small vehicle tires, and personal protective equipment (respirators, clothing, hardhats, etc.). In addition, there are 21.5 tons of non-hazardous spent carbon in this SWLF. Thus the current SWLF contains a total of approximately 1,680 tons of industrial waste. • Anderson Filter Media - approximately 72,000 pounds/year from 1980 to 1992 (about 10,000 to 15,000 pounds per year ,which could have contained trace amounts of elemental P4 from fume collection at the Phos Dock) - a total of approximately 250- 360 tons. • Closed double-bagged asbestos-containing wastes - this waste was removed from process equipment and disposed of per 40 CFR § 61.150 in a dedicated portion of the landfill. These asbestos-containing wastes comprised approximately 7 total tons.	Most of the current SWLF are covered with between 1 1/2 and 4 feet of slag and only a small area in the NE corner of the SWLF remains open.

Landfill Name	RU Designation & SWMU #	Description of the Landfill Operation and History of Waste Disposal	Waste Contents and Quantity	Present Cover
Former Solid Waste Landfill	**RU 19b** **SWMU # 44**	Landfill operations within the slag pile (area designated as RU 19b) began at the inception of plant operations in 1949 and ceased in 1980, when the new (referred to here as the "current" SWLF) was opened (RU 18). Use of RU 19 as a slag waste storage area continued until the plant closed in 2001. RU 19b, the area within the slag pile used for landfill operations, is approximately 20.3 acres in size. During the slag disposal operation, hardened slag was removed from the Slag Pit and place on the slag pile, including the area of RU 19b. The landfill cells within RU 19b were eventually covered by slag. Wastes disposed in RU 19b during its operation included office and lunchroom trash and solid waste from plant machine and equipment shop operations. These wastes were collected from trash bins (as many as 50) located throughout the plant site. Slag pile landfill wastes also included asbestos insulation, small vehicle tires, clothing, pallets, empty drums, scale from calciner pallets, kiln scrubber solids, fluid bed dryer solids, P4-bearing wastes, Anderson filter media (1978 to 1980 only), spent solvents, oily residues, and transformer oil. In addition, because this landfill accepted all the plant solid wastes generated prior to its closure in 1980, non-recyclable wastes that were generated during major construction projects at the plant and during furnace rebuilds and/or digouts were disposed in RU 19b. Review of historic photographs indicates that 21 railcars, potentially containing P4 sludge, had been placed during or prior to 1965 in a 2.7-acre area near the center of the slag pile (which now has thick depth of slag cover of approximately 150 feet). Discussions with former employees indicate that the railcars contained P4 sludge. Based on other plant operational data, the sludge might contain 15% to 95% P4. Refer to Figure 5-1 for the locations of the former landfill cells and the buried railcars. This area has been designated as RU 19c and will be addressed separately from other plant landfills during the SFS.	There is limited documentation regarding the types and volumes of wastes placed in the slag pile landfill. Testing for hazardous characteristics or constituents was not done on materials sent to the slag pile landfill because the disposal pre-dated RCRA requirements. This landfill is inaccessible within the slag pile and no documentation exists regarding its precise dimensions, although historical aerial photographs and plant drawings do indicate the location and approximate size. The known types of wastes disposed in the landfill are listed in the column to the left. Likely, the types and generation rates were similar to those for the current SWLF (RU 18), except that the materials disposed of in the CDLF (RU 17) were also disposed in this landfill during its operational history given that it received the entire range of plant wastes. The quantities of the different waste types cannot be estimated with any accuracy because the plant operation grew larger over time and certain process steps changed (e.g., calciners replaced the former kiln) during the 30 years that the RU 19b landfill was used. The following are the best estimates regarding the types and volumes of wastes, in addition to slag, that likely were disposed in the Former SWLF (RU 19b): • Slag – approximately 290,000 tons in RU 19b (a total of 17,800,000 tons were disposed in the entire slag pile) • Office Wastes, consisting of office and lunchroom solid wastes - assuming it received such wastes in volumes similar to those disposed at RU 18, approximately 400,000 pounds per year or a lifetime total of approximately 6,000 tons • Industrial Wastes - asbestos wastes, spent solvents, and oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, fluid-bed dryer wastes (no record, but assuming waste disposal rates similar to those at RU 18, it received an estimated 14,000 pounds/year or 210 tons) and minor amounts of AFM (only 2 years of disposal-approx 72 Tons) – resulting in combined lifetime total industrial waste disposal of approximately 280 tons. • Furnace Rebuild and Digout wastes (as described in RU 17 above, assuming annual tonnage based on the 1980's rate, during which the generation of such waste was at its maximum - a lifetime total of approximately 3,600 tons	The wastes contained in this former landfill are surrounded by slag and covered with slag between 50 and >100 feet deep.

