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FMC Corporation

Via Federal Express

March 1, 2010

US Environmental Protection Agency Region 10
1200 Sixth Avenue
Seattle, WA 98101

Attn: Ms. Kira Lynch, MS ECL-113
Remedial Project Manager

Re: Administrative Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit (U.S. EPA Docket No. CERCLA 10-2004-0010): **Final Supplemental Feasibility Study (SFS) Work Plan, January 2010, Revised March 2010 - Replacement Pages and updated DVD**

Dear Ms. Lynch:

FMC Corporation submitted the hardcopy final *SFS Work Plan* to EPA Region 10 on January 22, 2010. On January 29, 2010 and February 15, 2010, respectively, the Idaho Department of Environmental Quality (IDEQ) and the Shoshone-Bannock Tribes (SBT) provided additional comments on the hardcopy final *SFS Work Plan*. On February 16, 2010, EPA issued a letter approving the final *SFS Work Plan*, contingent upon FMC's addressing and responding to one EPA comment and the SBT and IDEQ comments referenced above.

With this letter FMC is providing 1) replacement pages for the final *SFS Work Plan* that contain text changes addressing the above-referenced EPA, IDEQ and SBT comments, 2) replacement pages for the response to comments (RTC) section that incorporate these comments and FMC's responses, and 3) an updated DVD that contains the complete and final *SFS Work Plan*, January 2010, Revised March 2010. Table 1 below lists the replacement pages, the comments these pages address, and where the text of the comments and FMC responses are located in the revised RTC section in Appendix A of the document.

Table 1
Final *SFS Work Plan* (January 2010)
March 2010 Revisions

Replacement Pages Section and Page #	Agency Comment Addressed	Comment Response Location
Section 2, Pages 2-16 and 2-17	EPA 2/16/10 comment #1 and SBT 2/15/10 comment #4	In revised Appendix A-11
Section 3, Page 3-1	SBT 2/15/10 comment #5	In revised Appendix A-11
Section 4, Page 5-6	SBT 2/15/10 comment #9	In revised Appendix A-11
Figure 3-2	IDEQ 1/29/10 comment #2	In revised Appendix A-11
Appendix A cover sheet	History of comment and responses	In updated work plan and DVD, labeled the final SFS Work Plan January 2010, Revised March 2010

The superseded pages should be discarded to avoid confusion. Similar to the final *SRI Addendum Report* (January 2010), two (2) of the four (4) EPA hard copies are being sent directly to Sue Skinner along with a total of six (6) DVDs, as requested.

If you have any questions, or wish to discuss this further, please contact me at (215) 299-6700.

Very truly yours,

Barbara E. Ritchie
Associate Director, Environment

cc: Doug Tanner
Waste and Remediation Manager
State of Idaho Department of Environmental Quality
444 Hospital Way #300
Pocatello, ID 83201

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U.S. EPA, Region 10
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921 S. 8th Ave, Stop 8007
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FMC Idaho LLC, Pocatello, Idaho

Supplemental Feasibility Study Work Plan for the FMC Plant Operable Unit

FINAL

January 2010
Revised March 2010

MWH

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FMC Corporation

Via Federal Express

January 22, 2010

Ms. Kira Lynch, MS ECL-113
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Administrative Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit (U.S. EPA Docket No. CERCLA 10-2004-0010):
Supplemental Feasibility Study Work Plan – Final Hardcopy January 2010

Dear Ms. Lynch:

FMC is submitting the enclosed final *Supplemental Feasibility Study Work Plan for the FMC Plant OU (SFS WP*) as directed in EPA's January 12, 2010 letter. The SFS WP has been in development for the past 18 months and FMC believes that the attached Final SFS WP addresses all agency comments received during that time as we have collaboratively exchanged draft revisions and comments on various sections of the document. Attached to this letter is a table summarizing the major documents we have exchanged in the process, but it does not fully describe the level of effort to gain agreement on the significant elements of the SFS WP, e.g., the table does not include all of the EPA, IDEQ and the Shoshone Bannock Tribes correspondence on ARARs or hypothetical residential risk scenarios for cadmium in home grown fruit and vegetables.

FMC expects that any further comments on the SFS WP would be relatively minor, or editorial in nature, given the level of effort to date to develop an 'approvable' document. Specific to ARARs, FMC acknowledges EPA's January 12, 2010 comment No. 6 regarding agreement on initial ARARs and understands that EPA cannot approve the ARARs identified in the SFS WP as the final ARARs for the FMC Plant OU at this time.

Summarizing recent efforts, FMC submitted a complete final draft SFS WP in electronic format on August 18, 2009 (revised to reflect all the comments received at that time). Following subsequent email exchange of questions primarily regarding "numeric" Remedial Action Objectives (RAOs), FMC submitted several further revised sections of the SFS WP on December 11, 2009, to reflect agreement on these questions and to further ensure complete alignment of the site characterization with the subsequently

approved SRI Addendum. FMC received comments on the December 11 revised sections from EPA on January 12, 2010 and IDEQ on January 7, 2010. The attached hard copy SFS WP addresses all of those comments, and Appendix A (which includes all formal comments received since the initial submittal of the draft SFS WP in July 2008) has been updated to reflect response and resolution of those comments.

Consistent with FMC's conventions for submitting final hard copy versions of documents, all the revisions that were highlighted in previous drafts has been removed from this document.

As requested by EPA, FMC has modified the distribution list to include shipment of two (2) of the four (4) EPA copies directly to sue Skinner (EPA-Pocatello), with the other two (2) EPA copies to EPA-Seattle. Sue Skinner will also get six (6) electronic copies of the document. Additionally, the Shoshone-Bannock Tribes will receive one printed copy of the Appendices to the report which were otherwise only distributed in electronic format. No other changes have been requested by EPA to the AOC distribution list.

Please call me with any questions, or to discuss further.

Sincerely,

Barbara E. Ritchie
Associate Director, Environment
FMC Corporation

cc: Doug Tanner
Waste and Remediation Manager
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444 Hospital Way #300
Pocatello, ID 83201

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Shoshone-Bannock Tribes
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Fort Hall, ID 83203

FMC Plant Supplemental Feasibility Study Work Plan (SFS WP) Chronology of Major Documents	
July 15, 2008	FMC submits draft SFS Work Plan
September 30, 2008	EPA comments on 7/15/08 draft SFS WP issued
October 2, 2008	SBT comments on 7/15/08 draft SFS WP issued
November 14, 2008	FMC submits detailed response to comments (RTC) received Sept/Oct 2008
June 9, 2009	FMC submitted an updated RTC and some revised tables to supplement the 11/14/08 RTC. No response to FMC's 11/14/08 RTC had been issued, rather updates were based on feedback provided by EPA in comments on other SRI/SFS deliverables.
July 2, 2009	FMC response to Tribal materials the Tribes have identified as potential ARARS
July 20, 2009	IDEQ comments on the draft SFS WP issued
July 21, 2009	EPA comments on the draft SFS WP issued
July 22, 2009	SBT comments on the draft SFS WP issued
August 18, 2009	FMC submits electronic copy of complete draft final SFS WP
September 11, 2009	IDEQ comments on the draft final SFS WP issued
December 11, 2009	FMC submitted revised sections and tables to supplement the 8/17/09 SFS WP. No formal response to FMC's 8/17/09 electronic SFS WP had been issued by EPA or SBT, rather updates were based on email correspondence regarding 'numeric values' for RAOs and feedback provided by EPA in comments on other SRI/SFS deliverables
December 22, 2009	EPA initial comments issued by email
January 7, 2010	IDEQ comments on the revised sections issued
January 12, 2010	EPA final comments issued
January 22, 2010	FMC issues final hard copies of SFS WP

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APPENDICES

FIGURES

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TABLES

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ACRONYMS/ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CAR	comparative analysis report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
CO	carbon monoxide
COC	constituent of concern and chain of custody
CSM	Conceptual Site Model
DPSRA	development and preliminary screening of remedial alternatives
FeP	ferrophos
FS	feasibility study
ft/day	feet per day
HHRA	Human Health and Risk Assessment
IDEQ	Idaho Department of Environmental Quality
MCL	maximum contaminant level
NCP	National Contingency Plan
NAREL	National Air and Radiation Environmental Laboratory
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	operable unit
P4	elemental phosphorus
RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
ROC	radionuclides of concern
RU	remediation unit
SFS	Supplemental Feasibility Study
SOW	Statement of Work
SRI	Supplemental Remedial Investigation
S/S	solidification/stabilization
SSL	soil screening level
UMTRCA	Uranium Mill Tailings Radiation Control Act

Section 1
INTRODUCTION

This *Supplemental Feasibility Study (SFS) Work Plan* describes the process for incorporating new information gathered since the 1997 FMC Subarea FS into the SFS for the FMC Plant Operable Unit (OU). Supporting information from 1) the Supplemental Remedial Investigation (SRI) is presented in the *SRI Report for the FMC Plant OU* (MWH 2009), 2) additional SRI soil sampling in 2008 is contained in the *SRI Addendum Report* (MWH, 2009a), and 3) ongoing groundwater sampling events since the original remedial investigation (RI) is presented in *Groundwater Current Conditions Report for the FMC Plant OU (GWCCR*, MWH 2009b). The findings presented in these documents will be combined with previous information and data collected at the FMC Plant OU so that the remedial alternatives can be efficiently identified and evaluated. In addition to the recent SRI findings, the primary information that will be relied upon for the SFS process is that contained in the *Remedial Investigation for the Eastern Michaud Flats Site* (*EMF RI Report*, BEI, 1996), the *Assessment of Seculer Equilibrium in EMF Site Surface Soils, Workplan for Phase I and Phase 2* (*Secular Equilibrium Study*, BEI, 2004*),* and *Treatment Technologies for Historic Ponds Containing Elemental Phosphorus* (EPA, 2003).. Although this is a supplemental FS (the original FS was completed and reported in *Feasibility Study Report FMC Subarea* [*FMC Subarea FS Report*, BEI, 1997]), this SFS will involve development and screening of technologies and alternatives considered in the *FMC Subarea FS Report* as well as all other appropriate technologies and alternatives currently available, taking into consideration information gathered since the 1997 FS.

During the original RI/FS, the site was divided into three "Subareas:" 1) the FMC Subarea, consisting of the FMC plant site and other FMC-owned properties at the Eastern Michaud Flats Superfund Site (EMF Site) as of the 1998 ROD; 2) the Simplot Subarea, consisting of the Simplot plant site and other Simplot-owned properties; and 3) the Off-Plant Subarea, consisting of the remainder of the EMF 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 Eastern Michaud Flats Superfund Site, Pocatello, Idaho* (*1998 ROD*, EPA, 1998). Figure 1-1 shows the area covered by the FMC Plant OU.

Consistent with the *2003 Administrative Order on Consent (2003 AOC)* for a SRI/SFS at the FMC Plant OU, the *SRI Work Plan for the FMC Plant OU* (*SRI Work Plan;* MWH, 2007) and field work were directed at the FMC Plant Site property. The *SRI Report for the FMC Plant OU* (*SRI Report*) refers to this area as the "FMC Plant Site." This SFS Work Plan and the SFS Report 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. The Tesco property was not evaluated as part of the FMC Plant Site or OU during the EMF RI/FS or SRI and is not being addressed in the CERCLA process. It will instead be addressed under RCRA corrective action authorities.

1.1 PURPOSE AND SCOPE OF THE SFS WORK PLAN

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 (*2003 AOC*) for a Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) at the FMC Plant Operable Unit. A memorandum was prepared by FMC, according to the Statement of Work (SOW) in *2003 AOC*, entitled "*Supplemental Remedial Investigation and Supplemental Feasibility Study for the FMC Plant Operable Unit Scoping and Planning Memo;"* (BEI, 2004a). According to the *2003 AOC SOW* presented in Attachment A to the *Scoping and Planning Memo*, this SFS Work Plan is the first step in the re-evaluation process of an FMC Plant OU remedy and is designed to achieve the following objectives:

1) Discuss procedures that will be used to update the applicable or relevant and appropriate requirements (ARARs) and Remedial Action Objectives (RAOs) for the FMC Plant OU to meet the SOW requirement to "ensure that they remain appropriate for evaluating former working areas of the plant and in establishing a protective basis for potential industrial redevelopment of the FMC Plant OU." The original ARARs and RAOs established by EPA in the *1998 ROD* were based on the information referenced in the *FMC Subarea FS Report* regarding site conditions, EPA's baseline risk assessment, and the identification and evaluation of ARARs. This section of the SFS Work Plan includes an evaluation as to whether the Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings (UMTRCA), (40 C.F.R. Part 192) are applicable or relevant and appropriate for purposes of the FMC Plant OU remedial action. The RAO for elemental phosphorus, which is required in the *2003 AOC SOW*, was presented in the *Remedial Investigation Update Memorandum for the FMC Plant Operable Unit* (*RI Update Memo*, BEI 2004b).

2) Provide a description and rationale of the work to be performed in the SFS and the methodologies to be utilized. This includes re-evaluation of the technologies and remedial action alternatives presented in the *FMC Subarea FS Report* and consideration of additional technologies and alternatives not evaluated in that report, as applied to the chemicals of concern (COCs), radionuclides of concern (ROCs), and site conditions evaluated during the original RI/FS and any new COCs, ROCs or site conditions identified during the SRI/SFS.

3) Provide the most recent conceptual site model (CSM) for the FMC Plant OU (included in the *RI Update Memo*) and update it as necessary using all available data (including the new SRI data as), identify COCs/ROCs, and identify risk-based concentrations (RBCs) for each COC/ROC (including elemental phosphorus [P4]). The most recent CSM is provided in the *SRI Report*.

4) Prepare a schedule for completion of the SFS that is consistent with the 2003 AOC and other documents. The scheduled completion dates include the following:

- SRI Report - 120 days after FMC's receipt of final validated laboratory data packages (agreed to by FMC and EPA during final approval of the SRI Work Plan in May 2007).

- Work Plan for Supplemental FS - 60 days after EPA approval of the SRI Report.

- Supplemental FS Report - 60 days after EPA approval of the Work Plan for the Supplemental FS.

Given the current list of COCs/ROCs, the current site conditions, and information gathered since the RI, the purpose of the SFS Work Plan and the SFS has evolved beyond a re-evaluation of the twelve alternatives include in the original *FMC Subarea FS Report*.

This SFS Work Plan provides:

- Updated ARARs, RAOs, and general response actions (including adding new ARARs and RAOs) for the FMC Plant OU.

- A description and rationale of the work to be performed during the SFS and the methodologies to be utilized.

- An updated CSM for the FMC Plant OU using all available data (including the new SRI data) and identifies the COCs and ROCs.

- A schedule for completion of the SFS that is consistent with the AOC and includes deliverables and studies that the AOC did not anticipate.

As discussed above, this SFS Work Plan addresses the FMC Plant OU, including the FMC Plant Site (the subject of the SRI field work and SRI Report) and the properties owned by FMC that are part of the FMC Plant OU (the subject of the SRI Addendum field activities and *SRI Addendum Report*). The SFS will address soils and groundwater within the FMC Plant OU. However, this SFS Work Plan defers discussion of the groundwater. FMC has provided EPA with a *GWCCR* that supplements the information presented in this SFS Work Plan and the *SRI Report*, and the *SRI Addendum Report* to support an SFS and Amended ROD for the FMC Plant OU as a whole.

1.2 REGULATORY BACKGROUND

The FMC Plant OU is a part of the larger 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 CERCLA AOC in May 1991 under which the companies agreed to conduct an RI/FS for the site.

As required under the *1991 AOC*, FMC and Simplot developed a number of EMF Site studies and reports. These included the *Preliminary Site Characterization Summary* (BEI, 1994*)* and the *EMF RI Report*. 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 draft and final reports for those risk assessments in July 1995 and July 1996, respectively. The conclusions of those risk assessments were factored into the *FMC Subarea FS Report* and the *1998 ROD*.

1.2.1 Key 1998 ROD Elements - FMC Plant Subarea

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 COC 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. Groundwater 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 been extracted and used in plant operations.

- Conduct operation and maintenance at areas capped to meet CERCLA requirements and, if implemented, at 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 *1998 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 site and its other owned properties, re-designated at that time as the Simplot OU. The consent decree for the Simplot OU was entered in May 2002.

Although the *1998 ROD* was not implemented for the FMC Plant OU, FMC has undertaken actions consistent with elements of the ROD including:

- FMC has continued to monitor groundwater at numerous CERCLA wells at the FMC Plant OU. Pursuant to an EPA-approved reduction in CERCLA groundwater monitoring in 1994, routine groundwater monitoring of CERCLA wells has continued for the following: arsenic, selenium, potassium, chloride, fluoride, ammonia/ammonium as nitrogen, nitrate as nitrogen NO3-N, orthophosphate, sulfate, pH, specific conductivity, temperature and turbidity (from 1995 to the present). Based on discussions between EPA and FMC during 2008 and 2009, sixteen monitoring wells are sampled semi-annually under FMC's voluntary CERCLA groundwater monitoring program as of the second quarter 2009. In addition, 36 wells are sampled quarterly under FMC's RCRA groundwater monitoring program and seven wells are sampled semi-annually under the Calciner Ponds Remedial Action (IDEQ) groundwater monitoring plan.

- FMC has also performed periodic supplemental (or special) groundwater investigation/monitoring programs or events driven by EPA or IDEQ. The routine groundwater monitoring programs and special investigation/monitoring events are described in detail and the groundwater data for those programs and special events through the second quarter 2008 are presented in the GWCCR – June 2009 Final.

- In 1995, FMC placed deed restrictions at the FMC Plant Site and all the other properties at the EMF Site it owned at the time that prohibited any potential future development of these properties for residential or day-care facility use. FMC acquired the Batiste Springs property in 1995 (this parcel includes both the "Spring at Batiste Road" [aka Swanson Road Spring] and Batiste Spring). FMC anticipates placing similar restrictions prohibiting residential and day-care facility use of the Batiste Spring parcel.

The remaining *1998 ROD* items have not been implemented for the FMC Plant OU.

1.2.2 2003 Administrative Order on Consent Requirements - FMC Plant OU

As discussed above, the *2003 AOC* incorporated a SOW that required the following deliverables and actions:

1. Submit a Supplemental RI/FS Scoping and Planning Memorandum. The final version of this deliverable, *Scoping and Planning Memo,* 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 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 an RBC for elemental phosphorus; and 4) update the Remedial Investigation Report for the FMC Plant OU. FMC submitted the final version of this document, *RI Update Memo*, 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*, 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. The *SRI Report* discusses the findings of that investigative work. This draft document was submitted to EPA for review and approval on June 16, 2008. This draft document was revised based on agency comments and the final *SRI Report* was submitted to EPA on May 14, 2009. EPA approved the final *SRI Report* on May 26, 2009.

5. Submit a Work Plan for a Supplemental Feasibility Study of remedial alternatives at the FMC Plant OU by no later than the date required under the *2003 AOC*. The draft SFS Work Plan was submitted on July 15, 2008 to meet this requirement. EPA responded with a letter dated July 21, 2009 which directed FMC to finalize the SFS WP according to FMC's responses to Agency comments. This final version of *SFS Work Plan* has been revised based on agency comments and is submitted to fulfill the requirements of the *2003 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 *2003 AOC*.

These efforts will support an Amended ROD for the FMC Plant OU.

1.2.3 SFS Process

The information gathered during the SRI allows EPA and FMC, in conjunction with other stakeholders, to ensure that cleanup requirements are appropriate for the current status of the FMC Plant OU and are compatible with its potential future commercial/industrial use. The SFS will ensure that the FMC Plant OU ARARs, RAOs, general response actions, remedial technologies, remedial alternatives, and proposed remedial actions are re-evaluated specifically in light of the SRI and other post-RI data and the updated CSM. Groundwater data collected since the EMF RI were compiled and submitted to the EPA in the draft *GWCCR* (October 2008) and the final *GWCCR* (June 2009) was submitted on June 26, 2009. The final GWCCR was approved by EPA on July 20, 2009. The findings

presented in the *GWCCR* will be considered along with the data from the original RI and the SRI in preparation of the SFS.

The SFS for the FMC Plant OU will focus on the potential for exposure to shallow soils and solids under a future commercial or industrial land use scenario, as well as the potential for migration of constituents from soils and solids through the subsurface to groundwater and the transport of constituents in groundwater to discharge into surface water at the Portneuf River. The air and groundwater pathways were evaluated on a site-wide basis in the *FMC Subarea FS Report.* The SFS process will update those pathway evaluations as necessary. It is anticipated that after the SRI/SFS is completed, EPA will issue an Amended ROD specifying the FMC Plant OU remedial action requirements.

1.3 DOCUMENT ORGANIZATION

This SFS Work Plan then has been organized to accomplish the objectives discussed in Section 1.1 above. The anticipated SFS Schedule is presented in Section 5.

Section 2.0 - presents a brief summary of the site's physical characteristics, plant process description and history, and summaries of previous investigations/ studies at the FMC Plant Site and findings.

Section 3.0 - presents a summary of the 2007 and 2008 SRI objectives and SRI findings, including updates regarding the potential sources of contamination and site COCs/ROCs, potential release mechanisms, potential exposure media, potential receptors, and exposure pathways. This information supports the updated CSM that is presented at the end of this section.

Section 4.0 - provides a review and update of ARARs, RAOs by media, and general response actions using all the data collected to date.

Section 5.0 - discusses the FS process and how the original 1997 FS for the EMF Site, specifically the *FMC Subarea FS Report*, will be updated for the FMC Plant OU using the SRI data and other information gathered and other developments since the *FMC Subarea FS Report*. Also, a current SFS schedule, consistent with the *2003 AOC* requirements, is presented in this section.

Appendix A – contains the Agency and Tribal comments and responses to comments on the draft *SFS Work Plan* that was submitted in July 2008. In addition, correspondence regarding this document, including the August 17, 2009 EMF RAO letter, are included in Appendix A.

Section 2
SITE BACKGROUND FOR THE FMC PLANT OU

2.1 INTRODUCTION

This section summarizes the site background information including a brief description of the physical characteristics, the plant manufacturing process, and previous investigations that are relevant to the SFS and their findings.

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 was the location of all of the process operations used for the production of elemental phosphorus. The FMC 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 Tesco property) that are also part of the FMC OU. Figure 1-1 also shows where the FMC Plant OU, which encompasses the FMC Plant Site, is located in the State of Idaho and in relationship to the city of Pocatello.

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 all 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.

2.2 SUMMARY OF PHYSICAL CHARACTERISTICS

This section describes the physical characteristics of the region and the FMC Plant OU, 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 the EMF RI and SRI as presented in the reports for those investigations (i.e., *EMF RI Report* and *SRI Report*) and in the *FS Report for the FMC Subarea*.

2.2.1 Geologic Setting

Regional Geology. As described in Section 3.1.1 of the *EMF RI Report*, the FMC Plant OU 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, and is 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 area, is shown on Figure 2-1 as mapped by K.L Othberg in an unpublished report by the Idaho Geological Survey in April 1997.

Site Geology. A detailed description of site geology is presented in the *EMF RI Report* Section 3.1.2 and was based on the RI 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 4.0 of the *SRI Report* 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). Table 2-1 lists the fill materials encountered at the surface and in the subsurface at each RU. Also included in this table are potential incidental fill materials and maximum/minimum depths of fill across each RU.

Native 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 below ground surface (bgs). Bedrock was encountered during the drilling in RU 15 and 16 and included basalt, rhyolite, and tuffs.

2.2.2 Hydrology

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 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 km) at the Bannock Range to over 1.5 miles (2.4 km) near the reservoir and the river course in sinuous. At the reservoir, the broad flat-bottomed area is called the Fort Hall Bottoms.

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 the area.

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, 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 boundaries of the Plant Site. 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 the plant site area (BEI, 1996).

The EMF RI investigation found no channels by which stormwater would 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.

2.2.3 Hydrogeologic Setting

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.

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.

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 stratigraphy of the Michaud Flats can generally be described as discontinuous layers of unconsolidated sediments (including the Michaud Gravel) overlying fine-grained silts, clays, and sands (American Falls Lake Bed deposits) that form a discontinuous, semi-confining unit. Deeper alluvial and colluvial silt, sand and gravels are typically volcanic (Sunbeam Formation), especially where the Michaud Flats area merges with the Bannock Range. These alluvial / colluvial sediments overlie an erosional surface incised in volcanic bedrock.

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 or resides within volcanic bedrock.

Portneuf River Valley groundwater is found 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 and the American Fall Lake Bed deposits are not present having been scoured out during deposition of the Bonneville flood gravels. 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.

Groundwater level depths range from more than 150 feet 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 the unconsolidated sediments 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.

2.2.4 Area Soils

Soils at the FMC Plant OU 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 OU.

As described in Section 1.2 of the *EMF RI Report* and in Section 2.2.2 from the *FMC Subarea FS Report*, the area including the FMC Plant OU 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).

2.2.5 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 as 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.

2.3 FMC PLANT PROCESS DESCRIPTION

Phosphate ore processing operations at the FMC Plant Site ceased in December 2001. From 2002 through 2006, the facility process units were decommissioned and the facility infrastructure was demolished to ground level. The following summarizes the FMC production operations at the facility from their beginning in 1949 through their termination in 2001.

The FMC facility produced elemental phosphorus from phosphate-bearing shale ore mined regionally. Ore was shipped to the facility 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 2-5 shows the designated RUs within the FMC Plant Site and indirectly shows the locations of the former buildings, processes, ponds, waste disposal areas and other plant facilities referenced 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, new surface impoundments (known as the calciner ponds) were installed and put into service beginning in 1968. The unlined ponds were located within RU 14. Beginning in 1986, a series of lined calciner ponds were built and put into service adjacent to and then on top of the footprint of the old unlined ponds within RU 14. Settled and dried solids removed during construction and operation of the new lined ponds were removed and stockpiled in an area (RU 16) south of the calciner ponds. The lined surface impoundments (and underlying footprint of the old unlined ponds) within RU 14 (Ponds 1C, 2C, 3C, 4C and 5C) were remediated (dewatered and capped) under a voluntary consent 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 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 formerly located within RU 6.

Slag, in a molten state at 2300 °F, was periodically tapped 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 consists primarily of calcium silicate (essentially wollastonite) and minor amounts of other ore 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 are located in RU 22b. They had ceased receiving wastes prior to the date upon which the FMC facility became subject to RCRA regulations due to the narrowing of the Bevill amendments and thus were not subject to RCRA operating or closure requirements. The railroad swale (designated as RU 22c) was designed as a stormwater retention area but also received phossy water from process spills.

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 of the *SRI Report*.

2.4 PREVIOUS INVESTIGATIONS AND SUMMARY OF FINDINGS

2.4.1 Introduction

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

2.4.2 Preliminary Site Characterization Summary

The *Preliminary Site Characterization Summary (PSCS;* BEI, 1994) 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 properties 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 source materials (such as slag, phosphogypsum and phosphate ore) cover significant portions 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.

2.4.3 Eastern Michaud Flats Remedial Investigation Report

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 the following:

- 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 of contaminants in the following media, which were outside the scope of the SRI:

- Groundwater

- Surface Water and Sediments

- Terrestrial Ecology

- Air

2.4.4 Feasibility Study Report for the FMC Subarea

The Feasibility Study (FS) Report was prepared for the FMC Subarea and submitted to EPA in 1997. The 1991 AOC required four interim FS deliverables: 1) the identification of candidate technologies memorandum, 2) the RAO memorandum, 3) the development and preliminary screening of Remedial Alternatives (DPSRA) memorandum, and 4) the comparative analysis report (CAR). These memoranda were submitted to EPA between 1993 and 1996. Remedial alternatives were developed for FMC Subarea COCs/ROCs that were associated with the soils/solids, groundwater, and air. Comparative analyses were conducted among 12 possible remedial alternatives. Alternative 4 was

recommended as the best alternative when evaluated using the nine screening criteria specified in the National Contingency Plan regulations. Alternative 4 consisted of the following:

Institutional Controls – Land use restrictions, groundwater use restrictions, and other legally binding restrictions to prevent unacceptable exposures in a future industrial land-use scenario.

Groundwater Monitoring – Ground water monitoring and evaluation would be conducted as part of the cleanup remedy for the FMC Plant OU to determine the effectiveness of the source control measures in reducing the contamination in the FMC plant area. Ground water monitoring would continue and be integrated, to the extent practicable, with the RCRA groundwater monitoring program. Ground water data would be periodically reviewed with the following goals: 1) ensure the source control measures at the plant site are effective, 2) ensure there are no new sources of contamination from existing or new hazardous waste surface impoundments or landfills, and 3) confirm eventual achievement of MCLs or RBCs.

Source Controls – These included grading, shaping to drain, and placement of soil cover at the old calciner pond solids storage area and the old phossy waste ponds area.

2.4.5 Treatment Technologies for Historic Ponds Containing Elemental Phosphorus – Summary and Evaluation (EPA, 2003)

This report provides a summary and evaluation of available information about technologies that have the potential to treat soil and sludge in historical ponds contaminated with elemental white phosphorus (P4), heavy metals, and radionuclides at the FMC Pocatello plant. These ponds were used by FMC during the manufacture of P4 from phosphate ore, and received the following wastes: phossy water, precipitator dust slurry, phossy solids, slag pit water and solids, and residuals from reclaiming P4 in other ponds.

The scope of this report is limited to a summary and review of available information from the technical literature and previous studies regarding the following:

- The 18 historical ponds identified in the *1998 ROD* that were not subject to RCRA operating and closure requirements, consisting of Ponds 00S, 0S, 1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 1E, 2E, 3E, 4E, 5E, 6E, and 7E. However, it should be noted that substantial portions of Ponds 2E, 3E, 5E, and 6E are overlain by RCRA ponds , which have since been capped, per EPA-approved RCRA Closure Plans and are under RCRA post-closure care.

- Treatment technologies that have been used or show promise for treatment of P4 based on available information.

Overall Findings - Six (6) technologies were identified as potentially applicable: solidification/stabilization (S/S); caustic hydrolysis; chemical oxidation; mechanical

aeration; incineration; and thermal desorption. The following is a summary and discussion of the major findings in this report.

- No technology has been used at full-scale to treat waste material similar to that found at the FMC ponds.
- No new treatment technologies have emerged as potentially applicable since the *FMC Subarea FS Report*.
- Other P4 manufacturing facilities primarily used capping as the remedy for similar waste.
- Minimal performance data currently exist for use of the six technologies to treat waste material similar to that contained in the FMC ponds.
- Additional testing would be necessary to assess whether treatment technologies could perform adequately across the range of contaminant concentrations and properties of the waste material found in the FMC ponds.
- The cost to implement any of the six treatment technologies would be high, based on the criteria used to identify high cost projects by EPA's National Remedy Review Board.

2.4.6 Secular Equilibrium Study

A work plan to assess secular equilibrium in the EMF Site surface soil was prepared in July 2004 (BEI, 2004) 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, 2004). 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."

2.4.7 RI Update Memorandum

The *RI Update Memo* was prepared as a directive of the *2003 AOC* for the FMC Plant OU. This memorandum presents the following information:

- An updated CSM for the FMC Plant OU. This CSM updated the description of potential sources, release mechanisms, exposure pathways, migrations routes, and potential receptors.

- A compilation of available data describing the nature and extent of contamination for exposure pathways and former working areas that were relevant to the updated CSM.

- An RBC for elemental phosphorus and other site COCs/ROCs.

- An assessment of potential ecological risks within the undeveloped areas of the FMC Plant OU for three COCs (cadmium, fluoride, and zinc) that were quantitatively evaluated in the *Baseline ERA*, and for the additional COCs of vanadium and chromium.

- A comparison of site data with RBCs, as a preliminary screen to identify areas in the FMC Plant OU (primarily the former working areas) that potentially require additional characterization.

- Identify and document any areas of the FMC Plant OU that: 1) were excluded from further investigation, 2) have adequate data to proceed with an evaluation of remedial alternatives under the SFS, and 3) have data gaps that need to be filled through SRI sampling and analysis.

The *RI Update Memo* recommended that two RUs proceed to evaluation of remedial action alternative in the SFS. These RUs consisted of RU 22b – the Old Phossy Ponds and RU 22c – the Railroad Swale. The *RI Update Memo* also recommended that RU 22a and RU 14 be excluded from the SRI/SFS process, because the ponds in RU 22a were being addressed under RCRA closure requirements and the calciner ponds in RU 14 were being addressed under a voluntary consent order between FMC and the State of Idaho. The *RI Update Memo* recommended that the SRI include the following additional investigations:

- Delineate the lateral extent of the FMC-proposed RCRA-engineered cap to prevent exposure to soils containing elemental phosphorus associated with historic spills and leaks from RUs 1 and 2 (the historic elemental phosphorus production, storage, and handling areas).

- Measure gamma radiation where slag had been use as fill.

- Sample sites in RUs 4, 5, and 20 where fuel oils and solvents had been managed to determine the need for potential hotspot removal.

- Collect additional soil samples at RUs 3, 4, 5, 6, 9, 11, and 13 to compare inorganic constituents with screening criteria at a greater statistical confidence level than could be supported with the existing data.

2.4.8 Supplemental Remedial Investigation Report for the FMC Plant Operable Unit (SRI Report; MWH, 2008)

The *SRI Report* was prepared as a directive of the *2003 AOC* for the FMC Plant OU. As discussed in Sections 4 and 5 of the *SRI Report*, the additional information generated during the SRI was determined to be sufficient 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 during both the RI and SRI. With few exceptions (specifically, only in the presence of a sustained 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. Groundwater conditions at the FMC Plant OU as a whole are described in the separate EPA-approved *GWCCR* as discussed in Section 2.4.9.

Based on the RI and SRI findings and the results of the Supplemental HHRA, the *SRI Report* recommends that all of the RUs 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 required 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 to be verified later in the CERCLA process provide a sufficient basis for the SFS evaluation of remedial alternatives.

2.4.9 Groundwater Current Conditions Report

The *Groundwater Current Conditions Report for the FMC Plant OU* (GWCCR) provides a summary of the EMF RI groundwater investigations and presents the substantial post-RI groundwater information developed under multiple regulatory programs and agencies in a single compendium to augment the Administrative Record for the FMC Plant OU. The *GWCCR* is a companion to the SRI Report for the FMC Plant OU (MWH, 2008). The *GWCCR* contains information on the current and future water use in the study area, regional and site-specific geology and hydrogeology, results of the EMF RI and FMC post-RI groundwater studies, groundwater quality and trends, a source area evaluation, groundwater fate and transport and an updated groundwater human health risk assessment.

In summary, the groundwater system within the EMF study area is very stable and flow direction and gradients have not changed significantly, as demonstrated by 18 years of quarterly monitoring. There is no migration of FMC site-related constituents in groundwater beyond FMC- (and Simplot-) owned properties. No domestic or public water supply wells are downgradient of site-impacted groundwater. FMC and Simplot-impacted groundwater discharges and mixes with the Portneuf River in the area between and including Swanson Road Spring (aka the Spring at Batiste Road) and Batiste Spring and, as such, migrates into the Off-Plant OU as surface water.

The spatial extent of the FMC-related groundwater impacts is comparable to that defined during the EMF RI. Concentrations of FMC-related groundwater impacts in the western ponds area, central plant area and downgradient portions of the joint fenceline / calciner ponds area have decreased (groundwater beneath the FMC Plant Site has improved) and are expected to continue to improve due to the lack of sustained hydraulic head on any identified or potential source areas at the site.

The following are the primary FMC-related source areas and source-distinguishable constituents contributing to groundwater impacts at the FMC Plant Site:

- Pond 8S within RU 22a (RCRA Ponds) - Potassium, chloride, sulfate, ammonia, nitrate, total phosphorus / orthophosphate, fluoride, arsenic, manganese, boron, selenium and total cyanide.
- Old “Phossy” Ponds (RU 22b) and portions of RU 13 with identified “phossy” pond solids in fill materials - Potassium, chloride, sulfate, ammonia, nitrate, total phosphorus / orthophosphate, fluoride, arsenic, manganese, boron, selenium and total cyanide.
- Furnace Building, Phos Dock and Secondary Condenser (RU 1) and Slag Pit (RU 2) – Elemental phosphorus.
- Former Kiln Scrubber Ponds and Calciners (RU 8) and Former Kiln Scrubber Overflow Pond (RU 9) - Ammonia, nitrate, fluoride, selenium, vanadium and total cyanide.
- Former Unlined Calciner Ponds, Calciner Sediment Storage Area ‘A’, Calciner Ponds (RU 14) - Potassium, chloride, fluoride, arsenic, manganese, boron and selenium.
- Calciner Solids Storage Area (RU 16) – Potassium, chloride, sulfate and selenium.
- Slag Pile (RU 19) – Potassium and sulfate.

The most significant factor in the reduction of groundwater constituent concentrations is advective mixing. Mixing of small volumes of EMF-affected groundwater with large volumes of unaffected groundwater within the EMF aquifer system substantially reduces

the concentration of all constituents, including conservative, non-attenuating solutes such as sulfate, along the groundwater flowpath.

There are no current exposed receptors to FMC-impacted groundwater (i.e., there are no domestic, industrial or agricultural wells that extract impacted groundwater). There are no domestic, industrial or agricultural uses of the water from the Batiste Spring or Swanson Road Spring where, along with baseflow, groundwater from the EMF Site merges with surface water at the Portneuf River. Potential risks associated with surface water (i.e., the Portneuf River) are addressed as part of the Off-Plant Operable Unit of the EMF Site.

Groundwater conditions at the FMC Plant OU have been characterized 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.

2.4.10 Supplemental Remedial Investigation Report Addendum for the FMC Plant Operable Unit

The *SRI Report Addendum* was prepared following additional field investigations during the fall of 2008 and is a companion document to the *SRI Report*. . The Addendum activities consisted of the evaluation of human health and ecological risks from surface soils in the Southern and Western Undeveloped Areas (SUA and WUA) and the FMC-owned Northern Properties of the FMC Plant OU.

The results discussed in this report supported three overall conclusions. The first is that elevated levels of metals, fluoride, and radionuclides detected in surficial soil samples collected in the SUA, WUA and Northern Properties are the result of wind blown dust and stack emissions from past FMC and past/current Simplot manufacturing operations. The second supporting conclusion is that parcels located directly downwind of the FMC and Simplot plant sites (i.e., Parcels 3, 4, and 6) are more heavily impacted by the EMF facility-related constituents (i.e., have higher concentrations of all constituents) than parcels located either in an upwind and cross-wind direction (i.e., Parcel 1, SUA, and WUA). Lastly, surface soil impacts decrease with distance from the FMC and Simplot plant sites, which further supports the conclusion that EMF impacts are related to the dispersion and deposition of facility air emissions. Parcel 3, located immediately downwind of the plant sites, contains the highest surface soil concentrations of all constituents, and these concentrations decrease with increasing distance downwind of the plant sites (e.g., Parcels 4 and 6). These general findings are consistent with those stated in the RI Report for the EMF site (BEI, 1996).

With respect to ecological receptors, the Supplemental ERA findings were similar to those of EPA's *Baseline Ecological Risk Assessment* (*BERA*) (E&E 1995). Specifically, the Supplemental ERA found that fluoride is the only COC associated with marginal risks, but that it is unlikely to result in adverse effects on population size or community composition. Nonetheless, potential fluoride ecological concerns in Parcels 2, 3, 4, and 6 will be carried forward into the SFS.

Based on the SRI Addendum findings and the results of the Supplemental HHRA the *SRI Addendum Report* shows that the SUA and WUA do not pose a risk to human health. However, the *SRI Addendum Report* recommends that Parcel 1 to Parcel 6 proceed to the SFS for evaluation of remedial alternatives based on risks to human health and the environment.

Section 3
SRI FINDINGS AND UPDATED CONCEPTUAL SITE MODEL

3.1 INTRODUCTION

This section summarizes the findings from the SRI and SRI Addendum and, based upon these findings, provides an update to the CSM. The SRI was conducted at the FMC Plant Site during the summer/fall of 2007. The SRI field work followed the EPA-approved *SRI Work Plan*, which included the *SRI Field Sampling Plan (SRI FSP)*. The final *SRI Report* was submitted to the Agencies on May 14, 2009. The SRI Addendum was conducted at the FMC Plant OU during the fall of 2008 according to the EPA-approved *SRI Work Plan Addendum - Field Modification #13, Additional Southern and Western Undeveloped Areas Field Investigations (MWH, 2008) and SRI Work Plan Addendum - Field Modification #14, Northern FMC-Owned Properties and Background Soil Sampling (MWH, 2008a)*. The final *SRI Addendum Report* for the FMC Plant OU was submitted to the Agencies on November 18, 2009.

3.2 SUMMARY OF SRI OBJECTIVES

3.2.1 SRI Performed in 2007

Based on the *Scoping and Planning Memo*, Attachment A SOW - Task 1.1, the SRI/SFS has the following site-specific objectives:

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) Provide the basis for selecting a remedial action that assures protection of human health and the environment, minimizes the need for long-term care and maintenance and is compatible with reasonably anticipated future land use and development.

As confirmed by the *2003 AOC* SOW, the SRI/SFS (like the original RI/FS) will take into account the reasonably 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 regulatory and RCRA consent decree requirements, and 2) former Calciner Ponds where FMC has conducted remedial action pursuant to a voluntary consent order with IDEQ. The SRI/SFS process excludes evaluation of these units.

It was anticipated in the *2003 AOC* that the SRI/SFS would focus on the potential for exposure to shallow soils and solids under a future commercial or industrial land use scenario, as well as the potential for migration of constituents from soils and solids through the subsurface to groundwater. The air and groundwater pathways were evaluated on a site-wide basis in the *FMC Subarea FS Report*. The groundwater conditions at the FMC Plant OU as a whole are described in detail in the final *GWCCR* submitted on June 26, 2009.

3.2.2 SRI Addendum Performed in 2008

During the fall of 2008, FMC collected surface soil samples in the Southern and Western Undeveloped Areas (SUA and WUA) and the northern properties owned by FMC that are part of the FMC Plant OU. These investigations were performed per the EPA-approved Field Modification #13 - RI Work Plan Addendum C and Field Modification #14 - RI Work Plan Addendum D, respectively.

The primary objective of the 2008 SRI Addendum sampling in the SUA and WUA was to collect surface samples of native soils in order to develop analytical data to further evaluate potential risks to ecological and human health risks to potential receptors in these areas. In addition, the analytical data was compared to commercial/industrial soil screening levels (SSLs) to confirm that levels are protective of hypothetical future worker exposure scenarios in these areas.

The primary objective of 2008 SRI Addendum sampling in the northern properties was to collect and analyze surface samples of native soils to further evaluate ecological and human health risks to potential future receptors in these areas. The analytical data was compared to ecological, residential and commercial/industrial worker soil screening levels (SSLs). Furthermore, select subsurface samples were collected from the northern property parcel that exhibited the highest surface concentrations in the RI data set in order to evaluate subsurface risks to potential future site workers.

In addition to the sampling identified above, soil samples were also collected from select areas within a 6 to 11 mile radius of the former FMC Plant Site. These soil samples, which were located outside of the area impacted by EMF facility operations, were used to further develop background concentrations for metal and radionuclide constituents of concern in FMC Plant OU soils.

3.3 SUMMARY OF SRI FINDINGS

Table 3-1 summarizes the SRI findings by RU or area for the SRI field work performed in 2007 and 2008. This table contains the following information for each RU or sampling area: the RU/sampling area name, field programs conducted at each RU/sampling area, investigation rationale for each field program, analytes collected during each field program, a summary of the results, and a discussion of the findings in the final column labeled contamination assessment. The text in Section 4.0 of the *SRI Report* and Section 3.0 of the *SRI Report Addendum* supports and expands on the information presented in this table.

Below the FMC Plant Site findings related to: 1) Potential Sources, 2) COCs/ROCs, 3) exposure media, 4) the potential receptors, and 5) routes of exposure are presented.

3.3.1 New Potential Sources or Site Conditions

While new potential sources were not identified during the SRI, new site conditions were encountered or information gathered that require the CSM to be updated. These new site conditions and/or information include:

- P4 was identified in the capillary fringe downgradient of the slag pit/furnace building area.
- With the completion of decommissioning and demolition activities at the FMC plant site along with significantly reduced traffic on site, fugitive particulate emissions have been greatly reduced.
- The final two remaining underground fuel storage tanks were removed per RCRA UST requirements in 2006.
- While additional soil investigations were not performed at FMC plant site landfills during the 2007 or 2008 investigations, the CSM was updated based upon information gathered for these landfills including:
    - The construction debris landfill (RU 17),
    - The active landfill (RU 18),
    - The historic landfill in the slag pile (in the southwest corner of RU 19), and
    - The buried railcars in the slag pile (center of RU 19).
- While physical soil investigations for underground piping were not performed during the 2007 or 2008 SRI, the CSM was updated based upon information gathered for underground piping within the FMC plant site.

3.3.2 Site Contaminants of Concern

New COCs/ROCs were not identified during the SRI. However, new site conditions were encountered that required the CSM to be updated. The principal new site condition was that P4 was encountered in the capillary fringe overlying shallow groundwater downgradient of RUs 1 and 2. The updated COCs/ROCs evaluated in the current CSM based upon the SRI results are shown in Table 3-2. This table also shows the COCs/ROCs that were identified in the EMF Site *1998 ROD* and in the *RI Update Memo*. Below the affected media and potential receptors and exposure pathways are discussed, leading to an updated CSM as discussed in Section 3.4.

3.3.3 Potential Exposure Media

This section updates the description of the environmental media identified during the SRI that could be impacted by potential releases from sources within the FMC Plant OU 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 Section 3.4 and Figure 3-1 for the changes to the CSM based on the SRI finding discussed below.

Soil - Impacts to soil quality that are 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. At RU 20, these constituents are fuel-related PAHs (i.e., semi-volatile compounds).

Air – Potential impacts to air quality that are 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 and bull rock piles (RU 19), 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 – An additional impact to groundwater that is 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 and groundwater, including capillary fringe soils downgradient (to the northeast of RU 1) for a distance up to approximately 500 feet.

3.3.4 Potential Receptors and Routes of Exposure

Individuals potentially exposed to FMC Plant OU-related contaminants include potential future site workers and nearby residents. Specifically, the updated CSM discussed in Section 3.4 of this work plan identifies 1) outdoor commercial/industrial workers, 2) indoor commercial/industrial workers, 3) construction workers, 4) utility workers, 5) maintenance workers and 6) nearby residents as being potential receptors to FMC Plant OU-related constituents.

Each of the receptors could be exposed to FMC Plant OU-related constituents via one or more exposure pathways or routes of exposure. The updated CSM based on the SRI findings summarizes the potential exposure pathways that are considered for each potential receptor. The identified pathways were developed based on the recommendations set forth in EPA Soil Screening Level (SSL) guidance documents for Superfund sites (EPA, 2002a; EPA, 2004a), as modified to reflect site-specific considerations at the FMC Plant OU. A complete description of the potential receptors and complete/incomplete routes of exposure is presented in the Supplemental Human Health Risk Assessment (HHRA) in Appendix J of the *SRI Report*.

As a 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 identified in the CSM have been deemed to be of no further concern:

- 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.