Sources of information contained in this table:

1. FMC response letter dated February 5, 1991 to EPA request for information pursuant to the Eastern Michaud Flat Site
2. FMC response letter (and all Attachments) dated February 27, 1998 to EPA's request for information pursuant to Section 104 of CERCLA and Section 3007 of RCRA
3. *Remedial Investigation Update Memorandum for the FMC Plant OU*, December 2004 Revision; Tables 2-1, 2-2, 6-3and Appendix A tables A-17, A-18, and A-19

TABLE 5-3

COCs/ROCs IN SOILS IDENTIFIED DURING THE SRI COMPARED TO THE EMF ROD AND RI UPDATE MEMO IDENTIFIED COCs/ROCs
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Parameter	EMF ROD COCs/ROCs	RI Update Memo COPCs/ROPCs	SRI COPCs/ROPCs	SRI COCs/ROCs
Antimony	X		X	X
Arsenic	X	X	X	X
Barium			X	
Beryllium	X		X	
Boron	X		X	
Cadmium	X	X	X	X
Chromium			X	
Cobalt			X	
Copper			X	
Coke PAHs and Metals			X[a]	X
Fluoride	X		X	X
Gross alpha	X[b]		b	
Gross beta	X[b]		b	
Lead			X	X
Lead-210	X	X[c]	X[c]	X
Liquid Petroleum Fuels[d]		X	X	X[g]
Lithium			X	
Manganese	X		X	
Mercury	X		X	
Molybdenum			X	
Nickel	X		X	X
PCBs		X	X	
Elemental Phosphorus (P4)		X	X	X
Polonium-210	X	X	X	X
Potassium-40	X		X	X
Radium-226	b	X	X	X
Radon	b, e		X	
Selenium	X		X	
Silver	X		X	
Solvents[f]		X	X	

TABLE 5-3

COCs/ROCs IN SOILS IDENTIFIED DURING THE SRI COMPARED TO THE EMF ROD AND RI UPDATE MEMO IDENTIFIED COCs/ROCs
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Parameter	EMF ROD COCs/ROCs	RI Update Memo COPCs/ROPCs	SRI COPCs/ROPCs	SRI COCs/ROCs
Thallium	X		X	X
Thorium-230	b			
Uranium			X	
Uranium-238	X		X	X
Vanadium	X		X	X
Zinc	X		X	

Notes:

[a]see Tables 1-6 and 1-8 for list of SRI coke PAHs and TCLP analytes

[b]individual radionuclides potentially responsible for elevated gross alpha and gross beta levels are also ROPCs

[c]Lead-210 and Polonium-210 are known to occur in precipitator dust and phossy solids.

[d]RI Update Memo included benzene, toluene, ethylbenzene, and xylenes. See Table 1-6 for SRI liquid petroleum fuel constituents.

[e] retained as a COPCs mainly for evaluation of potential radon infiltration into buildings under alternate future commercial or industrial uses at the site.

[f]RI Update Memo included TCE, PCE, Chloroform, 2-Butanone, and 1,1,1 TCA. See Table 1-6 for SRI lab- and shop-related constituents.

[g]Liquid petroleum fuel COCs identified in the SRI restricted to 6 PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene

Section 6
REFERENCES

Agency or Toxic Substances and Disease Registry. 1997. White Phosphorus, CAS # 7723-14-0, Fact Sheet. September, 1997.