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 were not the subject of the *SRI Report*. Those instead are addressed in *GWCCR* and the Draft *SRI Addendum Report*.

3.4 UPDATED CONCEPTUAL SITE MODEL FOR THE FMC PLANT OU

The current conceptual site model (CSM), along with associated notes, is presented in Figure 3-1. This CSM is a revised version of the 2004 CSM as a result of findings regarding current site conditions as updated by the *SRI Report*, the *2008 SRI Addendum*

Report, and the GWCCR. The updated CSM 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. This information presented above has been used to develop RAOs for protection of human health and the environment and general response actions as presented and discussed in Section 4 of this work plan.

3.5 TRANSITION FROM RUs TO REMEDIATION AREAS (RAs)

As part of the SRI/SFS scoping and planning activities, the impacted areas of the FMC Plant OU were divided up into 24 Remediation Units (RUs). An RU was intended to delineate one or more Solid Waste Management Units (SWMUs) with similar former processes or characteristics (including types of constituents of potential concern) and typically in the same geographical area of the FMC Plant OU. The SRI Work Plan was based upon investigation of these RUs.

Upon completion of the SRI, the contamination assessment of each RU has shown many of the RUs to have similar characteristics, warranting evaluation of similar remedial approaches. As the site moves into the SFS, combining (or in some cases dividing) RUs into new geographical areas will facilitate the SFS process and the RD/RA. These new areas are referred to as Remediation Areas (RAs). In general, the RAs are defined based on geographic proximity, similarity of contaminants of concern (COCs), and a consistent remedial approach. A description of each RA is presented in Table 3-3 (and shown on Figure 3-2) which also includes:

- The RUs contained within the RA;
- The grouping rationale for each RA;
- A listing of RCRA SWMUs within each RA;
- The Exposure Scenarios of Concern associated with each RA (or subarea within an RA) prior to Remedial Action; and
- The RAO(s) that must be addressed for each RA with Remedial Action.

Section 4

REVIEW AND UPDATE – REMEDIAL ACTION OBJECTIVES, ARARs, AND GENERAL RESPONSE ACTIONS

4.1 REVIEW AND UPDATE OF THE ARARS BASED ON SRI FINDINGS

This section presents a general discussion of the ARAR process and summarizes the ARARs forwarded for consideration in the development of the RAOs. ARARs associated with the FMC Plant OU were developed based on contaminants of concern, the affected media, and other site conditions as presented in Section 3 of this report. Table 4-1 presents the ARARs for the FMC Plant OU. The sections below present how ARARs were established.

Given the time that has passed since the last ARARs development, which was presented in the 1997 FS, the ARARs presented in Table 4-1 are the result of a review of the current standards and represent a standalone list rather than an addendum to the ARARs presented in the FS and utilized in the *1998 ROD*. The RAOs presented in Table 4-2 are those set forth in the 1998 ROD and *2003 AOC*. These RAOs are incorporated into Table 4-3, except as otherwise noted.

4.1.1 CERCLA Provision Requiring Remedial Actions to Meet ARARs

The requirement for identifying and meeting ARARs is established by CERCLA Section 121 (d)(2)(A), which states the following: "With respect to any hazardous substance, pollutant or contaminant that will remain on-site, if – (i) any standard, requirement, criteria, or limitation under any Federal environmental law...; or (ii) any promulgated standard, requirement, or limitation under a State environmental or siting law that is more stringent than any Federal standard, requirement, criteria, or limitation..... and that has been identified …… in a timely manner, is legally applicable to the hazardous substance or pollutant or contaminant concerned or is relevant and appropriate under the circumstances of the release or threatened of such hazardous substance or pollutant or contaminant, the remedial action selected ... shall require, at the completion of the remedial action, a level or standard of control for such hazardous substance or pollutant or contaminant which at least attains such legally applicable or relevant or appropriate standard, requirement, criteria, or limitation." CERCLA also exempts certain substantive standards from classification as ARARs, for example standards that are not of general applicability or have not been consistently applied in other similar circumstances.

4.1.2 Evaluation of Site-Specific ARARs

ARARs are substantive requirements that are either directly applicable or relevant and appropriate to actions or conditions at the site. A requirement is applicable if it is legally binding to a site condition and directly addresses the contaminants, locations or actions involved in the remedial action. A requirement may be relevant and appropriate if

circumstances at the site are similar to the problems or situations intended to be addressed by the requirement.

ARARs do not include administrative requirements that facilitate the implementation of the substantive requirements of a statute or regulation. Examples of administrative requirements are approvals; consultations with administrative bodies, and agency exemption or variance processes.

The NCP at 40 C.F.R. §300.5 provides the following ARARs-related definitions:

> *Applicable Requirements* are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.
>
> *Relevant and Appropriate Requirements* are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to the hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

As discussed in the NCP preamble at 55 FR 8741 (March 8, 1990), ARARs fall into three categories.

Chemical-Specific: These requirements define permissible concentrations of chemicals for various environmental media, such as soil or ground water. They are health- or risk-based criteria. Some are set at uniform levels that apply to all sites while others are based on site-specific calculations. An example of a chemical-specific ARAR is the set of Safe Drinking Water Act MCLs for drinking water.

Action-Specific: These requirements specify how a remedial action must be achieved. They are generally technology-based and apply to specific remedial approaches rather than to a site as a whole. Examples of action-specific ARAR would be the specifications or performance requirements (i.e., rules) for landfills or land treatment if those were components of the selected remedy.

Location-Specific: These requirements may mandate or restrict particular actions solely due to site location, even if the same actions were acceptable elsewhere. An example of a location-specific set of ARARs would be the rules pertaining to jurisdictional wetlands. Those rules might prohibit remedial action-related fills to wetlands where there was a practicable alternative or impose the requirement for compensatory mitigation where there was no such alternative. These same actions outside a wetland would not be subject to these requirements.

For the FMC Plant OU, the ARARs presented in Table 4-1, are organized by statute to minimize redundancy with respect to media, location and action-specific ARARs as originally presented in the draft *SFS Work Plan* (MWH, 2008). In addition, a separate table presenting RCRA ARARs also is included to provide a more detailed analysis of RCRA requirements that are potential ARARs. The revised Table 4-1 is entitled "Potential Applicable or Relevant and Appropriate Requirements other than those based on RCRA or asserted Tribal standards for the FMC Plant Operable Unit at the Eastern Michaud Flats Superfund Site" and Table 4-1A is entitled "RCRA Regulatory Requirements that may constitute ARARs for FMC Plant OU Remedial Action". The revised Table 4-1 and new Table 4-1A respond to EPA and IDEQ comments regarding both organization and content of the original ARAR table.

Potential ARARs listed in Tables 4-1 and 4-1Awere identified from pertinent environmental and health statutes including the following:

- Clean Air Act (42 U.S.C. § 7401 et seq.)
- Clean Water Act (33 U.S.C. § 1251 et seq.)
- Safe Drinking Water Act (42 U.S.C. § 300f et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.)
- Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings (40 C.F.R. Part 192).

4.2 REVIEW AND UPDATE OF REMEDIAL ACTION OBJECTIVES

The National Contingency Plan (NCP) specifies that RAOs be developed to address 1) contaminants of concern, 2) media of concern, 3) potential exposure pathways, and 4) preliminary remediation levels or goals. The development of these goals for the FMC Plant OU involves evaluation of the results of the Supplemental HHRA presented in the *SRI Report* and the identification and application of ARARs. The SFS will assemble general response actions and technologies into remedial alternatives that meet these RAOs.

RAOs for the FMC Subarea from the *1998 ROD* are presented in Table 4-2. RAOs have been updated for the FMC Plant OU based on the findings of the RI, SRI, other data (including groundwater data to be presented in the groundwater current conditions report) collected since the RI, and the findings of the EPA Baseline HHRA and the FMC Supplemental HHRA. Table 4-3 lists the updated RAOs that the SFS will apply in developing and evaluating remedial alternatives for the FMC Plant OU. The RAOs are organized by media (soil, groundwater, and air) and then grouped by potential receptors for each medium. For each receptor, the potential exposure pathways are listed, as are the COCs/ROCs for each pathway. The range of general response actions for each medium are listed in the final column of Table 4-3 and includes a range of responses to the RAOs listed in the adjoining column. As shown in Table 4-3, updates from the 1998

ROD RAOs include two additional pathways for soils and solids (dermal absorption and exposure to fire from P4) as well as a pathway for air (inhalation of fugitive dust and phosphoric acid aerosol). In addition, based on SRI data, inhalation of radon in ambient air does not appear to be a significant potential route of exposure and is not included as a potential exposure pathway. Note that surface water and sediments will not be discussed because they are not media of concern for the FMC Plant OU.

4.3 PRELIMINARY REMEDIATION GOALS

Site specific preliminary remediation goals (PRGs) to achieve the RAOs presented in Section 4.2 have been developed for the primary risk-driving chemicals and radionuclides of concern (COCs/ROCs) identified in the SRI and SRI Addendum human health risk assessments. The PRGs assume individuals could be exposed via all viable pathways under a reasonable maximum exposure (RME) scenario, and thereby ensure that any potential future receptors at the FMC Plant OU won't be exposed to unsafe levels of site-related chemicals. The COC/ROC-specific PRGs are equivalent to a hazard quotient (HQ) of 1 for non-carcinogens and a 1E-04 cancer risk above background for carcinogens. The total risk associated with each of the cancer-based PRGs is within EPA's allowable risk range, as defined in OSWER Directives 9355.0-30 and 9200.4-18.

The proposed PRGs are presented in Tables 4-4 and 4-5 for future outdoor commercial/industrial workers and future construction workers, respectively. In addition, as requested by EPA, Table 4-6 shows calculated PRGs for a hypothetical future resident on the FMC Northern Properties. The worker PRGs are applicable to all areas of the FMC Plant OU, whereas the residential values are only remotely relevant to the FMC Northern Properties which, if zoning laws were changed and deed restrictions rescinded, could potentially be residentially developed. The tables provide PRGs for select risk-driving COCs/ROCs because, as shown in Table 4-7, based on a comparison of the ratio of the COC/ROC exposure point concentrations (EPCs) in predominant fill materials at the FMC Plant OU to corresponding outdoor commercial/industrial worker PRGs, only a few constituents drive the potential need for remedial action (primarily radium-226). Appendix B provides the calculations used to derive the PRGs.

In summary, the risk-based PRGs provided in Tables 4-4, 4-5 and 4-6 are proposed for the following reasons:

- They are distinguishable from background and therefore measurable in the field;
- They are within the risk range cited in the NCP (300.430(e) (2)(I)), as further defined in OSWER Directives 9355.0-30 and 9200.4-18; and
- In addressing these primary COCs/ROCs, all other constituents will be addressed concurrently to below levels of concern.

4.4 GENERAL RESPONSE ACTIONS REVIEWED

General response actions describe those actions that will satisfy the RAOs as shown in Table 4-3. General response actions may include treatment, containment, excavation,

extraction, disposal, institutional controls, or a combination of these. Like remedial action objectives, general response actions are medium-specific.

The 2003 *AOC SOW* stated "the following general response actions will be evaluated - no action and application of a remedial action technology selected for similar site conditions in the *1998 ROD*". However, the SFS general response actions for soil/fill and groundwater in the FMC Plant OU will be expanded to be more inclusive and will include the following:

- No Action
- Institutional Controls
- Containment
- Removal/Disposal
- Ex-situ Treatment
- In-situ Treatment

For air, general response actions include the following:

- No Action
- Institutional Controls
- Containment
- Collection

Potential remedial technologies (response actions) are similar for soil and groundwater because they are general classes of response. However, the process options or specific remedial technologies to be utilized will vary depending on the medium to be treated and the site-specific conditions. This process of identification and selection of the appropriate remedial technologies is discussed in Section 5.

Section 5
SUPPLEMENTAL FEASIBILITY STUDY PROCESS - FMC PLANT OU

5.1 INTRODUCTION

Following EPA approval of this SFS Work Plan, FMC will evaluate: 1) the original EMF RI data, 2) data obtained during the SRI, 3) information that is contained in the *GWCCR*, and 4) the SRI Addendum Report that discusses the findings from surface soil samples collected from the properties north of Highway 30, to begin the SFS process for the FMC Plant OU. Findings derived from these data will be used to update the remedial alternatives for controlling risks to human health and the environment. During preparation of the SFS, candidate treatment technologies will be evaluated and remedial alternatives will be assembled that are appropriate for site conditions, following the standard FS alternative development process as shown on Figure 5-1. The SFS process will use the findings of the Supplemental HHRA including COCs/ROCs, exposure routes, and potential receptors and will apply ARARs to develop appropriate RAO and general response actions as presented in Section 4 and described below.

EPA's guidance entitled *"Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"* dated October 1988 (*RI/FS Guidance*, EPA 1988) will be followed during the SFS process.

The RAOs, discussed in Section 4, were developed:

- to protect human health and the environment for the FMC Plant OU (COCs/ROCs);
- for site-specific exposure routes and receptors;
- according to specific risk-based remediation goals (i.e., SSLs) for individual COCs/ROCs; and
- to meet ARARs.

General response actions are designed to meet the RAOs and may include treatment, containment, excavation, extraction, disposal, institutional controls, or a combination of these responses. In the SFS, remedial technologies will be evaluated for each general response action and class of COCs/ROCs (e.g., metals, radiological, etc.) at the FMC Plant OU. Again, the SFS will focus on the identification and evaluation of technologies that have been developed since the original *FMC Subarea FS Report*.

This identification and evaluation of candidate technologies likely will result in some of the alternatives from the original FS being retained because no new technologies have been developed for site-specific COCs/ROCs since the original FS. The following sections discuss in more detail the methods that will be used to evaluate technologies and assemble, screen, and select alternatives for the FMC Plant OU.

5.2 TECHNOLOGY EVALUATION – IDENTIFICATION AND SCREENING

The technology evaluation begins with a review of the general response actions that will satisfy the RAOs. Section 10.0 of the *1998 ROD* presented a selected remedy for the FMC Plant OU and the *2003 AOC SOW* stated "The purpose of the SFS is to supplement the existing FS based upon any new information…". However, the SFS will identify and screen an expanded list of technologies applicable to each general response action. The general response actions are engineering or administrative solutions for protection of human health and the environment from the site-related COCs/ROCs. As discussed above, general response actions may include treatment, containment, excavation, disposal, institutional actions, or a combination of these. Like RAOs, general response actions are medium-specific.

In the initial technology screening, the universe of potentially applicable remedial technology types and their associated process options is reduced by evaluating the options with respect to their on-site technical implementability (*RI/FS Guidance*). The goal is to reduce the number of process options per remedial technology to one. This is accomplished by using the information available from the RI, SRI and other studies on contaminant types, contaminant concentrations, and onsite characteristics to quickly screen out technologies and process options that cannot be effectively implemented at the site.

For example, the process options for the remedial technology "capping" might include soil, clay (low permeability natural material cap), capillary barrier (or evapo-transpiration), asphaltic, geosynthetic, and composite caps. If the wastes to be capped exhibit a RCRA hazardous waste characteristic, then cap types that meet the associated RCRA standards would be retained among the remedial alternatives. In this example, other cap types that could not meet RCRA standards would be dropped from further evaluation. Figure 5-2 provides a generic illustration of the FS process and indicates how technologies and individual process options are screened for each medium and then assembled into alternatives.

Also during the SFS, the technology evaluation presented in Sections 4 and 5 of the *FMC Subarea FS Report* will be reviewed to determine:

1) If the FMC Subarea COCs/ROCs (by medium), site conditions, and SSLs as identified in the SRI and the risk assessment have changed and if so, how have they changed.

2) If there are new technologies available for the COCs/ROCs, or for the site conditions existing either at the time of the FMC Subarea FS or identified after the FS, that could lead to new or revised alternatives.

This review will allow the SFS team to quickly assemble and screen technology types and select the most appropriate process options for each technology type.

Also, in this early portion of the SFS process, surface areas and volumes of contaminated media will be determined based on previously available calculations (e.g., those included

in the FMC Subarea FS) or new calculations. Surface areas, fill thickness and volumes will be calculated based on the RI/FS and SRI data. Table 2-1 indicates the types of fill encountered on the surface and at depth for each RU. Fill thicknesses and volumes will be calculated using soil boring logs and, where necessary, process knowledge at RUs 1, 2, 8, 9, 22b, and 22c. Process knowledge for estimation of fill thickness/volume will be utilized for areas where no RI or SRI borings were advanced due to factors such as the presence of P4 waste materials. For example, at RUs 1 and 2, P4 is present in the soil pore space beneath the former production facilities and extends to the groundwater capillary fringe. As a result, the quantity and extent of P4 underlying that area will be conservatively estimated based on process knowledge, the characteristics of P4, and the soil type.

Effectiveness, implementability, and relative cost - Following the initial technology screening based on technical implementability, technology process options considered to be implementable will be evaluated in greater detail before selecting one process to represent each technology type. One representative process is selected for each technology type to simplify the subsequent development and evaluation of alternatives without limiting flexibility during the remedial design. Possible process options will be evaluated with respect to effectiveness, implementability, and relative cost. This evaluation focuses on effectiveness with less emphasis on relative cost and implementability.

As described in the *RI/FS Guidance*, the effectiveness evaluation is the most important technology-evaluation criterion. Effectiveness is used to eliminate undesirable technologies and determine the most viable technologies for the site contamination in each medium and for specific conditions. This evaluation focuses on 1) the potential effectiveness of the process options in handling the estimated areas or volumes of media to meet the remediation goals identified in the RAO, 2) the potential impacts to human health and the environment during the construction and implementation phase of the remediation process, and 3) how proven and reliable the process is with respect to the contaminants and conditions at the site.

Implementability is evaluated with respect to both the technical and administrative feasibility of the process option. Cost plays a limited role in the evaluation and is based on engineering judgment as high, medium, or low relative to the other process options. Refer to Figure 5-2 for a generalized diagram of how technologies will be evaluated and alternatives will be assembled and screened.

In summary, a broad range of technologies will be screened with respect to their technical implementability for the affected media and site conditions at the FMC Plant OU. This initial screening will use the standard applicable technologies, and will identify any "new" technologies since the *FMC Subarea FS Report* and appropriate technologies for any "new" site conditions that were identified during the SRI. Following this initial screening of technologies, a master table will be prepared for screening the remaining technology/process options. As discussed above, effectiveness will be the primary screening criterion followed by implementability and relative cost. These criteria will be placed in successive columns and used to screen the remaining technologies and to select

viable technologies that will be retained for assembly into alternatives for the FMC Plant OU.

5.3 ASSEMBLY AND SCREENING OF ALTERNATIVES

5.3.1 Introduction

In assembling alternatives, general response actions and the process options chosen to represent the various technology types for each medium will be combined to form alternatives for the site as a whole (EPA, 1988). For the SFS, this process will entail assembling the alternatives based on the SFS evaluation described above and comparing the alternatives assembled for the SFS to the 12 previously identified remedial alternatives as documented in the *FMC Subarea FS Report*. The SFS will only evaluate remedial alternatives for the FMC Plant OU that are the most appropriate for the existing site conditions. Depending on the conclusions from the comparison, it may or may not be appropriate to evaluate any of the 12 previous alternatives. However, the process will be transparent and each of the alternatives developed during the SFS will be evaluated as described in the EPA's *RI/FS Guidance*.

5.3.2 Alternative Screening Evaluation - Effectiveness, Implementability, and Cost

The assembled alternatives will be evaluated against the short and long-term aspects of three broad criteria: effectiveness, implementability, and cost. In this step, the alternatives will be further reduced in number so that remaining alternatives can undergo a more extensive detailed analysis of alternatives.

Effectiveness – A key aspect of the screening evaluation is the effectiveness of each alternative in protecting human health and the environment. In addition, to be judged effective an alternative must 1) be effective in the short-term (referring to the construction and implementation period) and long-term (referring to long-term permanence of the alternative) and 2) reduce the toxicity, mobility, or volume of the contaminated media by the use of treatment that decreases the threats or risks associated with the contamination.

Implementability – Implementability, as a screening criterion, is the measure of both the technical and administrative feasibility of constructing, operating, and maintaining a remedial alternative given the particular process options and specific site conditions.

Cost – Cost estimates during the screening stage typically are based on a variety of cost-estimating data including vendor information, conventional cost estimating guides, or previous similar job project totals. Both O&M and capital costs will be considered and the costs will be reduced to a single figure for each alternative (i.e., an overall total project remediation cost). Because the alternatives at this stage of the process will need refinement, these costs are not as accurate as they need to be for purposes of the detailed analysis (for which the costs estimates should be within the range of +50% to -30%). As discussed in the *RI/FS Guidance*, "Absolute accuracy of the cost estimates during the screening is not essential."

Post-Screening Tasks - The screening process will yield a reduced number of remedial alternatives that will be evaluated further in the detailed analysis of alternatives discussed below. Often a meeting is held at this stage with the regulatory agencies so that all parties understand the direction of the SFS.

For the FMC Plant OU SFS, a meeting will be necessary and this may be accomplished either with a conference call or a face-to-face meeting if the previous FS alternatives are extensively revised. In addition, if additional data are necessary to complete the detailed analysis of alternatives, those data gaps will be discussed and filled during this phase of the FS process. These data needs might include treatability studies and/or limited investigations depending on, for example, site-specific process options and technical requirements.

5.3.3 Detailed Analysis of Alternatives – Using the Threshold, Balancing, and Modifying Criteria

A reduced number of viable alternatives will be taken through the detailed analysis. The purpose of the detailed analysis of alternatives is to provide decision makers with adequate information to permit selection of an appropriate site remedy. The detailed analysis is the last phase of the FS process in which alternatives are evaluated in detail with respect to the nine evaluation criteria that EPA has developed to address the CERCLA requirements and preferences (*CERCLA Overview*; EPA 1988 and 1990). The nine criteria consist of the following.

Criteria	Discussion
1. Overall protection of human health and the environment	These are "Threshold Criteria" that each alternative *must* satisfy to be eligible for selection based on statutory requirements. [(a)]
2. Compliance with ARARs	
3. Long-term effectiveness and permanence	These are the technical criteria called "Balancing Criteria" upon which the detailed analysis primarily is based.
4. Reduction of toxicity, mobility, or volume	
5. Short-term effectiveness	
6. Implementability	
7. Cost	
8. State acceptance	These "Modifying Criteria" are related to the acceptance of the remedial alternative by the public and regulatory agencies. These criteria are assessed formally after the public comment period at which time public and agency comments are factored into the selection of the preferred alternative.
9. Community acceptance	

[(a)] EPA can waive aspects of threshold criteria if there are logical reasons for the exception (e.g., an ARAR might be waived because of a unique site condition).

Again, this detailed analysis likely will include alternatives from the original *FMC Subarea FS Report* that may or may not be revised depending on a variety of factors including the SRI findings. In the detailed analysis, the alternatives are analyzed individually against each of the 9 criteria (this constitutes the "individual analysis") discussed above and then compared against one another (the "comparative analysis") to determine their respective strengths and weaknesses and identify the key trade-offs that must be balanced for the site. Identification of the "preferred" alternative will be the final step and outcome of the FS process.

5.4 SCHEDULE FOR COMPLETION OF THE SFS PROCESS

As discussed in the introduction to this document, the *2003 AOC SOW* establishes two deadlines for the SFS process:

- Work Plan for Supplemental FS - 60 days after EPA approval of SRI Report
- Supplemental FS Report - 60 days after EPA approval of Work Plan for the Supplemental FS.

However, several other unanticipated companion documents were prepared to supplement the RI and SRI reports and these documents should be considered in the overall SFS delivery schedule. These documents include the following:

- ***Groundwater Current Conditions Report*** **-** The RI and post-RI groundwater data through the second quarter of 2009 is presented in the *GWCCR* that submitted as final on June 26, 2009. EPA approved the GWCCR on July 20, 2009.
- ***SRI Addendum Report*** **- FMC Plant OU Properties North of Highway 30** The RI and post-RI surface soil data for the FMC properties north of Highway 30 (excluding the Tesco property) was presented in a draft *SRI Addendum Report* submitted to EPA for review on June 30, 2009. Once FMC receives approval of this document, it will be issued as final and should be considered the trigger for submittal of this *SFS Work Plan*.

To date, several companion documents have been prepared to support the development of the SFS and have been submitted to EPA as interim deliverables and reviewed in advance of the SFS Report. These documents were not specified as interim deliverables under the *2003 AOC SOW*. These include:

- *Identification and Evaluation of P4 Treatment Technologies* – presents an evaluation of possible P4 technologies currently available for P4 remediation in soil and worker/public risks associated with P4 remediation also are discussed in this memo.
- *Assembled Soil Alternatives for the FMC Plant Operable Unit (Interim Deliverable)* – was submitted to provide an initial review of the alternatives that were being assembled for the FMC Plant OU. This document includes descriptions of core elements that are common to all alternatives (e.g., cap

integration, monitoring, and management), the transition of RUs into remediation, and descriptions of the 5 preliminary alternatives.

- *Buried Railcar Evaluations for the FMC Plant OU* – presents an evaluation of various process options that were screened for the remediation of railcar that are buried in the Slag Pile (RU 19).

- *Comparison of Conventional and Alternative Capping Systems for Use at the FMC Plant OU* – evaluates the performance of conventional and alternative capping systems (ET caps) in arid environments and draws conclusions based on specific performance criteria. A preliminary ET cover design for the FMC site is presented in the final section of this report.

Section 6
REFERENCES

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APPENDIX A

AGENCY COMMENTS, FMC RESPONSES TO AGENCY COMMENTS, AND AGENCY LETTERS REGARDING THE SFS WORK PLAN FOR THE FMC PLANT OU

APPENDIX A

AGENCY COMMENTS, FMC RESPONSES TO AGENCY COMMENTS, AND AGENCY LETTERS REGARDING THE

SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN FOR THE FMC PLANT OU

A-1 FMC's Transmittal Letter and Initial Response (dated: November 14, 2008) to Agency/Tribes Comments (RTCs, dated: September 30, 2008 and October 2, 2008) on the draft *Supplemental Feasibility Study (SFS) Work Plan for the FMC Plant OU – July 2008*

A-2 FMC Transmittal Letter (dated: June 9, 2009) for Supplemental Responses to initial *SFS Work Plan* RTCs;

Attachment 2 - FMC's Supplement Responses (dated: June 9, 2009) to Initial RTCs to EPA/Tribes Comments on the draft *SFS Work Plan for the FMC Plant OU – July 2008*; and

Attachment 6 - FMC's Responses (dated: June 9, 2009) to IDEQ Comments on the Proposed RCRA ARARs presented in the *SFS Work Plan for the FMC Plant OU – July 2008*

A-3 FMC Transmittal Letter (dated: July 2, 2009) to Tribal Materials and FMC Response to Asserted Tribal ARARs for FMC Plant OU

A-4 IDEQ Approval Letter (dated: July 20, 2009) regarding Attachment 6 (June 9, 2009 FMC submittal) for the *SFS Work Plan for the FMC Plant Operable Unit – July 2008*.

A-5 EPA Comment Letter (dated: July 21, 2009) regarding the June 9, 2009 FMC submittal for the *SFS Work Plan for FMC Plant OU - July 2008*

A-6 FMC's Transmittal Letter (dated: August 18, 2009) for the electronic draft final submittal of the *SFS Work Plan for the FMC Plant OU – August 2009* and FMC's Responses to SBT Comments (dated July 21, 2009) on the *SFS Work Plan for the FMC Plant OU – July 2008*

A-7 FMC's Response to IDEQ Comment Letter (dated: September 11, 2009) regarding the draft final *SFS Work Plan for the FMC Plant Operable Unit – August 2009*.

A-8 FMC's Transmittal Letter (dated: December 11, 2009) of updated text and tables for the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

A-9 FMC's Response (dated: January 22, 2010) to IDEQ Comments (dated: January 7, 2010) on the December 11, 2009 electronic submittal of updated tables/text from the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

A-10 FMC's Response (dated: January 22, 2010) to EPA Comments (dated: January 12, 2010) on the draft final *SFS Work Plan for the FMC Plant OU – August 2009* and FMC's December 11, 2009 electronic submittal of updated tables/text from the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

A-11 FMC's Response (dated: March 2010) to EPA Comments (dated: February 16 2010), IDEQ Comments (dated: January 9, 2010) and SBT Comments (dated: February 15, 2010) on the hardcopy final *SFS Work Plan for the FMC Plant OU – January 2010*

APPENDIX A-1

FMC's Transmittal Letter and Initial Response (dated: November 14, 2008) to Agency/Tribes Comments (RTCs, dated: September 30, 2008 and October 2, 2008) on the draft *Supplemental Feasibility Study (SFS) Work Plan for the FMC Plant OU – July 2008*

FMC Idaho LLC
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FMC Corporation

Via Email

November 14, 2008

Ms. Kira Lynch
MS WCM-121
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Re: Administrative Order on Consent (AOC) of Supplemental Remedial Investigation/ Feasibility Study for the FMC Plant Operable Unit
US EPA Docket No. CERCLA 10-2004-0010
Response to EPA Comments on the *Supplemental Feasibility Study Work Plan – FMC Plant OU – July 2008*

Dear Ms. Lynch:

In accordance with the SRI/SFS Target Schedule sent to you dated November 5, 2008, please find attached the response to EPA comments (received via email on September 30, 2008) on the *Supplemental Feasibility Study (SFS) Work Plan for the FMC Plant OU – July 2008*. As requested by EPA, we are also copying the Shoshone-Bannock Tribes (SBT) and the Idaho Department of Environmental Quality (IDEQ) on this email submittal. If you desire a hardcopy, please let me know.

Contact me at (215) 299-6700 should you have questions regarding this submittal.

Sincerely,

Barbara Ritchie
FMC Associate Director, Environment
Enclosures

cc (email only): S. Skinner, USEPA Region 10
M. Masarik, USEPA Region 10
M. Stifleman, USEPA Region 10
R. Poeton, USEPA Region 10
B. Zavala, USEPA Region 10
C. Fisher, USEPA Region 10
E. Gruetert, BAH
K. Wright, Shoshone-Bannock Tribes
S. Hansen, Shoshone-Bannock Tribes
D. Tanner, IDEQ
M. English, IDEQ

ATTACHMENT 1
Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
A1	*EPA Letter (Kira Lynch) to FMC dated September 30, 2008* General Comment #1	Section 2 and 3 of the SFS WP present information on the site background and conceptual site model consistent with the information provided in the Draft Supplemental Remedial Investigation (SRI). EPA provided comments on the Draft SRI after the FS WP was submitted. These sections of the FS WP should be updated to address all comments submitted on the Draft SRI.	FMC will revise Sections 2 and 3 of the Supplemental Feasibility Study Work Plan (SFS WP) based on revisions to the background information and CSM in the revised SRI Report. The revised SFS WP will be submitted on April 15, 2009 based on EPA's recently email that contained the SRI/SFS schedule (November 05, 2008).	Sections 2 and 3
A2	(Same) General Comment #2	A complete review of the FS WP could not be performed because critical components of the site conceptual site model (CSM) have not been submitted. For example until the Groundwater Current Conditions Report is submitted and the groundwater CSM is agreed to EPA cannot concur that an RAO for groundwater to surface water impacts will not have to be considered. In addition, identification of final applicable and relevant requirements (ARARs) cannot be completed until the team has a better understanding of the potential remedial alternatives. FMC should submit a detailed schedule by October 10, 2008 that documents how all the various submittals currently under development (i.e., Final SRI, Groundwater Current Condition Report, Southern/Western Undeveloped Properties Sampling Report and Ecological Risk Evaluation, FMC Plant OU Properties North of Highway 30 Surface Soil Current Conditions Report, Final FS WP) will feed into the SRI FS. EPA also recommends adding a Technology Screening Memo deliverable into the schedule prior to performing the detailed analysis of alternatives for the SRI FS and finalizing the ARARs. The schedule should target submittal of the draft FS by January 2009	An updated CSM will be submitted in response to the Agency comments on the SRI Report on November 17, 2008. The updated CSM will have the benefit of information contained in Groundwater Current Conditions Report (GWCCR, submitted on October 31, 2008) and include RUs 17, 18, and 19 (landfills at the site). As discussed above in our response to comment A1, FMC provided a detailed schedule on November 5, 2008 of the various SRI/SFS pieces that remain to be completed (i.e., 2008 SRI field work and report, SFS WP and SFS, and Groundwater). This schedule indicates how these various pieces "feed into" one another. The draft Technology Screening table/memorandum is scheduled for submittal to the Agency on January 5, 2009. FMC disagrees that ARARs cannot be identified in advance of assembling and conducting a detailed analysis of remedial alternatives. ARARs are standards that are established in regulatory processes separate from individual CERCLA actions. ARARs do not change based on the range of remedial alternatives that are being addressed. The opposite is the case: The remedial alternatives are impacted by and can change based on whether they meet ARARs. Thus it is appropriate and in fact necessary to identify ARARs, as is being done here, in advance of evaluating potential remedial alternatives. Please confirm that the agency comments provided on the ARARs are complete. A revised ARAR table (including TBCs) to reflect the agency comments embedded in Table 4-1 will then be submitted. Agreement on ARARs and RAOs is necessary prior to completion of the technology screening table.	Table 4-1
A3	(Same) General Comment #3	If FMC is going to propose utilizing groundwater background as a target cleanup goal in place of an MCL the FS WP should include documentation of why an ARAR waiver should be considered.	CERCLA remedial actions address actual or threatened releases attributable to responsible parties. CERCLA does not require remedial action for conditions not associated with such releases, i.e., background levels. There is no need for an ARAR waiver with respect to any ARARs that establish constituent levels below site background. The groundwater-related RAOs as proposed in the SFS Work Plan include the following language,"RCBs, or MCLs for the COCs, or site-specific background levels where those are higher." Thus, an instance when site-specific background exceeds an ARAR does not trigger an ARAR waiver.	No Change
A4	(Same) Section Specific Comment #1	Section 4.1: This section should include a discussion of To Be Considered (TBCs) standards.	Section 4.1 will be augmented with a discussion of TBCs. A revised draft will be submitted for agency review in conjunction with the revised ARAR table, pending confirmation that agency comments are complete (also see comment #A2).	Table 4.1

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
A5	(Same) Section Specific Comment #2	Section 5.2: During the identification and screening of technologies a re-evaluation of the remediation unit (RU) boundaries should be performed. The FS must present the rationale for grouping various SRI RUs with similar waste types and associated risk.	The technology screening process involves evaluation of the universe of technologies with regard to effectiveness, implementability, and cost in relation to site-specific criteria, for the most part, independent of the physical location of the COCs. The technology screening process eliminates marginal technologies, based on the rationale included in the evaluation, and attempts to focus on the technologies and individual process options that will be successful at meeting the remedial action objectives (RAOs) thereby reducing risks to human health and the environment from site contaminants. The draft technology screening table/memorandum will be submitted to EPA for review on January 5, 2009 as indicated in our schedule submitted on November 5, 2008. Based on EPA's November 5th schedule, following Agency review of the draft technology screening document, FMC will submit revised technology screening tables to the Agency on April 15, 2009. EPA is scheduled to approve the viable technologies by May 15, 2009. After this approval FMC will assemble and screen potential remedial alternatives. This will be the point in the FS process at which remediation area boundaries should be developed and refined based on site conditions and stakeholder input. Based on EPA's November 5th schedule, on May 27, 2009, FMC will submit text and a table describing the screening of the preliminary alternatives and selection of viable alternatives that will undergo detailed analysis. In addition, FMC will provide "conceptual" remediation area boundaries of RUs that have similar site conditions.	No Change
A6	(Same) Section Specific Comment #3	Table 2-1: Please see SRI comments previously provided by EPA on this Table.	See response to Comment #A1 above.	Table 2-1
A7	(Same) Section Specific Comment #4	Table 3-2: The SRI COC/ROC column in this table may need to be updated pending ongoing groundwater and soil characterization reports.	Agreed. A final evaluation of COCs/ROCs will be performed based on the GWCCR and 2008 SRI sampling. The 2008 SRI Sampling Addendum to the SRI Report and final SFS Work Plan will be submitted to the Agency for review on April 15, 2009, as per the schedule distributed by the agency on November 5, 2008.	Table 3-2
A8	(Same) Section Specific Comment #5	Section 4.1.1: Delete last sentence in Section 4.1.1. Inconsistent application of stricter State standards is a waiver provision and is still an ARAR.	The sentence is appropriate and correct for purposes of the SFS Work Plan and SFS process. Standards that are not generally applicable or have been inconsistently applied do not constitute ARARs that govern remedial alternative evaluation and selection. The purpose of the identified sentence is to state this end result, rather than describe the procedural steps of ARAR evaluation including EPA determinations not to apply particular standards that would precede this result. For clarification, however, FMC will substitute the following for the referenced sentence, "CERCLA also provides for exemption or waiver for standards that are not generally applicable or that have not been consistently applied."	Section 4.2.1, page 4-2, paragraph 3, second to last sentence

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
A9	(Same) Section Specific Comment #6	Section 4.1.1: The Table 4-1 reference to UMTRCA includes a typo. The correct citation is 40 CFR, not "92". UMTRCA may be a potential ARAR, but considering the criteria for ARAR selection, I don't think it is "appropriate" for this site. The health-based criteria in UMTRCA pertain to unrestricted use, while the land use for the FMC plant site is anticipated industrial. It is not appropriate to require compliance with a unrestricted-based requirement for one contaminant in the context of a cleanup based on industrial use. In addition, the UMTRCA ARAR assumes a uniform radionuclide mix and therefore can be based primarily on Ra-226. At FMC there may be other risk drivers (e.g. Po-210), so risk-based radionuclide criteria would still be needed. If UMTRCA were used as an ARAR, it would still be necessary to show acceptable total radionuclide risks, so the UMTRCA ARAR would seem to be redundant. I don't believe UMTRCA is appropriate to either the circumstances at this site or the purpose of the remedial action.	Typographical error will be corrected. FMC disagrees that the UMTRCA soil cleanup standards for Ra-226 are not an ARAR. EPA has determined that the UMTRCA soil cleanup standards are an ARAR not only at the 24 uranium mill facilities to which they are specifically applicable, but also at a number of other NPL sites. These include, for example, the Stauffer Chemical Tarpon Springs Site, the Tex-Tin Corporation Site, and the St. Louis Airport Site. Further, EPA OSWER Directive 9200.4-25 reflects the fact that the UMTRCA surface and subsurface soil cleanup standards can be an ARAR, with no exclusion stated in that guidance based on anticipated future land use. Also, there is no basis for excluding these incremental standards as an ARAR because of the lack of a "uniform radionuclide mix." The only averaging requirement stated in the UMTRCA standards is for radium-226 soil concentrations to be assessed over a 100 m^2 area. The standards do not require that the radionuclides be uniformly mixed or distributed. The fact that there may be other risk drivers apart from Ra-226 in soils that may be need to be addressed does not make the UMTRCA standards any less appropriate for the constituents they address, or redundant with ARARs or risk-based calculations for other constituents such as Pb-210. ARARs frequently overlap and they are considered cumulatively in evaluating and selecting remedial alternatives. The fact that the UMTRCA standard is applicable to unrestricted future land use, and is therefore also protective of commercial/industrial exposure scenarios, does not preclude its use as an ARAR at the FMC Plant OU.	Table 4-1
A10	(Same) Section Specific Comment #7	Table 4-1: This table needs to be re-organized by media or remedy component to avoid redundancy within categories. See comments on attached Table 4-1.	The organization of ARARs in terms of location-specific, constituent-specific and action-specific standards is consistent with EPA guidance and practice at the EMF Site and other NPL Sites. The specific ARARs that are relevant to specific potential remedial alternatives can be identified and addressed in evaluating the specific alternatives.	No Change
A11	(Same) Section Specific Comment #8	Table 4-2: An RAO to address NCP requirements for treatment of all principal threat material should be added to this table.	FMC assumes that the comment is referencing Table 4-3, which includes the proposed RAOs for the FMC Plant OU. FMC does not agree that principal threat materials are present at the FMC Plant OU, including P4 that is found in soils underlying primarily RUs 1 and 2. See FMC's SRI Report responses to comment #B2, which details our position on principal threat materials and will be submitted November 17, 2008. With the exception of the agency comment on an RAO for principle threat materials, FMC would understand that the balance of the RAOs are accepted as written as no other comments related to the proposed RAOs were received.	No Change
B1	*EPA Email (Kira Lynch) to FMC dated September 30, 2008* Attachment – Table 4-1 (file name: Table 4-1 FMC Plant OU ARARskpl.doc) Page 1 of 44	This Table needs to be reorganized by media or remedy component.	See response to comment #A10 above	No Change

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
B2	(Same) Surface Water 40 CFR Part 131 Water Quality Standards for surface waters Page 3 of 44	Not applicable but arguably relevant and appropriate See 121(2)(A)(ii) very last sentence. At a minimum these are TBCs. Also AWQC are risk-based and can be used as a protectiveness standard. The stricter of AWQC or State standard will be the final cleanup target.	FMC will include this as a TBC.	Table 4-1
B3	(Same) Surface Water IDAPA 58.01.02 Page 4 of 44	Groundwater as source could impact SW/Sediment.	While we do not disagree, we believe the concern is addressed in the last sentence of the comments for this ARAR.	No Change
B4	(Same) Groundwater Safe Drinking Water Act, 42 USC §300f et seq. (SDWA) Page 5 of 44	MCLs are relevant and appropriate for all potable GW. See 121(2)(A)(ii) last sentence. MCLs must be met or waived non-potability is the only out applicability is irrelevant.	FMC agrees that MCLs are ARARs for potable groundwater.	Table 4-1
B5	(Same) Groundwater Safe Drinking Water Act, 42 USC §300f et seq. (SDWA) Page 6 of 44	Deleted text: could be Added text: are	FMC agrees with inserted text.	Table 4-1
B6	(Same) Groundwater 40 CFR Part 141 Page 6 of 44	Deleted text: could be Added text: are	FMC agrees with inserted text.	Table 4-1
B7	(Same) Groundwater 40 CFR Part 143 and IDAPA 58.01.08.400 Page 7 of 44	Could be TBCs	FMC will evaluate these when developing TBCs	Table 4-1

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
B8	(Same) Groundwater IDAPA 58.01.11 Page 9 of 44	Deleted text: approach being taken at the FMC Plant OU.	Rather than deleting the text, FMC proposes to instead replace the deleted text with the following sentence fragment, “established by the SRI/SFS AOC for the FMC Plant OU.”	Table 4-1
B9	(Same) Groundwater IDAPA 58.01.11 Page 9 of 44	See 121(d)(2)(B)(i) State aquifer categories unrelated to meeting MCLs.	Agreed, but no changes to the text required.	No Change
B10	(Same) Wetlands Clean Water Act, 33 USC §§1311 and 1344; 33 CFR §§320 and 323 Page 10 of 44	This would be an ARAR for any action in/near springs or river.	FMC will remove the last sentence in the ARAR comments and “the FMC Plant OU” from the first sentence.	Table 4-1
B11	(Same) Wetlands Executive Order No. 11990 Page 10 of 44	EOs are not ARARs but can be TBC for springs and river.	Agreed. FMC will evaluate this EO when developing TBCs.	Table 4-1
B12	(Same) Land 40 CFR Part 264; incorporated by reference at IDAPA 58.01.05.008 Page 13 of 44	The fact that CERCLA doesn’t require a permit for an on-site remedy does not mean the substantive aspects of the regs are not ARARs. All substantive portions of the 264 subparts and sections should be identified as ARARs	FMC agrees that the CERCLA section 121(e) permit waiver exempts the procedural, but not the substantive requirement of permit programs. FMC will provide review of the substantive portions of Part 264 in a revised Table 4-1.	Table 4-1
B13	(Same) Land 40 CFR Part 264; incorporated by reference at IDAPA 58.01.05.008 Page 13 of 44	Closure requirements are applicable. The logic that corrective action is applicable but closure isn’t makes no sense.	FMC disagrees. These requirements will be addressed in revisions to substantive portions of Part 264. See response to Comment #B12.	Table 4-1

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
B14	(Same) Endangered Species Act, 16 USC §§1531-1544; 50 CFR Part17 (plants and wildlife) Page 14 of 44	ESA is not an ARAR. ESA should be in a separate category after ARARs and TBCs.	FMC believes it is an ARAR, and requests further clarification as to what other category might be appropriate to fully evaluate this comment.	No Change
B15	(Same) Historic properties and archeological sites National Historic Preservation Act, 16 USC § 470 et seq.; 36 CFR Part 800 Page 15 of 44	This is an ARAR that would apply if archeological artifacts were found.	FMC agrees. Table 4-1 will be revised accordingly.	Table 4-1
B16	(Same) Groundwater Safe Drinking Water Act, 42 USC §300f et seq. Page 16 of 44	MCL ect. should all be in one place to eliminate redundant organization. Earlier MCL comments apply.	Refer to Comment #A10 response.	No Change
B17	(Same) Surface Water 40 CFR Part 131 Water Quality Standards for surface waters Page 20 of 44	Deleted text: Not independently enforceable and thus not an ARAR. These standards become requirements and thus a potential ARAR when they are incorporated into state water quality standards. Inserted text: See EPA comments on SW AWQC.	FMC disagrees with the deletion of the first sentence and proposes to insert the following sentence at the end of the Tabel 4-1 comment column related to this regulation. “These standards will be evaluated when developing TBCs”.	Table 4-1
B18	(Same) Air 40 CFR Part 50 National Primary and Secondary Ambient Air Quality Standards (NAAQS) Page 23 of 44	These are relevant and appropriate or can more generally be TBCs.	FMC believes the second sentence of the comment column of Table 4-1 resolves the concern.	No Change

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
B19	(Same) Air 40 CFR Part 60 New Source Performance Standards (NSPS) Page 23 of 44	Can be TBCs and relevant and appropriate.	FMC believes the second sentence of the comment column in Table 4-1 resolves the concern.	No Change
B20	(Same) Air IDAPA 58.01.01 Page 24 of 44	Could apply to state land portion of OU.	FMC agrees and the text will be modified accordingly.	Table 4-1
B21	(Same) Air Federal Implementation Plan for the Astaris-Idaho LLC Page 24 of 44	These are TBCs.	FMC agrees, the text will be modified in the revised Table 4-1.	Table 4-1
B22	(Same) Soils and Solids Resource Conservation and Recovery Act, 42 USC §§6901-6987 (RCRA) Page 27 of 44	Merge all RCRA ARARs and TBCs in one place.	Refer the Comment #A10 responses	No Change
B23	(Same) Occupational exposures to on-site remediation workers Occupational Safety and Health Act, 29 USC §§651-678 Page 29 of 44	Added text: but still has to be met.	FMC agrees with inserted text and will revise the text accordingly..	Table 4-1

Table 1
Comments on the FMC Plant OU Supplemental Feasibility Study Work Plan (July 2008),
Comment Resolution, and Description of Sections requiring revisions in SFS WP

Comment Number	Source Document and Comment Description	Comment	Comment Resolution	Sections to be Revised in SFS WP
B24	(Same) Air sparging/ biosparging, soil vapor extraction, bioventing 40 CFR Part 50 National Primary and Secondary Ambient Air Quality Standards (NAAQS) Page 31 of 44	These would be relevant and appropriate.	As stated, these are more appropriately addressed as TBCs. This is not an ARAR because it is not independently enforceable (i.e., a requirement).	No Change
B25	(Same) Capping of wastes left in place 40 CFR §264.228(b) (surface impoundments); 40 CFR §264.258(b); 40 CFR §264.310(a) (landfills) Page 33 of 44	Added text: or any other RCRA hazardous constituents	FMC disagrees with EPA's insertion and proposes the following replacement, "RCRA performance standards for in-place closure would be relevant and appropriate to any other source areas that are similar to surface impoundments or landfills that would otherwise be regulated under RCRA".	Table 4-1
C1	Email communication from Susan Hansen, with the Shoban tribes, to Kira Lynch dated October 2, 2008 1st paragraph of email	This is to followup our discussion this morning. I'm not sure it makes sense to spend a lot of resources reviewing the SFS Workplan and proposed treatment options for the FMC OU when the full extent of the problem has yet to be defined through the SRI.	FMC believes that through the RI and SRI process, the nature and extent of contamination at the FMC Plant OU have been sufficiently defined to move forward into the SFS Work Plan and SFS. The EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA, 1988) 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. This work plan documents the processes that will be used to evaluate technologies and assemble, screen, and select viable remedial alternatives for the identified site COCs and remedial action objectives.	No Change
C2	(Same) 2nd paragraph of email	This comment follows the review of the SRI and the need to further define the extent of P4 contamination in many of the RU's.	This comment appears to relate to the SRI, not the SFS Work Plan. Please see response to Comment #B1 above.	No Change
C3	(Same) 3rd and 4th paragraph of email	Until FMC and the agencies come to terms on this we will hold off on providing comments. However, we do want to make the point that Tribal ARARS would be applicable to all actions at this site. We will be working to identify all Tribal ARARS including the Tribal Waste Management Act, Cleanup Standards, proposed Water Quality Standards, and Air Regulations that need to be included in the ARAR list.	See above response to Comment #A2. In addition, the Tribes have not identified specific tribal standards that would be proposed as ARARs to which FMC could respond at this time.	No Change

APPENDIX A-2

FMC Transmittal Letter (dated: June 9, 2009) for Supplemental Responses to initial *SFS Work Plan* RTCs;

Attachment 2 - FMC's Supplement Responses (dated: June 9, 2009) to Initial RTCs to EPA/Tribes Comments on the draft *SFS Work Plan for the FMC Plant OU – July 2008*; and

Attachment 6 - FMC's Responses (dated: June 9, 2009) to IDEQ Comments on the Proposed RCRA ARARs presented in the *SFS Work Plan for the FMC Plant OU – July 2008*

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Via Email & 1st class mail

June 9, 2009

Ms. Kira Lynch, MS ECL-113
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Administrative Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit (U.S. EPA Docket No. CERCLA 10-2004-0010): **Supplement to FMC's November 14, 2008 Response to EPA Comments on the July 2008 Supplemental Feasibility Study Work Plan**

Dear Ms. Lynch:

On July 15, 2008, FMC submitted a *Supplemental Feasibility Study Work Plan (SFS WP)* for the FMC Plant OU. The AOC for the Supplemental Remedial Investigation (SRI) / Feasibility Study (SFS) requires submittal of the *SFS WP* 60 days following EPA approval of the *SRI Report*. FMC and EPA nevertheless agreed, as reflected in FMC's letter transmitting the *SFS WP*, that it would be useful to submit that document in advance of EPA approval of the *SRI Report* because this would help EPA confirm that the *SRI Report* adequately supported the anticipated SFS Report evaluation of remedial alternatives as outlined in the *SFS WP*. FMC's July 15, 2008 transmittal letter also referenced FMC's agreement to submit two significant deliverables that went beyond those specified in the SRI/SFS AOC Statement of Work (SOW). The first of these deliverables was the *Groundwater Current Conditions (GWCC) Report* that was prepared to address the groundwater underlying the entire FMC Plant OU. The second was an SRI Addendum, which will report the results of sampling effort conducted in the Southern and Western Undeveloped Areas and the Northern Properties during the fall of 2008. These areas are all within the FMC Plant OU but were not identified in the SRI/SFS AOC SOW as requiring further investigation.

FMC received written comments on the *SFS WP* from EPA Region 10 on November 5, 2008, and provided written responses to those comments (RTCs) on November 14, 2008. FMC's November 14, 2008 RTC submittal is included here as Attachment 1. While EPA

has not provided a written reply specific to FMC's November 14, 2008 RTCs submittal, we have received agency feedback in the form of comments on other submittals. This includes EPA's February 11, 2009, letter transmitting agency comments on FMC's RTCs on what was then the draft *SRI Report*, as well as feedback communicated during face-to-face meetings between FMC and the agency on other SRI and SFS topics. This feedback indicates that EPA has not fully accepted FMC's proposed resolution of agency comments on the *SFS WP*. Based on the need to fully address and hopefully resolve the agency comments, and the fact that FMC has submitted two significant deliverables that were not anticipated under the SRI/SFS AOC, FMC is proposing to clarify the completion schedule for the remaining SRI/SFS deliverables. This clarified schedule will better reflect the current action items and will advance our mutual goal of submitting the draft SFS Report in September 2009.

Attachment 2 to this letter identifies the proposed resolutions of agency comments set forth in our November 14, 2008 response that we believe EPA has not fully accepted. Attachment 2 repeats EPA's initial comment and FMC's initial proposed resolution, describes the supplemental information that has been communicated since then, and updates FMC's Proposed Comment Resolution. The following are the specific *SFS WP* areas that we believe remain unresolved:

A. Submittal of an RAO for P4 to reflect circumstances where P4 has been designated as a Principal Threat Waste (PTW);
B. Organization of the table of ARARs other than those based on RCRA (not encompassing Tribal provisions that the Tribes have recently identified as ARARs, which FMC will address separately as discussed below);
C. Supplemental clarification of RCRA requirements that may constitute ARARs, and revised responses to IDEQ comments regarding RCRA-based ARARs;
D. Submittal of an RAO that acknowledges Surface Water Quality Standards for the groundwater to surface water transport pathway; and,
E. Preparation of responses to the proposed Tribal ARARs.

FMC believes the attached Supplement to RTCs on the *SFS WP* will allow us to move forward with resolving all these areas, with the sole exception of Item E above. FMC proposes to handle this item on a separate schedule, due to the fact that the Tribe's proposed ARARs were only recently received and we have been in ongoing discussions on other *SFS WP* matters, including potential ARARs, for almost one year. Gaining agreement on all other *SFS WP* matters in an expeditious manner will allow us to jointly move forward with the aggressive, but we think achievable, schedule to submit a complete draft SFS Report on September 15, 2009. Since the agency has indicated that ARARs are not "locked in" until ROD issuance (or in this case, issuance of an amended ROD), addressing Item E above on a separate track should not delay resolution of the *SFS WP* agency comments. It will remain important, however, to add an evaluation of potential Tribal ARARs to the evaluations that FMC has already done regarding federal

and state requirements so that the complete set of ARARs can be identified to the maximum extent possible before conducting the detailed analysis of remedial alternatives for soil and for groundwater.

The SRI/SFS AOC SOW requires submittal of the *SFS WP* 60 days after approval of the *SRI Report*, and submittal of the draft *SFS Report* 60 days after approval of the SFS WP. The *SRI Report* was approved on May 26, 2009. However, the *SRI Report* has been supplemented by the two additional deliverables discussed earlier, i.e., the *GWCC Report* and the SRI Addendum Report (currently in preparation). These reports provide significant updates and additional information regarding the nature and extent of contamination at the FMC Plant OU and should be considered as companions to the *SRI Report*. The sequence and schedule of deliverables stated in the SRI/SFS AOC SOW should be clarified to account for these additional deliverables.

FMC believes the *GWCCR* can be finalized within the next 30 days, based on the final agency comments that FMC received on May 26, 2009. However, as we have discussed, the SRI Addendum will not be submitted to the agency for review until June 30, 2009. All three of these "nature and extent" documents must receive EPA approval before we can bring the draft SFS Report to completion (i.e., the *SRI Report*, the *GWCCR*, and the SRI Addendum). The site characterization information set forth in these documents is essential for determining the remedial action scope and evaluating remedial alternatives.

Assuming we agree upon a schedule that includes agency review and comment on the draft SRI Addendum by no later than July 30, and FMC issuance of an electronic revised report and RTC package back to the agency no later than August 30 (a turnaround time we believe we can meet provided the comments are not major), then EPA should be able to formally approve the SRI Addendum in advance of the draft SFS Report target submittal date of September 15, 2009. This is an ambitious schedule, but one that we think is achievable given that: 1) the agency has already received the results of 2008 sampling data and has not raised significant issue, and 2) we have agreed on risk assessment protocols,. The fact that this progress already has been made on initial elements of the SRI Addendum Report will help focus the agency review and facilitate its development into a final approvable document.

FMC requests prompt agency review of and comment on the Supplemental SRI Report.. If we can reach agreement this month on the matters described in the attachments, FMC proposes a target schedule of submitting an electronic revision of the revised *SFS WP* by approximately July 25, i.e., sixty days after EPA approval of the *SRI Report*. This is the timeline set forth in the SRI/SFS AOC for submittal of this document.

Note that the revisions to the *SFS WP* not only will address the matters discussed in this letter, but also will include updates to Section 2 (Site Background for the FMC Plant OU) and Section 3 (SRI Findings and Updated Conceptual Site Model) to make those sections consistent with the final approved *SRI Report*, GWCCR, and upcoming SRI Addendum

Report. Submitting a revised *SFS WP* by July 25 that includes all the needed changes will be a challenge given that FMC is working simultaneously on other SRI and SFS matters, including not only the SRI Addendum, but also on reaching agreement with the agencies on the assembled alternatives for detailed analysis in the SFS Report, conducting groundwater modeling, preparing a cap design evaluation white paper, and other critical work. Nonetheless, while we continue to work on various parallel paths, it is critically important for purposes of developing the draft SFS Report, facilitating agency review of that document, and achieving the timelines set forth in the SRI/SFS AOC SOW to ensure that all the various elements align and are agreed upon before the draft SFS Report is prepared and submitted. Thus, approval of a revised SFS WP prior to submittal of the draft SFS should also be a mutual goal.

Please call me with any questions, or to discuss further.

Sincerely,

Barbara E. Ritchie
Associate Director, Environment
FMC Corporation

Enclosure (4 copies)

Attachment 1 – FMC's November 14, 2008 Response to Agency Comments on the SFS Work Plan
Attachment 2 – Supplement to FMC's November 14, 2008 Response to Agency Comments on the Supplemental Feasibility Study Work Plan
Attachment 3 – Updated SFS WP Table 4-3 – FMC Plant OU Remedial Action Objectives and General Response Actions by Medium
Attachment 4 – Updated SFS WP Table 4-1 – Potential Applicable or Relevant and Appropriate Requirements other than those based on RCRA or asserted Tribal standards for the FMC Plant Operable Unit
Attachment 5 – New SFS WP Table 4-1A – RCRA Regulatory Requirements that may constitute ARARs for FMC Plan OU Remedial Action
Attachment 6 – FMC Responses to Idaho Department of Environmental Quality Comments on Proposed RCRA ARARs

cc: Doug Tanner (2 copies)
Waste and Remediation Manager
State of Idaho Department of Environmental Quality
444 Hospital Way #300
Pocatello, ID 83201

RCRA/CERCLA Program Manager (2 copies)
Shoshone-Bannock Tribes
P.O. Box 306 – Pima Drive
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Attachment 2

Supplement to FMC's November 14, 2009 Response to EPA Comments on the *Supplemental Feasibility Study Work Plan – FMC Plant OU July 2008*

A. Comment No. A11 – "Table 4-2: An RAO to address NCP requirements for treatment of all principal threat material should be added to this table"

FMC November 14, 2009 Proposed Comment Resolution – "FMC assumes that the comment is referencing Table 4-3, which includes the proposed RAOs for the FMC Plant OU. FMC does not agree that principal threat materials are present at the FMC Plant OU, including P4 that is found in soils underlying primarily RUs 1 and 2. See FMC's SRI report responses to comment #B2, which details our position on principal threat materials and will be submitted November 17, 2008. With the exception of the agency comment on an RAO for principal threat materials, FMC would understand that the balance of the RAOs are acceptable as written as no other comments related to the proposed RAOs were received."

Supplemental Information - EPA's letter of February 11, 2009 provided further clarification of the agency's position in the following paragraphs excerpted from the section of that letter titled "Elemental Phosphorus as a Principal Threat Waste."

> While the expectation for treatment of the elemental phosphorus wastes may guide the development of appropriate alternatives, the selection of the waste management strategy is determined through the remedy selection process outlined in the NCP. The remedy selection decision for the FMC Plant OU will be based on a comparative analysis of the alternatives using the nine critieria in accordance with the NCP. The ROD will examine the potential remedial alternatives under the nine evaluation criteria and, if a non-treatment alternative is slected, will describe how notwithstanding the statutory preference for treatment that remedy is justified.
>
> Underground piping containing elemental phosphorus, where, in addition to toxicity and risk, its concentration and presence in shallow soils where there is higher risk of exposure, should be considered principal threat waste. Transparant definition of what additional areas and volumes are assumed to contain elemental phosphorus materials will assist with defining materials that must be considered for source treatment in the SFS. EPA expects the SFS Work Plan and SFS, and appropriate future documents to reflect the circumstances where elemental phosphorus should be considered as a principle threat material will be developed for the SFS.

Update to Proposed Comment Resolution - Given this clarification, FMC is proposing to amend the RAO that FMC proposed for elemental phosphorus (P4) in Table 4-3 of the July 15, 2008 SFS WP ("Prevent exposure to levels of elemental phosphorus that can

spontaneously combust, posing a fire hazard") to the following RAO for P4, reflecting the agency's PTM guidance.

> "Prevent direct exposure to elemental phosphorus in shallow soils and underground piping that, if encountered during intrusion into the subsurface, would support vigorous and sustained fire and resultant air emissions that represent a significant risk to human health and the environment. Elemental phosphorus has been designated as a principal threat waste where present at such levels in shallow soils and underground piping and shall be remediated through removal and treatment unless a non-removal and treatment remedy is justified using the nine criteria in accordance with the NCP."

Attachment 3 includes a revised Table 4-3 from the *SFS WP* that incorporates this RAO.

B. Comment No. A10 – "Table 4-1: This table needs to be re-organized by media or remedy component to avoid redundancy within categories. See comments on attached Table 4-1."

FMC November 14, 2009 Proposed Comment Resolution – "The organization of ARARs in terms of location-specific, constituent-specific and action-specific standards is consistent with EPA guidance and practice at the EMF Site and other NPL Sites. The specific ARARs that are relevant to specific potential remedial alternatives can be identified and addressed in evaluating the specific alternatives."

Supplemental Information - FMC has continued to receive feedback from EPA, specifically at the meeting February 26 and 27, 2009 in Salt Lake City, that the redundancy associated with the organization of the ARARs table in the draft SFS WP was troublesome to the agency.

Update to Proposed Comment Resolution - So as to resolve this matter, FMC proposes organizing Table 4-1 by statute, thus minimizing redundancy. Pursuant to discussions with EPA and DEQ, a separate table covering RCRA ARARs has been developed that provides a more detailed analysis of RCRA requirements that are potential ARARs but also minimizes redundancy with respect to media, location and action-specific ARARs. Attachment 4 is a revised Table 4-1 now entitled "Potential Applicable or Relevant and Appropriate Requirements other than those based on RCRA or asserted Tribal standards for the FMC Plant Operable Unit at the Eastern Michaud Flats Superfund Site." Attachment 5 is a new Table 4-1A entitled "RCRA Regulatory Requirements that may constitute ARARs for FMC Plant OU Remedial Action" (refer to the updated resolution to issue D below). The revised Table 4-1 and new Table 4-1A respond to agency comments regarding both organization and content and are sufficient for purposes of guiding the SFS detailed analysis of remedial alternatives.

C. Comment No. B2 - Surface Water 40 CFR Part 131 Ambient Water Quality Standards for Surface Water – "Not applicable but arguably relevant and appropriate. See 121(2)(A)ii) very last sentence. At a minimum these are TBCs. Also, AWQC are risk-based and can be used as a protectiveness standard. The stricter of AWQC or state standard will be the final clean up target."

FMC November 14, 2009 Proposed Comment Resolution – "FMC will include this as a TBC."

Supplemental Information - FMC was further contacted on the matter of Surface Water Quality Standards during recent negotiations between the J.R. Simplot Company and EPA regarding the Proposed Plan to amend the 1998 EMF ROD for the Simplot Plant OU, specifically with respect to EPA's draft RAO for surface water. FMC provided input to Simplot and EPA. The following language was included as an RAO for surface water in the Simplot Proposed Plan:

> "Reduce the release and migration of COCs to surface water from facility sources that result in concentrations exceeding RBCs or chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs), including water quality criteria (WQC) pursuant to the Clean Water Act."

Update to Proposed Comment Resolution - The attached revised Table 4-3 also incorporates this RAO, for parity and consistency within the EMF Site (i.e., parity with the Proposed Plan and anticipated ROD amendment for the Simplot Plant OU).

D. Comment No. B12 – "The fact that CERCLA doesn't require a permit for an on-site remedy does not mean the substantive aspects of the regulations are not ARARs. All substantive portions of the 264 subparts and sections should be identified as ARARs."

FMC November 14, 2009 Proposed Comment Resolution – "FMC agrees that the CERCLA section 121(e) permit waiver exempts the procedural but not the substantive requirements of permit programs. FMC will provide review of the substantive portions of Part 264 in revised Table 4-1."

Supplemental Information – FMC's proposed comment resolution was further discussed at meetings with the agency in Pocatello on December 15 and 16, 2008. At that time EPA and FMC agreed that Dave Heineck (counsel for FMC) and Charlie Ordine (counsel for EPA) would work to develop a more detailed ARARs analysis specific to RCRA-based requirements, given that RCRA requirements are applicable to FMC Pocatello as an interim status facility and it is being addressed under the One Cleanup Program as a

concurrent CERCLA remedial action and RCRA corrective action. Margie English (IDEQ) indicated that she also wanted to be involved with this work. (This was documented in EPA's December 19, 2008 email transmitting the action items from that meeting and FMC's email of the same date transmitting meeting minutes, which included the following action item: "FMC will revise the SFS Work Plan ARAR table to more specifically identify the RCRA-based ARARs. Dave Heineck will work with Charlie Ordine and coordinate with Margie English regarding IDEQ inputs to the ARAR table.") Dave Heineck provided a draft of "RCRA Regulatory Sections that may constitute ARARs for the FMC Plant OU on January 26, 2009. We received preliminary comments from IDEQ (Margie English) dated February 20, 2009 and a complete set of IDEQ comments on February 27, 2009, during the Salt Lake City meeting where these comments were reviewed. FMC provided draft responses to the IDEQ comments on March 16, 2009. FMC had subsequent discussions with IDEQ that clarified the concerns reflected in those comments. This has allowed FMC to develop revised responses to the IDEQ comments on the RCRA ARARs table that both sets forth the comments verbatim and expands on our responses to more directly address and acknowledge IDEQ's comments and positions. .

Update to Proposed Comment Resolution - Attachment 5 to this letter is an updated table listing the potential RCRA-based ARARs, now identified as Table 4-1A, that has been revised somewhat in response to IDEQ comments. The narrative responses to the IDEQ comments have been revised to both include the IDEQ comments on the prior version verbatim and more fully address and acknowledge those comments. The revised responses to IDEQ comments are included here as Attachment 6.

E. Comment No. C3 from email communication from Susan Hanson, with the Sho-Ban tribes to Kira Lynch, dated October 2, 2008 – "Until FMC and the agencies come to terms on this we will hold off on providing comments. However, we do want to make the point that Tribal ARARs would be applicable to all actions at this site. We will be working to identify all Tribal ARARs including the Tribal Waste Management Act, Cleanup Standards, proposed Water Quality Standards, and Air Regulations that need to be included in the ARAR list."

FMC November 14, 2009 Proposed Comment Resolution – "See above response to Comment #A2. In addition, the Tribes have not identified specific tribal standards that would be proposed as ARARs to which FMC could respond at this time."

Supplemental Information – As documented in the above-referenced EPA action item list dated December 19, 2008 documenting agreements reached in the December 15 and 16, 2009 meetings in Pocatello, the SBT were to provide a list of ARAR concerns to EPA by January 12, 2009. To our knowledge the SBT did not respond by that date. Substantially later, on April 16, 2009, FMC received an email from EPA forwarding two attached files

from the Tribes ("Final version of WMA proposed amendments for public comment 04-08-09" and "Cleanup standards draft for public comment 3-18-09"), but that the Tribes did not identify as comprising the proposed Tribal ARARs. Subsequently, on April 28, 2009, FMC received a CD-ROM from EPA that contained scanned images of various Tribal documents that apparently represent the complete set what the Tribes have identified as Tribal-based ARARs for the FMC Plant OU remedial action.

Update to Proposed Resolution of Comment - FMC currently is reviewing the Tribal statutes, ordinances and other materials we received via EPA that the Tribes have compiled and characterize as ARARs for the FMC Plant OU. Given the amount of these materials, and the fact that that the Tribes did not identify either the specific provisions among these materials that they believe constitute ARARs or the rationale for such designation, FMC expects to respond separately regarding these materials by approximately June 26.

ATTACHMENT 6
FMC Responses to Idaho Department of Environmental Quality Comments on Proposed RCRA ARARs

General IDEQ Comments

General Comment No. 1:

DEQ appreciates the effort that went into developing this table, and believes it is useful as a starting point for identification of potential ARARs. However, as discussed during the December 16, 2008 meeting, DEQ cannot fully evaluate ARARS until specific remedies are identified. Therefore, these comments should be considered preliminary in nature, and ARARs will need to be re-evaluated during the feasibility study process as the alternatives are developed and screened. In some cases, general statements are made in this document which may or may not be valid when a site specific situation is considered.

FMC Response:

Acknowledged. ARAR consistency is one of the NCP criteria for comparing and selecting among remedial alternatives, and the consistency determination cannot be made until such alternatives are developed. It is essential to identify candidate ARARs early in the process and by no later than the commencement of the comparative analysis. This is a logical necessity because without ARARs having been developed remedial alternatives cannot be evaluated and compared. It is also a regulatory requirement: 40 CFR §300.515(d)(3) mandates that ARARs be identified by "no later than the early stages of the comparative analysis."

General Comment No. 2:

Note that future evaluations of potential ARARs should also include those other than RCRA/HWMA requirements.

FMC Response:

Agreed. FMC included an overall set of proposed ARARs, encompassing not only RCRA/ Idaho HWMA but also other requirements, in the proposed SFS Work Plan that it submitted to EPA, IDEQ and the Tribes in July 2008. One comment that FMC received in response to that submittal was that, given that the FMC Pocatello facility is an interim status facility that is subject to specific RCRA requirements, it would be useful to conduct a separate evaluation of the RCRA ARARs and describe them at a greater level of detail. FMC generated the separate RCRA ARARs table in response to that comment. Another comment that FMC received regarding the overall ARARs list was that it should be revised to eliminate redundancies. The redundancies were inherent in FMC's organization of that list into location-specific, constituent-specific, and action-specific ARARs as suggested by EPA guidance. FMC soon will submit a revised overall ARARs list that will have two

organizational differences from that submitted in July 2008: 1) it will not be divided into location-specific, constituent-specific, and action-specific ARARs, thus eliminating redundancies and making it shorter and more usable; and 2) it will not extend to RCRA ARARs, which now have been set forth in greater detail in a separate table. The two tables will complement each other and together will encompass all the potential ARARs for the FMC Plant OU remedial action.

General Comment No. 3:

It is unclear why FMC has cited both 40 CFR 264 Standards (Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities) and 40 CFR 265 Standards (Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities). Section 121 (e)(1) of CERCLA, 42 U.S.C. 9621 (e) (1) states that response actions conducted entirely on site are exempted from the procedural requirements to obtain federal, state, or local permits, when such response action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. 9621. However, the response action must satisfy the substantive aspects of all the applicable or relevant and appropriate standards, requirements, criteria or limitations which would have been included in such permit. Therefore, it appears that the pertinent RCRA requirements for response actions conducted on the FMC OU would be the substantive aspects of 40 CFR 264 standards for permitted facilities. Interim status under RCRA is allowed for a finite timeframe; that finite timeframe does not have meaning under CERCLA. In addition, if there are differences between 40 CRF 264 and 265 substantive requirements, those differences are typically such that interim status requirements are less stringent than permit requirements; the more stringent substantive requirements of 40 CFR 264 should prevail since interim status timeframes are irrelevant for a CERCLA action. If FMC has a concern that a particular substantive aspect of 40 CFR 265 standards are somehow more pertinent to an aspect of a defined CERCLA alternative, those requirements can be discussed and determined on a case-by-case basis.

FMC Response:

FMC cited both the 40 CFR Part 264 and Part 265 standards in its RCRA ARARs table for provisions that have counterparts in both. FMC did this to make the table both accurate and complete. Given that the FMC Pocatello facility is a RCRA interim status facility, the Part 265 standards are legally applicable and must be referenced. Nevertheless, the Part 264 standards while not applicable may be relevant and appropriate and thus the table also references them. There are relatively few instances where the Part 264 substantive standards are more stringent than those under Part 265. Where more stringent Part 264 requirements would have a bearing on a potential remedial action alternative—such as on-site incineration, where the Part 264 Subpart O incinerator standards are considerably more prescriptive than those under the interim status regulations—the Part 264 standards will govern where those are determined to be relevant and appropriate. With respect to the CERCLA §121(e) permit exemption, FMC acknowledges that some of the RCRA requirements listed in the January 29, 2009 version of the RCRA ARARs table, such as for

hazardous waste shipment manifesting and the time limits for on-site storage, are administrative and thus do not constitute ARARs. FMC accordingly has deleted them from the RCRA ARARs table. They remain independently applicable under RCRA.

General Comment No. 4:

The ARAR table identifies the major Subparts (e.g., Subparts I through O) that may be applicable. However, to be truly useful the table needs to identify the next tier criteria for the identified subpart. For example Subpart O requires waste analysis, performance standards, operating requirements, monitoring and inspections, and a risk assessment. Including this level of detail would make the table a more useful tool, and will be necessary when the alternatives are developed and finalized. Other examples of the type of detail regarding ARARs that must be developed along with the alternatives include, but are not limited to the following:

CONTAINERS	Subpart I
Condition of Containers	Containers used to manage hazardous waste must be in good condition (264.171)
Compatibility of Container	The waste must be compatible with the container so that the ability of the container to contain the waste is not impaired (264.172)
Management of Containers	Containers must be kept closed and handled so that the integrity of the container is not impaired (264.173)
Containment	Container storage areas must have secondary containment unless the stored waste contains no free liquids (264.175)
Ignitable or reactive waste	Containers holding ignitable or reactive waste can not be stored within 15 meters of the facilities property line (264.176)
Incompatible Wastes	Incompatible wastes or incompatible waste and materials must not be placed in the same container and should be separated by a dike, berm or other device (264.177)
TANKS	Subpart J
Design criteria	New tanks must meet the design criteria of 264.192 and .193.
Operating Requirements	The tank operator must not place incompatible wastes or treatment reagents in a tank if it will cause the tank to fail. The tank must also have overfill prevention controls. (264.194)

Inspections	The tank operator must develop and implement a daily monitoring and leak detection program (264.195)
Response to leaks	The tank operator must remove a tank from service if there has been a leak or spill. The operator must take necessary actions to address the release/spill (264.196)
Ignitable or Reactive Waste	The owner of a tank that stores or treats reactive or ignitable waste must comply with the National Fire Prevention Association Flammable and Combustible Liquids Code, Table 2-1 (264.198)

FMC Response:

FMC believes that the existing level of detail in the RCRA ARARs table is sufficient to guide the evaluation and comparison of remedial alternatives against these requirements. The existing table provides sufficient references to the pertinent RCRA subparts, and as appropriate to individual regulations within the subparts, to guide the evaluation of potential remedial alternatives against RCRA ARARs. FMC also notes that EPA guidance establishes that some of the RCRA regulatory requirements that IDEQ advocates be listed as ARARs, such as for developing and carrying out inspection programs, are administrative rather than substantive requirements and as such are exempt under CERCLA §121(e) from classification as ARARs. A further FMC response to this comment is that if the table were revised to set forth the suggested level of detail, the table would be nearly as voluminous as the regulations it cites and it would be unwieldy for purposes of guiding FMC, the Agencies and the public regarding RCRA ARARs consistency.

General Comment No. 5:

Several inactive landfills will require remedial actions. As has been conveyed previously in written comments, any landfills in which potential hazardous waste remains in place must meet the substantive aspects of closure and post-closure requirements outlined in 40 CFR 264.310. Please add this ARAR to the table.

FMC Response:

FMC already listed 40 CFR §264.310 as a potential ARAR with respect to landfills. See page 20 of the January 26, 2009 RCRA ARARs table. This reference has been retained in FMC's May 4, 2009 revision to this table. As stated both the earlier and current version of this table, the §264.310 closure and post-closure standards would be applicable to any landfill that was used to manage waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. The landfill closure and post-closure standards also could be relevant and appropriate for any landfill that was used to manage non-hazardous waste generated by the remedial action, where 1) such waste presented risks similar to those presented by RCRA-regulated hazardous waste and 2) meeting this closure and post-closure standard was necessary to meet RAOs. With

respect to plant landfills in RUs 17, 18, 19b, the mere presence of a waste that may have exhibited hazardous waste characteristics when generated does not change the applicability of the EPA Presumptive Remedy for Municipal Solid Waste Landfills. EPA guidance regarding that presumptive remedy acknowledges that municipal landfills are a "heterogeneous mixture of municipal waste frequently co-disposed with industrial or hazardous waste."

General Comment No. 6:

Potentially applicable ARARs that will facilitate cleanup are found in 40 CFR 264 Subpart S. In particular, Temporary Units (TUs, 40 CFR 264.553), Remediation Waste Staging Piles (40 CFR 264.554), and Corrective Action Management Units (CAMU, 40 CFR 264.552) are designed for management of hazardous remediation wastes and can facilitate CERCLA cleanups. TUs are non-land based units for treatment and storage of hazardous remediation wastes. Placement of wastes in TUs is not considered land disposal so wastes do not have to be treated to meet LDR treatment standards prior to being placed in a TU. However LDRs must be met if hazardous remediation wastes are eventually land disposed after they are removed from the TU. A Remediation Waste Staging Pile is an accumulation of solid, non-flowing remediation waste that is not a containment building and that is used only during remedial operations for temporary storage at a facility. Remediation wastes may be accumulated in a staging pile without being subject to LDR. These units are intended to be temporary, and therefore, have somewhat less stringent operational and closure requirements. Please note that as such, DEQ has determined that the timeframes specified in 40 CFR 264.553 (d) and (e) and 40 CFR 264.554 (d) and (h) are substantive requirements which are applicable to CERCLA remedial actions.

FMC Response:

FMC agrees that the Part 264 Subpart S regulations authorizing CAMUs and Staging Piles (for both solid and hazardous remediation waste) and TUs (for hazardous remediation waste) provide flexibility that can facilitate corrective action/ remedial action. These provisions have been added to the RCRA ARARs table. The TU provision has been listed under the section of the table that addresses RCRA storage requirements, since its scope is temporary container and tank storage. The CAMU and Staging Piles provisions are listed under the table section discussing RCRA disposal requirements, given that even temporary land placement can constitute RCRA disposal. FMC acknowledges but does not agree with IDEQ's position that the timeframes specified in 40 CFR §§264.553 (d) and (e) and 40 CFR §§264.554 (d) and (h) are substantive requirements that are applicable to CERCLA remedial actions.

General Comment No. 7:

MISCELLANEOUS UNITS Subpart X

Applicable regulations for a Subpart X unit may incorporate requirements from tanks, land treatment, thermal treatment, incineration, landfills. Only containment building requirements are not applicable to Subpart X units. Subpart X units have three overarching environmental performance standards: Protect Ground Water and Soils, Protect Surface Water, Protect the Air as follows:

Ground water/Soils	Prevention of releases that may have adverse effects on human health or the environment due to migration of wastes in the subsurface (264.601(a))
Surface Waters	Prevention of releases that may have adverse effects on human health or the environment due to migration of wastes in surface waters, wetlands or on the soil surface (264.601(b))
Air	Prevention of releases that may have adverse effects on human health or the environment due to migration of wastes in air (264.601(c))

To achieve this criteria the regulatory body can require additional monitoring, performance testing (e.g., trial burns) or enhanced inspections.

FMC Response:

The revised May 4, 2009 RCRA ARARs table adds Part 264 Subpart X to the ARARs list. Because this addition makes the references in the previous draft table to the 40 CFR Part 265 Subpart Q standards superfluous, those references have been deleted from the revised table.

General Comment No. 8:

General Facility Standards: Depending upon the alternatives that are developed, the substantive aspects of the following General Facility Standards may be ARARs:

Waste Analysis	The facility must have an established waste analysis plan that describes the procedures and analyses necessary to characterize the waste, the treated waste and any by-products of the generation/treatment process (264.13)
Site Security	The facility must control access to the site to ensure the public is protected (264.14)

Inspection Plan	The facility must establish inspection procedures to detect malfunctions, operator errors, deteriorations and discharges that may pose a threat to human health or the environment (264.15).
Personnel Training	Personnel must be trained to ensure compliance and ensure safety. This includes waste management techniques, emergency procedures, shutdown of operations (264.16)
Requirements for ignitable, reactive or incompatible wastes (and incompatible materials)	The facility must take precautions to prevent accidental ignition or reaction of ignitable wastes or reactive wastes (264.17)
Quality assurance program	The facility must have a construction quality assurance program designed to ensure constructed units meet or exceed design criteria (264.19)
Preparedness Plan	The facility must have a preparedness and prevention plan that describes the equipment and procedures for safe plant operations. Items include equipment maintenance, communications and appropriate aisle space (264 Subpart C)
Contingency Plan	The facility must have a contingency plan designed to minimize hazards to human health and the environment from fires, explosions, any unplanned sudden or non-sudden release (264 Subpart D)
Recordkeeping	The facility must have an appropriate record-keeping system addressing the facility data needs including hazardous waste manifests, operating records and other information deemed necessary by the regulating agency. (264 Subpart E)
Closure and Post closure	The facility must have a plan to close the operating units and, if necessary, maintain the unit throughout a post closure care period (264 Subpart G)

<u>FMC Response</u>:

FMC acknowledges but does not agree with IDEQ's position that the cited provisions are substantive standards that may constitute ARARs. Except as discussed in the second paragraph below of this FMC response, all the cited General Facility Standards represent procedural and administrative requirements for obtaining a RCRA Part B permit. CERCLA §121(e) establishes that such requirements do not apply to CERCLA-selected remedial actions conducted entirely on-site. EPA guidance confirms that such requirements do not constitute ARARs. See, e.g., "RCRA ARARs: Focus on Closure Requirements," OSWER

9234.2-04FS (October 1989). That guidance at page 1 states that "On-site actions do not require RCRA permits, nor is compliance with administrative requirements necessary for on-site actions." Also, page 2 of that guidance states that "Administrative Requirements. . . include the requirements for preparing a contingency plan. . . recordkeeping, and consultations." Most of the requirements listed in the IDEQ comment relate to planning and reporting and other administrative requirements and thus do not constitute ARARs.

Two of the cited provisions, however, do constitute ARARs. The first of these is the 40 CFR §264.17 requirement (identical to that set forth at 40 CFR §265.17 except for an added Part 264 administrative requirement for maintaining compliance documentation) for managing ignitable, reactive or incompatible (IRI) waste. FMC's January 26, 2009 draft RCRA ARARs table referenced the IRI waste requirements set forth in the unit-specific subparts of Part 264, such as in 40 CFR §§264.198 and 264.199 for tanks. FMC has augmented these references with a specific reference, added to the May 4, 2009 table, to the general ICI requirements specified at 40 CFR §264.17/ §265.17. The second cited requirement that constitutes an ARAR, or more precisely the set of two regulatory requirements in the cited reference to 40 CFR Part 264 Subpart G that meets ARAR criteria, is the pair of requirements at 40 CFR §§264.111 and 264.114 that respectively establish closure performance and closure decontamination standards. However, page 17 of FMC's January 26, 2009 draft RCRA ARARs table already referenced these requirements (and also the corresponding 40 CFR §§265.111 and .114 requirements, which are functionally identical to their Part 264 counterparts). With respect to post-closure requirements, Part 264 and 265 list post-closure performance standards not in Subpart G but in their unit-specific subparts (such as in Subpart J, at 40 CFR §264.197, for tank systems). The January 26, 2009 table already referenced those requirements. No additional references to Part 264/ 265 Subpart G are needed.

Specific IDEQ Comments

Specific Comment No. 1:

Page 2, Temporary on-site storage of hazardous waste generated from CERCLA remedial action, accumulation time

The timeframe identified in 40 CFR 262.34 is an administrative requirement that would not be applicable to a CERCLA remedial action. The provisions of 40 CFR 264.34 (b) clearly state that a generator who accumulates hazardous wastes for more than 90 days is subject to the permit requirements of 40 CFR 270. However, an on-site CERCLA remedial action is not subject to these administrative permit requirements. Therefore, wastes generated, stored and treated as part of the remedial action should be managed in accordance with the substantive aspects of 40 CFR Part 264 requirements. This approach provides the most environmental protection while allowing the greatest flexibility.

FMC Response:

FMC agrees that the time limits for on-site hazardous waste storage specified at 40 CFR §262.34 are administrative and not substantive requirements and thus do not constitute an ARAR. FMC accordingly has revised the RCRA ARARs table dated May 4, 2009 to delete reference to these storage time limits. FMC also agrees that, conversely, substantive RCRA requirements regarding hazardous waste generation, storage and treatment constitute potential ARARs for on-site CERCLA remedial action at the FMC Plant OU. This has been reflected both in FMC's overall list of ARARs submitted in July 2008 and in each iteration of its proposed RCRA ARARs table.

Specific Comment No. 2:

Page 5, Management Requirements for ignitable, reactive, or incompatible RCRA hazardous waste: waste piles, surface impoundments, land treatment and landfills

These citations appear under a Subject Heading of "*Temporary on-site storage of hazardous waste generated from the CERCLA remedial Action.*" However, "Temporary on-site storage of wastes" is not authorized in landfills. Modify the table accordingly.

FMC Response:

FMC has re-labeled table headings so that the RCRA requirements for managing ignitable, reactive, and incompatible waste are listed in the category of "on-site hazardous waste management and storage." This should help eliminate the ambiguity that gave rise to this comment. FMC acknowledges but does not agree with IDEQ's position that the RCRA regulations categorically prohibit temporary hazardous waste placement in landfills.

Specific Comment No. 3:

Page 6, Management requirements for ignitable, reactive, or incompatible RCRA hazardous wastes: chemical, physical or biological treatment in units other than tanks, surface impoundments and land treatment facilities

These citations appear under a Subject Heading of "*Temporary on-site storage of hazardous waste generated from the CERCLA remedial action.*" However, such treatment is not allowed in a storage unit. The correct regulatory citation for a unit in which chemical, physical, or biological treatment may occur is 40 CFR Part 264 Subpart X. This subpart draws on the other major regulatory Subparts I, J, K, L, M, N, O, S, W, AA, BB, CC, and Part 63 Subpart EEE to establish applicable requirements. Please modify the table accordingly.

FMC Response:

FMC has modified the RCRA ARARs table to delete the reference to the 40 CFR §§265.405 and 265.406 standards that address chemical, physical or biological treatment in units other

than tanks, surface impoundments and land treatment facilities, and replace that with a reference to 40 CFR Part 264 Subpart X. Although the cited Part 265 standards are applicable to interim status facilities such as FMC Pocatello that treat hazardous waste in units other than tanks, surface impoundments and land treatment facilities, the Part 264 Subpart X standards provide a more complete basis for regulating treatment in such "miscellaneous units" as Subpart X refers to them. Therefore the Part 264 Subpart X standards likely would be relevant and appropriate and their greater specificity would displace the cited Part 265 standards. Although FMC has made this requested change, FMC acknowledges but does not agree with two other aspects of this IDEQ comment. First, FMC does not agree with IDEQ's statement that "treatment is not allowed in a storage unit." FMC believes the RCRA regulations clearly authorize treatment in a range of storage units, for example tanks and containers. Second, FMC does not agree that 40 CFR Part 264 Subpart X regulates any "unit in which chemical, physical, or biological treatment may occur." FMC interprets Subpart X, as indicated by its title "Miscellaneous Units," to apply only to treatment units that Part 264 does not otherwise address and thus not to apply to specifically regulated units such as tanks, surface impoundments and land treatment units.

Specific Comment No. 4:

Page 9, Incinerators

The wording under the "description" column is not clear with respect to the sequencing between 40 CFR 264 Subpart O requirements and 40 CFR Part 63 Subpart EEE (Maximum Achievable Control Technology for Hazardous Waste Combustors). Note that the Subpart O requirements will apply for a new incinerator until the demonstration of compliance is completed and the unit is passed to 40 CFR Part 63 Subpart EEE (Maximum Achievable Control Technology for Hazardous Waste Combustors) for ongoing operation. Upon closure of such unit, the applicable requirements are found under 40 CFR 264.351.

FMC Response:

This IDEQ comment correctly states the sequence of RCRA and Clean Air Act regulation of new hazardous waste incinerators and correctly references the regulation governing their closure. FMC has revised the RCRA ARARs table to reference this regulatory sequence. No change is needed regarding the incinerator closure standard because the January 16, 2009 RCRA ARARs table already referenced the 40 CFR §264.351 standard.

Specific Comment No. 5:

Page 10, Thermal Treatment

The correct regulatory citation for thermal treatment (non-incineration) is 40 CFR Part 264 Subpart X. This subpart draws on the other major regulatory Subparts I, J, K, L, M, N, O, S, W, AA, BB, CC, and Part 63 Subpart EEE to establish applicable requirements.

FMC Response:

IDEQ is correct that any new thermal treatment unit that FMC installed to treat CERCLA remediation waste would be subject to ARARs based on Part 264 Subpart X, and that such ARARs would displace those under 40 CFR Part 265 Subpart P that apply to thermal treatment units regulated under interim status. FMC accordingly has revised the RCRA ARARs table by adding a reference to "miscellaneous units," stating that ARARs for such units would be based on 40 CFR Part 264 Subpart X, and identifying thermal treatment units as a type of miscellaneous unit subject to Subpart X standards. FMC has deleted the reference to 40 CFR Part 265 Subpart P as a potential source of ARARs for thermal treatment units.

Specific Comment No. 6:

Page 10 Chemical, physical and biological treatment of RCRA hazardous waste in units other than tanks, surface impoundments and land treatment units

The correct regulatory citation for a unit in which chemical, physical, or biological treatment may occur is 40 CFR Part 264 Subpart X. This subpart draws on the other major regulatory Subparts I, J, K, L, M, N, O, S, W, AA, BB, CC, and Part 63 Subpart EEE to establish applicable requirements. Please modify the table accordingly.

FMC Response:

FMC has revised the RCRA ARARs table to identify 40 CFR Part 264 Subpart X as the source of ARARs for chemical, physical, biological or other treatment of hazardous waste in "miscellaneous units" that Part 264 does not otherwise specifically address. FMC acknowledges but does not agree with this comment to the extent it takes the position that all such treatment is regulated under Subpart X. As discussed in this other FMC responses, FMC interprets Subpart X to apply only to units that are not otherwise addressed under Part 264: treatment in tanks and surface impoundments, for example, would be governed respectively by Part 264 Subparts J and K and not by Subpart X.

Specific Comment No. 7:

Page 12, Waste treatment in an elementary neutralization unit or wastewater treatment unit

Two of the regulations identified in this item (40 CFR 264.1(g) (6); 40 CFR 265.1 (c) (10)) are not RCRA ARARs but rather what is necessary to be exempt from RCRA regulation. If the remedial action treatment unit meets these criteria RCRA would not be applicable (to the treatment unit). This would be a Clean Water Act activity subject to CWA ARARs.

FMC Response:

Agreed. The two cited provisions have been deleted from the RCRA ARARs table.

Specific Comment No. 8:

Page 13, Note Regarding Placement

Placement is also triggered when wastes are excavated and treated in a unit within the AOC, or are excavated and then managed in such a way as to constitute a RCRA storage unit as defined by 40 CFR 260.10, even if the storage unit is located within the AOC. In such cases, LDRs must be met if hazardous remediation wastes are eventually land disposed, for example, after they are removed from the treatment or storage unit. However, if treatment results in constituent concentrations that comply with applicable land disposal restriction treatment standards, no further treatment prior to land disposal is required as a condition of the LDRs.

FMC Response:

As stated in the Note in the RCRA ARARs table regarding the circumstances in which RCRA "disposal" occurs, FMC agrees that excavated materials that constitute RCRA hazardous waste at the point of generation that are treated outside the AOC from which they originated and are returned to that AOC (or placed into a different AOC) are considered "disposed of" under RCRA and thus are subject to LDRs and other RCRA disposal requirements. FMC acknowledges but does not agree with the IDEQ comment that RCRA disposal "is also triggered when wastes are excavated and treated in a unit within the AOC, or are excavated and then managed in such a way as to constitute a RCRA storage unit as defined by 40 CFR 260.10, even if the storage unit is located within the AOC." FMC believes that IDEQ's position is overbroad in that, for example, it would classify temporary placement of remediation waste in containers with an AOC and subsequent placement of that waste back to the same AOC as RCRA "disposal" when the EPA guidance cited in the Note states the contrary. Whether a given type of remediation waste treatment or other management within an AOC constitutes RCRA disposal is an issue that EPA, IDEQ and FMC can address as needed in the context of evaluating remedial alternatives and any RCRA disposal requirements that such alternatives might trigger.

Specific Comment No. 9:

Page 23, Corrective Action Program

The FMC site and contiguous FMC properties are currently subject to RCRA corrective action requirements. It is appropriate to identify the need for a ground water monitoring program associated with new land based units but the full RCRA corrective action requirements are already in force regardless of the CERCLA remedial activities.

<u>FMC Response</u>:

FMC acknowledges that RCRA corrective action requirements are independently applicable at the FMC Pocatello facility regardless of also being an ARAR for purposes of the CERCLA remedial action. However, RCRA corrective action requirements for the FMC Plant OU are being identified concurrently with the CERCLA remedial action requirements under the EPA One Cleanup Program and both sets of requirements will be implemented concurrently during the RD/RA. No change is needed to the RCRA ARARs table.