Agency or Toxic Substances and Disease Registry. 2002. Phosphine, CAS # 7803-51-2, Fact Sheet. April, 2002.

BEI. See Bechtel Environmental, Inc.

Bechtel Environmental, Inc. 1994. Preliminary Site Characterization Summary for the Eastern Michaud Flats Site. January 1994.

Bechtel Environmental, Inc. 1996. Remedial Investigation for the Eastern Michaud Flats Site. Bechtel Environmental, Inc. Draft issued September 1995 and revised August 1996.

Bechtel Environmental, Inc. 1997. Feasibility Study Report FMC Subarea. April 1997.

Bechtel Environmental, Inc. 1999. Phossy Waste Treatment Plant, ZIMPRO Demonstration Test Plan Quality Assurance/Quality Control Sampling and Analysis Procedures.

Bechtel Environmental, Inc. 2003. Pond 16S Closure Plan. November 1998, Revised July 2003.

Bechtel Environmental, Inc. 2004a. Assessment of Seculer Equilibrium in EMF Site Surface Soils, Workplan for Phase I and Phase 2, July 2004.

Bechtel Environmental, Inc. 2004b. RI Update Memorandum, December 2004.

Bechtel Environmental, Inc. 2004c. Scoping and Planning Memorandum, February 2004.

Carr, W. J., and D. E. Trimble. 1963. Geology of the American Falls Quadrangle Idaho. U. S.Geological Survey Bulletin 1121-G. pp. 44 .

Dohrenwend, J. C. 1987. Basin and Range: in Graf, W. L. (ed), Geomorphic Systems of NorthAmerica, Geological Society of America Centennial. Special Vol. 2, Ch. 9. pp. 303-342.

E&E. *See* Ecology and Environment, Inc.

Ecology and Environment, Inc., 1995. Draft Baseline Human Health Risk Assessment, Eastern Michaud Flats, Pocatello, Idaho, prepared for U.S. Environmental Protection Agency. March 1995; revised July 1995.

Ecology and Environment, Inc. 1996. Baseline Human Health Risk Assessment - Eastern Michaud Flats, Pocatello, Idaho. Prepared for EPA by Ecology and Environment, Inc. under ARC Region 10 Contract # 68-W9-0029.

EPA. *See* United States Environmental Protection Agency.

Fenwick, Gary, 1993a. Personal communication between William Myers of Bechtel Environmental, Inc., and Gary Fenwick, Shoshone-Bannock tribal council representative. September 15, 1993.

FMC, 1999. Pocatello RCRA Consent Decree RCRA Consent Decree in United States vs. FMC Corporation in the United States District Court for the District of Idaho. Civil Action No. 98-0406-E-BLW. Entered July 13, 1999.

HAI-IRM. See Hanna Associates, Inc. Integrated Risk Management

Hanna Associates, Inc. Integrated Risk Management. 2008. Human Health Risk Assessment Protocol for the FMC Plant Operable Unit. February 2008.

Houser, B. B. 1992. Quaternary stratigraphy of an area northeast of American Falls Reservoir, eastern Snake River Plan, Idaho, Link, P. K., et al., eds. Regional Geology of Eastern Idaho and Western Wyoming. *Geological Society of America Memoir.* Vol. 179. pp. 269-288.

IDEQ *See* Idaho Department of Environmental Quality

Idaho Department of Environmental Quality. 2002. Recommended Practices for Site Assessments During Closure of Undergound Storage Tanks and Accidental Releases & Spills of Petroleum Hydrocarbon Products. Information Series #3. May 2002.

Malde, H. E. 1968. The Catastrophic Late Pleistocene Bonneville Flood in the Snake River Plain, Idaho. U. S. Geological Survey Professional Paper. Vol. 596. pp. 51.

MWH, 2007. Supplemental Remedial Investigation Work Plan for the FMC Plant Operable Unit. May 2007.

MWH, To be finalized. Draft Groundwater Current Conditions Report for the FMC Plant Operable Unit. Draft October 2008. Final date to be determined.