APPENDIX A-3

FMC Transmittal Letter (dated: July 2, 2009) to Tribal Materials and FMC Response to Asserted Tribal ARARs for FMC Plant OU

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FMC Corporation

Via Email

July 2, 2009

Kira Lynch
Office of Environmental Cleanup (ECL-113)
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Re: FMC Plant Operable Unit, Eastern Michaud Flats Site
FMC response to Tribal materials the Tribes have identified as potential ARARS

Dear Kira:

The Shoshone-Bannock Tribes (the Tribes) have compiled a set of Tribal materials onto a CD-ROM that they have identified as potential Applicable or Relevant and Appropriate Requirements (ARARs) for the FMC Plant OU remedial action. The Tribes sent that CD-ROM to EPA, and you then provided that to FMC on April 27, 2009. Enclosed is FMC's response to the Tribes' proposed set of Tribal ARARs. Please do not hesitate to contact me, or have our respective legal counsel Charlie Ordine and David Heineck arrange to discuss this, if you have any questions or comments.

Sincerely,

Barbara Ritchie
Associate Director, Environmental

Enclosures

cc (w/encl):
Kelly Wright, Shoshone-Bannock Tribes
Susan Hanson, Shoshone-Bannock Tribes
Doug Tanner, Idaho Department of Environmental Quality

FMC Response to Tribal ordinances and other materials that the Tribes characterize as ARARs for the FMC Plant OU

FMC Corporation (FMC) provides the following responses regarding the Tribal ordinances and other materials that the Shoshone-Bannock Tribes (the Tribes) have proposed for designation as applicable or relevant and appropriate requirements (ARARs) for the FMC Plant Operable Unit (OU) remedial action. The Tribes sent these materials to Region 10 of the U.S. Environmental Protection Agency (EPA), and EPA provided a CD-ROM containing these materials to FMC on April 27, 2009.

These responses are divided into two sections: general comments identifying issues that make the Tribal materials as a whole ineligible for ARARs designation, and specific comments discussing how these issues affect each of the individual Tribal documents.

A. General comments

1. CERCLA does not authorize EPA to designate Tribal standards as ARARs

A. CERCLA authorizes EPA to designate only Federal and State standards as ARARs

CERCLA Section 121(d) establishes EPA's authority to designate human health and environmental standards as ARARs and require those standards to be met in a CERCLA response action. That section delineates only two types of standards that can be designated as ARARs: Federal standards, and State standards. Tribal standards are not identified in this or any other CERCLA section as being eligible for ARAR designation. CERCLA Section 121(d) states in relevant part:

> **(d) Degree of cleanup**
>
> (1) Remedial actions selected under this section or otherwise required or agreed to by the President under this chapter shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the

environment. Such remedial actions shall be relevant and appropriate under the circumstances presented by the release or threatened release of such substance, pollutant, or contaminant.

(2)(A) With respect to any hazardous substance, pollutant or contaminant that will remain onsite, if—

> (i) ***any standard, requirement, criteria, or limitation under any Federal environmental law***, including, but not limited to, the Toxic Substances Control Act [15 U.S.C.A.§2601 et seq.], the Safe Drinking Water Act [42 U.S.C. A. §300f et seq.], the Clean Air Act [42 U.S.C.A. §7401 et seq.], the Clean Water Act [33 U.S.C.A. §1251 et seq.], the Marine Protection, Research and Sanctuaries Act [16 U.S.C.A. §1431 et seq., §1447 et seq., 33 U.S.C.A. §1401 et seq., §2801 et seq.], or the Solid Waste Disposal Act [42 U.S.C.A. §6901 et seq.]; or
>
> (ii) ***any promulgated standard, requirement, criteria, or limitation under a State environmental or facility siting law that is more stringent than any Federal standard***, requirement, criteria, or limitation, including each such State standard, requirement, criteria, or limitation contained in a program approved, authorized or delegated by the Administrator under a statute cited in subparagraph (A), and that has been identified to the President by the State in a timely manner,

is legally applicable to the hazardous substance or pollutant or contaminant concerned or is relevant and appropriate under the circumstances of the release or threatened release of such hazardous substance or pollutant or contaminant, ***the remedial action*** selected under section 9604 of this title or secured under section 9606 of this title ***shall require***, at the completion of the remedial action, ***a level or standard of control for such hazardous substance or pollutant or contaminant which at least attains such legally applicable or relevant and appropriate standard***, requirement, criteria, or limitation. Such remedial action shall require a level or standard of control which at least attains Maximum Contaminant Level Goals established under the Safe Drinking Water Act [42 U.S.C.A. §300f et seq.] and water quality criteria established under section 304 or 303 of the Clean Water Act [33 U.S.C.A. §1314 or 1313], where such goals or criteria are relevant and appropriate under the circumstances of the release or threatened release.

CERCLA Section 121(d)(1)-(d)(2)(A), 42 U.S.C. §9621(d)(1)-(d)(2)(A) (emphases added).

CERCLA Section 121(d) does not identify Tribal standards as qualifying for ARAR designation. CERCLA accords that status only to Federal and State standards. Further, the term "State" as used in CERCLA does not include Tribes. CERCLA Section 101 defines "State" as follows:

> The terms "United States" and "State" include the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Commonwealth of the Northern Marianas, and any other territory or possession over which the United States has jurisdiction.

CERCLA Section 101(27), 42 U.S.C. §9601(27). Tribes are not included in that definition. Further confirming that CERCLA does not classify Tribes as a "State," CERCLA sets forth a separate definition for "Indian tribes:"

> The term "Indian tribe" means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village but not including any Alaska Native regional or village corporation, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

CERCLA Section 101(36), 42 U.S.C. §9601(36). Congress therefore did not make Tribal standards potential ARARs in granting "State" standards that status.

Congress amended CERCLA in 1986 under the Superfund Amendments and Reauthorization (SARA). One of the SARA amendments was the addition of a new section, codified as CERCLA Section 126(a), that granted Indian tribes "treatment as States" (TAS) with respect to an enumerated list of CERCLA provisions. The following is the full text of this section:

> The governing body of an Indian tribe shall be afforded substantially the same treatment as a State with respect to the provisions of ***section 9603(a)*** of this title (regarding notification of releases), ***section 9604(c)(2)*** of this title (regarding consultation on remedial actions), ***section 9604(e)*** of this title (regarding access to information), ***section 9604(i)*** of this title (regarding health authorities) and ***section 9605*** of this title (regarding roles and responsibilities under the national contingency plan and submittal of priorities for remedial

action, but not including the provision regarding the inclusion of at least one facility per State on the National Priorities List).

CERCLA Section 126(a), 42 U.S.C. §9626(a) (emphases added).

Absent from the list of CERCLA sections for which Tribal TAS status applies is the section under which ARARs are established: 42 U.S.C. §9621(d), CERCLA Section 121(d). Congress was very specific regarding the CERCLA provisions, five to be exact, for which Tribes have TAS status. The ARARs provision at CERCLA Section 121 is not listed. Given Congress' specificity, the fact that CERCLA Section 121 was not included cannot be viewed as a Congressional oversight that EPA can ~~"c~~orrect" by adding it. It violates canons of statutory construction to imply additional authorities where the Congressional authorization, as here, is expressly defined. CERCLA does not expressly or implicitly authorize Indian tribes to be treated in the same manner as States with respect to ARARs. CERCLA does not give Tribal standards ARAR status.

A general canon of statutory construction is that the enumeration of specific statutory sections implies that the omitted sections are excluded from that rule's application. This interpretive principle is referred to as *expressio unius est exclusio alterius*. *Cash Currency Exchange, Inc. v. Shine (Matter of Cash Currency Exchange, Inc.)*, 762 F.2d 542, 552 (7th Cir.), cert. denied sub nom. *Fryzel v. Cash Currency,* 474 U.S. 904, 106 S.Ct. 233, 88 L.Ed.2d 232 (1985). CERCLA Section 126(a) provides a textbook case for applying this principle. It very specifically lists the CERCLA provisions for which Tribes are granted TAS status. While other specific CERCLA provisions are listed, the ARARs provision at CERCLA Section 121(d) is not. The effect of Congress' omission is that only Federal and State standards are authorized to be applied as ARARs. The fact that Congress specifically listed the CERCLA sections that it extended to Tribes, and CERCLA Section 121(d) was not among them, means that Tribes are not "~~S~~States" for purposes of that section and Tribal standards cannot be ARARs.

B. The only basis for an EPA designation of Tribal standards as ARARs is the National Contingency Plan (NCP) regulations, and EPA did not provide any legal justification in its NCP rulemaking for its policy decision to accord Tribal standards ARARs status

The National Contingency Plan (NCP) regulations promulgated at 40 C.F.R. Part 300 set forth the procedures that EPA follows in planning and conducting CERCLA response actions, including the designation of ARARs that generally are among the cleanup criteria that remedial actions must meet. The current NCP largely

was promulgated at 55 Fed. Reg. 8666 (March 8, 1990), after the 1986 SARA amendments.

In its NCP regulations, EPA has made Tribal standards eligible for ARAR designation. EPA has done this through the mechanism of defining "State" to generally include Indian tribes:

> *State* means the several states of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Virgin Islands, the Commonwealth of Northern Marianas, and any other territory or possession over which the United States has jurisdiction. ***For purposes of the NCP, the term includes Indian tribes as defined in the NCP except where specifically noted.*** Section 126 of CERCLA provides that the governing body of an Indian tribe shall be afforded substantially the same treatment as a state with respect to certain provisions of CERCLA. Section 300.515(b) of the NCP describes the requirements pertaining to Indian tribes that wish to be treated as states.

40 C.F.R. §300.5 (emphasis added). EPA's decision to expand the definition of "State" to include Indian tribes conflicts with the definitional sections of the CERCLA statute that the NCP supposedly is meant to implement. More importantly, it also results in a direct conflict with CERCLA Section 126(a) by according Tribal standards an ARAR status that Congress excluded.

The original CERCLA NCP regulations that EPA promulgated in 1982 did not define the term "State" to include Indian tribes. EPA first proposed this in its 1988 notice of proposed rulemaking to amend the NCP, which largely was directed at conforming the NCP to the 1986 SARA amendments. 53 Fed. Reg. 51394 (December 21, 1988). In the preamble to the 1988 proposed rulemaking EPA did not provide any explanation regarding this definitional change or its consequences, beyond the general statement that it was appropriate to defines Tribes as "States" given SARA's Tribal TAS provisions now codified at CERCLA Section 126(a):

> In addition, because Indian Tribes are afforded substantially the same treatment as States are afforded during response actions, the proposed definition of "State" includes Federally recognized Indian Tribes. (See §300.515 for requirements Indian Tribes must meet to be afforded the same treatment as States.) Thus, for example, EPA may enter into cooperative agreements with such Indian Tribes.

53 Fed. Reg. 51394, 51398 (December 21, 1988).

EPA did not explain in its December 21, 1988 notice of proposed rulemaking that one result of defining Tribes as "States" was that Tribal standards, classified as "State" standards, would be among the "State" requirements that CERCLA Section 121(d) makes eligible for ARAR designation. EPA made this explicit only in its final rulemaking that adopted this new definition and most other elements of the proposed rule into the revised NCP:

> CERCLA section 126 directs EPA to afford Indian tribes substantially the same treatment as states for certain specified subsections of CERCLA sections 103, 104 and 105; EPA believes, as a matter of policy, that it is similarly appropriate to treat Indian tribes as states for the purpose of identifying ARARs under section 121(d)(2).

55 Fed. Reg. 8666, 8741 (March 8, 1990).

EPA did not present any legal argument in its 1988 proposed rulemaking or in connection with the 1990 NCP final rule providing CERCLA statutory support for its "policy" decision to confer ARAR status on Tribal standards. This is not surprising. As discussed above, the statutory text in CERCLA Sections 101, 121(d) and 126(a) and canons of statutory construction make any such legal argument untenable.

Since promulgating the final NCP, EPA has relied on this 1990 NCP "policy" decision as its legal basis for according Tribal standards ARAR status. For example, EPA has designated Tribal standards as ARARs in Memoranda of Agreement (MOAs) with Indian tribes, such as MOAs with the Swinomish and Spokane Tribes, and in the CERCLA Record of Decision for the Midnite Mine Superfund Site within the Spokane Indian Reservation. These designations have apparently gone unchallenged and unexamined. The Shoshone-Bannock Tribes now invite EPA to perpetuate its CERCLA legal error by similarly designating their asserted standards as ARARs. Any such EPA designation that would have a material impact on remedial action selection will not go unchallenged this time.

C. EPA has exceeded its statutory authority in issuing NCP regulations that accord Tribal standards ARAR status

EPA has exceeded its statutory authority in making a "policy" decision to designate Tribal standards as ARARs when Congress did not authorize that either expressly or implicitly. The general standard of review for agency decisions interpreting statutes they are charged with administering is set forth in the U.S. Supreme Court decision in *Chevron USA Inc. v. NRDC, Inc.*, which in relevant part states as follows:

> When a court reviews an agency's construction of the statute which it administers, it is confronted with two questions. First, always, is the question whether Congress has directly spoken to the precise question at issue. If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress. If, however, ... the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute.

Chevron U.S.A. Inc. v. NRDC, Inc., 467 U.S. 837, 842-43, 104 S.Ct. 2778, 2781-82, 81 L.Ed.2d 694 (1984) (footnotes omitted).

Congress did not authorize EPA to treat Indian tribes in the same manner as States for purposes of CERCLA Section 121(d). Congress clearly knew how to draft legislation that contains specific provisions applicable to Indian tribes, and it did so in the 1986 SARA amendments that added CERCLA Section 126(a) granting Tribes limited TAS status. Congress was neither ~~"s~~ilent" nor "ambiguous" regarding the State-related CERCLA provisions that it extended to Tribes: it granted Tribes TAS status with respect to five specific provisions, and no others. The fact that Congress did not engage in redundant drafting to list the CERCLA provisions that were *not* extended to Tribes does not create any ambiguity. To find otherwise would require Congress, to avoid the risk of being found ambiguous and subject to agency re-write, to complement every statutory grant of authority with a listing of the authorities that conversely it did *not* grant. No court has required this. And no reviewing court would require that here.

Both the CERCLA statutory text and canons of statutory construction make it clear that Congress did not expressly or implicitly make Tribal standards eligible for ARAR designation. EPA has no authority under the *Chevron U.S.A.* standard of review to change what Congress has specified merely because it believes that as a matter of ~~"p~~olicy" the list of Tribal TAS provisions should be longer. EPA's regulatory expansion beyond what the statute specifies is not a matter of permissible agency ~~"i~~nterpretation." Congress has spoken to the Tribal TAS issue and specified the CERCLA provisions that define the TAS scope. A reviewing court would find that EPA has exceeded its authority in according Tribal standards an ARAR status that Congress excluded.

2. <u>The Tribes have failed to meet CERCLA and EPA requirements by providing only a "laundry" list of Tribal standards they assert are ARARs without any explanation regarding the specific standards they contend should have ARAR status</u>

A threshold requirement for consideration of State (and, under EPA's approach, Tribal) standards as potential ARARs is that they must be ~~"i~~identified" to EPA. The Shoshone-Bannock Tribes have failed to do this. They have simply provided a list and the texts of their statutes, ordinances and other materials that they contend EPA should designate as ARARs. As an initial matter, the Tribes have not identified the ~~"r~~equirements" within these materials. Nor have they separated the ~~"s~~ubstantive" requirements, which under EPA's approach would be eligible for ARAR consideration, from those (such as the permit and fee requirements under the various Tribal programs) that are ~~"a~~dministrative" and not eligible. Further, they have not provided any evaluations supporting classification of the claimed substantive requirements of these materials as either ~~"a~~pplicable" or ~~"r~~elevant and appropriate." EPA must require the Tribes to provide these identifications and evaluations as a prerequisite to any consideration of their materials as potential ARARs.

CERCLA Section 121 requires States (and, as EPA applies the statute, Tribes) to provide such identification:

> (2)(A) With respect to any hazardous substance, pollutant or contaminant that will remain onsite, if—
>
> . . . .
>
> (ii) any promulgated standard, requirement, criteria, or limitation under a State environmental or facility siting law that is more stringent than any Federal standard. . . ***that has been identified to the President by the State in a timely manner***,
>
> is legally applicable… or relevant and appropriate under the circumstances of the release… the remedial action. . . shall require… a level or standard of control…which at least attains such legally applicable or relevant and appropriate standard….

CERCLA Section 121(d)(2)(A), 42 U.S.C. §9621(d)(2)(A) (emphasis added).

EPA further articulated this requirement in the preamble to its 1990 final rule adopting what is essentially the current NCP:

> Furthermore, the language of CERCLA section 121(d)(2)(A) makes clear, and program expediency necessitates, that the specific requirements that are applicable or relevant and appropriate to a

> particular site be identified. ***It is not sufficient to provide a general "laundry" list of statutes and regulations that might be ARARs for a particular site***. The State, and EPA if it is the support agency, must instead provide a list of requirements with ***specific citations to the section of law identified as a potential ARAR, and a brief explanation of why that requirement is considered to be applicable or relevant and appropriate***.

55 Fed. Reg. 8666, 8746 (March 9, 1990) (emphases added).

EPA should require the Tribes to provide "specific citations" to the standards they contend qualify as ARARs and "a brief explanation" supporting that designation. This is necessary for any EPA determination that such standards are "relevant and appropriate" (FMC assumes that given its legal position that the Tribes lack regulatory jurisdiction with respect to its non-Member and fee-owned property, discussed later in this response, that EPA will not insert itself into that jurisdictional dispute by finding the Tribal standards "applicable"). The following are some general EPA guidelines from its 1988 proposed NCP rulemaking for determining whether requirements are "relevant and appropriate:"

> In determining which requirements are relevant and appropriate, the pivotal criteria differ depending upon the type of requirement under consideration, namely chemical-specific, location-specific, or action-specific… In general, for chemical-specific requirements the focal point for the relevant and appropriate determination is whether the requirement for the chemical at the CERCLA site sets a health- or environmental-based level based on an exposure scenario (including the medium) that is similar to the potential exposure at a CERCLA site. For location-specific requirements, generally the primary test for relevance and appropriateness is whether the location under consideration is sufficiently similar to the location upon which the requirement is based. For action-specific requirements, generally the test for relevance is whether the action contemplated at the CERCLA site is similar.
>
> . . . .
>
> If a requirement is not applicable, the decisionmaker uses best professional judgment to determine whether the requirement addresses problems or situations that are generally pertinent to the conditions at the site (i.e., the requirement is relevant) and whether the requirement is well-suited to the particular site (i.e., the requirement is appropriate).

53 Fed. Reg. 51394, 51436-37 (December 21, 1988).

The Tribes must identify the specific provisions within the materials they have provided that they contend should be designated as ARARs, and explain both why those are substantive requirements and how they meet the above criteria for being considered relevant and appropriate.

In the absence of the required Tribal explanations, FMC has reviewed and evaluated the Tribes' materials against the CERCLA and EPA regulatory criteria for ARAR designation. The remainder of this response sets forth FMC's review of these materials and the factors leading to the conclusion that they do not meet ARAR criteria, even under EPA's construct of CERCLA that would allow such designation.

3. <u>The Tribal materials do not constitute environmental "requirements" that would be eligible for ARAR designation</u>

Even if it were assumed that Tribal ordinances could be deemed an ARAR, the ordinances and other materials cited by the Tribes do not constitute ~~"r~~equirements" and are therefore not appropriate for consideration as ARARs. The NCP clearly provides that Tribal standards are subject to the same ARARs criteria that apply to Federal and State ARARs:

> Only those state standards that are promulgated, are identified by the state in a timely manner, and are more stringent than federal requirements may be applicable or relevant and appropriate. For purposes of identification and notification of promulgated state standards, the term *promulgated* means that the standards are of general applicability and are legally enforceable.

40 C.F.R. §300.400(g)(4) (emphasis in original).

The NCP further provides as follows:

> The lead and support agencies shall identify requirements applicable to the release or remedial action contemplated based upon an objective determination of whether the requirement specifically addresses a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.

40 C.F.R. §300.400(g)(1).

These NCP provisions impose several criteria that must be met before EPA can designate a Federal, State or (under EPA's approach) Tribal standard as a ~~"r~~equirement" eligible for ARAR status. The standard must:

- Contain a requirement that specifically addresses a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site;
- Be promulgated, which the NCP defines as having general applicability and being legally enforceable;
- Be identified by the State (or, under EPA's CERCLA construct, an Indian Tribe) in a timely manner; and
- Be more stringent than Federal requirements.

Comparing the Tribes' ordinances and other materials against these criteria, there is no showing that any of them can qualify as "requirements" under the NCP. The vast majority do not even meet the first of these criteria because they do not establish substantive environmental requirements that would affect cleanup decisions at the site. This is the case, for example, with respect to the treaties and policy statements included in the Tribal materials, and for individual ordinances such as the Tribal water resources code for water rights appropriations, Tribal pesticide application standards, Tribal zoning/land use requirements, the Tribal emergency planning and community right to know ordinance, and the Tribal administrative procedures act. Such materials are not environmental or human health directives that would affect CERCLA remedial action selection. Thus they cannot constitute ARARs.

Where the Tribal codes address environmental concerns, they largely do not set specific standards themselves: they authorize Tribal agencies to do that through rulemaking. As a result, even where the codes address environmental issues they generally do not establish numerical or other specific requirements or limitations that could be candidates for classification as ARARs.

Further, the Tribes generally have not promulgated regulations under the environmental-related codes that would provide the specificity missing from the codes themselves. The Tribes provided only one set of implementing regulations in their materials, the *Proposed Soil Cleanup Standards for Contaminated Properties*. The Tribes have proposed but not promulgated these standards. For this and other reasons, discussed in more detail in FMC's specific comments below, the proposed soil cleanup standards do not meet ARARs criteria. Apart from the fact they are not promulgated, the principle reason they do not constitute ARARs is that their ostensible "standards" are subject to numerous variables and broad, undefined waivers that make their application subject to the unfettered discretion of the enforcement agency. When "standards" can be nullified by such broad waivers they do not constitute "generally applicable" requirements that can be considered for ARAR designation.

Several of the ordinances and codes authorize the Tribes to require and issue permits for a particular activity or use. However, the permit authorizations often do not set any standards for permit issuance or prescribe what requirements such permits must contain. Thus they do not provide standards that could be considered for ARAR classification. Further, asserted Tribal requirements to obtain permits are not applicable to the FMC Plant OU remedial action both because the Tribes lack jurisdiction with respect to that FMC-owned property (as discussed later in this response) and because CERCLA Section 121(e) exempts on-site CERCLA response actions from procedural permit requirements.

4. <u>Many of the Tribal ordinances have not been properly "promulgated" with respect to Tribal non-members such as FMC and thus also fail on that basis as potential ARAR "requirements"</u>

Many of the Tribal ordinances and regulations, including those characterized as final, are deficient because they have not been properly adopted and approved. The Tribes' Constitution contemplates two levels of approval: the Business Council, and the Secretary of Interior through the Bureau of Indian Affairs (BIA). For an ordinance to be adopted under Tribal law and enforceable against Tribal members, the Business Council must adopt it. For an ordinance to be enforceable against non-members (subject to a showing of Tribal jurisdiction over that non-member), it is necessary under the Tribes' Constitution to obtain BIA approval of that approved ordinance. As a matter of *Tribal* law, without that approval, the Tribal ordinance is not valid and enforceable against non-members under any circumstances. Section 1(l) of the Tribal Constitution states in pertinent part that the Business Council shall, "subject … to all express restrictions upon such powers contained in this constitution and bylaws" have the power:

> To safeguard and promote the peace, safety, morals, and general welfare of the Fort Hall Reservation by regulating the conduct of trade and use and disposition of property upon the reservation, ***provided that any ordinances directly affecting nonmembers of the reservation shall be subject to review by the Secretary of the Interior.***

Constitution and Bylaws for the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho, Section 1(l) (emphasis added).

Thus, under the Tribes' Constitution, the Business Council may enact resolutions and ordinances that affect non-members (again, assuming jurisdictional authority to do so). But those are subject to review of the Secretary of the Interior and

do not take legal effect with respect to non-members until that approval has been obtained.

The BIA approval process is set forth in Section 2 of the Tribes' Constitution. That Section provides that, when a resolution or ordinance is subject to review by the Secretary of the Interior, it is effective only *after* it receives the appropriate approvals. Section 2 states, in its entirety:

> Any resolution or ordinance which by the terms of this constitution is subject to review by the Secretary of the Interior shall be presented to the superintendent of the reservation who shall, within 10 days thereafter, approve or disapprove the same, and it [sic] such ordinance or resolution is approved, it shall thereupon become effective, but the superintendent shall transmit a copy of the same, bearing his endorsement, to the Secretary of the Interior, who may, within 90 days from the date of enactment, rescind said ordinance or resolution for any cause, by notifying the council of such action: *Provided*, That if the superintendent shall refuse to approve any resolution or ordinance submitted to him within 10 days after its enactment, he shall advise the council of his reasons thereof, and the council, if such reasons appear to be insufficient, may refer it to the Secretary of the Interior, who may pass upon same and either approve or disapprove it within 90 days from its enactment.

The mere enactment by the Business Council of an ordinance or resolution does not make that ordinance or resolution effective. This is significant in the context of this ARARs review. For the majority of the documents provided in the Tribes' ARAR package, the Tribes have not provided any evidence that those laws have received Secretary of the Interior approval and therefore have potential legal effect with respect to non-members such as FMC. Even apart from the lack of Tribal jurisdiction regarding the FMC Plant OU, discussed later in these responses, there can be no possible application of Tribal ordinances and regulations under Tribal law unless the Tribes show affirmative evidence that those ordinances and regulations have received proper approvals from the Business Council and the BIA. This is a further ground, specific to Tribal law, for concluding that the Tribal materials do not constitute promulgated "requirements" that are eligible for ARARs consideration at the FMC Plant OU.

5. <u>The Tribes have not identified any environmental "requirements" in their materials that are more stringent than Federal standards</u>

CERCLA specifies that State (and, under EPA's approach, Tribal) requirements must be more stringent that those under Federal law to be candidates for ARAR designation. The basic CERCLA definition of potential State ARARs is ~~"a~~***any promulgated standard***, requirement, criteria, or limitation ***under a State environmental or facility siting law that is more stringent than any Federal standard***, requirement, criteria, or limitation...." CERCLA Section 121(d)(2)(A)(ii), 42 U.S.C. §9621(d)(2)(A)(ii). The NCP incorporates this same requirement at 40 C.F.R. §300.400(g)(4). The Tribes' materials do not meet the CERCLA criterion of being more ~~"s~~stringent" than Federal standards, for several reasons.

First, as discussed earlier, the Tribes' regulations are not ~~"r~~equirements" and therefore lack the requisite level of certainty that they would be applied to a particular site. Because of that lack of certainty, it cannot be said that the standards are more ~~"s~~tringent." It takes more than simply stating a numerical limit, for example, to characterize that as a ~~"r~~equirement" than then can be compared to a federal standard. The numerical limit must be promulgated within a legal framework that applies it in a comprehensive and predictable manner. The Tribes' ordinances do not provide that framework. And no such framework can be inferred, under the 40 C.F.R. §300.400(g)(1) requirement that EPA must identify ARARs based on an ~~"o~~bjective determination." The CERCLA and NCP criteria that ARARs must be ~~"~~promulgated" and ~~"e~~nforceable" requirements of ~~"g~~eneral applicability" emphasize that their applicability to a given site must be certain. The uncertainty regarding the Tribal provisions, for reasons including the fact that most of the Tribal materials do not set forth specific environmental requirements or are eviscerated by broad and standardless waiver provisions, means that the Tribal provisions are not ~~"r~~equirements" whose stringency can be compared to federal standards.

Second, it is the Tribes' obligation to demonstrate that their environmental standards are more stringent than federal ones. They have made no attempt to do so. Their ARAR submission does not identify any substantive environmental requirements in their materials, does not identify the federal standards such requirements would impact, and does not evaluate the extent to which Tribal standards would be more stringent than the federal standards. In short, they have not shown what, if anything, would be done differently with respect to the FMC Plant OU remedial action if Tribal regulations were applied.

Lastly, the Tribes may contend that their codes and regulations should be deemed more stringent where they contain absolute prohibitions against the presence of certain materials or mandate cleanup beyond what CERCLA can require. There

are examples of these in the Tribal materials. For example, the Tribes' proposed soil cleanup standards would adopt California-based limits that for some constituents, such as arsenic, are below Southeastern Idaho background levels. Such ~~"re~~quirements" are not legally cognizable under CERCLA, for several reasons. First, such provisions address a facility's physical state and not CERCLA ~~"re~~leases." Second, they are arbitrary and capricious in that they are not based on reasoned determinations regarding the levels necessary to protect human and the environment. Third, they likely are not ~~"g~~enerally applicable" in that they appear to be improperly targeted at the FMC facility.

Such prohibitions and ~~"s~~tandards" also are in conflict with the legislative history of CERCLA Section 121(d), which includes the following Congressional statement:

> This section states that the level or standard of control required in accordance with the above standard ***shall be required only with regard to remedial actions taken with respect to the release or threatened release*** of a hazardous substance or pollutant or contaminant from the facility concerned and shall not be applicable to contamination from other sources. ***The Committee intends that the remedial action shall not require a level of control which exceeds the background levels of the hazardous substance, pollutant or contaminant which would have existed without the release***.

H.R. REP. 99-253(I), 1986 U.S.C.C.A.N. 2835, at 2879 (emphasis added).

Congress' intent was to only use ARARs to address a ~~"re~~lease" or ~~"th~~reatened release" of a hazardous substance. It is not intended to address conditions that pre-existed the release, or that originated from sources other than that release. For example, the prohibition on leaving waste in place under the proposed Waste Management Act amendments does not address a ~~"re~~lease." The mere presence of waste materials on site does not constitute a release. Tribal provisions must address an actual or potential release, and not just a site's physical state, to be eligible for ARARs consideration (under EPA's approach that allows Tribal standards to be given ARARs status).

Tribal provisions that lack any reasoned basis with respect to human health or environmental protection, that would require cleanup to below background levels, or that prohibit site conditions rather than address site releases are not CERCLA-recognized ~~"re~~quirements." Thus they cannot be more ~~"ts~~tringent" than federal standards and cannot be classified as ARARs.

More fundamentally, the Tribes have an obligation to identify which of their provisions are environmental ―requirements" are which of those are more ―stringent" than federal standards. They have made no attempt to so. This is an additional reason the Tribal materials do not qualify as ARARs.

6. <u>Even if there are CERCLA-recognized environmental "requirements" in the Tribal materials that are "more stringent than" federal standards, the Tribes have not provided any information supporting an EPA determination that they are "relevant and appropriate" for the FMC Plant OU remedial action</u>

As discussed in above in Section A.2. of these responses, the Tribes simply provided a ―laundry" list of treaties, codes, ordinances and other materials that they contend EPA should classify as ARARs. They failed to identify the specific provisions they contend meet ARARs criteria or explain why those provisions are relevant and appropriate for the FMC Plant OU remedial action. CERCLA Section 121, the NCP regulations, and EPA guidance require such information. Section A.2. above sets forth the basic considerations that are involved in determining whether a State (and here, Tribal) standard establishes environmental levels based on exposures similar to those at a specific CERCLA site and otherwise is a ―relevant and appropriate" cleanup action requirement. The Tribes have not provided the information necessary to make these determinations. EPA must require the Tribes, as a prerequisite to any ARARs evaluation, to provide information regarding the exposure assumptions underlying any Tribal requirement specifying contaminant concentration levels and other information demonstrating that the requirement is ―well-suited" to the FMC Plant OU remedial action.

FMC has reviewed the Tribal materials notwithstanding the Tribes' failure to provide the information described above. Although handicapped by the lack of that information, FMC has not identified any provision that meets the basic ARARs criteria (operating under EPA's approach that makes Tribal standards eligible for that designation): a promulgated, enforceable and generally applicable environmental ―requirement," and one that is both ―more stringent than" federal standards and ―relevant and appropriate" for inclusion among the site cleanup requirements based on the factors listed in EPA guidance, including comparability of the exposures addressed by the standard to those anticipated at the site. FMC invites EPA to make its own analysis. We submit that EPA will reach similar conclusions.

7. Even assuming that one or more Tribal provisions met all the ARARs criteria (putting aside the fact that CERCLA categorically excludes them), they still would not apply at the FMC Plant OU because the Tribes have not shown that any such standards have been consistently applied

CERCLA provides that standards that otherwise meet ARARs criteria nevertheless are waived if States (or, under EPA's approach, Tribes) do not consistently apply them:

> (4) The President may select a remedial action... that does not attain a level or standard of control at least equivalent to a legally applicable or relevant and appropriate standard... if the President finds that—
>
> . . . .
>
> (E) with respect to a State standard... the State has not consistently applied (or demonstrated the intention to consistently apply) the standard... in similar circumstances at other remedial actions within the State.

CERCLA Section 121(d)(4)(E), 42 U.S.C. §9621(d)(4)(E).

As another consequence of the Tribes' having provided only a "laundry" list of materials proposed for ARAR status with no accompanying explanation, the Tribes have failed to provide any information demonstrating their past application of these putative requirements or (for recently-enacted standards) their intention to apply them in similar circumstances. Selective application makes standards that otherwise qualify as ARARs inapplicable. The fact that the FMC Plant OU is largely within the Fort Hall Reservation boundaries creates the risk that the Tribal standards 1) have been targeted specifically at the FMC site 2) have not been applied and are not intended to be applied to similar contaminants at other areas. The Tribes should be required to demonstrate that any of their standards that otherwise meet ARARs criteria (again, putting aside the fact that CERCLA categorically excludes them) have been or will be applied consistently elsewhere.

8. The Tribal materials also do not constitute TBCs and cannot be applied to the FMC Plant OU remedial action on that basis

The Tribal ordinances and other materials do not meet CERCLA or EPA regulatory criteria for designation as ARARs, for the reasons discussed elsewhere in this response. This leads to the question of whether any provisions within these materials nevertheless can have the same effect as ARARs by being categorized as To Be Considered documents (TBCs). The following analysis shows that they do not meet TBC criteria and do not become cleanup standards under that rubric.

The TBC classification is created by EPA guidance and not by the CERCLA statute. Thus EPA guidance, as articulated in policy statements and rulemakings, defines the TBC category and how TBCs apply to remedial actions. A 1988 EPA guidance document defines TBCs as follows:

> To-be-Considered Material (TBCs) are non-promulgated advisories or guidance issued by Federal or State government that are not legally binding and do not have the status of potential ARARs. However, as described below, in many circumstances TBCs will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health or the environment.

CERCLA Compliance with Other Laws Manual: Interim Final, EPA/540/G-89/006, August 1988, page xiv.

TBCs by definition are not ARARs and do not become part of the baseline cleanup requirements for a given site on that basis. They can become the basis for CERCLA cleanup requirements only on the second ground on which those are established: protectiveness. They cannot be legally justified otherwise. The same EPA guidance document cited above recognizes that TBCs have no role in setting cleanup requirements unless without them the remedial action would not be protective:

> ARARs (and TBCs necessary for protection) must be attained for hazardous substances, pollutants, or contaminants remaining on-site at the completion of the remedial action, unless waiver of an ARAR is justified. In addition, EPA intends that the implementation of remedial actions should also comply with ARARs (and TBCs as appropriate) to protect public health and the environment.
>
> ARARs (and TBCs necessary for protection), pertaining both to contaminant levels and to performance or design standards, should generally be attained at all points of potential exposure, or at the point specified by the ARAR itself.

CERCLA Compliance with Other Laws Manual: Interim Final, EPA/540/G-89/006, August 1988, pages xv – xvi (emphases in original).

The preamble to EPA's 1988 proposed rulemaking to revise the NCP similarly makes it clear that TBCs do not become cleanup standards unless they are necessary to assure that the remedy is protective:

> **Other information to be considered (TBC)**. Other information that does not meet the definition of ARAR may be necessary to determine what is protective or may be useful in developing Superfund remedies. Criteria, advisories, or guidance developed by EPA, other Federal agencies, or States may assist in determining, for example, health-based levels for a particular contaminant for which there are no ARARs or the appropriate method for conducting an action.

53 Fed. Reg. 51394, 51436 (December 21, 1988) (emphasis in original).

Thus the threshold determination in evaluating the Tribal materials for potential classification as TBCs is whether the ARARs already established for the FMC Plant OU remedial action are not sufficiently protective of human health and the environment. As described in EPA's 1988 rulemaking preamble cited above, TBCs are essentially "gap-fillers" that have a role only where ARARs do not address the issue. FMC submits that the existing ARARs, comprising an extensive set of Federal and State requirements that address surface water, groundwater, soils, air, radionuclides, and management of hazardous waste and materials presenting risks similar to such waste, meet CERCLA protectiveness requirements. This makes evaluation of the Tribal materials as potential TBCs for site cleanup unnecessary.

Even if the existing FMC Plant OU ARARs did not assure that the remedy will be protective, the Tribes have not demonstrated that any of the materials they have provided would assure remedy protectiveness that the existing ARARs fail to provide. The Tribal materials cannot be considered as potential TBCs that would function like ARARs to drive site cleanup unless the Tribes 1) identify gaps in the existing ARARs that make those ARARs insufficiently protective, 2) specify the provisions in the Tribal materials that would fill those gaps, and 3) present the health science and ecological risk basis for any such Tribal provisions demonstrating that they would provide health or environmental protection not provided by the existing ARARs. The Tribes have not done any of these three things. Unless and until the Tribes provide this information, there is no basis for evaluating any of the Tribal materials for potential classification as TBCs that the site cleanup must meet.

9. The Tribal ordinances and other materials are not applicable to the FMC Plant OU remedial action because the Tribes lack jurisdiction with respect to FMC's fee-owned property

The Tribes may ask EPA to categorize the Tribal ordinances as "applicable" to the FMC Plant OU and thus designate the ordinances as ARARs on that basis. However, such a request would insert EPA into a jurisdictional dispute that EPA has no authority to resolve. It is well-established law under *Montana v. United States*, 450 U.S. 544 (1981) and its progeny that the Tribes do not have jurisdiction over

lands owned in fee by non-members. *Montana* establishes the general presumption that Indian tribes lack authority to regulate non-member conduct. *Id.* Thus, the Tribes' ordinances do not apply to the FMC Plant OU in any manner. This rule applies with special force when the non-member activity occurs on private lands owned in fee by non-members – or on equivalent lands, such as rights of way. *See Strate v. A-1 Contractors*, 520 U.S. 438 (1997). However, *Montana's* general rule applies to both Tribal (Tribal or allotted trust lands) and non-member lands. *See Nevada v. Hicks*, 533 U.S. 353 (2001).

Under the *Montana* test, recently applied in the U.S. Supreme Court decision, *Plains Commerce Bank v. Long Family Land and Cattle Co.,* 554 U.S. _____, 128 S.Ct. 2709 (2008), there are two narrow exceptions to *Montana*'s general rule. Under those exceptions, a Tribe can regulate non-member conduct only when the Tribe has demonstrated that the non-member conduct either (1) intrudes on the internal relations of the Tribe or threatens Tribal self-rule, and the non-member has expressly entered into a "consensual relationship" with the regulating Tribe, or (2) will directly and substantially "menace" a Tribe's political integrity, economic security, or health or welfare to such an extent that the effect of the conduct would be "catastrophic." *Plains Commerce Bank.* slip opinion at 18-19, 23.

The Tribes cannot establish that either *Montana* exception supports the broad assertion of jurisdiction under FMC's fee lands. The proposition that non-member activities involving hazardous, solid, or other types of waste could, in the abstract, affect human health or welfare, or the environment, does not satisfy the second *Montana* exception. Tribal regulation of non-member activities is not necessary to protect Tribal interests because the federal and state governments already comprehensively regulate environmental cleanup activities, and these matters do not imperil the Tribal community. The Supreme Court's decisions in *Strate v. A-1 Contractors* and *Plains Commerce Bank* teach that the question is not whether the activity theoretically could affect Tribal health or welfare. Instead the question is whether, in light of available state or federal remedies, Tribal regulation is necessary to protect the Tribe from injury that would be "catastrophic" or could "imperil the subsistence of the Tribal community." *Plains Commerce Bank*, at 19.

The Tribes have not established either of the two *Montana* exceptions summarized above, and FMC rejects any Tribal claim of jurisdiction with respect to the FMC Plant OU and other FMC-owned property. For this reason, and others as discussed in this response, the Tribal materials are not applicable to the FMC Plant OU and cannot be classified as ARARs on that basis.

B. Specific comments

The Tribes provided their asserted ARARs on a CD-ROM that had 22 enumerated and two unenumerated sets of documents, for a total of 24 document sets. These materials do not constitute ARARs for the reasons discussed above in FMC's general comments. The following summarizes the materials contained in the document sets and the principal reasons they do not meet ARARs criteria, beyond the basic factor that CERCLA makes them categorically ineligible for ARARs designation. References to "the site" in the following summaries refer to the FMC Plant OU.

Document 01: Table of Contents, treaties, legislation and other materials

Document "01" contains a Table of Contents, a summary of "Treaties and Cession Agreements" between the United States and the Shoshone-Bannock Tribes, the text of several letters and Federal legislative enactments, and an Executive Proclamation. None of these documents contain any substantive environmental requirements that would affect cleanup decisions at a site. Document "01" does not qualify as an ARAR or TBC.

Document 02: Tribal Air Quality Protection Act

Document "02" contains a copy of the Shoshone-Bannock Tribes' Air Quality Protection Act of 1992. The Act appears to have been passed by the Business Council, but not approved by the BIA. The Air Quality Protection Act creates the Tribes' Air Quality Program and authorizes it to adopt regulations, issue permits, and enforce regulations. But the Act does not itself establish any specific emission limits, air quality standards or other substantive environmental requirements that would affect cleanup decisions at the site. Document "02" does not qualify as an ARAR or TBC.

Document 03: Tribal Air Pollution Control Rules

Document "03" contains as copy of the Shoshone-Bannock Tribes Rules and Regulations for the Control of Air Pollution on the Fort Hall Indian Reservation. There is a handwritten notation on the cover page that it was "passed in ordinance form." However, there is no attestation from the Business Council, no date of passage, no ordinance number, and no other information demonstrating that it was enacted. There also is no evidence that the BIA approved these Rules and Regulations. They therefore are not ARARs because they have not been promulgated, i.e., they are neither "generally applicable" nor "legally enforceable." If they were in fact promulgated, however, they would still not qualify as ARARs, for

two basic reasons. First, to the extent they establish substantive requirements, they replicate the federal air quality standards and cannot qualify as ARARs because they are not "more stringent" than federal standards. Second, the Tribes have not established that they would be "relevant and appropriate" standards for the FMC Plant OU remedial action. FMC would challenge any such characterization, for reasons including the fact that the ARARs established for the FMC Plant OU remedial action already include protective standards under the Federal Clean Air Act and the Federal Air Rule for Reservations (FARR). Document "03" does not qualify as an ARAR or TBC.

Document 04: Ordinance prohibiting aerial application of materials

Document "04" is Tribal Ordinance No. S6-70, entitled "Application of Poisonous Chemicals Resident of Reservation." It states that it prohibits the application by aircraft "of any substance whatsoever" on vegetation within the Fort Hall Reservation. This Ordinance does not contain any substantive requirements that would affect cleanup decisions at the site. Document "04" does not qualify as an ARAR or TBC.

Document 05: Land Use Policy Ordinance

Document "05" is Ordinance No. S4-75, entitled "Land Use Policy Ordinance." The Land Use Policy Ordinance establishes four categories of land use (agricultural, mining, industrial, and urban and commercial), requires Tribal permits for industrial and commercial land use, and contains permitting and enforcement provisions. It does not specify any contaminant or exposure levels for soil, air, groundwater or other media or any other substantive environmental requirements that would affect cleanup decisions at the site. Document "05" does not qualify as an ARAR or TBC.

Document 06: Operative Land use Policy Guidelines

Document "06" contains the Fort Hall Operative Land Use Policy Guidelines. The Land Use Policy Commission adopted and the Business Council approved the Guidelines to implement the Land Use Policy Ordinance. There is no evidence that the BIA has approved the Guidelines. Thus there is no evidence that they have been promulgated with respect to Tribal non-members such as FMC. These Guidelines provide additional detail beyond that provided in the Land Use Policy Ordinance regarding the activities that require land use permits, establish building permit requirements, specify property boundary setback distances for commercial and residential structures, and list other requirements regarding types of allowable land use and permitting procedures. Like the Land Use Policy Ordinance, the Guidelines

do not specify any contaminant or exposure levels for soil, air, groundwater or other media or any other substantive environmental requirements that would affect site cleanup decisions. Document "06" does not qualify as an ARAR or TBC.

Document 07: Ordinance Regarding Burning of Fields or Brush

Document "07" is a Tribal ordinance enacted in 1980 that requires a Fire Permit for any burning of fields or brush. This ordinance does not contain any substantive environmental requirements that would affect cleanup decisions at the site. Document "07" does not qualify as an ARAR or TBC.

Document 08: Synopsis of Code, Certification Plan, and the Pesticide Programs Regulation

Document "08" is a document entitled "Synopsis of Code, Certification Plan, and the Pesticide Programs Regulation." Document "08" appears to be what it states, a synopsis of standards, and not a Tribal ordinance or regulation. The Tribes have not provided any information demonstrating that it has been promulgated at all, let alone after BIA approval to make it promulgated with respect to non-members, and thus it has no independent legal force or effect. Even if it were promulgated, the provisions it summarizes regarding Tribal certification requirements for pesticide applicators and requirements regarding pesticide application and storage do not provide substantive environmental requirements that would affect cleanup decisions at the site. For these reasons, Document "08" does not qualify as an ARAR or TBC.

Document 09: Certification Plan

Document "09" is a document entitled "Shoshone-Bannock Tribes Certification Plan" and dated November 15, 1989. Document "09" is not a Tribal ordinance or regulation. Instead, it describes the Tribal program for certifying pesticide applicators and doing so in consultation with EPA and the Idaho Department of Agriculture. The Certification Plan has no independent legal force or effect, and it is not legally enforceable. Further, it has no substantive environmental requirements that would affect cleanup decisions at the site. For these reasons, Document "09" does not qualify as an ARAR or TBC.

Document 10: Pesticide and Farm Chemical Code

Document "10" is a Tribal ordinance entitled "Shoshone-Bannock Tribes Pesticide and Farm Chemical Code" and dated November 15, 1989. It purports to regulate the distribution, storage, transportation, use and disposal of pesticides at the Fort Hall Reservation. However, the Tribes have not provided any information

demonstrating that it was adopted by the Business Council or approved by the BIA. Thus the Tribes have not demonstrated that it has been promulgated and is legally enforceable. Further, it addresses pesticide registration, pesticide distribution, use and disposal, and pesticide applicator certification. It does not establish substantive environmental requirements that would affect cleanup decisions at the site. Document –10" does not qualify as an ARAR or TBC.

Document 11: Penalty Assessment Guidelines for Farm Chemical Violations

Document –11" is a document entitled –Shoshone-Bannock Tribes Penalty Assessment Guidelines for Farm Chemical Violations." It is not a Tribal ordinance or regulation, has not been promulgated by the Tribes, and it has no legal force and effect. Further, as its title indicates, this document provides guidelines for Tribal enforcement and penalty assessment for pesticide-related violations. It does not establish any substantive requirements, and thus does not establish any substantive environmental requirements that would affect cleanup decisions at the site. Document –11" does not qualify as an ARAR or TBC.

Document 12: Administrative Procedures Act

Document –12" is a copy of the Shoshone-Bannock Administrative Procedures Act, dated October 26, 1989. The document does not show whether the Business Council adopted it or the BIA approved it. In August 2008, the Business Council adopted a different version of the Administrative Procedures Act, subject to public notice and comment. With the Tribes' submission of the 1989 Administrative Procedures Act as an asserted ARAR, the Tribes have created uncertainty regarding the status of the August 2008 Administrative Procedures Act. In any event, both versions of the Administrative Procedures Act set forth procedural, not substantive, requirements. Nothing in either document would affect cleanup decisions for the site. Document –12" does not qualify as an ARAR or TBC.

Document 13: Disposal of Trash and Garbage

Document –13" is Tribal Ordinance No. 9-1971. It shows evidence of Business Council adoption and BIA approval. The text of the ordinance makes it unlawful to dispose of trash and garbage at the Fort Hall Reservation unless such disposal is done at authorized locations and in compliance with the other requirements this ordinance prescribes. This document has no substantive environmental requirements that would affect cleanup decisions at the site. Document –13" does not qualify as an ARAR or TBC.

Document 14: Water Code Declaration

Document "14" is Tribal Ordinance No. S3-74, entitled "Water Code Declaration." It states that the Business Council adopted it on October 9, 1974, but there is no evidence of BIA approval. The Water Code Declaration provides for the allocation of water resources at the Fort Hall Reservation and issuance of water use permits. It has no substantive environmental provisions that would affect cleanup decisions at the site. Document "14" does not constitute an ARAR or TBC.

Document 15: 2007 Tribal Water Resources Code

Document "15" is a Tribal ordinance No. WATR-07-S1, entitled "Shoshone-Bannock Tribes 2007 Tribal Water Resources Code." The document contains a certification that the Business Council adopted it on March 16, 2007, but there is no evidence of BIA approval. The 2007 Tribal Water Resources Code regulates the allocation and permitting of water rights. It requires permits and licenses for conducting certain activities involving well drilling, withdrawing or otherwise diverting water, and water use. Although the Code at Section 1 states that one of its purposes is to protect against the degradation of water quality at the Reservation and at Section 4 it requires a permit for activities including "discharging waste… into Reservation water, it does not prescribe groundwater protection standards or criteria for issuing such waste discharge permits. Because it lacks the BIA approval necessary to make it a "promulgated" enactment with respect to Tribal non-members such as FMC, and because it does not contain any substantive environmental provisions that would affect cleanup decisions at the site, it does not meet the criteria to be classified as an ARAR or TBC.

Document 16: Well Construction Standards

Document "16" consists of 1) what is captioned as the "Shoshone-Bannock Tribes Well Construction Standards Ordinance," 2) an Ordinance dated December 31, 2002 under which the Tribal Business Council adopted these standards, and 3) an administrative form reflecting its adoption by the Business Council. However, the section of that form that calls for listing the approval or disapproval of the BIA Fort Hall Superintendant is blank. The inference, which the Tribes have not rebutted, is that the BIA has not approved this ordinance. The lack of BIA approval means that it has not been promulgated with respect to Tribal non-members such as FMC. Also, these standards relate to well construction materials and practices and do not specify any contaminant levels or other substantive environmental requirements that would affect site cleanup standards. Document "16" does not qualify as an ARAR or TBC.

Document 17: Ground Water Protection Act of 1991

Document "17" is captioned the "Shoshone-Bannock Tribes Ground Water Protection Act of 1991." This statute authorizes the Tribal Water Quality Specialist to map and classify aquifers (Section 5), to carry out or require monitoring regarding ground water quality (Section 6), develop well construction rules and regulations (Section 7) and adopt regulations or an ordinance setting ground water quality standards (Section 8). It also authorizes the Business Council to promulgate rules establishing "enforcement standards" and "preventive action limits" for specific contaminants (Section 9). Further, it authorizes the Tribal Land Use Policy Commission to prepare a land use management plan to protect ground water (Section 10), to issue regulations establishing a wellhead protection program to protect ground water used as a public drinking water supply (Section 11), and to recommend to the Business Council regulations or an ordinance establishing Ground Water Management Areas (Section 12). The statute also has permitting and enforcement provisions.

The Tribes have not provided any information demonstrating that this statute was enacted by the Business Council or approved by BIA. Thus there is no information that it has been promulgated generally with respect to Tribal members, or more to the point with respect to Tribal non-members such as FMC. There is a statement in Document "18," discussed below, that this statute was "temporarily adopted." But neither Document "18" nor any other document the Tribes have provided indicates what "temporary adoption" means, whether that made the statute enforceable, or the duration of the "temporary" adoption. The reference to this statute in Document "18" does not demonstrate that it was promulgated and legally enforceable generally or with respect to non-members. The reference to this statute in connection with Document "18," which includes a Tribal groundwater protection ordinance enacted in 2002, also suggests that this 1991 statute has been superseded and is no longer in effect. If that is true this is another factor demonstrating that it cannot constitute an ARAR or TBC.

The statute also does not establish substantive environmental standards that could be classified as site ARARs or TBCs. It does not establish ground water quality standards, wellhead protection standards, or other specific environmental standards—it defers that to agency rulemaking. Further, while Section 6 of the statute authorizes the Tribal Water Quality Specialist to require ground water quality monitoring, it does not establish any contaminant levels or other criteria for triggering that requirement. Thus the statute does not contain substantive environmental standards that might be considered for ARARs or TBC designation. Lastly, CERCLA Section 121(e) makes its procedural permitting requirements inapplicable to CERCLA response actions. For these reasons Document "17" does not qualify as an ARAR or TBC.

Document 18: Ground Water Protection Act enacted in 2002

Document "18" consists of 1) what is captioned as the "Shoshone-Bannock Tribes Ground Water Protection Act Ordinance," 2) an Ordinance dated December 31, 2002 under which the Tribal Business Council adopted the "Ground Water Protection Act," 3) a letter dated January 10, 2003 letter from the Tribes to the BIA Superintendant for the Fort Hall Agency requesting BIA review and approval or disapproval of the Ordinance, and 4) an administrative form reflecting its adoption by the Business Council and its approval by the BIA Fort Hall Agency Superintendant. This Ground Water Protection Act enacted in 2002 appears to be identical, except for its caption, to the Ground Water Protection Act of 1991. Unlike the 1991 Act, it appears to have been properly promulgated both generally and with respect to Tribal non-members. However, like the 1991 Act it does not establish ground water standards or other substantive requirements, deferring establishment of such requirements to agency rulemaking. And CERCLA Section 121(e) makes its procedural permit requirements inapplicable to CERCLA response actions. Therefore, like the 1991 statute, Document "18" does not constitute an ARAR or TBC.

Document 19: Ordinance Regarding Using Chemicals to Kill Moss in Irrigation Canals and Ditches

Document "19" is a copy of the approval sheet for Tribal Ordinance No. S4-70, stating that it was adopted by the Business Council on October 13, 1970 and approved by the BIA on October 17, 1970. The approval sheet references the ordinance as "Lessees & Canal Companies Operating on the Reservation Have Adopted Practice of Treating Irrigation Canal & Ditches with Chemical for Treating Moss." Document "19" consists only of the approval and does not include a copy of the referenced ordinance. Without a copy of the ordinance, it is impossible to assess whether it could have any impact on site cleanup decisions. Based on its caption, however, it appears very unlikely that it could affect remedial action selection. Provisions regarding the application of chemicals to kill moss in irrigation canals and ditches have no relevance to the FMC Plant OU remedial action. More fundamentally, however, in the absence of the ordinance there is nothing in Document "19" that can be considered for potential ARAR or TBC designation.

Document 20: Contamination of Reservation Waters

Document "20" is a copy of Tribal Ordinance No. S2-77. It is entitled "Contamination of Reservation Waters (Addition to Law & Order Code)" and was adopted by the Business Council as an amendment to the Tribes' Law and Order Code Section 62.1. The Tribes have not included a copy of that Law and Order Code

either here at Document –20" or elsewhere in the materials they have provided. This amendment makes any person who contaminates —fresh springs and waters" at the Reservation waters subject to criminal penalties, including both a fine and jail time. However, the amendment does not define what types of pollution or contamination are subject to these criminal sanctions, or what waters are encompassed in the category of —fresh springs and waters." Thus the amendment does not provide any substantive environmental standards that could affect remedial action selection at the FMC Plant OU. Furthermore, this is a criminal ordinance. The Tribes lack criminal jurisdiction over non-members. The ordinance has no force or effect with respect to non-members such as FMC, and it is legal error to apply as –relevant and appropriate" a criminal standard that categorically is inapplicable to Tribal non-members. This amendment does not qualify as an ARAR or TBC.

Document 21: Environmental Policy Act

Document –21" is a copy of the Shoshone-Bannock Tribes Environmental Policy Act. This ordinance was adopted on November 4, 1974, but there is no evidence of BIA approval. The Environmental Policy Act sets forth Tribal objectives regarding environmental protection and purports to require the Federal government to consult with the Business Council and obtain Tribal input before taking actions that could impact the Reservation environment. It does not contain any substantive environmental requirements and does not require any specific cleanup standards or actions. Thus it does not meet the criteria for being considered an ARAR or TBC.

Document 22: Emergency Planning and Community Right-to-Know Ordinance

Document –22" is a copy of a Tribal Ordinance No. ENVR-01-S2, captioned –Shoshone-Bannock Tribes Emergency Planning and Community Right-to-Know Ordinance." The Business Council approved the ordinance on September 6, 2001, and it appears that the Tribes submitted the ordinance to BIA for approval. The Tribes have not provided any information, however, showing that BIA provide the approval necessary to make the ordinance –promulgated" with respect to Tribal non-members such as FMC. The ordinance establishes a Tribal Emergency Response Commission and local emergency planning committees. It also requires facilities subject to its requirement to provide certain notifications, including notices of releases of designated hazardous substances. Its provisions are administrative, and do not include any substantive environmental requirements that would affect site cleanup decisions. For these reasons the ordinance does not qualify as an ARAR or TBC.

Document 23: 2009 Amendments to the Waste Management Act

Document ―23" is a document captioned ―Shoshone-Bannock Waste Management Act, PROPOSED AMENDMENTS April 8, 2009." The Waste Management Act document has not been adopted by the Business Council, nor has it received BIA approval. It does not qualify as an ARAR because it has not been promulgated under Tribal law either generally or with respect to Tribal non-members and it has no legal effect. Nor does it qualify as a TBC, because the Tribes have not demonstrated that it contains substantive provisions that are 1) more stringent than the ARARs already established for the FMC Plant OU and 2) necessary to make the site remedial action protective.

The document itself, even if adopted and approved, would still not qualify as an ARAR or TBC. First, the Tribes have not identified any specific requirements that they contend apply to response actions at the FMC Plant OU. Second, the WMA itself does not provide any substantive environmental requirements that would affect decision-making for the CERCLA response action. Instead, it authorizes the Tribes' Environmental Waste Management Program to issue regulations establishing the substantive standards that the proposed WMA by design does not articulate. For example, Section 211 identifies the categories of regulations that may be adopted to identify wastes and implement a permitting program. Sections 410 and 411 indicate that regulations regarding closure and post-closure of waste disposal facilities will be promulgated through later rulemaking. Section 603 provides for promulgation of regulations establishing a Waste Response Plan, under which remedial actions are to be conducted. To date, no regulations have ever been adopted under the WMA. And no regulations can be proposed or adopted while the WMA Amendments themselves remain in proposed form. Without a comprehensive set of implementing regulations, the WMA lacks critical definition regarding its scope (for example, key terms such as ―waste" and ―hazardous substance" remain undefined) and lacks defined cleanup standards (under Section 603, these are to be prescribed in the Waste Response Plan that to date has been neither proposed nor adopted).

Apart from deferring substantive requirements to future Tribal rulemakings, the WMA's requirements are primarily implemented through a permitting system. For example, Section 210 requires owners and operators of waste treatment, storage and disposal facilities to obtain a permit. However, nowhere does the WMA specify the criteria for permit issuance or the environmental requirements such permits must contain. Because the WMA does not specify substantive permit requirements, its permit provisions are procedural only and thus inapplicable to CERCLA response actions under CERCLA Section 121(e).

The WMA also is so closely tailored to the site conditions at the FMC Plant OU that it can be fairly characterized as not meeting the "general applicability" requirements. It would be highly unlikely for the Tribes to include provisions such as Section 406, which prohibits the disposal of liquid waste "by burial," and Section 401, which specifies "existing certificate" criteria for waste disposal facilities that would be virtually impossible for FMC to meet, unless the FMC facility were the intended target.

An additional reason why the WMA would not qualify as an ARAR or TBC, even if it were adopted, is that the WMA does not contain any CERCLA-recognized "requirements" that are more stringent than federal standards. The WMA's outright prohibitions on the presence of contaminants do not address an actual or potential "release" or define criteria for remedial action selection. Instead, they address site conditions. Such provisions do not have a role in the selection of a remedial action. Nor can such provisions been deemed TBCs. Under the discussion in the General Comments section above, only "gap-filling" provisions that provide site protection not provided by existing ARARs can be given TBC status. The Tribes have not shown what protectiveness gap is intended to be filled with the WMA's provisions, nor have they shown that the WMA's provisions are more stringent than comparable state laws or federal standards.

Further, although it is difficult to understand the WMA's provisions without any explanatory statement from the Tribes, it appears that considerable decision-making discretion is put into the hands of the EWMP Program Manager for a broad range of matters. This includes selection of a cleanup remedy. Such broad discretionary authority is a strong indication that 1) the WMA itself lacks substantive environmental requirements, and thus cannot be an ARAR or TBC, and 2) even if the WMA did provide such requirements, the Program Manager's ability to summarily bypass them means that they would not meet the basic ARARs criterion of being enforceable "requirements." An example of this is seen in WMA Section 605(D)(1), which applies to the selection of cleanup remedies. It states as follows (emphasis added):

> (1) Response actions ***selected under this section or otherwise required or agreed to by the Program Manager*** shall attain a degree of cleanup of wastes released into the environment and of control of further release at a minimum that assures protection of human health and the environment. Such response actions shall be relevant and appropriate under the circumstances presented by the release or threatened release of such waste.

This provision is the only one that indicates how response actions would be selected. It states that the degree of cleanup shall be ―at a minimum that assures protection of human health and the environment.‖ Not only does this provide no indication of how such protectivness is to be ascertained, but it makes the response action selection depend on what the Program Manager ―requires‖ or ―agrees to.‖ This delegation of limitless discretion to the Program Manager cannot meet ARAR requirements of being ―generally applicable‖ or ―legally enforceable.‖ Document ―23‖ does not qualify as an ARAR or TBC.

Document 24: Proposed Soil Cleanup Standards

Document ―24‖ is captioned ―Shoshone-Bannock Tribes Environmental Waste Management Program Soil Cleanup Standards for Contaminated Properties, DRAFT FOR PUBLIC COMMENT, March 17, 2009.‖ This draft set of proposed soil cleanup standards has not been promulgated and is not legally enforceable. It has neither Business Council nor BIA approval. It therefore does not constitute an ARAR. Nor can it be applied as a TBC: the Tribes have not identified any gap in the existing ARARs for the FMC Plant OU that would make the soil remediation, absent these proposed standards, non-protective.

More fundamentally, the proposed regulation has a fundamental flaw that makes it categorically ineligible for ARAR or TBC designation: its putative ―standards‖ are illusory. The document provides limitless discretion to the EWMP Program Manager regarding whether, and in what manner, to apply the stated ―standards.‖ Section 1.5 of the proposed cleanup levels contains a lengthy, open-ended list of situations where their application would be inappropriate. This makes the proposed regulation fail the ARARs criteria of being ―generally applicable‖ and ―legally enforceable.‖ The various loopholes and exceptions to the application of the proposed soil cleanup levels make them so vague and arbitrary to render them meaningless—the exceptions consume the rule.

Further, the use of screening levels developed for California (the proposed soil cleanup standards are copied verbatim from the California Regional Water Quality Control Board, San Francisco Bay Region's soil screening levels for the) results, in some cases, in cleanup standards that are below background levels in southeastern Idaho and at the FMC Plant OU. The proposed soil cleanup standards cannot be considered ARARs because they seek to address soil conditions, not releases, and as such are not ―requirements‖ that CERCLA could impose either independently or through designating them as ARARs or TBCs.

FMC's concerns regarding the Tribes' proposed soil cleanup standards are described in more detail in the Interested Party comments that were submitted to the

Tribes in the context of their proposed rulemaking. Those comments provide specific examples of the limitless discretion and authority of the EWMP, and the legal impossibility of meeting the proposed soil cleanup standards. FMC sent a copy of those comments to the EPA Region 10 Regional Counsel. A copy also is attached to this Response. FMC expressly incorporates those comments into this Response by this cross-reference. For the reasons discussed above and in FMC's incorporated comments, even if Document "24" were promulgated it would not meet the criteria for ARAR or TBC designation.

APPENDIX A-4

IDEQ Approval Letter (dated: July 20, 2009) regarding Attachment 6 (June 9, 2009 FMC submittal) for the *SFS Work Plan for the FMC Plant Operable Unit – July 2008*.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

July 20, 2009

Kira Lynch
US EPA Region 10
1200 Sixth Avenue, Suite 900
Office of Environmental Cleanup (ECL-113)
Seattle, Washington 98101

Subject: Final DEQ Comments on the Supplemental Feasibility Study Work Plan for the FMC Plant Operable Unit, FMC Letter June 9, 2009 with Attachments

Dear Ms. Lynch:

In order to gain final approval for the FMC Supplemental Feasibility Study Work Plan (SFS WP), FMC has requested that the Idaho Department of Environmental Quality (DEQ) approves the supplemental clarification of RCRA based ARARs, attached to the June 9, 2009 letter. Responses to DEQ's comments are found in attachment number 6.

As stated and acknowledged repeatedly through the approval process of the SFS WP, the work plan is attempting to preliminarily identify to the maximum extent possible all appropriate, relevant and applicable regulations (ARARs) before conducting the detailed analysis of remedial alternatives. From FMC's response to DEQ's comments it is unclear at this time exactly how the ARARs will be applied.

Most of DEQ's comments concerning the ARARs are based upon past precedents set between the state and the EPA on other projects. DEQ conditionally approves the FMC response to comments. However, DEQ reserves its right to determine its concurrence on this matter until its final review of how EPA applies the ARARs in the Record of Decision.

Sincerely,

Scott A. Miller, P.G.
Idaho Department of Environmental Quality

SAM:sjt

C: Doug Tanner, DEQ PRO
Barbara Ritchie, FMC
COF

APPENDIX A-5

EPA Comment Letter (dated: July 21, 2009) regarding the June 9, 2009 FMC submittal for the *SFS Work Plan for FMC Plant OU - July 2008*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

July 21, 2009

Reply To: ECL-113

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Ms. Barbara Ritchie
FMC Corporation
1735 Market Street
Philadelphia, PA 19103

Re: Eastern Michaud Flats Superfund Site – FMC Plant OU Administrative Order on Consent (AOC) CERCLA 10-2004-0010. Supplement to FMC's November 14, 2008 Response to EPA Comments on the July 2008 Supplemental Feasibility Study (SFS) Work Plan (WP).

Dear Ms. Ritchie:

EPA has completed review of the Supplement to FMC's November 14, 2008 Response to EPA Comments on the July 2008 SFS WP. EPA comments on this submittal are provided below. Comments from the Idaho Department of Environmental Quality (IDEQ) on this submittal are enclosed.

General Comments:

1. The Remedial Action Objective (RAO) for P4 as a principal threat material (PTM) should be revised to, "Prevent direct exposure to elemental phosphorus under conditions that it may spontaneously combust, posing a fire hazard or resultant air emissions that represent a significant risk to human health and the environment".

2. EPA is in agreement with the initial applicable and relevant requirements (ARARs) identified for the site, however identification of final ARARs can not be completed until the team has a better understanding of the potential remedial alternatives. In addition, EPA is still reviewing FMC's response to the proposed Tribal ARARs that we have agreed to address on a separate schedule.

EPA believes that the SFS WP should be finalized with the revisions proposed by FMC, and that we should continue to work together to document a final complete set of ARARs to support the detailed analysis of remedial alternatives for soil and for groundwater. If you have any concerns regarding these issues, please contact me at (206)553-2144.

Sincerely,

Kira Lynch
EMF Superfund Project Manager

cc: Doug Tanner, IDEQ-Pocatello
Kelly Wright, Shoshone Bannock Tribes

Enclosure

APPENDIX A-6

FMC's Transmittal Letter (dated: August 18, 2009) for the electronic draft final submittal of the *SFS Work Plan for the FMC Plant OU – August 2009* and FMC's Responses to SBT Comments (dated: July 21, 2009) on the *SFS Work Plan for the FMC Plant OU – July 2008*

FMC Corporation
1735 Market Street
Philadelphia PA 19103

215.299.6000 phone
215.299.6947 fax

www.fmc.com

FMC Corporation

Via Email

August 18, 2009

Ms. Kira Lynch, MS ECL-113
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Administrative Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit (U.S. EPA Docket No. CERCLA 10-2004-0010):
Supplemental Feasibility Study Work Plan – Electronic copy of draft final and Updated Response to Comments

Dear Ms. Lynch:

On July 15, 2008, FMC submitted a ***draft Supplemental Feasibility Study Work Plan for the FMC Plant OU (SFS WP)***. FMC received written comments on the ***SFS WP*** from EPA Region 10 on September 30, 2008 and from the Shoshone-Bannock Tribes (SBT) on October 2, 2008, and provided written responses to those comments (RTCs) on November 14, 2008. While EPA did not provided a written reply specific to FMC's November 14, 2008 RTCs submittal, FMC received agency feedback in the form of comments on other submittals. On June 9, 2009, FMC submitted revised ***SFS WP*** tables and updated RTCs to supplement the November 14, 2008 RTCs.

In July 2009, FMC received comments regarding the ***draft SFS WP*** from the Idaho Department of Environmental Quality (IDEQ) (letter dated July 20, 2009) and from the SBT (letter dated July 22, 2009). FMC also received additional comments on this document from EPA (letter dated July 21, 2009). EPA's letter provided two general comments and further indicated that the ***draft SFS WP*** should be finalized with the revisions proposed by FMC first in November 2008 and most recently in June 2009, as discussed above.

This letter serves to transmit an electronic version of a ***draft final SFS WP***, with changed text highlighted, as well as FMC's RTCs packages for previous EPA and recent SBT comments in a new Appendix A. Appendix A also includes FMC's August 17, 2009 letter clarifying the interpretation of some Remedial Action Objectives (RAOs) where there may have been some confusion.

It should be noted that tables in the attached ***draft final SFS WP*** have been revised to reflect comments received (e.g., the elemental phosphorus RAO has be changed in Table 4-3) and generally should be considered final. However, revisions to tables 3-1 and 3-3 may not yet be final depending on the outcome of current discussions with EPA regarding FMC's RTCs on the ***SRI Addendum Report***. Specifically, Table 3-3 entitled "Description of Remedial Areas to be used in the SFS" lists all Remedial Areas (RAs) for the FMC Plant OU, including those designated as RA-I and RA-J. These two RAs now comprise FMC Northern Properties and are characterized in the columns in Table 3-3 entitled the "Exposure Scenarios of Concern" and "RAOs which Remedial Alternatives Must Address". FMC and EPA currently are in discussions in the context of the ***draft SRI Addendum Report*** regarding several issues related to these RAs. These discussions could affect both Tables 3-1 and 3-3. Both of these tables thus may require revision when the ***SRI Addendum Report*** is finalized, following agency review of FMC's August 17, 2009 RTC on that document.

It should also be noted that while both the EPA and IDEQ July 2009 comments on the ***draft SFS WP*** reflect provisional agreement with the initial applicable and relevant requirements (ARARs) that FMC has identified for the site, both agencies have noted that final ARARs cannot be determined until remedial alternatives are more fully defined. FMC acknowledges this point and will further refine the ARARs, if required, during the FS process. FMC also notes that it submitted comments on July 2, 2009 regarding the materials the SBT has identified as Tribal ARARs. Our expectation is that the SFS process will continue to proceed pending EPA review of those comments.

Given that the ***SRI Addendum Report***, the ***SFS WP***, confirmation of RAO interpretation, and the Cadmium Fruit and Vegetable risk update are all very near completion, but are inter-related deliverables, a firm schedule for submitting the final SFS WP and these other documents cannot be developed at this time. FMC nevertheless will provide an updated tentative schedule for all of these documents in the near future, in response to your recent "Action Item Summary" transmitted by email on August 5, 2009.

Lastly, FMC can prepare and provide you, IDEQ, and the Tribes with a hard copy of this electronic ***draft final SFS WP*** at your request if that would be useful. Otherwise, upon agreement on any changes that the agency may suggest for this electronic draft final document, highlighting will be removed and a final hard copy produced and submitted pursuant to the requirements of the AOC.

Please call me with any questions, or to discuss further.

Sincerely,

Barbara E. Ritchie
Associate Director, Environment
FMC Corporation

cc: Doug Tanner
Waste and Remediation Manager
State of Idaho Department of Environmental Quality
444 Hospital Way #300
Pocatello, ID 83201

RCRA/CERCLA Program Manager
Shoshone-Bannock Tribes
P.O. Box 306 – Pima Drive
Fort Hall, ID 83203

July 21, 2009 Tribal comments on the *Supplemental Feasibility Study Work Plan for the FMC Plant Operable Unit, July 2008*.

1. The Shoshone Bannock Tribes have reviewed the response to agency comments provided by FMC and provide comments below. As discussed with you we are concerned with the limited scope of the Remedial Action Objective for elemental phosphorus and believe the Principle Threat from this waste includes not only the burning of elemental phosphorus but more importantly the ability of elemental phosphorus to react below ground surfaces through both oxidation and hydrolysis. These uncontrolled reactions have proven to generate highly toxic gases that seep through the soil columns. We believe elemental phosphorus should be treated at all soil depths.

FMC Response:

Throughout the SBT comments, reference is made to oxidation and hydrolysis of elemental P4to "generate highly toxic gases". This discussion is provided to present a summary of historical and current information about P4 reactions, products, and the presence, or likely presence at levels that could present a threat to human health and the environment.

The primary processes for chemical transformation of P4 are oxidation and hydrolysis. In a solid phase such as in soil, P4 reacts with available oxygen to form phosphorus pentoxide (P_4O_{10}, commonly expressed as P_2O_5), which exists as a particulate at ambient conditions. Phosphorus pentoxide has a strong affinity for water and will react with available water (hydrolyze), including moisture from the atmosphere, to form various phosphorus acids, primarily orthophosphoric acid (H_3PO_4). In soils, due to limited availability of both oxygen and water, these reactions proceed slowly and incompletely, occurring on the outer edges of the solid P4 that forms a crust that can further slow the reaction by reducing the surface area available to contact oxygen and water. In water, dissolved and suspended P4 is oxidized by dissolved oxygen to form various forms of soluble phosphorus acids, including $H_2PO_4^-$, HPO_4^{-2}, and PO_4^{-3}. In water with other dissolved ions, and depending on environmental conditions such as pH and Eh, these acids may be further converted to a solid metal phosphate compound such as calcium phosphate. The rate of phosphorus oxidation in water is governed by the form of the phosphorus (dissolved or suspended), Dissolved oxygen concentration, salt concentration, metal ion concentration, pH, and temperature.

P4 also is hydrolyzed in water to form PH_3 and lesser amounts of phosphorus acids. PH_3 is a toxic gas that has a low solubility, and thus is expected to migrate from the water to the air; the portion of phosphine that dissolves is generally oxidized to form the above-referenced forms of phosphorus acids. The rate of hydrolysis of P4 is enhanced by an increase in the pH of the water reacting with the white phosphorus (WP). (USACE, 1998). In the presence of soil moisture, the P4 contained in soils may react to slowly form phosphine gas, depending on a number of variables including temperature, pH, presence of metal phosphides

(present in precipitator solids), and the amount of water present. As the gas travels through the soil, phosphine would be likely reacting with both air in the pore spaces of the soil or soil constituents to convert to P_2O_5, phosphoric acid, and/or phosphate compounds. The Agency for Toxic Substances and Disease Registry (ATSDR) reports:

- In the air, phosphine will exist solely as a gas. Phosphine gas reacts with substances commonly found in the air. Half of the phosphine in the air degrades in about 1 day.
- When released to soil, phosphine is broken down very quickly (http://www.atsdr.cdc.gov/tfacts177.html)

Metal phosphides, which are also mentioned throughout the SBT comments, were generated in the reducing atmosphere of the elemental phosphorus furnaces. These compounds included ferrophos (FeP), zinc phosphide (ZnP), magnesium phosphide (MgP), and aluminum phosphide (AlP). The vast majority of metal phosphides discharged the furnace in the FeP which was tapped out of the bottom of the furnace, solidified, stockpiled, and sold as a by-product. However, some metal phosphides were captured in the electrostatic precipitators and ended up in the precipitator dust. These metal phosphides are relatively stable, however, during aqueous treatment at low or high pH, the phosphorus in some metal phosphides within the precipitator dust (most notably ZnP and AlP) will disassociate and hydrolyze to form PH_3. This becomes an issue in the application of chemical treatment such as caustic hydrolysis. For example, during the design of the LDR system at the Pocatello plant, which was designed to treat precipitator dust, PH_3 gas evolution from the disassociation of ZnP and AlP during lime treatment was a key design consideration. It should be noted that metal phosphides are not gases and do not pose any unique or different exposure pathways than are already accounted for in the current conceptual site model and risk assessment.

As discussed above, PH_3 is the only known gaseous COCs associated with P4 hydrolysis or oxidation. Other gases identified by the SBT in the comments (i.e., hydrogen cyanide, sulfide, hydrogen fluoride) have been studied as potential process emissions from elemental phosphorus manufacturing, from RCRA ponds prior to closure, and at Pond 16S as part of a CERCLA removal action. These studies included:

- RCRA Pond Emission Study (BEI, 1998)
- RCRA Pond emission study per the EPA-approved “RCRA Pond Management Plan” (PMP)
- Pocatello Sweep Gas Characterization Study (ENSR, 2000)
- Pond 16S Gas Characterization Report (MWH, 2007).

A summary of these studies, as well as process knowledge concerning these gases, is presented here.

Hydrogen Cyanide (HCN): Although HCN was not used in the P4 manufacturing process, it is believed that HCN was generated when CO, nitrogen, and water came into contact at high temperatures in the reducing atmosphere within the furnaces. Cyanide balances performed in 1998 indicated that the primary source of HCN to ponds would have been through the precipitator slurry. Chemistry within ponded material does not favor HCN gas generation at neutral or high pH levels. Phossy water had a neutral pH and precipitator slurry had a high pH. HCN gas generation from ponded materials would not be expected from these materials under the pH conditions as placed in the ponds.

This was shown to be the case during pond gas measurements performed prior to pond closures. FTIR monitoring of the active RCRA ponds under the PMP prior to closure showed that HCN levels at the ponds were very low (as measured at the edge of RCRA ponds 16S, 17 and 18). Maximum 1-hour concentrations were less than 1 ppm. The PMP specified an HCN action level threshold of 10 ppm.

It should also be noted that only wastes containing precipitator solids would have the potential for HCN gas generation. Areas in which P4 product was released to the underlying soils would not have the potential for HCN gas generation, i.e., RA-B containing the furnace building, slag pit, secondary condenser, and phos dock.

Concentrations of HCN under the cap at Pond 16S (post-closure) were measured at 3 ppm or less (using NIOSH Method 6010) and thus are far below 10% of the 56,000 ppm LEL, less than the IDLH value (50 ppm) and less than the PEL (10 ppm). No concentrations of HCN are suspected in the ambient air near any of the ponded wastes.

Hydrogen Fluoride (HF): While HF was known to have been formed in the calcining process, HF was confined to the calciner scrubber water recycle loop, where it was treated with lime to form calcium fluoride. These process streams were not co-mingled with furnace area wastewaters. HF was not known to have been formed in the furnace reaction and was not associated with phossy water or precipitator slurry. FTIR monitoring of the active RCRA ponds under the PMP showed minor detections of HF levels at the ponds (two detections in 1999). FMC prepared a report in 1999 stating that there appeared to be little or no HF in the pond area at the FTIR detection levels (typically around 0.01 to 0.30 ppm) and no evidence of pond emissions of HF. (OP-FTIR Air Monitoring Annual Report, 1999)

Concentrations of HF under the cap at Pond 16S (post-closure) were measured at 16 ppm or less (using NIOSH Method 6010). These results were suspected as being cross-sensitivity issues with the HF adsorbent tube and PH3. There is no

LEL for HF, but all samples were less than the IDLH value (30 ppm), but above the PEL (3 ppm) in many of the samples. No concentrations of HF are suspected in the ambient air near any of the ponded wastes.

Hydrogen Sulfide (H_2S): Hydrogen sulfide, with its distinctive "rotten egg" smell, was never detected during industrial hygiene monitoring at the P4 furnace or related process operations. FTIR monitoring of the active RCRA ponds under the PMP did not detect H_2S associated with the RCRA pond emissions. Concentrations of H_2S under the Pond 16S cap were measured as high as 67 ppm (using OSHA Method 1008) and thus are far below 10% of the 40,000 ppm LEL, less than the IDLH value (100 ppm). These results were considered suspect as cross-sensitivity with PH_3 was believed to be occurring, thus giving a false positive result. No concentrations of H_2S are suspected in the ambient air near any of the ponded wastes.

In summary, the RAO as drafted is appropriate and no change is warranted.

2. Attachment 3 Table 4 3 FMC Plant OU Remedial Action Objectives and General Response Actions by Medium Supplemental Feasibility Study Work Plan

General Comment:

Potential Remedial Action Objectives should be changed to prevent excess cancer risks above 1x10-6 or 1 excess cancer in 1,000,000 rather than 1x10-4 or 1 excess cancer risk in 10,000 to all Potential Remedial Action Objectives within the Fort Hall Reservation.

FMC Response:

FMC disagrees that the potential Remedial Action Objectives listed in Table 4-3 should be changed to prevent excess cancer risks above 1x1-6, rather than an excess cancer risk of 1x10-4 as currently cited. Under the NCP, excess human health cancer risks are deemed acceptable within the range of 1x10-6 to 1x10-4. In the 1998 ROD, EPA incorporated the high end of this cancer risk range (i.e., 1x10-4) into the RAOs for the EMF facility.

2A. Soils and Solids

Potential Receptor: Add Off Site Residents, Off Site Transient users of property within Vicinity.

FMC Response:

On February 4, 2008, FMC submitted a *Human Health Risk Assessment Protocol for the FMC Plant Operable Unit* which identified exposure scenarios (i.e., potential receptors and exposure pathways) considered plausible for the FMC

Plant Site. In addition to outdoor and indoor commercial/industrial worker, construction workers, utility workers and maintenance workers, the Protocol identified that hypothetical nearby off-site residents could be exposed from inhalation of construction-related fugitive dust emissions from the FMC Plant Site. Following EPA, IDEQ and the Tribes' review of this document, the Supplemental Human Health Risk Assessment (HHRA) of the FMC Plant Site was performed in accordance with the Protocol. This assessment determined that potential risks to hypothetical, maximally-impacted future off-site residents located directly downwind of RUs 7 and 20 would be below levels of concern (i.e., incremental cancer risks less than 1E-06 and an incremental hazard quotient less than 1). Therefore, off-site residents are not potential receptors of concern to be added to Table 4-3.

While unclear, FMC assumes that the Tribes' reference to offsite transients implies concern over potential exposures to trespassers on the FMC Plant OU. However, any trespassers would not experience long-term exposures and, consequently, would be subject to lower risks than the receptors that were included in the SRI evaluation (e.g., future outdoor commercial/industrial workers). On this basis, trespassers were not identified as receptors requiring evaluation in the EPA-approved SRI Work Plan for the FMC Plant Site (MWH, 2008), the EPA-approved SRI Work Plan Addendum for the Southern and Western Undeveloped Areas (MWH, 2008a) or the EPA-approved SRI Work Plan Addendum for the Northern FMC-Owned Properties (MWH, 2008b). Moreover, during EPA, IDEQ and the Tribes' review of draft versions of these Work Plans, FMC did not receive any comment indicating that such a receptor should be evaluated. Consequently, off-site transient (trespasser) receptors have never been considered to be a potential concern with respect to the FMC Plant OU, and will not be added to Table 4-3.

Potential Exposure Pathways: Add Exposure to reaction by-products, gases and metal phosphides.

FMC Response:

By-product gases are addressed under the elemental phosphorus RAO and exposure to fire exposure pathway. Metals are addressed under incidental ingestion and dermal absorption RAOs for soils and solids and listed in the COCs for those pathways. As discussed above, no additional potential exposure pathways are known or suspected for "reaction by-product gases and metal phosphides". As a result, no changes in the exposure pathways for soils/solids are appropriate or warranted.

Potential Remedial Action Objectives: Prevent direct and indirect exposure to elemental phosphorus and reaction by products in all soil and from all soils and ancillary pipes and materials that may be buried throughout the site that if encountered during intrusion into

the subsurface would create an environment for a reaction including oxidation and/or hydrolysis and subsequently cause fire and or generation and release of metal phosphides gases including phosphine, hydrogen cyanide, sulfide, hydrogen fluoride, or other reaction primary or secondary by products that represent a risk to human health and the environment. Elemental phosphorus has been designated a principal threat waste where present in levels in any soils and/or ancillary piping where fire and uncontrolled chemical reactions may occur. The principal threat shall be remediated through removal and treatment unless a non-removal and treatment remedy is justified using the nine criteria in accordance with the NCP.

FMC Response:

This suggested change addresses many other potential COCs in addition to elemental phosphorus and is inappropriate for an RAO related to elemental phosphorus (see discussion above). EPA on July 21, 2009 directed FMC to include the following language for elemental phosphorus in the Soil/Solids Potential Remedial Action Objectives, "Prevent exposure to elemental phosphorus under conditions that may spontaneously combust, posing a fire hazard or resultant air emissions that represent a significant risk to human health and the environment".

2B. Groundwater:

Constituents of Concern: Based on concentrations compared from 2000 and 2005 groundwater samples collected by Hydrometrics and submitted by the Shoshone Bannock Tribes several constituents demonstrated a significant increase in trending. Some of these constituents included but not limited to:

- Boron
- Barium
- Cyanide
- Iron
- Fluoride
- Gross Alpha
- Gross Beta
- Manganese
- Nitrogen N as Nitrate
- Potassium
- Sodium
- Vanadium

Potential Remedial Action Objective: Any constituent that has been measured above MCLs in FMC monitoring wells and has the ability to migrate off site.

FMC Response:

As described in the Groundwater Current Conditions Report for the FMC Plant OU (GWCCR), June 2009 Final, FMC is well aware that the SBT obtained and analyzed collocated groundwater samples from the FMC site during the 2000 to 2006 period:

"3.2.1.4 Collocated Sampling Conducted by Sho-Ban Tribes
The Shoshone Bannock Tribes staff collected collocated groundwater samples from selected wells during the 2000 through 2006 period as listed below. This list was prepared based on FMC file information regarding the sampling events (e.g., quarterly and annually) during which FMC allowed the Tribes to obtain these samples.

The Tribes have never provided FMC with a copy of any Sampling and Analysis or Quality Assurance Plan for their groundwater samples and analyses, nor have the Tribes provided FMC with the analytical results for all of the sampling events listed below. FMC obtained only a possibly incomplete set of the laboratory reports for the Tribes 2000 and 2005 collocated groundwater samples, and an Excel spreadsheet from EPA that apparently contains at least partial results from the Tribes collocated groundwater samples from 2000, 2003, 2004, 2005 and 2006."

FMC is not aware of, nor had the opportunity to review, any statistical or other data evaluation conducted by the SBT that supports the statement "several constituents demonstrated a significant increase in trending." Regardless of the SBT's apparently unsupported statement, the GWCCR, Section 5.1 presents the results of statistical test for trend for numerous wells throughout the FMC Plant OU. The trend analysis in the GWCCR fully support the conclusion "concentrations of FMC-related groundwater impacts in the western ponds area, central plant area and downgradient portions of the joint fenceline / calciner ponds area have decreased (groundwater beneath the FMC Plant Site has improved) and are expected to continue to improve due to the lack of sustained hydraulic head on any identified or potential source areas at the site."

The comment suggests that the constituents listed should be identified as groundwater constituents of concern (COCs). The listed constituents are discussed below:

- **Constituents Identified as Groundwater COCs in the 1998 ROD:**

Fluoride, Manganese and Nitrate ("Nitrogen (N as Nitrate)") were identified as EMF groundwater COCs on Table 36 in the 1998 EMF ROD. These constituents are still appropriately identified as groundwater COCs for the FMC Plant OU and are now shown in updated Table 4-3. Additionally, Table 4-3 has been updated to

clarify that the COCs listed are those which will be considered in the Supplemental Feasibility Study (SFS) as they exceed RAOs.

Boron, Manganese and Vanadium were identified as EMF groundwater COCs on Table 36 in the 1998 EMF ROD. As described in detail in the GWCCR, the 2Q2008 groundwater results showed that manganese, boron and vanadium in groundwater are limited to small areas within the overall (arsenic) impacted groundwater area. The recent (2008) manganese, boron and vanadium results are adequate to define the limited extent of these constituent impacts to groundwater at the site. Manganese is still appropriately identified as a groundwater COC and is shown in updated Table 4-3.

Vanadium has only been detected twice above the comparative value (CV), both results from well 123, since 2000. Vanadium has been detected above the CV in less than 2 percent of over 1,000 vanadium results (RI and post-RI) for FMC wells. Nonetheless, vanadium is identified as a groundwater COC for the FMC Plant OU in Table 4-3.

Boron has not been detected in FMC wells above the comparative value since 1992 and is not a groundwater COC for the FMC Plant OU.

Gross alpha and gross beta were identified as EMF groundwater COCs on Table 36 in the 1998 EMF ROD. Table 36 is also footnoted to include "Individual radionuclides potentially responsible for elevated gross alpha and gross beta levels are also COPCs. These include, but are not limited to Lead-210, Polonium-210, Potassium-40, Thorium-230, Uranium-234, and Uranium-238." As described in the GWCCR, gross alpha was recently analyzed during the 2Q2008 event and was not elevated in groundwater downgradient from FMC source areas. Wells 161 and 164, located at the eastern FMC property line and upgradient from the calciner ponds (RU 14), were the only FMC Plant Site wells with gross alpha activities that exceed the CV. Consistent with the EMF RI Report hypothesis, the gross alpha activity in wells 161 and 164 is likely related to the dissolution of uranium from rocks and gravels in the saturated zone due to a longer residence time of acidic seepage within this lower permeability region, rather than to migration of uranium isotopes from the gypstack. The gross alpha results for wells 161 and 164 and likely relationship to Simplot gypsum stack influences do not suggest that gross alpha (underlying alpha-emitting isotopes) is an FMC-related groundwater constituent at the FMC Plant OU.

As described in detail in the EMF RI Report and the GWCCR, gross beta (and potassium-40 in its naturally-occurring ratio with potassium) correlates to potassium concentrations in groundwater at the site and no other beta emitting radionuclides (radium-226 [daughters (Pb-214 and Bi-214)] and -228) were identified as contributing materially to the measured gross beta activities in groundwater. The MCL (identified as the relevant CV on Table 36) for gross beta is based on an exposure dose rate of 4 millirems (mrem)/year, therefore the

measured gross beta activity in pCi/L cannot be directly compared to the CV. In reviewing 40 CFR Part 141 National Primary Drinking Water Regulations, Subpart C – Monitoring and Analytical Requirements, the regulation specifies that the naturally occurring potassium-40 beta particle activity is subtracted from the compliance sample' gross beta particle activity prior to comparing the result to the appropriate screening level. These regulations suggest that gross beta attributable to naturally occurring potassium-40 (in its natural ratio with potassium) is excluded from the determination of compliance with the gross beta MCL and that the MCL is not an appropriate CV for gross beta activity attributable to potassium-40 in its natural ratio with potassium in groundwater at the FMC Plant OU.

FMC identified a Department of Energy (DOE) screening level for potassium-40 that is based on a dose equivalent of 4 mrem/year. As shown on Table 1-4 of the "Groundwater Standards for Radiological Compounds, 2001 BNL Groundwater Status Report" (**bnl.gov**/erd/**Groundwater**/GW**report**01Files/**...**/Table1-04.PDF) under the column DOE Groundwater Screening Level pCi/L, the screening level for potassium-40 is 280 pCi/L. That potassium-40 screening level in its natural ratio equates to a total potassium concentration of 341.5 mg/l. Only the recent potassium concentrations at former Pond 8S downgradient wells 155, 156 and 157 are higher than a total potassium level based on the DOE potassium-40 screening level.

Based on the limited and localized extent of potassium and potassium-40 in its natural ratio to potassium above the DOE screening level associated with former Pond 8S, gross beta is not appropriately identified as a groundwater COC for the FMC Plant OU.

- **Constituents Not Identified as Groundwater COCs in the 1998 ROD:**

Barium and iron were not identified as EMF groundwater COCs on Table 36 in the 1998 EMF ROD. As described in the EMF RI Report and further documented in the GWCCR, barium and iron are not site-related groundwater COPCs / COCs.

Potassium and sodium were not identified as EMF groundwater COCs on Table 36 in the 1998 EMF ROD. As described in the GWCCR, potassium is identified as a useful indicator parameter to evaluate the groundwater impacts at the FMC Plant OU and remains a laboratory parameter for the routine CERCLA, RCRA and Calciner Pond programs. There are no comparative values (i.e., there are no primary or secondary drinking water standards or preliminary remediation goals) for potassium and sodium. These common ions are not identified as presenting human health risks and thus do not constitute groundwater COCs.

- **Constituent Not Evaluated as a Potential Groundwater COCs in the 1998 ROD:**

Cyanide was not analyzed in groundwater during the EMF RI and was not evaluated as a potential EMF groundwater COC on Table 36 in the 1998 EMF ROD. As described in detail in the GWCCR, the 2Q2008 groundwater results showed that total cyanide in groundwater is limited to a small area within the overall (arsenic) impacted groundwater area and no total cyanide concentrations exceeded the drinking water standard (MCL). The recent (2003 and 2008) total cyanide results do not exceed the CV and, therefore, cyanide is not identified as a groundwater COC for the FMC Plant OU.

2C. Surface Water

Constituents of Concern: Add Arsenic, total alpha, total gamma, radium 226, lead 210, lead, nickel, vanadium, antimony, cadmium, chromium, zinc, magnesium, and thallium….

Potential Remedial Action Objectives: Prevent the release and migration of all COCs including lead 210 radium 226 lead nickel vanadium antimony cadmium chromium, zinc, magnesium, thallium, gross alpha, gross beta, to surface water from facility sources that will enter onto the Fort Hall Reservation through the Michaud Creed Diversion on the Portneuf River.

Prevent the release of metals and or radionuclides that may be bound to the sediments within the Portneuf River from anoxic conditions resulting from excess orthophosphate triggering hyper respiration and depressed oxygen concentrations.