National Oceanic and Atmospheric Administration. 2007. Local Climatological Data (LCD) Summary with Comparative Data for Pocatello, Idaho.

NOAA. *See* National Oceanic and Atmospheric Administration.

Scott, W. E., et al. 1982. Revised Quaternary Stratigraphy and Chronology in the American Falls area, southeastern Idaho. Idaho Bureau Mines and Geology Bulletin 26. pp. 581 595.

SOW. 2003. Statement of Work. http://yosemite.epa.gov/R10/CLEANUP.NSF/88b0452f26c113d88825685f006ab43f/41199131114ae8ec88256517006c051c!OpenDocument

Spanggord, R.J., R. Rewick, T.-W. Chou, R. Wilson, R.T. Podoll, T. Mill, R. Parnas, R. Platz and D. Roberts (1985) Environmental fate of white phosphorus/felt and red phosphorus/butyl rubber military screening smokes: Final Report. SRI International, Menlo Park, CA 94025. ADA176922.

Stearns H.T., Crandall, Lynn, and Steward, W.G., 1983. Geology and Groundwater in the Michaud Flats Project, Power County, Idaho. U.S. Geological Survey Water Supply Paper. Vol. 774. pp 268.

Trimble, D. E., and W. J. Carr, 1961. The Michaud Delta and Bonneville River near Pocatello, Idaho. *Geological Survey Research 1961*. U. S. Geological Survey Professional Paper 424-B. Article 69,. pp. B-164 through B-166.

Trimble, D. E., 1976. Geology of the Michaud and Pocatello Quadrangles, Bannock and Power Counties, Idaho. *U. S. Geological Survey Bulletin*. Vol. 1400. pp. 88.

U.S. Department of Commerce, Bureau of Census, 2000. Selected Population and Housing Characteristics: 2000 Pocatello City, Idaho," Chubbuck City, Idaho, 2000.

U.S. EPA. *See* United States Environmental Protection Agency.

United States Environmental Protection Agency. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA.

U.S. Environmental Protection Agency. 1993. Presumptive Remedy for CERCLA Municipal Landfill Sites. United States Environmental Protection Agency, Official Solid Waste and Emergency Response. EPA540-F-93-035, OSWER # 9355.0-49FS. September 1993.

United States Environmental Protection Agency. 1997. Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination, United States Environmental Protection Agency, Official Solid Waste and Emergency Response Directive 9200.4-18.

United States Environmental Protection Agency. 1998. Record of Decision. Declaration, Decision Summary, and Responsiveness Summary for Eastern Michaud Flats Superfund Site, Pocatello, Idaho. U.S. Environmental Protection Agency, Region 10. June 1998.

United States Environmental Protection Agency. 2000. Data Quality Objectives for Hazardous Waste Site Investigations. EPA QA/G-4HW EPA/600/R-00/007. January 2000.

United States Environmental Protection Agency. 2002a. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December 2002.

United States Environmental Protection Agency. 2002b. Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan, EPA QA/G-5S, EPA/240/R-02/005.

United States Environmental Protection Agency. 2003. Treatment Technologies for Historical Ponds Containing Elemental Phosphorus-Summary and Evaluation. EPA-542-R-03-013.

United States Environmental Protection Agency. 2006. Unilateral Administrative Order (UAO), 2006, CERCLA Order for Removal Action at FMC Idaho LLC Facility, Pocatello, Idaho. CERCLA Docket No. CERCLA-10-2007-0051.

Van Voris, P. M.W. Ligotke, K.M. McFadden, S.W. Li, B.L. Thomas, D.A. Cataldo, T.R. Garland, J.K. Fredrickson, R.M. Bean and D.W. Carlile (1987) Evaluate and characterize mechanisms controlling transport, fate and effects of army smokes in the aerosol wind tunnel: transport, transformations, fate, and terrestrial ecological effects of red phosphorus-butyl rubber and white phosphorus obscurant smokes. PNL-6071. Pacific Northwest Laboratory, Richland, Washington.