Protect/Restore the aesthetic value of the lower Portneuf River that is being degraded by cultural eutrophication from the EMF site that is limiting Tribal cultural activities.

FMC Response:

FMC does not agree that the cited list of chemicals need to be identified as surface water constituents of concern in Table 4-3. Surface water bodies are not present on the FMC Plant OU, and this media was only included on Table 4-3 to document the concern that total phosphorus levels in groundwater released from the FMC Plant OU could adversely impact surface water quality in the Portneuf River. However, this concern does not carry over to other constituents.

The findings of previous studies are sufficient to conclude that risks to human health and the environment associated with non phosphorus-related surface water exposures and risks are de minimus. Specifically, EPA's Baseline HHRA (E&E, 1996) determined that there "… does not appear to be any potential for significant

human exposure to potentially contaminated surface water or sediment near the site." In addition, EPA's Baseline ERA (E&E, 1995) determined that "… site-related risks were not identified for the riparian, riverine, or mudflat habitats associated with the Portneuf River". EPA's subsequent Preliminary Assessment/Site Investigation of the Lower Portneuf River (LPR) (E&E, 2005), in which the Tribes played an active role in the study design and execution, revealed little toxic or radioactive contamination. In fact, based on the PA/SI findings, EPA recommended no further action be taken. Finally, a Radiological Evaluation of the LPR (Beitollahi, 2007) determined that: 1) radionuclide concentration downstream of the EMF sites are not higher than upstream levels, and 2) there is "… no indication of an apparent need for concern of a hazardous radiological exposure pathway from surface water, sediment, or for those individuals who consume trout from the Portneuf River."

In summary, the RAO for surface water currently included in Table 4-3, which is the same as Simplot's RAO and was approved by EPA, is protective of surface water downstream of groundwater discharges from the FMC and Simplot Plant OUs. There is no need to develop surface water RAOs specific to metals and/or radionuclides, and the EPA-approved RAO addresses eutrophication concerns.

2D. Air

Constituents of Concern: Add metal phosphides to both Inhalation of fugitive dust and inhalation of airborne phosphorus reaction products.

Add by products of elemental phosphorus oxidation and/or hydrolysis reactions including phosphine, hydrogen cyanide, sulfides, hydrogen fluoride to inhalation of airborne phosphorus reaction products.

FMC Response:

Phosphine is the only one of these gases that is a significant product of elemental phosphorus oxidation and/or hydrolysis reactions. Refer to FMC's response to Tribal comment #1 for a detailed discussion of elemental phosphorus oxidation and/or reaction by products. Based on those discussions, no changes in the COCs for Air are proposed.

Potential Remedial Action Objectives: Add Prevent inhalation of all by products from the oxidation/ and or hydrolysis reaction of elemental phosphorus that pose an acute or chronic risk.

FMC Response:

Currently the RAO states, "Prevent inhalation of P4 reaction products resulting from combustion or hydrolysis of P4 at levels that pose an excess non-cancer risk

HQ of 1." This RAO encompasses the RAO that the Tribes have proposed and as a result, no changes to the Air RAOs are proposed.

General Response Action: Add in situ treatment of source ex situ treatment to list.

FMC Response:

The general response action "Collection" listed in Table 4-3 under Air includes active treatment of constituents of concern in the air. In-situ and Ex-situ treatment technologies are usually associated with soil/solid and groundwater media because these media can be treated successfully both in place (in-situ) and externally (ex-situ) after excavation or pumping using various treatment technologies. Because "collection" of air encompasses treatment of COCs found in air, no changes are proposed for the Air GRAs listed.

APPENDIX A-7

FMC's Response to IDEQ Comment Letter (dated: September 11, 2009) regarding the draft final *SFS Work Plan for the FMC Plant Operable Unit – August 2009*.

September 11, 2009 IDEQ Comments on the draft final SFS WP for the FMC Plant Operable Unit (submitted electronically 08/18/09) and FMC Responses

IDEQ Editorial Comments

1. Page 1-2, third objective - define "CSM" (conceptual site model) and remove definition on page 1-6 deliverable/action number 2.

   FMC Response*:*

   Pages 1-2 and 1-6 have been revised at suggested.

2. Section 3.5 page 3-6 - change heading "RUS" and "RAS" to "RUs" and "RAs".

   FMC Response:

   The Section 3.5 heading has been revised as suggested.

3. Please recheck highlighted text for cut and paste type errors, such as multiple periods and text spacing.

   FMC Response:

   Comment noted.

IDEQ Technical Comments

1. Section 2.4.9, 1st full paragraph on page 2-16 - states "There are no current exposed receptors to FMC impacted groundwater (i.e., there are no domestic, industrial or agricultural wells that extract impacted groundwater)". What about exposure of the general public and the environment to groundwater discharging from Batiste and Swanson Rd Springs? Keep in mind that Appendix A-6 FMC's Responses to Shoshone-Bannock Tribes Comments (dated August 17, 2009) on the Supplemental Feasibility Study Work Plan for the FMC Plant OU -July 2008, states that "surface water bodies are not present on the FMC Plant OU" so the springs must be an expression of groundwater that is a potential point of exposure to COCs.

   FMC Response:

   As described in the Groundwater Current Conditions Report for the FMC Plant OU, Section 1.3.4.3, FMC owns the Batiste Spring Parcel that encompasses both Batiste Spring and Swanson Road Spring (aka the Spring at Batiste Road) and the J.R. Simplot Company (Simplot) owns the water rights (groundwater and surface water) to the property. Further, Simplot has transferred the Point-of-Diversion for

those water rights to another Simplot property. At the point that groundwater discharges to surface water at the springs and as base flow to the Portneuf River, the groundwater becomes surface water in the Portneuf River, Swanson Road Spring "pool" and Batiste Spring channel and, other than a minimal length of the Batiste channel and a portion of the Swanson Road Spring "pool," are physically located in the Off-Plant Operable Unit. As such, any trespasser human exposure on the Batiste Spring property or ecological exposure would be to surface water. The potential human health and ecological risks related to surface water (principally the Portneuf River) were evaluated in the Baseline Human Health Risk Assessment for the EMF Site and no unacceptable risks to human health or the environment were identified. In 2005, EPA completed a PA/SI on the Lower Portneuf River that assessed the Portneuf River for potential CERCLA response action apart from the EMF Site. The PA/SI concluded that there were not sufficient cancer or other risks to people or the environment to warrant proceeding further (Interim Amendment to the Record of Decision for the EMF Superfund Site Simplot Plant Operable Unit Pocatello, Idaho, January 2010). Based on this information, FMC has revised the text in Section 2.4.9, 1st full paragraph on page 2-16 as follows:

"There are no current exposed receptors to FMC impacted groundwater (i.e., there are no domestic, industrial or agricultural wells that extract impacted groundwater). There are no domestic, industrial or agricultural uses of the water from the Batiste Spring or Swanson Road Spring where, along with baseflow, groundwater from the EMF Site merges with surface water at the Portneuf River. Potential risks associated with surface water (i.e., the Portneuf River) are addressed as part of the Off-Plant Operable Unit of the EMF Site."

APPENDIX A-8

FMC's Transmittal Letter (dated: December 11, 2009) of updated text and tables for the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

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Via Email

December 11, 2009

Ms. Kira Lynch, MS ECL-113
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Subject: Administrative Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit of the Eastern Michaud Flats Superfund Site (U.S. EPA Docket No. CERCLA 10-2004-0010): **Supplemental Feasibility Study Work Plan – Revised sections, amending electronic copy of draft final submitted August 18, 2009**

Dear Ms. Lynch:

On August 18, 2009, FMC submitted an electronic draft of a final Supplemental Feasibility Study Work Plan (SFS WP) for the FMC Plant Operable Unit. The final electronic draft was a revision to the initial draft SFS WP that FMC had submitted to EPA on July 15, 2008, the revisions addressing Agency comments on the initial draft that FMC received in late 2008. As detailed in FMC's August 18, 2009 transmittal letter for the final electronic draft, FMC and the Agencies have been engaged in significant review, commenting and responding to comments to develop the final SFS WP. As you know, the SFS WP is a required deliverable under the subject order prior to submittal of the draft SFS Report. Its final preparation is interrelated with two other work elements not listed in the order but that FMC agreed to develop as part of the SRI/SFS, specifically (1) the SRI Addendum report and (2) numeric interpretation of updated Remedial Action Objectives (RAOs) for the FMC Plant OU. This letter serves to clarify the status and provide updates to the August 18, 2009 draft SFS WP to allow FMC to move forward with preparation and submittal of the draft SFS report.

SRI Addendum - FMC received final EPA and DEQ comments on the electronic final draft of the SRI Addendum report on November 9, 2009. FMC then finalized that report and produced it in hard copies, dated November 18, 2009. FMC awaits final agency approval of the hard copy production of the previously reviewed electronic versions.

The revisions to the SRI Addendum, specifically the contamination assessments for the FMC Northern Properties, necessitated relatively minor updates to the SFS Work Plan with respect to the characterization of the FMC Northern Properties.

- Attachment 1 is a revised SFS WP Table 3-1 (Summary of SRI Field Program Rationale, Results and Contamination Assessment) to reflect these updates.

Numeric interpretation of updated RAOs - FMC's August 17, 2009 letter to EPA detailed FMC's understanding of the 1998 EMF Site RAOs. Your email of August 19, 2009 requested that FMC prepare numeric values reflecting the RAOs for the FMC Plant OU. FMC provided those numeric values to EPA on September 11, 2009, and supplemented those with detailed backup calculations on September 21, 2009. In the course of email exchanges regarding the risk calculations, EPA raised a concern that the numeric values did not reflect risks associated with all relevant pathways. This largely was a result of an RAO having been developed independently for each exposure pathway in the 1998 ROD. EPA did not raise other concerns with the calculated values, and acknowledged that they were generally consistent with clean up levels or remediation goals that EPA has prescribed at other sites with similar constituents of concern. EPA did express concerns, however, regarding FMC's interpretation of the EMF Site RAOs set forth in the 1998 ROD.

FMC's reading of the RAOs as set forth and applied under the 1998 ROD was consistent with its understanding that EPA had remediation goals that reflect a 1×10^{-4} cancer risk over and above existing background risks. Since the background risks at the EMF Site are themselves in the range of 1×10^{-4}, this would establish a risk-based remedial action level of approximately 2×10^{-4}. FMC identified several similar CERCLA sites with remediation goals set at approximately this same level, supporting its reading of the RAOs. EPA policy documents that were in place at the time of the 1998 ROD also supported FMC's interpretation. These include OSWER Directive No. 9355.0-30, which states that "the upper boundary of the risk range is not a discrete line at $1x10^{-4}$," and OSWER Directive No. 9200.4-18, which states that "EPA's acceptable risk range is generally defined as 1×10^{-4} to 1×10^{-6} but also includes an upper bound of 3×10^{-4} as essentially equivalent to 1×10^{-4}." FMC's proposed RAO-based numeric values submitted September 11, 2009 were consistent with these directives and EPA's application of these directives at other similar sites.

EPA has clarified its position that the RAOs are based on total risk and not additional risk above background. Based on this and other EPA clarifications regarding pathways and hazard quotients, FMC is submitting the following revisions to the electronic draft of the SFS WP submitted on August 18, 2009. Consistent with previously established protocols for electronic revisions, changed text is highlighted and deletions are not shown.

- Attachment 2 - New Section 4.3 text ("Remediation goals"); the existing Section 4.3 text would be renumbered as Section 4.4 in the final document

- Attachment 3 – Revised Table 4-3 ("FMC Plant OU Remedial Action Objectives and General Response Actions")
- Attachment 4 - New Tables 4-4, 4-5 and 4-6 (updated numeric RAOs from FMC's September 11, 2009 email reflecting EPA comments) and other supporting tables which would form the new Appendix B, document development of Tables 4-4, 4-5 and 4-6
- Attachment 5 – Revised Table 3-3 ("Description of Remediation Areas to be Used in the SFS")

Appendix A-7 (FMC's August 17, 2009 letter) would be deleted in the final SFS WP.

These changes track the remedial goals that EPA developed and applied at the Northeast Church Rock Mine Site, the Butte Priority Soils Operable Unit/Silver Bow Creek /Butte Area NPL Site, and the Stauffer Chemical NPL Site in Tarpon Springs. Similar to the approach taken at the above sites (and others), note that FMC did not expand the SFS WP to include Remediation Goals for all COCs. FMC instead included Remediation Goals only for those COCs that are found to be significant risk drivers based on their concentrations in site fill/source materials (i.e.., As, Cd, F, Ra-226 and Pb-210). Based on the human health and ecological risk assessments, which evaluated all the COCs, remedial action that addresses the significant risk drivers also will address all the other COCs to acceptable levels. The revised remedial goals are presented in SFS WP Tables 4-4, 4-5 and 4-6, which respectively address Outdoor Commercial/Industrial workers, future construction workers, and hypothetical residents on the FMC Northern Properties.

Please provide any comments on these proposed additional revisions to the SFS WP so that FMC can prepare and submit the final SFS WP in hard copy. Please call me with any questions, or to discuss further.

Sincerely,

Barbara E. Ritchie
Associate Director, Environment
FMC Corporation

cc: Doug Tanner
Waste and Remediation Manager
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P.O. Box 306 – Pima Drive
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APPENDIX A-9

FMC's Response (dated: January 22, 2010) to IDEQ Comments (dated: January 7, 2010) on the December 11, 2009 electronic submittal of updated tables/text from the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

January 7, 2010 IDEQ Comments on the revised sections/tables of the SFS WP FMC Plant Operable Unit (electronic submittal 12/11/09) and FMC Responses

IDEQ Editorial Comments on Table 3-1

Page 2, RUs 1 and 2, Column – (3) Investigation Rationale: The statement "Define the extent and concentration of P4 in shallow subsurface soils to: 1) define the extent of P4 in the subsurface…" is awkward, the following wording is recommended: 1) Define the areal extent and concentration of P4 in the shallow subsurface soils and 2) evaluate …

FMC Response:

Comment noted. Although this language is redundant, it has not been revised because this exact language was accepted in the Agency-approved *Final SRI Report* (MWH, 2009), Table 4-1.

Page 9, RU 7, Columns – (6) Field Program Results and Contamination Assessment: The second paragraphs in each column do not agree, the Field Program Results states that chromium exceeded the SSL and the Contamination Assessment states it was cadmium. Please correct as needed.

FMC Response:

The contamination assessment column should state that chromium exceeded the SSL for protection of groundwater. Table 3-1 has been revised as suggested.

Page 10, RU 8, Column – (6) Field Program Results, second paragraph: States "Four (4) borings reported at least *once*…." should read "…at least *one*…"

FMC Response:

Table 3-1 has been revised as suggested.

Page 15, RU 12, Column – (6) Field Program Results, first sentence: Delete the second "solvents" at the end of the sentence.

FMC Response:

Table 3-1 has been revised as suggested.

Page 26, RU 22b Column – (6) Field Program Results, first paragraph: See comment for page 10, RU 8.

FMC Response:

Table 3-1 has been revised as suggested.

IDEQ Technical Comments on Table 3-1

Page 9, RU 7, Column – (7) Contamination Assessment first paragraph: Based on the text it appears as though 25% of the samples were dismissed or ignored because they were over the SSLs. Please clarify.

FMC Response:

The purpose of the SRI investigation in each RU, including RU 7, was to evaluate whether any constituents of potential concern in the overlying fill are leaching into native soils. During the SRI in each RU, 20-increments of soil from 0-2 feet below the native ground surface were composited to form one composite soil sample (bns, i.e, below the exiting fill materials). This compositing was completed in each quadrant of RU 7 for a total of 4 composite samples that were submitted for metals and radionuclides analyses. As presented in Table 4-10 of the *Final SRI Report* (May 2009), one of the four SRI samples collected in RU7 reported an exceedance of several SSLs for one constituent. Specifically, potassium-40 was reported at a concentration of 21.1 pCi/g in composite sample RU7-SFS-SSC001, which marginally exceeds the background concentration of 20.5 pCi/g for potassium-40 and SSLs for various workers and protection of groundwater (all of which default to background).

In summary, each of the 4 composite samples were analyzed for 27 analytes; thus, only 1 of 108 analytes was found to exceed its SSLs (or approximately 0.9 % of the analytes) for RU 7. Because this was a single, shallow, low-level exceedance, FMC concluded, and EPA/IDEQ agreed by approving the *Final SRI Report* that: 1) the overlying fill materials are not leaching constituents of potential concern into native soils and 2) there are no concerns that groundwater, located over 70 feet below grade, would be impacted based on these results. To summarize, the marginal SSL exceedance at RU 7 was not ignored; instead, it was determined that this one result did not warrant additional SRI/SFS investigations at RU 7.

Page 22, RU 20, Column – (7) Contamination Assessment: Text in this column states that leaching from slag to underlying native soils is not a concern yet 10% of the native soil samples collected had metal concentrations above SSLs and 15% of the samples had metals concentrations above background. Please clarify.

FMC Response:

As shown in Table 4-17 of the *Final SRI Report*, a total of 2 analytes exceeded their SSLs protective of groundwater in the 20 samples collected during the RU 20 Slag Investigation. Each of the 20 samples was analyzed for 27 analytes; thus, only 2 of 540 analytes exceeded their groundwater SSL (or 0.4 % of the analytes reported). Specifically, RU20-REF-SB002 reported a manganese concentration of 494 mg/kg, marginally above the groundwater SSL, which defaulted to the background value of 482 mg/kg for this constituent. RU20-REF-SB007 reported a cadmium concentration of 32.6 mg/kg, which also exceeded its SSL protective of groundwater. Similar to the response immediately above, FMC concluded, and EPA/IDEQ agreed by approving the *Final SRI Report*, that since only two of 540 analytes exceeded groundwater SSLs in near surface samples, and groundwater is over 70 feet below grade leaching from slag to underlying native soils is not a credible or valid concern and that no additional investigation was warranted.

APPENDIX A-10

FMC's Response (dated: January 22, 2010) to EPA Comments (dated: January 12, 2010) on the draft final *SFS Work Plan for the FMC Plant OU – August 2009* and FMC's December 11, 2009 electronic submittal of updated tables/text from the draft final *SFS Work Plan for the FMC Plant OU – August 2009*

January 12, 2010 EPA Comments on the revised SFS WP for the FMC Plant Operable Unit (electronic submittal 08/18/2009) and FMC Reponses

EPA General Comments:

1. Table 3-1 includes a contamination assessment column that should not be considered as a final determination of which parcels will be evaluated against remedial alternatives in the SFS. While EPA does not disagree with the results presented for the risk assessment for each parcel, EPA does not necessarily agree with the conclusions regarding which receptors and alternatives will be evaluated during the SFS. These decisions will be made during the development of the SFS.

   FMC Response*:*

   The text in the contamination assessment column of Table 3-1 does not include a discussion of which remedial alternatives will be evaluated in the SFS; a task that is reserved for the SFS Report. However, the contamination assessment column does identify the human and ecological receptors within each RU and Parcel that exceed acceptable risk levels and thereby need to be evaluated in the SFS.

   Identification of the receptors of concern for each RU and Parcel within the contamination assessment column was intended to support this SFS Work Plan, which lays out the framework for the scope of the analysis of alternatives in the SFS. The purpose of the AOC Task for development of the SFS Work Plan is to reach agreement on the scope of the SFS based on the remedial investigation work performed. The discussions presented in the contamination assessment column simply document site conditions within individual RUs/Parcels that exceed preliminary remediation goals so the process can move forward. FMC does not believe changes to the column are necessary, but does believe that agreement on the information presented in this column is critical before the CERCLA process can proceed.

2. Table 3-3 – Remove the RAO column. RAOs apply to the entire site and not individual parcels.

   FMC Response*:*

   Table 3-3 has been revised as suggested.

3. Remediation Goal Tables 4-4, 4-5, and 4-6. Remediation Goals should be relabeled Preliminary Remediation Goals. Final Remediation Goals will be established in the ROD, not in the SFS WP. In addition, cite basis for exposure parameters used in the SFS WP.

FMC Response*:*

Tables 4-4, 4-5, and 4-6, along with the text in Section 4.3, have been revised to refer to Preliminary Remediation Goals (PRGs). In addition, the basis for each of the RME exposure parameters used to calculate the PRGs has been added to the "RME Exposure Factors" worksheet of the EXCEL file that was provided as Attachment 4 to FMC's December 11 submittal.

4. Table 4-3 – Delete footnote on phosphorus. Elemental phosphorus is a CERCLA hazardous substance and the ortho-phosphorus is a breakdown product from elemental phosphorus so total phosphorus impacts to the environment must be addressed.

FMC Response*:*

As directed by the comment, the footnote on total phosphorus has been deleted from Table 4-3. As EPA is aware, the EMF RI and SRI and the Groundwater Current Conditions Report (GWCCR) for the FMC Plant OU present comprehensive evaluations of the nature and extent, fate and transport and potential human health risks associated with total phosphorus (and orthophosphate) at the FMC Plant OU. Based on those evaluations and as directed by EPA, FMC included the RAO for surface water in the SFS Work Plan Table 4.3 so that total phosphorus impacts to the environment from the FMC Plant Site will be addressed in the SFS.

However, the comment appears to be based on an incorrect premise that most or all of the total phosphorus (and one of its forms - orthophosphate) at the FMC Plant Site is a "breakdown product" of elemental phosphorus. The data for the FMC Plant OU demonstrate the converse of EPA's premise in that the overwhelming majority (by mass) of the total phosphorus in surface soils, wastes (e.g., calciner pond sediments, slag, phossy pond sediments) and wastewater (e.g., calciner scrubber water, precipitator slurry, phossy water) and resultant releases of pond water to groundwater from the former unlined ponds is from phosphate derived from incompletely reduced forms of phosphorus from the ore (Fluoroapatite, $Ca_5(PO_4)_3F$) rather than from the fully reduced elemental phosphorus form. As described in the GWCCR, analysis of phossy pond water found total phosphorus in the range of 1,370 to 7,680 mg/l compared to a maximum solubility of elemental phosphorus of 3 mg/l at 15^o C. Based on this information, elemental phosphorus would account for less than 0.3 percent of the total phosphorus in pond solute that migrated to groundwater at former Pond 8S (and other former unlined phossy ponds). As also described in the GWCCR, elemental phosphorus has only been routinely detected at two wells (wells 108 and 122 located immediately downgradient from RUs 1 and 2), but the elemental phosphorus contribution to total phosphorus in groundwater was less than 2 percent at well 108 and less than 0.01 percent at well 122 (May 2008 results). The elemental phosphorus concentrations at well 108 and 122 are essentially indiscernible from the total phosphorus / orthophosphate plume from the western ponds area. Finally,

identified and potential FMC sources of total phosphorus to groundwater in the joint fenceline are all from "pre-reduction furnace" processes such that no elemental phosphorus could be present in the associated solid / wastewaters at these areas (e.g., former kiln scrubber ponds, former unlined calciner pond). In summary, the site data do not support EPA's apparent basis for this comment.

5. Table 4-6 – The residential remediation goal for cadmium should be left as undetermined at this time because it is not required to complete the SFS. If it is determined that a residential cleanup goal for cadmium is required the home grown produce ingestion pathway must be considered.

FMC Response*:*

The residential remediation goal for cadmium in Table 4-6 has been revised to indicate that it is undetermined. In addition, a footnote has been added to state that this remediation goal is not required to complete the SFS and to acknowledge that, if it is subsequently determined that a residential remediation goal for cadmium is needed, the home grown produce ingestion pathway must be considered.

6. EPA is in agreement with the initial applicable and relevant requirements (ARARs) identified for the site, however identification of final ARARs cannot be completed until the team has a better understanding of the potential remedial alternatives.

FMC Response*:*

Comment noted.

APPENDIX A-11

FMC's Response (dated: March 2010) to EPA Comments (dated: February 16 2010), IDEQ Comments (dated: January 9, 2010) and SBT Comments (dated: February 15, 2010) on the hardcopy final *SFS Work Plan for the FMC Plant OU – January 2010*

February 16, 2010 EPA Comments on the final hardcopy SFS WP FMC Plant Operable Unit (January 22, 2010 submittal) and FMC Responses

EPA General Comments

1. The language in Section 2.4.10 that references ecological risks and associated remedial actions to be considered in the SFS should be revised to be consistent with Table 3-1.

> **FMC Response:** Section 2.4.10, pages 2-16 and 2-17 have been revised in the enclosed package of insert/replacement pages for the final *SFS Work Plan* to be consistent with Table 3-1 and the findings and conclusions of the final *SRI Addendum Report* (November 2009).

2. Comments from the Idaho Department of Environmental Quality (IDEQ) and the Shoshone Bannock Tribes on this submittal are enclosed. Comments from IDEQ can be addressed with change pages for the Final SFS WP.

> **FMC Response:** The FMC responses to IDEQ and SBT comments are provided below. In addition, insert/replacement pages to the final *SFS Work Plan* that respond to these comments, as described below, are also being submitted.

3. Response to Tribal comments should be prepared for the Administrative Record. Most of the comments from the Tribes have already been responded to by EPA and FMC in the past and others can be addressed in the SFS.

> **FMC Response:** The EPA responses as well as FMC supplemental responses to SBT comments on the final *SFS Work Plan* are provided below.

January 29, 2010 IDEQ Comments on the final hardcopy SFS WP for the FMC Plant Operable Unit (January 22, 2010 submittal) and FMC Responses

IDEQ General Comments

1. As stated in DEQ comments on the November 2003 Scoping and Planning Memorandum for the SRI/SFS (Dec. 2003) and the June 2008 SRI Report (Aug. 2008) regarding the Conceptual Site Model (CSM), DEQ does not agree that areas without sustained hydraulic head could not adversely affect groundwater. Infiltration and percolation of precipitation through contaminated source areas and site soils could transport contaminants to the aquifer through the vadose zone without a sustained hydraulic head providing a transport mechanism. While a sustained hydraulic head (ponded surface water) may play a role in the transport of contaminants through the vadose zone in areas where such conditions existed, water movement through the vadose zone is a very complex process and other factors such as matrix potential and gravity also play a large role in water movement. The potential for aquifer contamination above risk based concentrations resulting from the infiltration/percolation of precipitation depends on the timing and magnitude of infiltration, the magnitude and extent of the contaminant source term, the nature of the contaminant, and the properties of the vadose zone.

> **FMC Response:** A detailed response and chronology is provided below to this very general comment. To summarize, IDEQ made a similar comment regarding the November 2003 Scoping and Planning Memorandum, to support its position that the SRI needed to include subsurface investigation of Remediation Units (RUs) without applied hydraulic head. FMC expanded the scope of the SRI to address this concern. This is reflected in the final EPA-approved *SRI Work Plan* (May 2007), which added subsurface sampling in areas with little or no sustained hydraulic head. IDEQ also had a similar comment regarding the June 2008 draft SRI Report. In that case the issue was focused on RU 16, where wet calciner pond solids had been placed during plant operations that resulted in a limited applied hydraulic head. The SRI determined that specific COCs had migrated in the vadose zone to depth at this RU. FMC expanded the SRI Report evaluation of RU 16 to address this IDEQ comment.
>
> Background chronology:
>
> The IDEQ comments, dated December 22, 2003, on FMC's November 2003 Scoping and Planning Memorandum included the following comment, which IDEQ identified as its General Comment 1:
>
> "Regarding the preliminary draft revision to the Conceptual Site Model presented during the Supplemental Remedial Investigation/Feasibility Study (SRI/SFS) Scoping Meeting on October 23, 2003, DEQ does not agree that sites grouped under the category of "*Areas without Sustained Hydraulic Head*" could not adversely affect groundwater. Infiltration and percolation of precipitation through contaminated source areas and site soils in the vadose zone could transport

contaminants to the aquifer. The potential for aquifer contamination above risk based concentrations resulting from this release mechanism depends on the timing and magnitude of infiltration, the magnitude and extent of the contaminant source term, the nature of the contaminant, and the hydraulic properties of the vadose zone. **The SRI should evaluate whether the COCs at each SRI site (including those without a sustained hydraulic head) could contaminate the site groundwater in excess of risk-based concentrations via infiltration/percolation.**" **(emphasis added)**

The EPA-approved final *SRI Work Plan* (May 2007) included a substantial amount of field work and evaluations that addressed this IDEQ comment. The SRI included several investigations of native soil beneath "fill materials" (i.e., ore, slag, precipitator dust, etc.) in areas without sustained hydraulic head. The SRI results from RUs without sustained hydraulic head demonstrated virtually no migration into the vadose zone at these RUs, except at RU 16, the subject of one of IDEQ's comments on the draft *SRI Report* (June, 2008).

The IDEQ comments, dated August 29, 2008, on the draft *SRI Report* (June 2008) included what IDEQ identified as Comment 1 that addressed Section ES 3.1, page ES-3, paragraph 2, first sentence in the draft *SRI Report* (June 2008). This IDEQ comment stated as follows:

> "The parenthetical statement requires modification. The Supplemental Remedial Investigation (SRI) Special Investigation Area (SIA) for RU 16 demonstrated that contaminants migrated from the calciner solids stockpile without the presence of a sustained hydraulic head. Although some of the dredged sediments would have been fairly wet when they were placed in RU 16, it would not be accurate to characterize this as a "*sustained hydraulic head.*" (emphasis in original)

FMC responded to this IDEQ comment, as part of its overall November 2008 draft *SRI Report* response to comments (RTC), as follows:

> "Agreed, as shown in the Conceptual Site Model Figure 5-1, RU 16 is characterized as an area with "potential limited applied head." The first two sentences will be revised to state "*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 applied 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 identified and potential groundwater impacts from source areas*

at the FMC Plant OU is presented in the Groundwater Current Conditions Report that was submitted October 31, 2008." (emphasis in original)

IDEQ did not disagree with FMC's response or the proposed revised text that addressed this IDEQ comment. The proposed text was incorporated without change into the EPA-approved final *SRI Report* (May 2009).

FMC requests that IDEQ either retract this comment or specifically identify the text with which they disagree and propose alternative text. We respectfully request that any text proposed by IDEQ accurately reflect the findings presented in the final *SRI Report* (May 2009) and the final *Groundwater Current Conditions Report for the FMC Plant OU* (June 2009) (*GWCC Report*).

2. Figure 3-2 as referenced in Section 3.5 page 3-6 is missing from the report.

FMC Response:

This figure has been included in the package of insert/replacement pages for the final *SFS Work Plan.*

February 15, 2010 Shoshone-Bannock Tribes (SBT) Comments on the final hardcopy SFS WP for the FMC Plant Operable Unit (January 22, 2010 submittal) and FMC Responses

SBT General Comments

1. The Tribes communicated their concerns regarding how SSL were applied at this site specifically, the SSL used were elevated and screened out specific metal COC that resulted in RAO being developed for a reduced list of contaminants. The SSL used exceeded the Region 9 Preliminary Remediation Goals (PRG) for most constituents.

According to the Users' Guide and Background Technical Document for US EPA Region 9's PRGs, "the risk-based concentrations presented in the Table may be used as screening goals or initial cleanup goals if applicable". When considering PRGs as cleanup goals, it is EPA's preference to assume maximum beneficial use of a property (that is, residential use unless a non-residential number can be technically justified.)

Further, when multiple contaminants are present, "scaling" of PRGs is conducted at these sites. This reduces the screening value by dividing the value by $1/10^{th}$ providing for greater conservatism. This approach has been used by the US EPA Region X Office at the Midnite Mine Site for calculating the PRGs for a uranium mine. Residential values were used and further conservatism was built in reducing the residential number by $1/10^{th}$.

> **EPA Response:** The approach approved by EPA to evaluate soil data and identify contaminants of concern to be evaluated in the risk assessment was very conservative and did not result in overlooking any potential contaminants of concern that would impact the SFS process.
>
> **FMC Supplemental Response:** The soil screening levels (SSLs) applied at the FMC Plant OU were developed in EPA-approved documents prepared in support of the SRI, not the SFS. The Tribes have previously provided essentially the same SSL-related comments as above during their review of draft versions of the SRI documents. Consequently, the Tribes should refer to FMC's past responses to SSL-related comments associated with the RI Update Memorandum (BEI, 2004; comment responses provided in Appendix E), the draft *SRI Report* (FMC's comment response letter dated March 30, 2009), the final *SRI Addendum Report* (comment responses provide in Appendix G) and work plans prepared in support of the SRI activities. In particular, FMC's March 30, 2009 responses to Tribal comments on the draft *SRI Report*, particularly comments F1, F2, F3 and F4, address the specifics of the above comment.
>
> In summary, FMC agrees with EPA's response that the approach to screening the SRI data was very conservative and did not result in the oversight of any potential COCs that would impact the SFS process.

SBT Specific Comments

1. Section 1.2 Regulatory Background –

Add language to this section identifying the FMC OU is largely within the exterior boundaries of the Fort Hall Reservation

> **EPA Response:** Section 1.2 comments do not have any bearing on the SFS but can be included in the SFS in the future.
>
> **FMC Supplemental Response:** The SBT requested language is already included in the document. Section 2.1, third paragraph, page 2-1 of the final *SFS Work Plan* states "*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*." Repetition of this statement is neither necessary nor warranted.

2. Section 1.2.1 Key 1998 ROD Elements - FMC Plant Subarea Pg 1-5 - 3rd Bullet –

In 1995, FMC placed deed restrictions at the FMC Plant Site and all the other properties at the EMF site it owned at the time that prohibited any potential future development of these properties for residential or day-care facility use. The property in questions is within the exterior boundaries of the Fort Hall Reservation. FMC has not filed deed restrictions with either the Bureau of Indian Affairs or the Tribal Land Use Department.

> **EPA Response:** Section 1.2 comments do not have any bearing on the SFS but can be included in the SFS in the future.
>
> **FMC Supplemental Response:** Tribal permitting and zoning ordinances do not apply to the FMC fee-owned land located within or outside the exterior boundaries of the Fort Hall Reservation. FMC rejects, based on lack of Tribal jurisdiction, any application of Tribal permitting and zoning ordinances within or outside the CERCLA process to its fee owned property. FMC recorded its 1995 deed restrictions, and will record any future additional deed restrictions, with the Power County Recorder's Office. This provides legal notice regarding the restrictions that would be binding on all future interest holders in the property regardless of whether these restrictions also were recorded with the Tribes. No further actions are necessary or warranted.

3. Section 2.4.9- Groundwater Current Conditions Report Pg. 2-15- 1st Paragraph –

FMC and Simplot impacted groundwater discharges and mix with the Portneuf River in the area between and including Swanson Road Spring (aka the Spring at Batiste Road) and Batiste Spring and, as such, migrates into the Off-Plant OU as surface water. Add- and onto the Fort Hall Reservation, including the Fort Hall Bottoms area, a culturally significant location. In addition, water from this area is pumped throughout the reservation via the Michaud Flats Lift Station.

> **EPA Response:** Section 2.4.9 comment can and should be included in the SFS as part of the discussion.
>
> **FMC Supplemental Response:** As the title states, the *SFS Work Plan for the FMC Plant OU* covers the FMC Plant OU not the Off-Plant OU of the EMF Site. The *GWCC Report* text is accurate as written and correctly states the scope of the FMC Plant OU SFS. No revision of the SFS Work Plan is necessary or warranted.
>
> Within the Off-Plant OU, potential impacts from the EMF Site to the Portneuf River were investigated and reported in the EMF RI and, more recently, in the EPA Preliminary Assessment (PA) of the Fort Hall Bottoms. The SBT are aware that the results from the EMF RI and the EPA PA did not find unacceptable health risks in the Portneuf River, including the downstream reach of the Portneuf River referred to as the Fort Hall Bottoms. Even in the context of the Off-Plant OU, where this comment would be relevant, these analytical results do not support any finding of adverse EMF Site health impacts to the Portneuf River or the Fort Hall Bottoms that this comment suggests.

4. Section 2.4.10- Supplemental Remedial Investigation Report Addendum for the FMC Plan Operable Unit Pg. 2-16 Last Paragraph –

…..Specifically, the Supplemental ERA found that fluoride is the only COC associated with marginal risks, but that it is unlikely to result in adverse effects on population size or community composition. Consequently, no remedial action to address fluoride ecological risks is appropriate for consideration in the SFS for the SUA, WUA, or Northern Properties.

The Tribes have never concurred with idea and assumptions to determine risks based on population size or community composition. Rather, the Tribes have repeatedly communicated their desire to identify risks to individual species and address these risks through the risk management process. Risk management decisions have been made prematurely using assumptions and terms such as "unlikely".

> **EPA Response:** Section 2.4.10 comment brings up conclusions related to the Supplemental ERA noted in the SRIA Report. Please see EPA comment above in regards to the discussion of ecological risk in this section of the SFS WP.

FMC Supplemental Response: The Supplemental ERA was performed in accordance with EPA guidance for performing ecological risk assessments. Evaluating the risk assessment findings in the context of potential impacts to population size and community composition, in addition to individual receptors, is commonly performed in such studies and provides valuable input to subsequent risk management decisions.

In accordance with General Comment # 1 in EPA's February 16, 2010 SFS Work Plan approval letter, FMC has revised the language in Section 2.4.10 of the SFS Work Plan that references ecological risks and associated remedial actions to be consistent with the contents of Table 3-1. Thus, the text in this section has been amended to indicate that risk management decisions regarding ecological concerns on the FMC Plant OU will be evaluated in the SFS.

5. Section 3- SRI Findings and Updated Conceptual Site Model –

This section summarizes the findings from the SRI and SRI Addendum and the updated CSM as presented in the final SFS Work Plan submitted to the Agency on May 7, 2007. Pg 3-1

The current conceptual site mode (CSM), along with the associated notes, is presented in Figure 3-1. This CSM is a revised version of the 2004 CSM as a result of findings regarding current site conditions as updated by the SRI Report, the 2008 SRI addendum and the GWCCR. Pg 3-5

The text above is confusing. The SRI and SRI Addendum (yet to be approved or finalized) were completed during summer 2007 and 2008. The CSM presented in the SFS Work plan dated May 7, 2007 was not revised based on the SRI or SRI addendum because this work was yet to be done. If the CSM presented in the 2007 workplan was from the 2004 CSM it should be noted or made clear.

EPA Response: Section 3 comment states that the SRI and SRIA have not been finalized, which is an error.

FMC Supplemental Response: One of the objectives of the *SFS Work Plan*, as specified in Section 3 of that document, is to update the CSM presented in the *RI Update Memorandum* (BEI, 2004) based upon the findings of the *SRI Report* (approved by EPA on May 26, 2009), the *SRI Addendum Report* (approved by EPA on December 23, 2009) and the *GWCC Report* (approved by EPA on July 20, 2009). The introductory sentence on page 3-1 has been revised to make this point more clearly, and the reference to the May 7, 2007 final *SRI Work Plan* (not *SFS Work Plan* as stated in the text) has been removed. The text cited from page 3-5 is factually correct and requires no changes. A replacement page 3-1 is included in the package of insert/replacement pages for the final *SFS Work Plan*.

6. Section 3.3.1 New Potential Sources or Site Conditions Pg 3-3 – 4th bullet –

While additional soil investigations were not performed at FMC plant site landfills during the 2007 or 2008 investigations, the CSM was updated based upon information gathered for these landfills including: the construction debris landfill, (RU 17), the active landfill (RU 18), the historic landfill in the slag pile (RU 19), the buried railcars in the slag pile (center of RU 19).

References should be provided and what information was gathered for these landfills should be listed.

> **EPA Response:** Section 3.3.1 comment regarding landfill information is not critical to the SFS Work Plan. If it becomes an issue the information can be included in an appendix in the SFS.
>
> **FMC Supplemental Response:** Based on IDEQ comments (dated August 29, 2008) on the draft *SRI Report* (June 2008), FMC provided additional information on the landfills located in RUs 17, 18, and 19. This information is provided in Section 5.2.5 and Appendix L of the final *SRI Report* (May 2009). Therefore, no further actions are necessary or warranted.

7. Section 3.3.2 Site Contaminants of Concern Pg 3-3 and 3-4 –

New COCs/ROCs were not identified during the SRI.

The Tribes are not in-concurrence with this statement. The Tribes maintain phosphine, hydrogen cyanide and other gases are new COC's that were not identified in the previous ROD.

While we recognize FMC has identified new site conditions encountered, that being P4 was encountered in the capillary fringe overlying shallow groundwater downgradient of RUs 1 and 2, additional new site conditions should include chemical reactions including hydrolysis and oxidation of phosphorus.

Soil -

Add chemical reaction products from oxidation and hydrolysis of P4- including phosphine, hydrogen cyanide.

Air - Add radon emanation, phosphine, hydrogen cyanide, metal phosphides and other chemical reaction by-products from P4.

EPA Response: Section 3.3.2 comment regarding phosphine, phosphides and other constituents are not expected to be found outside the RCRA pond areas because reagents needed to produce these chemicals are not found outside the RCRA regulated areas. A discussion could be included in the SFS but does not need to be in the SFS Work Plan.

FMC Supplemental Response: In this SBT comment, reference is made to oxidation and hydrolysis of elemental phosphorus (P4) to generate other gases that may be COCs in soil and air. FMC previously has responded to this same comment, in the FMC Response to SBT comments (SBT comments dated July 21, 2009) found in Appendix A-5 of the draft *SFS Work Plan* (August 2009). As discussed in that response, phosphine (PH_3) is the only known gaseous hazardous substance associated with P4 hydrolysis or oxidation. Other gases identified by the SBT in this comment (i.e., hydrogen cyanide) have been studied as potential process emissions from elemental phosphorus manufacturing, from RCRA ponds prior to closure, and at Pond 16S as part of a CERCLA removal action. No concentrations of HCN have been observed or are suspected that approach levels of concern in the ambient air at or near the Site.

Regarding radon emanation in air, the 2007 SRI investigation collected radon flux measurements at the ore stockpile (RU 7), the slag pile and bullrock pile (RU 19), and the former ponds (RU 22b). As documented in the final *SRI Report* (May 2009), the 500 radon flux measurements from these area were below the UMTRCA guideline of 20 pCi/m2/sec, with radon flux concentrations from these areas ranging from non-detect (<0.59) to 4.80 pCi/m2/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 site do not exceed the UMTRCA guideline, radon was not identified as a COC to be incorporated into the Supplemental HHRA.

Based on those discussions, no changes in the COCs are proposed. Table 3-2 as included in the final *SFS Work Plan* is appropriate and no change to the COC list is warranted.

8. Section 3.3.4 Potential Receptor s and Routes of Exposure Pg 3-5-

FMC uses "significant potential route of exposure" "principal concern" and "exposure scenario of concern" throughout this section to justify non-inclusion of routes of exposure in RA. For example first bullet on page 3-2 states "inhalation or radon in ambient air does not appear to be significant potential routes of exposure. The SRI has shown radon emanation rates to be very low - at or near background, and significantly lower than risk based UMTRCA guidelines of 20 pCi/m2/second.

It is unclear whether such subjectivity is warranted. The Tribes assert that Air is a potential route of exposure for radon, phosphine, hydrogen cyanide, metal phosphides and other reaction products from uncontrolled reactions of P4

EPA Response: Section 3.3.4 comments regarding routes of exposure are applicable in the RCRA area only. With respect to radon, radon is already addressed in the ROD.

FMC Supplemental Response: As previously stated in response to SBT comment #7 above, radon, phosphine, hydrogen cyanide, metal phosphides and other reaction products from uncontrolled reactions of P4 have been thoroughly investigated on the FMC Plant Site during numerous studies and were not found to be COCs. See the FMC Response to SBT comments (SBT comments dated July 21, 2009) found in Appendix A-5 of the draft *SFS Work Plan* (August 2009). In addition, by-product gases are addressed under the elemental phosphorus RAO and exposure to fire exposure pathway in the final *SFS Work Plan*. Metals are addressed under incidental ingestion and dermal absorption RAOs for soils and solids and are listed among the COCs for those pathways. As discussed above, no additional potential exposure pathways are known or suspected for "reaction by-product gases and metal phosphides." As a result, no changes in the exposure pathways for air or soils/solids are appropriate or warranted.

9. Section 5.4 Schedule for Completion of the SFS Process Pg 5-6 –

To date, several unanticipated companion documents have been prepared to supplement the SFS process and have been submitted to EPA as interim deliverables in advance of the SFS Report

The documents listed are not "unanticipated". These were well planned and anticipated the presentation is misleading.

EPA Response: Section 5.4 comment has no impact on finalizing the SFS WP.

FMC Supplemental Response: The statement in the text pointed out that the referenced documents had not been required under the *2003 AOC Scope of Work*. Several of these documents are "stand-alone" technical document and all have been reviewed by the EPA. While these documents have provided valuable resources to the development of the SFS, the development of these documents was not anticipated prior to submittal of the final *SFS Work Plan* and draft *SFS Report*. The text on page 5-6 of the *SFS Work Plan* has been clarified to reflect this and an insert/replacement page is attached here.

10. Figure 3-1 CSM for Potential Human Exposure to Contaminants –

Air- Add C, F to Workers - This pathway is complete for current and or future workers.

Radon Inhalation - May be complete pathway for Future workers

Residual P4 from Former Spills, Process Leaks at Pr Production, Storage and Handling Areas- Add radionuclide's and metals - Anderson Filter Media contains radionuclide's and metals- At soils as a secondary sources - soils surrounding these areas are expected to be impacted and serve as a potential secondary release mechanism.

> **EPA Response:** Figure 3-1 comments should be considered but could be addressed in the SFS.
>
> **FMC Supplemental Response:** The intent of the CSM presented in Figure 3-1 is to identify the exposure pathways by which current and future receptors could potentially be exposed to constituents of concern above a level of health concern. As such, the CSM does identify inhalation of air containing P4 reaction products and fugitive dust as a complete exposure pathway for current and future workers. However, as stated in note 12 to Figure 3-1 and responses to comments 7 and 8 above, radon flux measurements taken during the 2007 SRI in areas with slag, ore and phossy/precipitator solids were found to be at or below regional background levels, and significantly lower than the UMTRCA risk-based guidance level of 20 pCi/m2/second for outdoor workers. In addition, indoor exposure to radon is not a concern because future buildings on the FMC Plant Site will be constructed with radon control measures, per the 1998 ROD. Thus, current and future worker inhalation of radon is not a complete pathway.
>
> Residual P4 from Former Spills, Process Leaks at P4 Production, Storage and Handling Areas is identified as a primary potential source in the CSM to specifically address the unique potential fate, transport and exposure mechanisms for P4 in these areas. Radionuclide and metal COCs in P4 containing source materials are addressed within other primary potential sources in the CSM; for example, metals and radionuclides in Anderson Filter Material are addressed by the Landfill Areas primary potential source. Moreover, acknowledging that surrounding soils could be impacted, subsoils beneath Landfill Areas are identified as a secondary potential source in the CSM.
>
> In summary, no changes to the CSM are necessary or warranted.

11. Table 3-1

Contamination Assessment Column - Uncontrolled chemical reactions from hydrolysis, oxidation or other unknown chemical property and the reaction byproducts including phosphine, hydrogen cyanide poses an unacceptable acute and potential long term health hazard to potential future receptors. Inhalation, adsorption (HCN) should be included to each receptor where P4 is identified. Spontaneous combustion of P4 is not the only hazard associated with P4.

RU 19: Slag Pile - Add P4 to analyte list and associated exposures to contamination assessment column. Add Groundwater as a potential media impacted.

Full characterization of the slag pile was not completed as part of the SRI. Because this area is approximately 97 acres, railroad cars with unknown quantities and qualities of material are buried in the slag pile and the physical integrity of the railroad cars is unknown it is reasonable to expect they may be or will be leaking hazardous waste.

The Montana DEQ Remediation Division completed a study done on Rhodia slag deposited on the floodplain of a nearby drainage. The test pits showed radiation increased with depth, suggesting downward migration of "soluble salts of radioactive metals contained in the.

EPA Response: Table 3-1 comments can be discussed in the SFS and do not need to be discussed in the work plan.

FMC Supplemental Response:

The information in this table is consistent with the final *SRI Report* (May 2009) and final *SRI Addendum Report* (November 2009), both of which have been reviewed and approved by EPA. As discussed above in response to comments 7 and 8 above, HCN is not of concern and no changes are necessary or warranted to the ”Contamination Assessment Column” in Table 3-1.

FMC investigated radon flux potential from RU 19 slag pile in 2007 as well as performed a reference study at RU 20 (for slag) to determine if constituents, including radionuclides, in slag have migrated into underlying soils. As discussed in the final *SRI Report* (May 2009), there is no indication that constituents are leaching from slag at the site. The final *SRI Report* also includes detailed information on RU 19 in Section 5.2.5 and Appendix L. Further, FMC submitted a separate technical document, entitled *Buried Railcar Evaluations for the FMC Plant OU* (dated May 13, 2009), which presented an evaluation and screening of various process options for potential remediation of the railcars that are buried in the Slag Pile (RU 19). These documents address the buried railcars and any potential impacts to groundwater.

With respect to the Montana DEQ Remediation Division study on Rhodia slag, FMC has never received a copy of this report and thus has not had the opportunity to review the underlying data or Montana DEQ conclusions, let alone to evaluate whether this report is appropriate for comparison to the FMC Plant OU. Regardless, when this concern was raised during comment on the SRI Work Plan in 2006, the agreed upon resolution was to develop what was termed the Slag Reference Study, wherein samples were collected in soils underlying the large slag fill area in RU-20 (Bannock Paving area) to determine whether slag was leaching COCs as those results could be used as a reference for other areas where

FMC slag was present. The 2007 SRI studies, as reported in the EPA-approved final SRI Report, did not show that constituents are leaching from slag.

Based on this no changes to Table 3-1 are necessary or warranted.

12. Table 4-3 RAO's

Environmental Media- Soils and Solids- Potential Future Receptors- should include visitors to the site
Potential Exposure Pathways #5) should specifically call out phosphine

Constituents of Concern to be addressed in the sfs should include all reaction products of P4

RAO- Current Language- Prevent exposure to elemental phosphorus under conditions that may spontaneously combust, posing a fire hazard, and resultant air emissions that represent a significant risk to human health and the environment.

This does not address past or current Tribal comments and concerns possible language could include:
Prevent exposure to elemental phosphorus, by-products from reactions of elemental phosphorus including phosphine and other gases in air, soils and all media that may represent a risk to human health and the environment.

Groundwater: Potential Future Receptors: Add Native American Hunter/Gatherer (Northern Properties)

Surface water: If Surface Water remains listed as a RAO within the FMC OU then the following should be included: Potential Future Receptors: Add Native American Ceremonial Use, Cultural Use

Potential Future Exposure Pathways: Add ingestion, adsorption, inhalation
COC's: Add language for a place holder that if any of the indicator parameters are routinely measured (such as sulfate from Simplot, representing COC's from the FMC site it will be assumed all these COC's the indicator parameter is representing is present in the river and appropriate action will take place . (regular monitoring for those constituents)

Comments surrounding the Location Specific ARARs, i.e. 1x10-6 rather than 1x10-4 on Tribal land, and specifics regarding FMC's response to Tribal comments.

EPA Response: Table 4-3 comments can be discussed in the SFS.

FMC Supplemental Response:

Soils and Solids

Inclusion of visitors as potential future receptors of concern with respect to exposure to soils and solids is unwarranted and inconsistent with EPA guidance. The currently listed potential future worker and resident receptors of concern are based on the findings of the SRI human health risk assessments (HHRA) for the FMC Plant OU, which were conducted in accordance with EPA guidance. The specific hypothetical resident and worker receptors evaluated in the HHRA were identified in the EPA-approved *SRI Work Plan for the FMC Plant Site* (MWH, 2007), the EPA-approved *SRI Work Plan Addendum for the Southern and Western Undeveloped Areas* (MWH, 2008a) and the EPA-approved *SRI Work Plan Addendum for the Northern FMC-Owned Properties* (MWH, 2008b). These receptors were chosen because they represent sub-populations with the greatest potential for exposure to site-related constituents of concern. Moreover, during development of draft versions of these Work Plans, FMC did not receive any comment indicating that any other receptors should be evaluated.

In summary, ensuring that the remedy is protective of hypothetical future receptors with the greatest potential exposure to soils and solids will also ensure that it is protective of other potential future receptors, such as site visitors.

Elemental Phosphorus Reaction Products

For elemental phosphorus, "exposure to fire and inhalation of airborne phosphorus reaction products" are identified as the potential exposure pathways in Table 4-3. To the extent that phosphine is a potential component of airborne phosphorus reaction products, the existing text encompasses that constituent. Moreover, while individual potential P4 reaction products are not identified as Constituents of Concern, Table 4-3 clearly indicates that the SFS will evaluate all reaction products of P4. In summary, there is no need to amend Table 4-3 based on this comment.

With respect to the Tribes' suggested revision to the RAO for P4 and its reaction products, FMC previously noted in its response to the Tribes' July 21, 2009 comments (see page 6 of Attachment A-6 to the January 2010 version of the SFS Work Plan) that EPA has provided suggested text for this RAO, which formed the basis for the current language in Table 4-3. Therefore, the RAO will not be amended as suggested.

Groundwater

The suggestion to add a hunter-gatherer (HG) as a potential future groundwater receptor is rejected. As the FMC property is owned in fee, any potential HG receptor would actually represent a trespasser receptor and, in either case, would

have a far shorter exposure to groundwater than the residential receptor scenario that forms the basis for the Safe Drinking Water Act National Primary Drinking Water Standard Maximum Contaminant Levels ("MCLs"). As a practical matter, the shallowest depth to groundwater at monitoring wells at the FMC Plant OU is just over 16 feet below ground surface (bgs) at wells 524 and 525, and averages 60 feet bgs at wells within the FMC Northern Properties. We suspect a short walk to the Portneuf River would be a more fruitful approach for a HG or trespasser to find water than digging a hole over 16 feet in the ground. No revision to the SFS Work Plan is necessary or warranted.

As described in response to SBT comment #3, the Portneuf River is within the Off-Plant OU. Potential impacts from the EMF Site to the Portneuf River were investigated and reported in the EMF RI (BEI, 1996) and, more recently, in the the Preliminary Assessment/Site Investigation (PA/SI) of the Lower Portneuf River (LPR) (E&E, 2005). Specifically, EPA's Baseline HHRA (E&E, 1996) determined that there "… does not appear to be any potential for significant human exposure to potentially contaminated surface water or sediment near the site." In addition, EPA's Baseline ERA (E&E, 1995) determined that "… site related risks were not identified for the riparian, riverine, or mudflat habitats associated with the Portneuf River." EPA's PA/SI, in which the Tribes played an active role in the study design and execution, revealed little toxic or radioactive contamination. In fact, based on the PA/SI findings, EPA recommended no further action be taken. Further, the SBT has repeatedly failed to provide EPA with sufficient information for EPA or FMC to consider the hypothetical future native American receptors referenced in the comment. No revision to the SFS Work Plan is necessary or warranted.

<u>Surface Water</u>

Addition of human receptors and related exposure pathways for surface water is not necessary. As discussed in FMC's response to the Tribes' July 21, 2009 Comment 2A regarding surface water COCs (see Appendix A-6 of the final *SFS Work Plan)*, the findings of previous studies are sufficient to conclude that risks to human health and the environment associated with non phosphorus-related surface water exposures and risks are de minimis. Specifically, EPA's Baseline HHRA (E&E, 1996) determined that there "… does not appear to be any potential for significant human exposure to potentially contaminated surface water or sediment near the site." In addition, EPA's Baseline ERA (E&E, 1995) determined that "… site related risks were not identified for the riparian, riverine, or mudflat habitats associated with the Portneuf River". EPA's subsequent Preliminary Assessment/Site Investigation of the Lower Portneuf River (LPR) (E&E, 2005), in which the Tribes played an active role in the study design and execution, revealed little toxic or radioactive contamination. In fact, based on the PA/SI findings, EPA recommended no further action be taken. Finally, a Radiological Evaluation of the LPR (Beitollahi, 2007) determined that: 1) radionuclide concentration downstream of the EMF sites are not higher than

upstream levels, and 2) there is "… no indication of an apparent need for concern of a hazardous radiological exposure pathway from surface water, sediment, or for those individuals who consume trout from the Portneuf River."

Potential Future Exposure Pathways

The portion of the comment that refers to COC's is not clear and does not appear to relate to the SFS Work Plan. The comment appears to refer to groundwater monitoring parameters for the EMF Site. The SBT will have opportunities in the future to review and provide comments on FMC's interim and long-term CERCLA groundwater monitoring plan. No revision to the SFS Work Plan is necessary or warranted.

Location-Specific ARARs

The Tribes previously submitted essentially the same comment, advocating in their July 21, 2009 comments the use of a cancer risk action level of 1x10-6 rather than 1x10-4 on FMC Plant OU areas within the exterior boundaries of the Fort Hall Reservation. Page 4 of Appendix A-6 to the January 2010 version of the SFS Work Plan provides the response FMC made at that time to this comment. To reiterate that response, FMC disagrees that a 1 x10-6 excess cancer risk action level should apply at these properties. Under the NCP, excess human health cancer risks are deemed acceptable where they are within the range of 1x10-6 to 1x10-4. In the 1998 ROD, EPA incorporated the high end of this cancer risk range (i.e., 1x10-4) into the RAOs for the EMF Site. It should also be noted that the Tribes incorrectly characterize this allowable risk range as being a function of an ARAR. As referenced above, this is not the case. Risk action levels are established by the NCP and not by the ARARs listed in the *SFS Work Plan*. To the extent asserted Tribal ARARs are the basis for this Tribal comment, FMC has documented previously that none of the standards the Tribes have sought to have classified as ARARs meet the criteria for that designation.

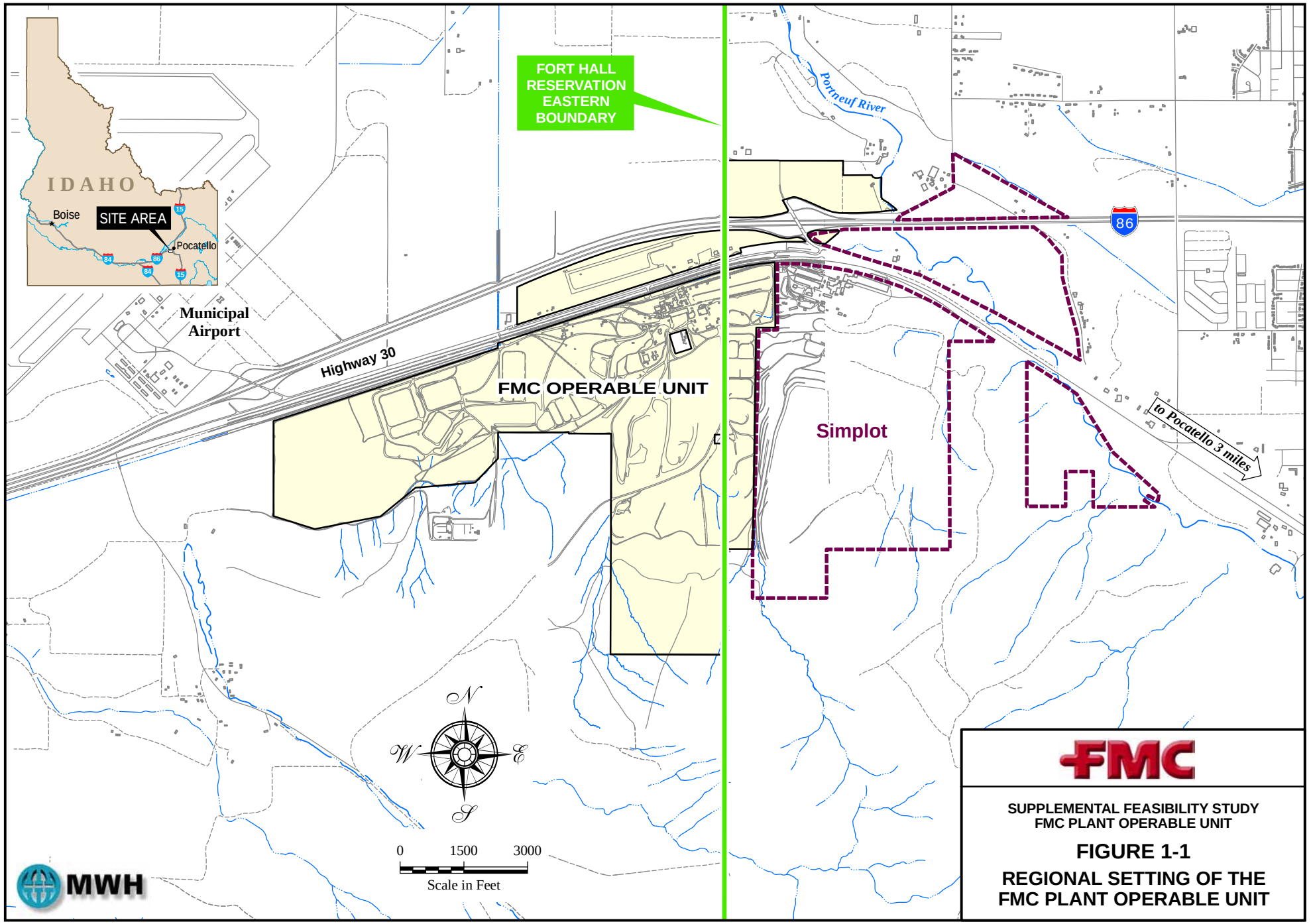
APPENDIX B

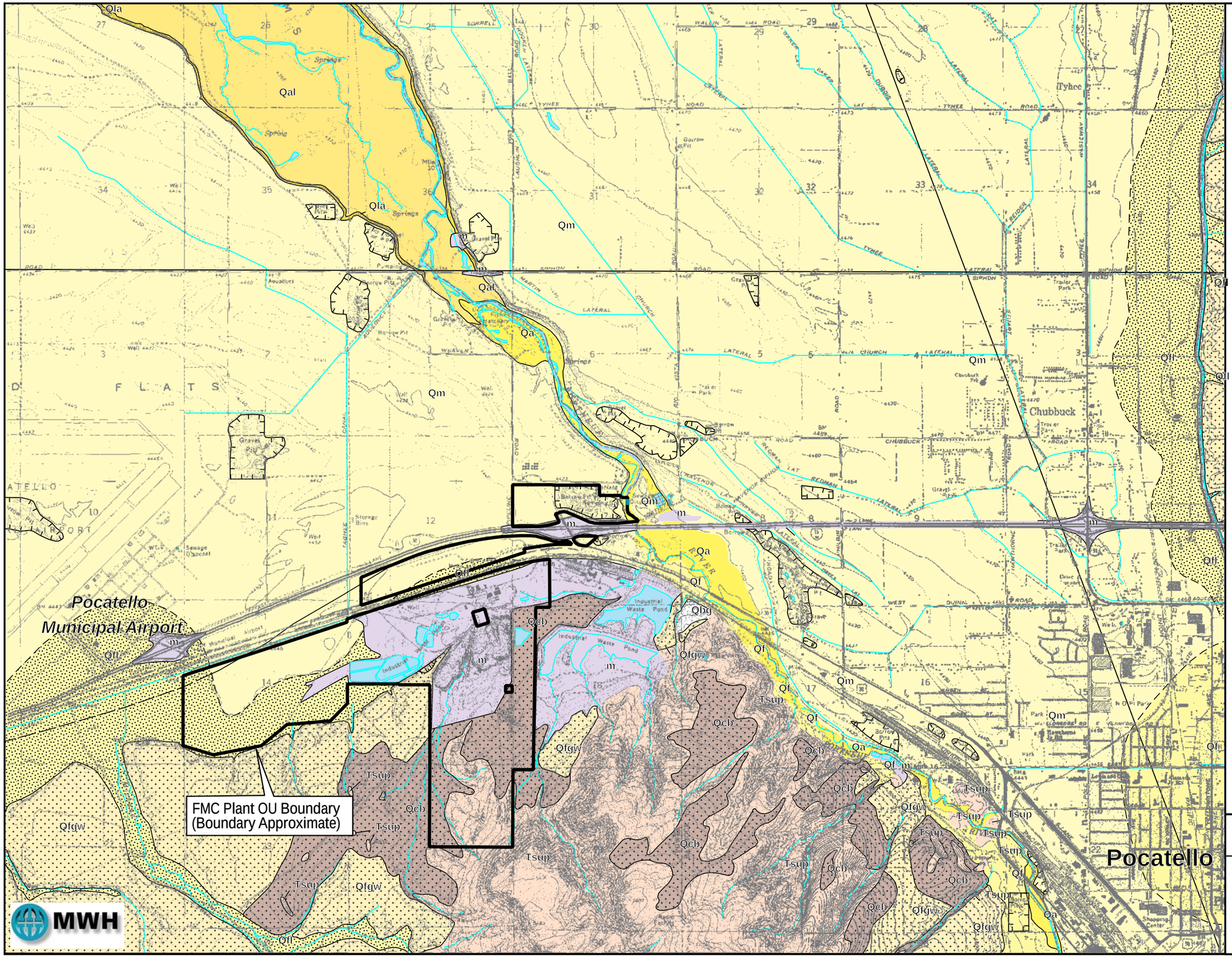
PRELIMINARY REMEDIATION GOAL CALCULATIONS

(provided electronically only)

FIGURES

FILE *Fig 1-01 Regional Setting_508.mxd 6/ 06/08*





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 W E S

0 3000

Feet

FMC

SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

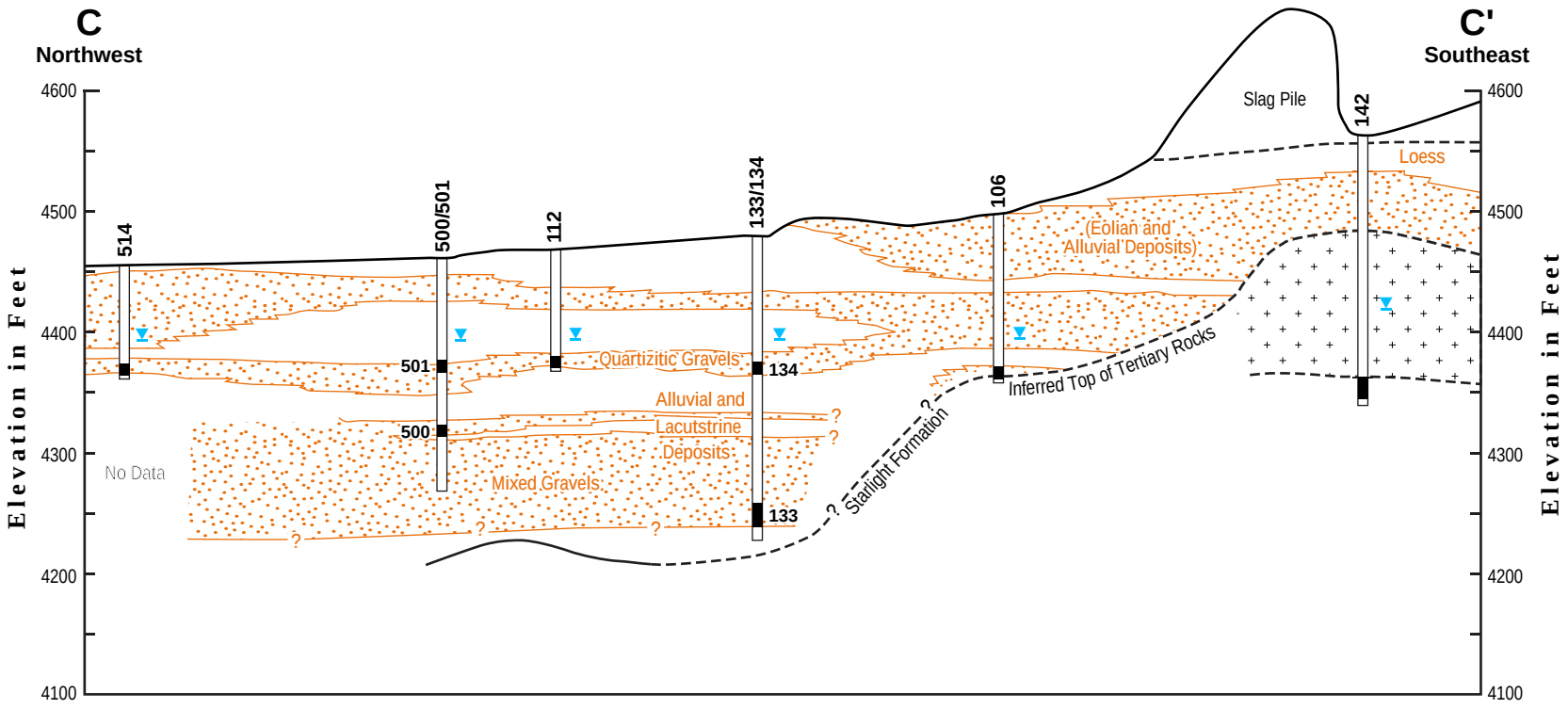
FIGURE 2-1

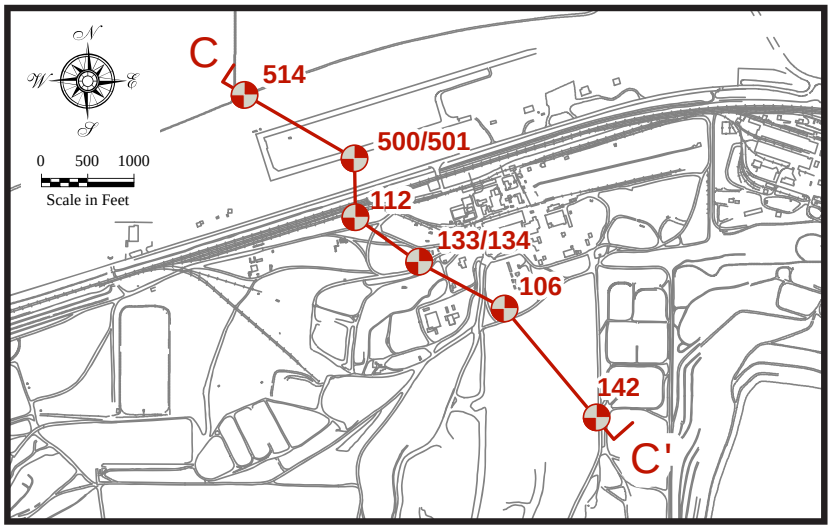
REGIONAL GEOLOGY

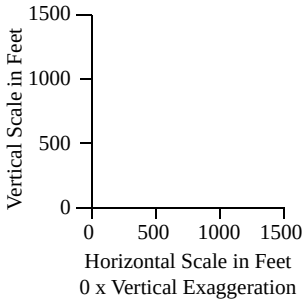
MWH

FILE *Fig 2-1 Regional Geologic map.ai 6/05/08*

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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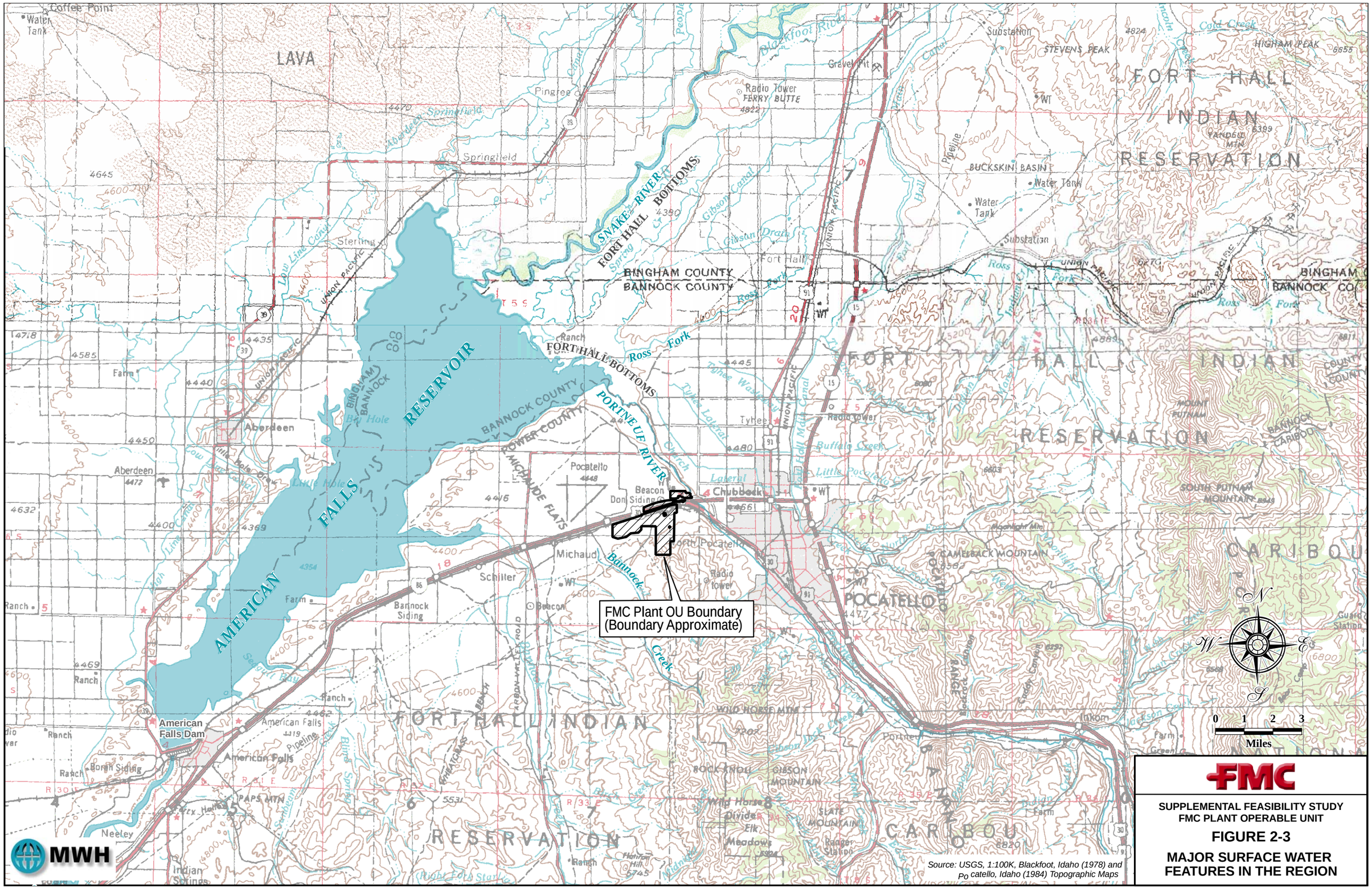
SUPPLEMENTAL REMEDIAL INVESTIGATION
FMC PLANT OPERABLE UNIT

FIGURE 2-2
HYDROGEOLOGIC CROSS SECTION C-C′



Source: USGS, 1:100K, Blackfoot, Idaho (1978) and Pocatello, Idaho (1984) Topographic Maps

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SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

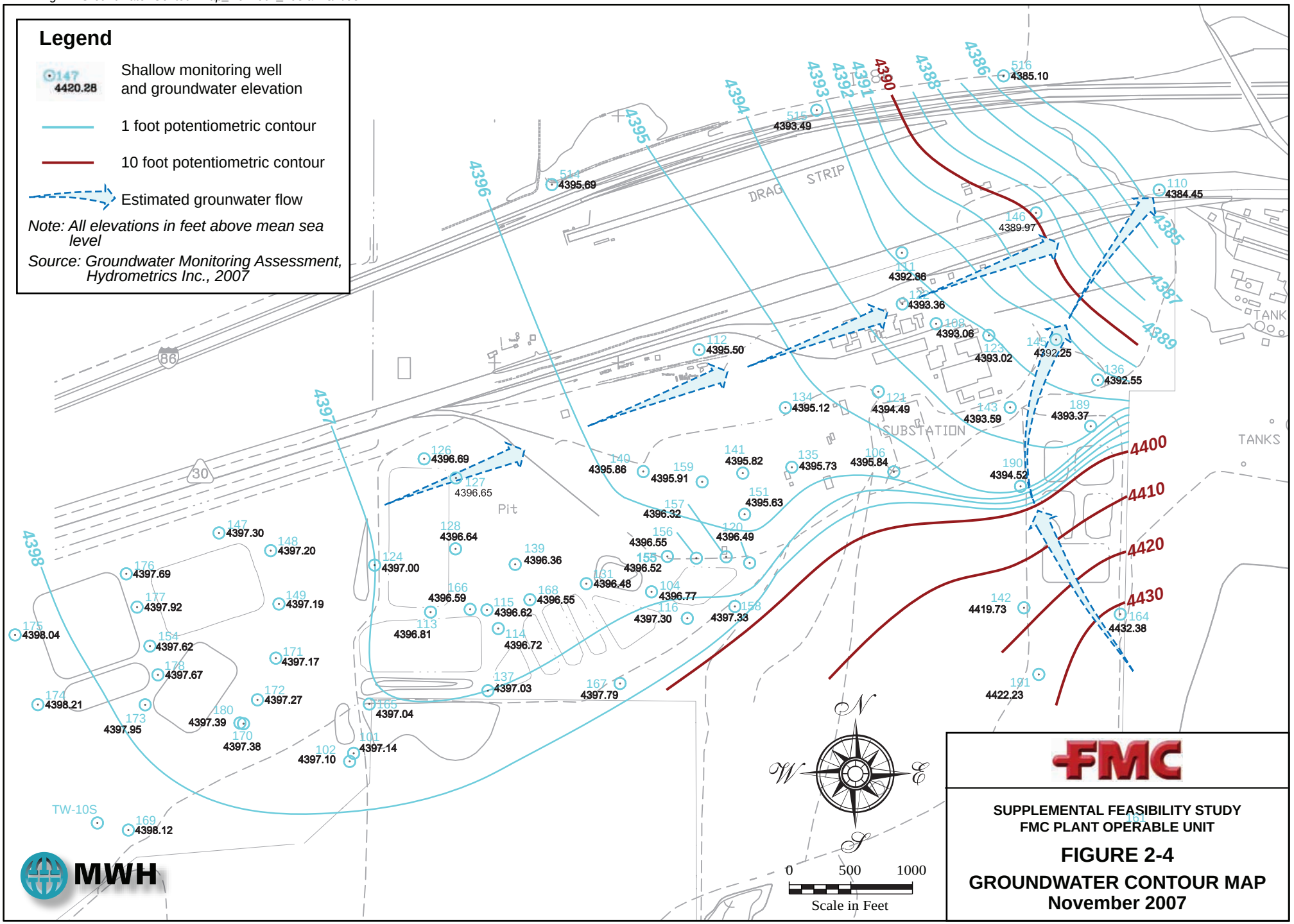
FIGURE 2-3

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*



Legend

Remediation Unit

Property Boundary

22c
3
4
5
6
7
24
1
9
24
2
8
24
10
24
11
12
20
24
22b
13
14
22b
19
15
22b
16
17
18

FORT HALL RESERVATION EASTERN BOUNDARY

N
W
E
S

0 325 650
Feet

MWH

FILE Fig 2-05_RU Bndries at FMC Plant_208.mxd 6/05/08

FMC

SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

FIGURE 2-5

RU BOUNDARIES AT FMC PLANT
November 4, 2007 Aerial Photo

Potential Sources (Primary)	Potential Release Mechanism (Primary)	Potential Sources (Secondary)	Potential Release Mechanism (Secondary)	Pathway	Receptors and Routes of Exposure

Areas Operated Without Sustained Applied Head

Residual materials and soils at unlined feedstock & byproduct handling areas & stockpiles (Note 1)
RUs: 2, 7, 8, 9, 15, 16, 19, 20, & 22b
Source Materials: Coke, Phos. Solids, Pptr. Solids, Ore, Cal. Pond Solids
COCs: Coke PAHs, Metals, Rads, Fluoride, P4

Soils at used equipment, waste storage, & treatment units
RUs: 20
Source Materials: Fuel Spill Residues
COCs: Fuel PAHs

→ Erosion/stormwater runoff

→ Excavation, reuse as fill

→ On-site soil and by-products

Exposure Pathway	Nearby Potential Off-Plant Area Residents (Note 9)	Workers
Ingestion	Incomplete path	C, F
Dermal contact	Incomplete path	C, F
External Radiation	Incomplete path	C, F
Inhalation (fugitive dust)	(Note 10)	C, F
Inhalation (VOCs)	Incomplete path	Incomplete path (Note 11)

C = Complete path under current conditions.
F = Complete path under future conditions.

Slag Used as Fill (Note 2)
RUs: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 19, 20, 22b, 22c, & 24
Predominant Fill Materials: Slag
COCs: Metals, Rads, Fluoride

→ Use of by-product as fill

→ Excavation, reuse as fill

→ Air

Radon inhalation (Note 12)	Incomplete path	Incomplete path

Residual P4 from Former Spills, Process Leaks at P4 Production, Storage & Handling Areas (Note 3)
RUs: 1, 2, 3, 8, 12, 13, 18, 19b, 19c, 22b, 22c & 24
Source Materials: P4, Phossy Solids, Precipitator Solids, Anderson Filter Media, UG Piping (Presumed)
COCs: P4

→ Subsurface excavation, reactions, &/or P4 vapor

→ Seepage/Percolation

→ Air

Dermal contact	Incomplete path	C, F
Inhalation (P4 reaction products)	C, F	C, F
Inhalation (P4 vapor)	Incomplete path (Note 15)	Incomplete path (Note 15)

Areas Operated with Sustained Applied Head (Note 4)
RUs: 1, 2, 8, 9, 10, 22b, & 22c
Source Materials: P4, Phos Solids, Pptr. Solids, Cal. Pond Solids
COCs: Metals, Rads, Fluoride, P4

Areas with Potential Limited Applied Head (Note 5)
RUs: 1, 2, 3, 5, 8, 12, 13, 16, 22b, & 24
Source Materials: Cal. Pond Solids, Phos. Solids, UG Piping (Presumed)
COCs: P4, Metals, Rads, Fluoride

→ Direct contact, erosion, stormwater runoff

→ Infiltration/Percolation → Subsoil beneath sources

→ Groundwater (Note 8)

Ingestion	Incomplete path (See Off-Plant Area)	Incomplete path (Note 13)
Dermal contact		Incomplete path (Note 13)

Groundwater (Note 8) → Surface Water and Sediment

Incidental ingestion	C, F (See Off-Plant Area)	Incomplete path
Dermal contact		Incomplete path
Fish consumption		Incomplete path

Landfill Areas (Note 14)
RUs: 17, 18 & 19b
Source Materials: Plant Trash, Furnace Feed & Carbon, Empty Containers
COCs: VOCs and Semi-VOCs, Metals, Rads, Fluoride

Simplot Sources (Note 6)
Waste units operated with sustained applied head.

Surface soils impacted by deposition from former EMF facility emissions - FMC's Northern Properties/Southern and Western Undeveloped Areas (Note 7)

Notes are presented on the following page.

FMC

Supplemental Feasibility Study Work Plan
FMC Plant Operable Unit
Figure 3-1
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 3-1

Legend

- Remediation Area
- Property Boundary
- RCRA Cap
- Calciner Pond Cap

All RA boundaries are approximate and will be established upon final remedial design

DETAIL A RA-K Railroad Swale

RA-K Railroad Swale

FORT HALL RESERVATION EASTERN BOUNDARY

SEE DETAIL A

RA-A1 Fuel hydrocarbon area

RA-I

Clean Landfill Area

RA-J

RA-G

RA-A

RA-B

RA-E

RA-C

RA-D

RA-F

RA-H

WMU #9 POND 9E

WMU #10 (POND 16S)

WMU #3 POND 15S

WMU #8 PHASE IV PONDS

WMU #7 POND 8S

WMU #11 POND 8E

WMU #15 POND 18 CELL A

WMU #14 POND 17

RA-F1 Buried Railcars

RA-F2 Historic Landfill

CALCINER PONDS

WESTERN UNDEVELOPED AREA

SOUTHERN UNDEVELOPED AREA

N W E S

0 450 900

Feet

Date of Aerial Photography November 4, 2007

MWH

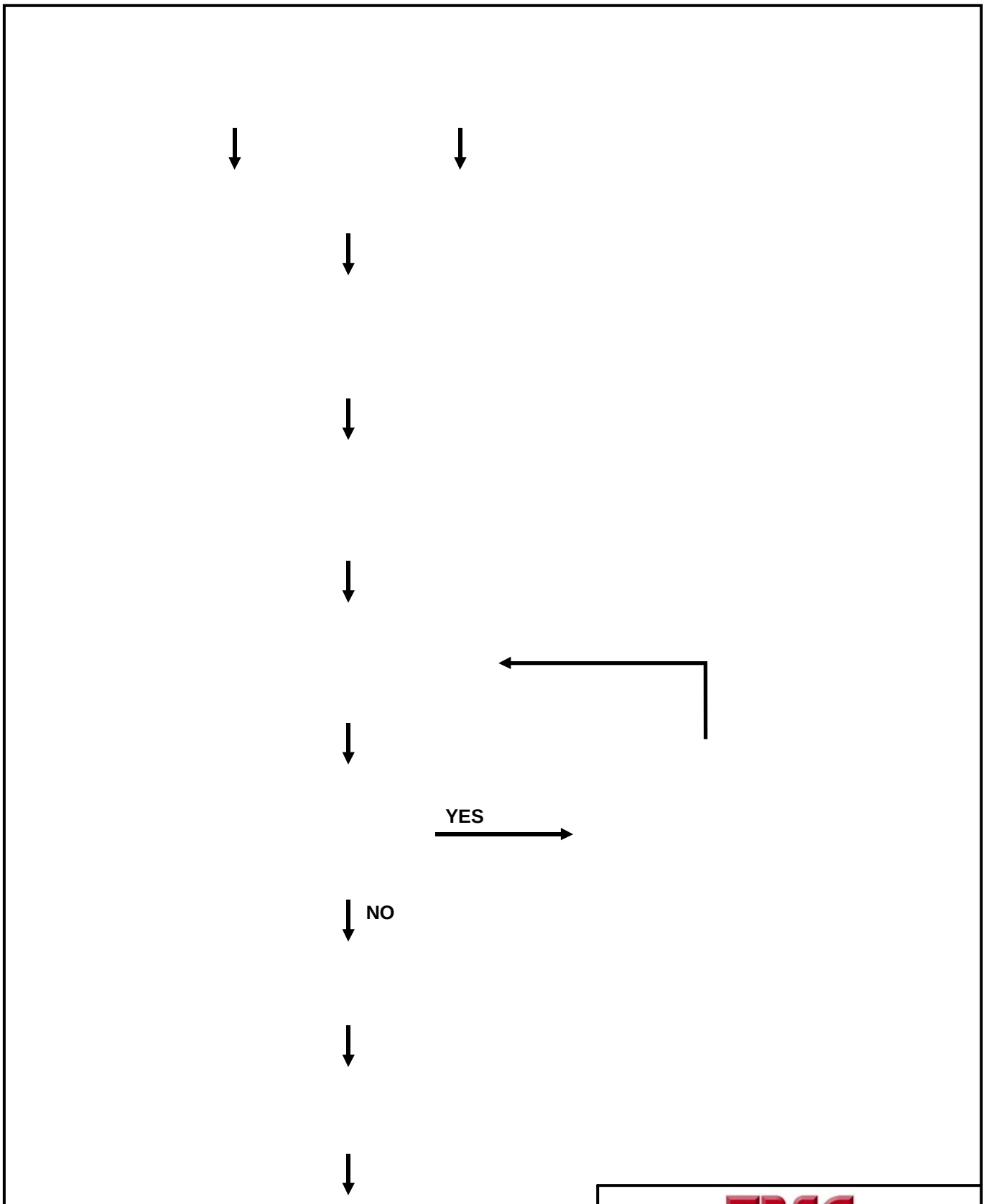
FMC

SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

FIGURE 3-2

REMEDIATION AREA (RA) BOUNDARIES

FILE *Fig 3-02_FMC_RA Boundaries_1109.mxd 11/11/09*



FMC

SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

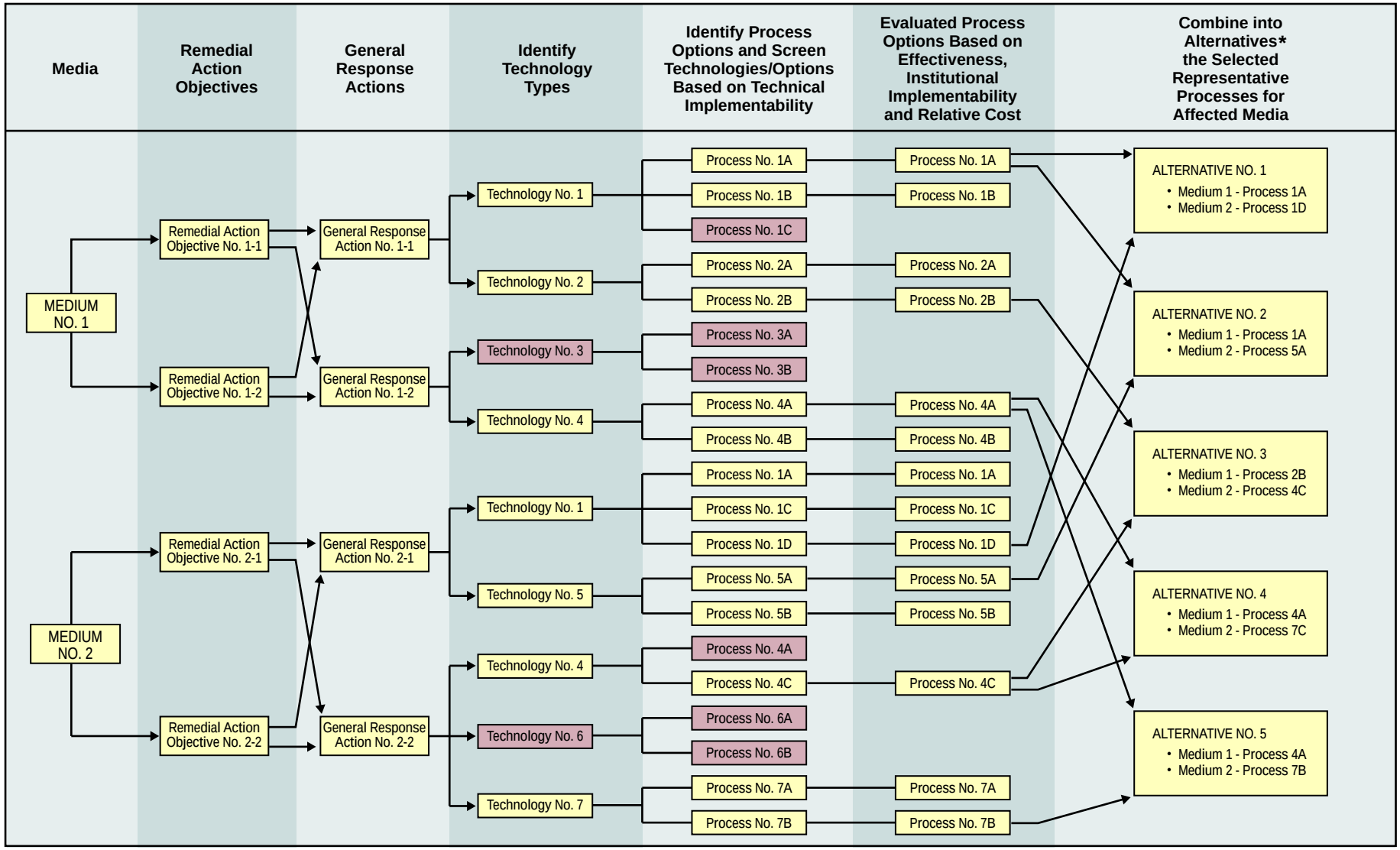
FIGURE 5-1

ALTERNATIVE DEVELOPMENT

MWH

FILE *Fig 5-01 Alternative Development_708.ai 7/14/08*

FILE *Fig 5-02_Generic Alternative Development Process 6/05/08*



Source: EPA/540/G-89/004, OSWER Directive 9355 3-01, October 1988 Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA

Process options that are screened out

Process options selected to represent technology type

* *The combination of medium-technology options into site-wide alternatives may be conducted later in the FS if media interactions are insignificant*

MWH

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SUPPLEMENTAL FEASIBILITY STUDY
FMC PLANT OPERABLE UNIT

FIGURE 5-2

GENERIC ALTERNATIVE DEVELOPMENT PROCESS

TABLES

TABLE 2-1

FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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 2-1

FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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 2-1

FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho
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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	Min: 8 feet Max: 14 feet	Min: 8 Max: 15	Slag Phossy solids	40,607	4 to 10 Min. assumes 1000 ppm in

[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 2-1

FILL/SOURCE MATERIALS OBSERVED IN EACH RU
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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)
			Ore		Ave: 12	P4 Ore		fill. Max assumes 2500 ppm in fill
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 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
2007 Supplemental Remedial Investigation Details (SRI Report- May 2009)						
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> 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. Cancer and non-cancer risks associated with incidental fill materials identified within RU 2 exceed the 1998 ROD RAO for the soil ingestion pathway. 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> Cancer and non-cancer risks associated with incidental fill materials in RU 2 exceed the 1998 ROD RAO for the soil ingestion pathway. 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 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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. Cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> 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 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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. 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> 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 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> Cancer risks associated with predominant fill materials present within RU 6 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks to outdoor workers, primarily associated with incidental fill materials, exceed the 1998 ROD RAO for the soil ingestion pathway. 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> Non-cancer risks associated with incidental fill materials in RU 6 exceed the 1998 ROD RAO for the soil ingestion pathway. 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> Cancer risks associated with predominant fill materials present within RU 7 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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 chromium. 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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SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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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> Cancer risks associated with predominant fill materials present within RU 8 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Non-cancer risks associated with incidental fill materials in RU 8 exceed the 1998 ROD RAO for the soil ingestion pathway. 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 one 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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SUMMARY OF SRI FIELD PROGRAMS 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 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> Cancer risks associated with predominant fill materials present within RU 9 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Non-cancer risks associated with incidental fill materials in RU 9 exceed the 1998 ROD RAO for the soil ingestion pathway. 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> Cancer risks associated with predominant fill materials present within RU 10 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials identified within RU 10 exceed the 1998 ROD RAO for the soil ingestion pathway. 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> Cancer and non-cancer risks associated with incidental fill materials in RU 10 exceed the 1998 ROD RAO for the soil ingestion pathway. 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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> 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS 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	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> Cancer risks associated with predominant fill materials present within RU 12 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials identified within RU 12 exceed the 1998 ROD RAO for the soil ingestion pathway. 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> 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. 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. 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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. 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.

TABLE 3-1

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SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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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. Cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS 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	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> Cancer risks associated with predominant fill materials present within RU 13 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials identified within RU 13 exceed the 1998 ROD RAO for the soil ingestion pathway. 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> Cancer and non-cancer risks associated with incidental fill materials in RU 13 exceed the 1998 ROD RAO for the soil ingestion pathway. 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.

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SUMMARY OF SRI FIELD PROGRAMS 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)**	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.
	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. 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 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.	<u>Outdoor and Indoor Commercial/Industrial Workers</u> Cancer risks associated with predominant fill materials present within RU 15 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Non-cancer risks associated with incidental fill materials in RU 15 exceed the 1998 ROD RAO for the soil ingestion pathway. 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

TABLE 3-1

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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> Cancer risks associated with predominant fill materials present within RU 16 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. 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> Non-cancer risks associated with predominant fill materials in RU 16 exceed the 1998 ROD RAO for the soil ingestion pathway. 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.
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> 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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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 **(continued)**	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.
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> Cancer risks associated with predominant fill materials present within RU 20 exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks to outdoor workers, primarily associated with incidental fill materials, exceed the 1998 ROD RAO for the soil ingestion pathway. 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> Non-cancer risks associated with incidental fill materials in RU 20 exceed the 1998 ROD RAO for the soil ingestion pathway. 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 SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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)	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.
	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. 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).

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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)	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. 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 Liquid Petroleum Fuels	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. 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.	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. 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.
	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.

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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 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.	<u>Utility Workers</u> 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 SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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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> Cancer risks associated with predominant fill materials present within RU 22b exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. 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> 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. 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. 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.

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SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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)**	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.
	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 one 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.
RU 22b: Old Ponds **(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 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. 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> Cancer risks associated with predominant fill materials present within RU 22c exceed the 1998 ROD RAO for the external exposure to gamma radiation pathway. Cancer and non-cancer risks associated with incidental fill materials exceed the 1998 ROD RAO for the soil ingestion pathway. <u>Construction Worker</u> Non-cancer risks associated with incidental fill materials in RU 22c exceed the 1998 ROD RAO for the soil ingestion pathway. 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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SUMMARY OF SRI FIELD PROGRAMS 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 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> 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.

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SUMMARY OF SRI FIELD PROGRAMS 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 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> 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.

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FMC Corporation, Pocatello, Idaho

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. Cancer and non-cancer risks associated with precipitator and phossy solids presumed present in underground piping do not exceed the 1998 ROD RAOs.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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.
	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.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
2008 Supplemental Remedial Investigation Details (*Final SRI Addendum Report*- November 2009)						
Background Soil Sampling		Background soil data was needed to develop comparative values (CV) for each COC which the soil data from the SUA/WUA and parcels were screened against.	A total of 10 background sampling locations were identified in the greater Pocatello area within a 6 to 11-mile radius of the former FMC Plant Site. At each site, 20 discrete samples, randomly located in a 10' by 10' grid, were collected from 2 intervals (0 to 2 inches and 2 to 6 inches bgs) for compositing into 2 samples. Discrete samples were collected from the center of the grid, one at 0 to 2 and another at 2 to 6 inches bgs for a total of 4 samples from each location that were submitted for analyses.	<u>0 to 2 inches</u> Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Fluoride Lead, Lithium, Manganese,Mercury Molybdenum, Nickel, Selenium, Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, Uranium-238 <u>2 to 6 inches</u> Radium-226, Lead 210,Uranium 238	The calculated 95% UCL concentrations within the 0 to 2 inch bgs sampling interval are generally similar between composite and discrete samples. Background samples from the 0 to 2 and 2 to 6 inch bgs intervals were analyzed for radionuclides and both the discrete and the composite samples from each interval have similar concentrations. The composite sample data were combined with the ecological and human health SSL to develop comparative values, against which the soil data collected from the SUA, WUA, and parcels 1-6 were screened (CVs = 95% UCL + SSLs).	NA
Southern Undeveloped Area (SUA)	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this relatively undisturbed area of the Plant Site because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	In both the SUA and WUA, a total of eight grids from a random origin were placed on these areas. Twenty discrete soil samples were collected from 0 to 2 inches bgs in each of these grids and used to prepare a single composite sample from each grid for a total of 8 composite samples from each area that were submitted for analyses.	<u>0 to 2 inches</u> Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Fluoride Lead, Lithium, Manganese,Mercury Molybdenum, Nickel, Selenium, Thallium,Uranium, Vanadium, Zinc	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the SUA (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Future Workers) – none • Ecological Risk Assessment – cadmium, fluoride, mercury, and vanadium.	Based on the findings of the *Supplemental ERA and HHRA Addenda*, no levels above a concern are exceeded in the SUA and thus it will not be forwarded to the SFS for evaluation of remedial alternatives.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
Western Undeveloped Area (WUA)	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this relatively undisturbed area of the Plant Site because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	In both the SUA and WUA, a total of eight grids from a random origin were placed on these areas. Twenty discrete soil samples were collected from 0 to 2 inches bgs in each of these grids and used to prepare a single composite sample from each grid for a total of 8 composite samples from each area that were submitted for analyses.	0 to 2 inches Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Fluoride Lead, Lithium, Manganese,Mercury Molybdenum, Nickel, Selenium, Thallium,Uranium, Vanadium, Zinc	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the WUA (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Future Workers) – none • Ecological Risk Assessment – cadmium and fluoride.	Based on the findings of the *Supplemental ERA and HHRA Addenda*, no levels above a concern are exceeded in the WUA and thus it will not be forwarded to the SFS for evaluation of remedial alternatives.
Parcel 1	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	A total of eight grids, from a random origin, were placed over the Parcel 1 area. From each grid, twenty discrete soil samples were collected from 0 to 2 inches bgs and 2 to 6 inches bgs. These samples were used to prepare two composite samples from each grid (one from 0 to 2inches and another from 2 to 6 inches bgs) for a total of 16 composite samples from this area that were submitted for analyses.	0 to 2 inches Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238 2 to 6 inches Radium-226, Lead 210,Uranium 238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 1 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Residential) – cadmium, fluoride, vanadium, uranium-238, radium-226, and lead-210 • Human Health Risk Assessment (Future Workers) – uranium-238, radium-226, and lead-210 • Ecological Risk Assessment – cadmium, chromium, fluoride, mercury, vanadium, and zinc.	The risks posed to human health have been sufficiently bound and provide adequate support to conclude that, at a minimum, Parcel 1 requires evaluation of remedial alternatives in the SFS for hypothetical future residential receptors. None of the COCs carried forward into the *Supplemental ERA Addendum* were found to be associated with risks above a level of concern.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
Parcel 2	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	A total of eight grids, from a random origin, were placed over the Parcel 2 area. From each grid, twenty discrete soil samples were collected from 0 to 2 inches bgs and 2 to 6 inches bgs. These samples were used to prepare two composite samples from each grid (one from 0 to 2inches and another from 2 to 6 inches bgs) for a total of 16 composite samples from this area that were submitted for analyses.	0 to 2 inches Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238 2 to 6 inches Radium-226, Lead 210,Uranium 238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 2 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Residential) – cadmium, fluoride, thallium, uranium, vanadium, uranium-238, radium-226, and lead-210 • Human Health Risk Assessment (Future Workers) – uranium-238, radium-226, and lead-210 • Ecological Risk Assessment – cadmium, chromium, fluoride, lead, mercury, selenium, vanadium, and zinc	The findings of the *Supplemental ERA Addendum* are similar to the findings of the BERA, namely that fluoride is the only COC that exceeds NOAEL HQs, although only marginally. As concluded in the BERA, the likelihood for adverse effects on population size or community composition is also considered marginal. Thus, while there are no mammalian or avian LOAEL HQs greater than one, potential fluoride ecological concerns in Parcel 2 will be carried forward into the SFS on the basis of the avian NOAEL HQs which are marginally above one. In addition, the risks posed to human health have been sufficiently bound and provide adequate support to conclude that, at a minimum, Parcel 2 requires evaluation of remedial alternatives in the SFS for hypothetical future residential receptors.
Parcel 3	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	A total of eight grids, from a random origin, were placed over the Parcel 3 area. From each grid, twenty discrete soil samples were collected from 0 to 2 inches bgs and 2 to 6 inches bgs. These samples were used to prepare two composite samples from each grid (one from 0 to 2inches and another from 2 to 6 inches bgs) for a total of 16 composite samples from this area that were submitted for analyses.	0 to 2 inches Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238 2 to 6 inches Radium-226, Lead 210,Uranium 238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 3 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Residential) – antimony, cadmium, fluoride, thallium, uranium, vanadium, uranium-238, radium-226, and lead-210 • Human Health Risk Assessment (Future Workers) – cadmium, uranium-238, radium-226, and lead-210 • Ecological Risk Assessment – cadmium, chromium, fluoride, lead, mercury, selenium, vanadium, and zinc.	The findings of the *Supplemental ERA Addendum* are similar to the findings of the BERA, namely that fluoride is the only COC that marginally exceeds NOAEL HQs, and a LOAEL HQ in one receptor although only slightly. As concluded in the BERA, the likelihood for adverse effects on population size or community composition is also considered marginal. Nonetheless, potential fluoride ecological concerns in Parcel 3 will be carried forward into the SFS. In addition, the risks posed to human health have been sufficiently bound and provide adequate support to conclude that Parcel 3 requires evaluation of remedial alternatives in the SFS for hypothetical future residential and future worker receptors.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
Parcel 4	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	A total of eight grids, from a random origin, were placed over the Parcel 4 area. From each grid, twenty discrete soil samples were collected from 0 to 2 inches bgs and 2 to 6 inches bgs. These samples were used to prepare two composite samples from each grid (one from 0 to 2inches and another from 2 to 6 inches bgs) for a total of 16 composite samples from this area that were submitted for analyses.	<u>0 to 2 inches</u> Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238 <u>2 to 6 inches</u> Radium-226, Lead 210,Uranium 238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 4 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health Risk Assessment (Residential) – cadmium, fluoride, uranium, vanadium, uranium-238, radium-226, and lead-210 • Human Health Risk Assessment (Future Workers) – uranium-238, radium-226, and lead-210 • Ecological Risk Assessment – cadmium, chromium, fluoride, mercury, selenium, vanadium, and zinc.	The findings of the *Supplemental ERA Addendum* are similar to the findings of the BERA, namely that fluoride is the only COC which exceeds NOAEL HQs, although only marginally. As concluded in the BERA, the likelihood for adverse effects on population size or community composition is also considered marginal. Thus, while there are no mammalian or avian total or LOAEL HQs greater than one, potential fluoride ecological concerns in Parcel 4 will be carried forward into the SFS on the basis of the avian NOAEL HQs which are marginally above one. In addition, the risks posed to human health have been sufficiently bound and provide adequate support to conclude that, at a minimum, Parcel 4 requires evaluation of remedial alternatives in the SFS for hypothetical future residential receptors.
Parcel 5	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions. Based on future landuse of this parcel (a gravel pit), stockpiled soils and undisturbed areas of this parcel were sampled.	A total of three 20-part composite samples were collected throughout this parcel. No samples were collected within the gravel pit or in the areas that contain backfilled materials. Twenty discrete samples from 0 to 6 inches bgs were collected from each of the 3 composite sample grids and were combined to prepare one composite sample from each grid. A total of 3 composite samples from this parcel were submitted for analyses.	<u>0 to 6 inches</u> Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 5 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below: • Human Health Risk Assessment (Residential) – cadmium, fluoride, uranium-238, radium-226, and lead-210 • Human Health Risk Assessment (Future Workers) – radium-226 • Ecological Risk Assessment – cadmium, fluoride, mercury, vanadium, and zinc	The risks posed to human health have been sufficiently bound and provide adequate support to conclude that, at a minimum, Parcel 5 requires evaluation of remedial alternatives in the SFS for hypothetical future residential receptors. None of the COCs carried forward into the *Supplemental ERA Addendum* were found to be associated with risks above a level of concern.

TABLE 3-1

SUMMARY OF SRI FIELD PROGRAMS RATIONALE, RESULTS, AND CONTAMINANT ASSESSMENT
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

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
Parcel 6	Surface Soil Char. Study	The surface soil investigation was conducted to see if there were impacts to this area because of historical FMC stack and fugitive dust emissions, along with current Simplot stack and fugitive dust emissions.	A total of eight grids, from a random origin, were placed over the Parcel 6 area. From each grid, twenty discrete soil samples were collected from 0 to 2 inches bgs and 2 to 6 inches bgs. These samples were used to prepare two composite samples from each grid (one from 0 to 2inches and another from 2 to 6 inches bgs) for a total of 16 composite samples from this area that were submitted for analyses.	<u>0 to 2 inches</u> Antimony, Arsenic Cadmium, Chromium,Fluoride, Lead,Manganese, Mercury,Selenium,Thallium,Uranium, Vanadium, Zinc, Lead-210, Radium-226, and Uranium-238 <u>2 to 6 inches</u> Radium-226, Lead 210,Uranium 238	Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the Parcel 6 (i.e., analyte comparisons to CVs), the following constituents exceeded CVs and were carried forward into the quantitative human health and/or ecological risk assessments. • Human Health (Residential) – cadmium, fluoride, uranium, vanadium, uranium-238, radium-226, and lead-210 • Human Health (Future Workers) – uranium-238, radium-226, and lead-210 • Ecological Risk Assessment – cadmium, chromium, fluoride, mercury, selenium, vanadium, and zinc.	The findings of the *Supplemental ERA Addendum* are similar to the findings of the BERA, namely that fluoride is the only COC that exceeds NOAEL HQs, although only marginally. As concluded in the BERA, the likelihood for adverse effects on population size or community composition is also considered marginal. Thus, while there are no mammalian or avian LOAEL HQs greater than one, potential fluoride ecological concerns in Parcel 6 will be carried forward into the SFS on the basis of the avian NOAEL HQs which are marginally above one. In addition, the risks posed to human health have been sufficiently bound and provide adequate support to conclude that, at a minimum, Parcel 6 requires evaluation of remedial alternatives in the SFS for hypothetical future residential receptors.

(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 3-2

COCs/ROCs IN SOILS IDENTIFIED DURING THE SRI COMPARED TO THE EMF ROD AND RI UPDATE MEMO IDENTIFIED COCs/ROCs
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho
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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	
Thallium	X		X	X
Thorium-230	b			
Uranium			X	

TABLE 3-2

COCs/ROCs IN SOILS IDENTIFIED DURING THE SRI COMPARED TO THE EMF ROD AND RI UPDATE MEMO IDENTIFIED COCs/ROCs
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Parameter	EMF ROD COCs/ROCs	RI Update Memo COPCs/ROPCs	SRI COPCs/ROPCs	SRI COCs/ROCs
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

TABLE 3-3

DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS SUPPLEMENTAL FEASIBILITY STUDY REPORT
FMC Corporation, Pocatello, Idaho
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
RA-A	3, 4, 5, 6, 20, and portions of 24	This area contains former office areas, parking areas, railroad siding, laydown areas, and Bannock Paving area. Most of the remedial area is covered with non-leachable fill including primarily slag, coke, silica, concrete, asphalt, and native soil. Underground piping (storm sewers) containing COCs (including P4) exists in RU 3 as listed separately below. RA-A does not encompass any identified or potential sources of COC releases to groundwater. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag Coke Ferrophos PCDT water residue	SWMU# 1 Drum Storage Unit SWMU# 38 Road Segments SWMU# 39 Chemical Lab Drain Pit SWMU# 46 Railcar Loading and Unloading Area-BPC SWMU# 47 Bannock Paving Areas SWMU# 47 Coke Settling Pond (former BAPCO Unit) SWMU# 48 Surface roads Bannock Paving Company SWMU # 61 Laboratory Chemical Disposal Area SWMU# 63 Long-Term Phosphorus Storage Tanks SWMU# 66 Boiler Fuel Tank and Pipeline Area SWMU# 68 Railroad Spurs SWMU# 70 Satellite Storage Area for Spent Laboratory Solvents SWMU# 72 Former Satellite Storage Area for Waste Paint Solvents SWMU# 92 P4 Maintenance Cleaning Facility (Decon Building) SWMU# 99 Drum Storage Area at Training Center SWMU# 101 Railcar Loading Overflow Tank
RA-A1	Portion of RU 20	This area is located at the former Bannock Paving area and included above ground fuel storage tanks and vehicle fueling area. This area was investigated during the SRI in 2007 and found to contain fuel PAHs above the soil SSLs. RA-A1 does not encompass any identified or potential sources of COC releases to groundwater. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag PCDT water residue Fuel spill residue	SWMU# 47 Bannock Paving Areas SWMU# 48 Surface roads Bannock Paving Company
RA-B	1, 2, and down gradient to include P4-impacted capillary fringe.	This area contains former locations of the furnace building, phossy dock, secondary condenser, and slag pit. Surface and/or subsurface fill within this remedial area contains P4 (subsurface), phossy solids, precipitator solids, slag, ore, concrete, asphalt, and silica. Underground piping containing COCs (including P4) exists in RUs 1 and 2. RA-B encompasses identified and potential sources of COC releases to groundwater.. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag P4 Precipitator solids Phossy solids Underground Piping Containing P4	SWMU# 5 Slag Pit Wastewater Collection Sump SWMU# 13 Andersen Filter Media (AFM) Washing Unit SWMU# 36 & 55 Rail Car Loading/Unloading, and Phos Dock SWMU# 38 Road segments SWMU# 41 (partial) Stacks and Vents SWMU# 54 Phos Dock Area SWMU# 60 Secondary Condenser/Former Fluid Bed Dryer Area SWMU# 68 Railroad Spurs SWMU# 73 Satellite Areas for Spent Anderson Filter Media SMWU# 74 East AFM Bin Area SMWU# 75 Precipitator Dust Slurry Pots SWMU# 76 Medusa Scrubber Blowdown Collection Tank SWMU# 77 P4 Load Dock, Scrub. Blowdown Sump, and NS Tank SWMU# 78 Washdown Collection Sumps--Furnace Building Area

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[2] 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.
[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

TABLE 3-3

DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS SUPPLEMENTAL FEASIBILITY STUDY REPORT
FMC Corporation, Pocatello, Idaho
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
			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 SWMU# 86 V-3700 Tank and Associated Piping SWMU# 90 V-3800 Tank and Associated Piping SWMU# 91 NOSAP Intercept Tank (Tank T-8010) SWMU#102 Former Slag Pit (prior to slag handling) SWMU# 104 #3 P4 Sump
RA-C	RUs 13, northern portion of 12, eastern portion of 22b, and a small portion of RU 24 between RUs 1 & 2 and RU 22b.	This area contains former phossy/precipitator slurry ponds, the piping corridor between RUs 1 and 2 and 22b (small portions of RUs 12 and 24), and the Pond 8S recovery process. Surface and/or subsurface fill within this area contains P4 (subsurface), phossy solids, precipitator solids, slag, ore, ferrophos, concrete and asphalt. Underground piping containing COCs (including P4) exists in RUs 13, 22b and 24. RA-C encompasses identified and potential sources of COC releases to groundwater.. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag Precipitator solids Phossy solids P4 Ferrophos PCDT water residue Underground Piping Containing P4	SWMU# 4 Former 8S Recovery Process 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 Pptr. Dust Pile atop pond 10S) SWMU# 38 Road Segments SWMU# 43 Ferrophos Storage Areas SWMU# 53 Old Pond 7S Tree-Line Area SWMU# 56 Drum Storage Area for other Nonhazardous Wastes SWMU# 57 Transformer Salvage Area SWMU# 58 PCB Storage Shed (removed 2000) SWMU# 59 Waste Oil Storage Area SWMU# 62 Area West of Mobile Shop SWMU# 64 (partial) Phossy Waste Pipeline Cleanout Areas SWMU# 65 (partial) Precipitator Slurry Pipeline Cleanout Areas SWMU# 71 Satellite Storage Areas for Waste Degreasing Solvents SWMU# 82 (partial) Facility-wide Wastewater Piping System SWMU# 83 High-pressure steam cleaning Station SWMU# 84 Used Oil Collection Tank SWMU# 107 Portable Storage Tanker for Dielectric Fluid

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[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

TABLE 3-3

DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS
SUPPLEMENTAL FEASIBILITY STUDY REPORT
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
RA-D	Western portion of 22b and Pond 9S	This area contains former clarified phossy water/precipitator slurry overflow ponds and precipitator slurry ponds. No P4 is present but surface/subsurface fill contains phossy solids, precipitator solids, slag, and ore. RA-D encompasses identified and potential sources of COC releases to groundwater. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag Precipitator solids Phossy solids PCDT water residue Underground Piping Containing P4	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# 52 Pond 7E
RA-E	RU 8, southern portion of RU 9, and southern portion of RU 16.	This area contains former ore kilns, kiln scrubber ponds, calciners, calciner pond solids stockpile, silica stockpiles, and calcined ore stockpiles. No P4 is present but surface/subsurface fill contains slag, ore, silica, kiln pond solids (subsurface). Underground piping containing COCs (including P4) exists in RU 8 and is listed separately below. RA-E encompasses identified and potential sources of COC releases to groundwater. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** Slag Ore Calciner pond solids Calcined ore Coke Underground Piping Containing P4	SWMU# 12 Wastewater Treatment Unit SWMU# 17 Calciner Pond Sediment Stockpile SWMU# 35 Three kiln Scrubber Ponds SWMU# 38 Road Segments SWMU# 41 Stacks and Vents (i.e., calciner system) SWMU# 51 Kiln (scrubber) Overflow Pond SWMU# 67 Former Flare Pit for Carbon Monoxide SWMU# 103 New Horizontal Flare Pit
RA-F	RUs 19, 11, and southern portion of 12	This area contains the slag pile and bullrock pile (RU 19) and former equipment maintenance/laydown areas (RUs 11 and 12). Surface and subsurface fill within this area consists predominantly of slag and bull rock. Southwestern corner of slag pile was location of the former plant landfill (RU 19b) and is listed separately below. Railcars containing P4 and phossy solids (RU 19c) are listed separately below. RA-F does not encompass any identified or potential sources of COC releases to groundwater. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Precipitator solids Phossy solids Ferrophos PCDT water residue	SWMU# 38 FMC surface road segments SWMU# 42 Slag Pile

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[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

TABLE 3-3

DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
RA-F1 (Buried Railcars)		In 1964, 21 railcars containing an estimated 10 to 25% P4 sludge were placed at the southern edge of the slag pile and covered with native soil. The railcars were then covered with 80 to 120 feet of slag as the slag pile progressed to the south. RU 19c is a potential source of COC releases to groundwater [3]. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Phossy solids P4	None
RA-F2 (Former Landfill)		This sub-area is located within the southwestern corner of the slag pile (RU 19). Landfill operations within this sub-area (RU 19b) began at the inception of plant operations in 1949 and ceased in 1980. Wastes placed in RU 19b included slag, office wastes (consisting of office and lunchroom solid wastes), industrial wastes (consisting of asbestos, spent solvents, oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, fluid-bed dryer wastes, and AFM) furnace rebuild/digout wastes (consisting of furnace feed materials, carbon materials, concrete, rocks, and debris), IWW sediments, and baghouse dust. These wastes are covered by 50 - >100 ft of slag. RU 19b is a potential source of COC releases to groundwater [3]. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Office wastes Industrial wastes – asbestos wastes, spent solvents, and oily residues, transformer oil, kiln scrubber solids, phosphorus-bearing wastes, fluid-bed dryer wastes AFM Furnace digout/rebuild wastes	SWMU# 44 Landfill (old)

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[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

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DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS SUPPLEMENTAL FEASIBILITY STUDY REPORT
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
RA-G	RUs 7, northern portion of 9, 10, 15, northern portion of 16, and portions of 24.	This area contains the ore stockpiles, silica stockpile, IWW pond and ditch, dry process waste pile (RU 15) and the northern portion of RU 16. Surface and subsurface fill within this area include various plant solid materials including ore, baghouse dust, coke, carbon, calciner solids, and slag. RA-G does not encompass any identified or potential sources of COC releases to groundwater. The northeastern portion of RA-G (on State land) includes areas within the PCDA Development Agreement. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Ore Coke Calcined ore Calciner pond solids Precipitator solids	SWMU# 16 Calciner Solids Pile SWMU# 37 Shale Ore Handling Areas SWMU# 38 Road segments SWMU# 49 Industrial Wastewater Basin SWMU# 50 Industrial Wastewater Ditch SWMU# 69 Oversize Ore, Broken and Used Electrode, Baghouse Dust Storage and Recycling, and Used Conveyor Belt Area SWMU# 105 Coke Unloading Building SWMU# 106 Nodule Pile
RA-H	RUs 17 and 18	This area contains the active plant landfill (RU 18) and the construction/demolition debris landfill (RU 17). Surface and subsurface fill within this area contains solid waste including plant trash, Andersen filter media (AFM), asbestos, empty containers, concrete, carbon, and furnace feed materials (ore, silica, coke). RA-H is a potential source of COC releases to groundwater [3]. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Furnace feed materials (ore, silica, coke) Office wastes Packaging materials AFM Asbestos containing materials Carbon	SWMU# 38 Road segments SWMU# 45 Landfill (also referred to as Solid Waste Landfill) SWMU# 89 Roadway Landfill
RA-I	Northern Properties (Parcels 1, 2, 4, 5, and 6)	This area of the FMC Plant OU is north of the Plant Site and includes all land owned by FMC (Parcels 1, 2, 4, 5, and 6) with exception of Parcel 3. It was not used for plant production activities, but was used for various agricultural, commercial and recreational activities. Some slag was applied to the surface for roads and parking. RA-I does not encompass any identified or potential sources of COC releases to groundwate**r.** **Sources Considered for HHRA and ERA Exposure Scenarios:** Fugitive dust and stack emissions deposited on land surface.	None

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[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

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DESCRIPTION OF REMEDIATION AREAS (RAS) TO BE USED IN THE SFS
SUPPLEMENTAL FEASIBILITY STUDY REPORT
FMC Corporation, Pocatello, Idaho
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RAs	RUs	Description and Fill/Source Materials	Associated RCRA SWMUs [1]
RA-J	Northern Properties (Parcel 3)	This area of the FMC Plant OU contains property (Parcel 3) north of Highway 30, but south of I-86 on State lands. It was not used for plant production activities, but was used for various agricultural and commercial activities. RA-J does not encompass any identified or potential sources of COC releases to groundwater.. **Sources Considered for HHRA and ERA Exposure Scenarios:** Fugitive dust and stack emissions deposited on land surface.	None
RA-K (Railroad Swale)	RU 22c	This sub-area is located along the northeastern border of the FMC Plant Site and was used for stormwater retention. In addition to stormwater, the Railroad swale (RU 22c) also received an intermittent flow of phossy water and is known to contain low levels of P4 and phossy solids. In the late 1980s, the railroad swale was excavated and backfilled with slag and ore. RU 22c is a potential source of COC releases to groundwater[3]. **Fill/Source Materials Considered for HHRA Exposure Scenarios:** Slag Phossy solids P4 Ore	SWMU# 18 Railroad Swale
UG Piping		This sub-area includes underground piping that remains in place and may contain P4, precipitator solids, and/or phossy solids. This UG piping is believed to exist in RUs 1, 2, 3, 8, 12, 13, 22b and 24. UG Piping is a potential source of COC releases to groundwater[3]. **Fill/Source Materials Considered for HHRA Exposure Scenarios[2]:** P4 Precipitator solids Phossy solids	SWMU# 64 Phossy Waste Pipeline Cleanout Areas SWMU# 65 Precipitator Slurry Pipeline Cleanout Areas
FMC Plant OU Groundwater		The nature and extent of the FMC Plant OU wide impacted groundwater and evaluation / identification of FMC (and non-FMC) sources of groundwater impacts are described in the Groundwater Current Conditions Report for the FMC Plant OU (MWH, June 2009).	

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[3] These RAs / subareas have not been identified as sources that have discernibly impacted groundwater (GWCCR, June 2009); however, based on historical knowledge and/or the SRI results, the SFS will consider these RAs / subareas as potential sources of COC releases to groundwater.

TABLE 4-1

POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OTHER THAN THOSE BASED ON RCRA OR ASSERTED TRIBAL STANDARDS FOR THE FMC PLANT OPERABLE UNIT AT THE EASTERN MICHAUD FLATS SUPERFUND SITE
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Potential Applicable or Relevant Requirements			
Subject matter	**Citation**	**Description**	**Discussion**
Discharges of pollutants or dredged and fill materials to surface waters and wetlands	Clean Water Act, 33 USC §§1311 and 1342; 40 CFR Parts 121-131	Point source discharges to rivers, streams and other waters of the United States generally require Clean Water Act NPDES permits and compliance with technology-based and water quality-based discharge limits.	NPDES permits and the technology-based and water quality-based effluent limits they establish are generally applicable to point source discharges to surface waters. With respect to discharges to surface waters that are a component of CERCLA response actions, the procedural requirement to obtain an NPDES permit would be waived under CERCLA Section 121(e) but the substantive NPDES requirements are potentially relevant and appropriate.
	40 CFR Part 131	As specified at CERCLA Sections 121(d)(2)(A)-(B)(i), federal water quality criteria are minimum levels of control that CERCLA cleanups must attain where such criteria are relevant and appropriate in the circumstances of the release.	Federal water quality criteria (FWQC) are potentially relevant and appropriate to FMC OU releases to surface waters depending on the designated or potential use of the water body, the environmental media affected, the purposes for which the criteria were developed, and the latest information, as specified at CERCLA §121(d)(2)(B)(i) and 40 CFR Part 131.
	IDAPA 58.01.02	Idaho water quality criteria and standards.	State water quality standards are potential ARARs with respect to FMC Plant OU releases to surface waters to the extent that the state standards are more stringent than the FWQC.
	Clean Water Act, 33 USC §§1311 and 1344; 33 CFR §§320 and 323	Clean Water Act Section 404 permits are generally required for discharges of dredged or fill material to wetlands and other waters of the United States.	The substantive requirements of the Section 404 program would be applicable to any CERCLA response action at the FMC Plant OU that involved filling jurisdictional wetlands, or dredging or filling in navigable waters, but no Section 404 permit would be required due to the CERCLA §121(e) permit waiver.

FMC Plant OU ARARs apart from RCRA-based or potential Tribal-based

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POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OTHER THAN THOSE BASED ON RCRA OR ASSERTED TRIBAL STANDARDS FOR THE FMC PLANT OPERABLE UNIT AT THE EASTERN MICHAUD FLATS SUPERFUND SITE
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Potential Applicable or Relevant Requirements			
Subject matter	**Citation**	**Description**	**Discussion**
	40 CFR Part 403	Sets standards to control pollutants that pass through or interfere with treatment processes at publicly-owned treatment works (POTWs) or that may contaminate POTW sludge. Applicable pass through/ interference standards are set by individual POTWs.	Substantive pretreatment requirements would apply to any discharges of water generated during the FMC Plant OU remedial action that was sent to a POTW for treatment before discharge to surface waters. Administrative requirements for a pretreatment permit would not apply, due to the CERCLA §121(e) permit waiver.
	Executive Order No. 11990	Direction to federal agencies to implement federal programs and activities in a manner that minimizes the loss or degradation of wetlands.	Policy statement rather than an ARAR, but would be relevant consideration for any CERCLA response action that would result in wetland loss or degradation.
Releases to groundwater	Safe Drinking Water Act, 42 USC §300f et seq. (SDWA)	Standards for water supplied by public water systems for human consumption.	SDWA drinking water standards are potentially relevant and appropriate with respect to FMC Plant OU releases as discussed below.
	40 CFR Part 141; IDAPA 58.01.08.002	Primary maximum contaminant levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for water supplied by public water systems for human consumption.	MCLs and non-zero MCLGs (public health goals) are relevant and appropriate for any FMC Plant OU releases to current or potential sources of drinking water. Pursuant to CERCLA Sections 121(d)(2)(A)-(B)(i), MCLs and non-zero MCLGs are minimum levels of control CERCLA cleanups must attain depending on the circumstances of the release, i.e., where the release is to a current or potential drinking water source.
	40 CFR Parts 144-147	Provides protection of underground sources of drinking water applicable to Underground Injection Control (UIC) program.	UIC standards would be applicable or relevant and appropriate if the selected remedial action at the FMC Plant OU included injection of contaminants into underground sources of drinking water, although a UIC permit would not be needed due to the CERCLA §121(e) permit exemption.

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SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Potential Applicable or Relevant Requirements			
Subject matter	**Citation**	**Description**	**Discussion**
	IDAPA 58.01.11	Establishes state ground water quality standards based on aquifer category and groundwater uses.	Applicable or relevant and appropriate for FMC Plant OU releases to groundwater to the extent that 1) MCLs and MCLGs are not relevant and appropriate, or 2) these ground water quality standards are more stringent than MCLs and non-zero MCLGs.
Radionuclide releases to soil or groundwater	Uranium Mill Tailings Radiation Control Act (UMTRCA), 42 U.S.C. §7901 et seq.; EPA Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, 40 C.F.R. Part 92	EPA regulations establish ground water and soil concentration limits applicable to the uranium and thorium mill tailings sites identified under the UMTRCA statute.	Applicable only to the closed set of 24 sites identified under UMTRCA and the EPA regulations. Relevant and appropriate to the extent site uses are similar to those assumed in the Part 92 regulations given that the standards are health-based and focus on radium-226, the predominant radionuclide of concern (ROC) at the FMC Plant OU.
Releases to air	40 CFR Part 50 National Primary and Secondary Ambient Air Quality Standards (NAAQS)	Designed to form the basis for SIP, FIP and air operating permit requirements that are protective of human health and welfare.	Potential relevant and appropriate standards with respect to emissions-generating remedial actions such as air sparging/ biosparging, vapor extraction and bioventing.
	40 CFR Part 60 New Source Performance Standards (NSPS)	Sets emission standards for specific categories of new and modified sources.	Potential but unlikely applicable or relevant and appropriate standards for emissions-generating remedial actions such as air sparging/ biosparging, vapor extraction and bioventing. Like NAAQS, intended for incorporation into enforceable instruments such as SIPs and air operating permits. Not likely to be

TABLE 4-1

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SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Potential Applicable or Relevant Requirements			
Subject matter	**Citation**	**Description**	**Discussion**
			applicable or relevant and appropriate because it is unlikely that the CERCLA remedial action for the FMC Plant OU will include treatment systems or other emission sources for which NSPS have been promulgated.
	IDAPA 58.01.01	State of Idaho air pollution control rules.	Potentially applicable or relevant and appropriate for emissions-generating remedial actions such as air sparging/ biosparging, vapor extraction and bioventing to the extent the state standards are more stringent than federal-based ARARs, including FARR requirements discussed below.
	Federal Implementation Plan under the Clean Air Act for the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation of Idaho (FARR), 40 C.F.R. §10701 et seq. (70 Fed. Reg. 18073, April 8, 2005).	Establishes air emissions limits, source registration, recordkeeping and other requirements.	Potential relevant and appropriate standards for emissions-generating remedial actions such as air sparging/ biosparging, vapor extraction and bioventing. Substantive emissions standards and other non-administrative requirements of the FARR should be considered and met with respect to emission sources that are components of the CERCLA remedial action.
Removal or remediation of underground storage tanks	40 CFR §§280.60 - .66	Standards for response/ corrective action for USTs containing petroleum or hazardous substances.	Part 280 release response requirements would be applicable if the selected remedy addresses releases from regulated UST systems and could be relevant and appropriate for releases from underground tank systems not addressed by these regulations.

TABLE 4-1

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SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Other Potentially Relevant Laws			
Subject matter	**Citation**	**Description**	**Discussion**
Migratory bird habitat	Migratory Bird Treaty Act, 16 USC §§703-712; 50 CFR §10.13	Prohibits taking, killing or selling federally-designated migratory birds.	Remedial action at FMC Plant OU must be designed and implemented to avoid takings or killings of migratory birds.
Bald eagle and golden eagle habitat	Bald Eagle and Golden Eagle Protection Act, 16 U/SC §§668-668d	Prohibits taking, killing or selling or bald eagles and golden eagles.	Remedial actions at FMC Plant OU must be designed and implemented to avoid takings or killings of bald eagles or golden eagles.
Occupational exposures to on-site remediation workers	Occupational Safety and Health Act, 29 USC §§651-678	Regulates worker health and safety. Sets general industry standards for workplace exposure to chemicals, and sets health and safety training requirements for workers at hazardous waste sites.	OSHA worker safety standards are independently applicable to hazardous waste and remediation sites.
	29 CFR Part 1910, Subpart Z	Establishes occupational exposure levels for specific contaminants.	OSHA worker safety standards are applicable to hazardous waste and remediation sites.

TABLE 4-1A

RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
Hazardous waste generation and shipment to an off-site treatment, storage and/or disposal (TSD) facility	Determining whether generated waste is a RCRA hazardous waste	40 CFR §262.11	Requirement to determine at the point of generation whether waste is a RCRA hazardous waste	ARAR	Applicable to waste materials that are excavated or otherwise generated as part of the CERCLA remedial action
	Identification of RCRA hazardous waste	40 CFR §§261.2-.9, and 40 CFR Part 261 Subparts B (waste characteristics) and D (waste listings)	Criteria for determining if a material is a RCRA solid waste and RCRA hazardous waste, and not excluded from RCRA regulation	ARAR	Same as above
	Labeling and packaging of RCRA hazardous wastes that will be sent to an off-site TSD facility	40 CFR §§262.30-.33	RCRA hazardous wastes to be sent to an off-site TSD facility must be properly packaged, labeled and placarded	ARAR	Same as above
On-site hazardous waste management and storage	Management requirements for waste accumulation storage units	40 CFR §§262.34 and incorporated 40 CFR Part 265 Subpart I standards for containers, Part 265 Subpart J standards for tanks, Part 265 Subpart W standards for drip	Containers, tanks, drip pads and containment buildings in which RCRA hazardous wastes are accumulated on-site must meet unit integrity, labeling and management requirements. For example, containers must	ARAR	These management requirements would be applicable to any wastes excavated or otherwise generated by the remedial action, determined to be RCRA hazardous waste, and stored on-site prior to shipment to a TSD facility. The referenced management requirements would apply depending on the types of storage units that were used. Some of these standards,

TABLE 4-1A

RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
		pads, Part 265 Subpart DD standards for containment buildings, and Part 265 Subpart BB standards for any stored hazardous waste that contains 10% or more organics by weight	be kept closed except when adding or removing waste, and tanks must meet leak detection and secondary containment requirements.		such as the requirements for keeping containers closed and similar physical requirements, also may be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create risks similar to those created by RCRA hazardous wastes if managed in units not meeting these standards.
	Alternate management requirements for storing hazardous remediation waste under Temporary Unit designation	40 CFR §264.553	Hazardous remediation waste may be stored on-site in containers and tanks under alternate conditions to those applicable to TSD facility operation	ARAR	Applicable to hazardous remediation waste managed under Temporary Unit criteria. May be relevant and appropriate to non-hazardous waste that creates risks from container and tank storage similar to those presented by hazardous waste.
	General management requirements for ignitable, reactive, or incompatible wastes	40 CFR §§264.17/ 265.17	TSD facility owners and operators must separate and protect ignitable or reactive waste from sources of ignition or reaction, including for example open flames and	ARAR	Applicable to any waste materials excavated or otherwise generated as part of the CERCLA remedial action that constitute ignitable, reactive or incompatible RCRA hazardous wastes and are managed on-site. May be relevant and appropriate to other types of hazardous and

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			hot surfaces and by posting "No Smoking" signs, to prevent accidental ignition or reaction. Also, where specifically required under other RCRA regulations, TSD owners and operators must take steps to prevent reactions that threaten human health or the environment including production of uncontrolled toxic mists or fumes in sufficient quantities to create such endangerment		non-hazardous waste generated by the remedial action and managed on-site to the extent such management creates hazards similar to ignitable, reactive or incompatible RCRA hazardous waste.
	Management requirements for ignitable, reactive, or incompatible RCRA hazardous wastes: **containers**	40 CFR §§264.176 and 264.177; 40 CFR §§265.176 and 265.177	Containers into which ignitable or reactive RCRA hazardous wastes are placed must be located at least 15 meters (50 feet) from the facility's property boundary; and incompatible wastes generally must not be combined in the same	ARAR	Applicable to any waste materials excavated or otherwise generated as part of the CERCLA remedial action that constitute ignitable, reactive or incompatible RCRA hazardous wastes and are placed into containers. May be relevant and appropriate to other types of hazardous and non-hazardous waste generated by the remedial action and placed into containers to the extent such management creates hazards similar to

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			container		ignitable, reactive or incompatible RCRA hazardous waste.
	Management requirements for ignitable, reactive, or incompatible RCRA hazardous wastes: **tanks**	40 CFR §§264.198 and 264.199; 40 CFR §§265.198 and 265.199	Ignitable or reactive RCRA hazardous waste must not be placed into tank systems, unless immediately treated to remove those characteristics or otherwise treated or stored to prevent ignition or reaction; and incompatible wastes generally must not be placed into tank systems	ARAR	Applicable to any waste materials excavated or otherwise generated as part of the CERCLA remedial action that constitute ignitable, reactive or incompatible RCRA hazardous wastes and are placed into tanks. May be relevant and appropriate to other types of hazardous and non-hazardous waste generated by the remedial action and placed into tanks to the extent they create hazards similar to ignitable, reactive or incompatible RCRA hazardous waste.
	Management requirements for ignitable, reactive, or incompatible RCRA hazardous wastes: **waste piles, surface impoundments, land treatment units, and landfills**	40 CFR §§ 264.256 and 264.257/ 40 CFR §§265.256 and 265.257 (waste piles); 40 CFR §§264.229 and 264.230/ §§265.229 and 265.230 (surface impoundments); 40 CFR §§264.281	Ignitable or reactive RCRA hazardous waste must be treated to remove those characteristics and meet RCRA Land Disposal Restriction (LDR) requirements before being placed in waste piles, surface impoundments, land treatment units or landfills; and incompatible	ARAR	Applicable to any waste materials excavated or otherwise generated as part of the CERCLA remedial action that constitute ignitable, reactive or incompatible RCRA hazardous wastes and are placed in waste piles, surface impoundments, land treatment units or landfills. May be relevant and appropriate to other types of hazardous and non-hazardous wastes generated by the remedial action and placed in such units to

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
		and 264.282/ 40 CFR §§265.281 and 265.282 (land treatment units); and 40 CFR §§264.312 and 264.313/ 40 CFR §§265.312 and 265.313 (landfills)	wastes generally must not be placed into such units		the extent they create hazards similar to ignitable, reactive or incompatible RCRA hazardous waste.
	Management requirements for ignitable, reactive, or incompatible RCRA hazardous wastes: **miscellaneous units**	40 CFR Part 264 Subpart X	Hazardous waste, including ignitable, reactive or incompatible hazardous wastes, that are placed in miscellaneous units (i.e., units other than containers, tanks, landfills and other units for which there are specific Part 264 standards) must be managed in accordance with Part 264 Subpart X environmental and human health protectiveness standards and pertinent standards from Part 264	ARAR	Applicable to any waste materials excavated or otherwise generated as part of the CERCLA remedial action that constitute ignitable, reactive or incompatible RCRA hazardous wastes and that are managed in miscellaneous units. May be relevant and appropriate to other types of hazardous and non-hazardous wastes generated by the remedial action and placed in such units to the extent they create hazards similar to ignitable, reactive or incompatible RCRA hazardous waste.

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			unit-specific provisions		
	Accumulation area closure requirements	40 CFR §§262.34, 265.111 and 265.114	When RCRA hazardous waste accumulation areas are closed they must meet the decontamination and general health and environmental protectiveness criteria specified respectively at 40 CFR §§265.114 and 265.111	ARAR	Any accumulation areas storing RCRA hazardous waste generated by the CERCLA remedial action must be closed in accordance with 40 CFR §§265.114 and 265.111
On-site treatment of hazardous waste generated by the CERCLA remedial action using specific treatment processes or facilities	Tanks	40 CFR Part 264/ 265 Subpart J; 40 CFR §264.553	Tank systems that are used to treat RCRA hazardous waste must comply with the design and operating requirements specified in Part 264/ 265 Subpart J; unless those are modified for hazardous remediation waste treatment under 40 CFR §264.553 Temporary Unit designation	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined to be RCRA hazardous waste, and are then treated in a tank system. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in tanks not meeting these standards, and the standards are necessary to meet FMC Plant OU Remedial Action Objectives (RAOs).

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
	Containers	40 CFR Part 264/ 265 Subpart I; 40 CFR §264.553	Containers that are used to treat RCRA hazardous waste must comply with the requirements specified in Part 264/ 265 Subpart I; unless those are modified for hazardous remediation waste treatment under 40 CFR §264.553 Temporary Unit designation		Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined to be RCRA hazardous waste, and are then treated in containers. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in containers that do not meet these standards, and the standards are necessary to meet FMC Plant OU Remedial Action Objectives (RAOs).
	Waste piles	40 CFR Part 264/ 265 Subpart L	Waste piles that are used for treating RCRA hazardous waste must comply with the design and operating requirements specified in Part 264/ 265 Subpart L	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined to be RCRA hazardous waste, and are then treated in a waste pile. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in waste piles not meeting these standards, and the standards are necessary to meet RAOs.
	Land treatment	40 CFR Part 264/ 265 Subpart M	Land treatment units that are used for treating RCRA	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of

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SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			hazardous waste must comply with the design and operating requirements specified in Part 264/ 265 Subpart M		the CERCLA remedial action and determined to be RCRA hazardous waste, and are then treated in a land treatment unit. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in land treatment units not meeting these standards, and the standards are necessary to meet RAOs.
	Incinerators	40 CFR Part 264 Subpart O	Incinerators that are used to treat RCRA hazardous waste must meet the design and operating requirements specified in Part 264 Subpart O, including Clean Air Act requirements at 40 CFR Part 63 Subpart EEE during incinerator operations	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined to be RCRA hazardous waste, and are then treated in an incinerator. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in incinerator units not meeting these standards, and the standards are necessary to meet RAOs.
	Miscellaneous units	40 CFR Part 264 Subpart X	Hazardous waste treatment in miscellaneous units (i.e., units other than containers, tanks, landfills and other	ARAR	Applicable or relevant and appropriate to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			units for which there are Part 264 unit-specific standards) must comply with the environmental performance, monitoring and other standards specified in Part 264 Subpart X and pertinent requirements from Part 264 unit-specific provisions. Thermal treatment units, for example, are not addressed by specific Part 264 provisions and thus would be governed under Subpart X.		to be RCRA hazardous waste, and that are treated in a miscellaneous unit. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if treated in miscellaneous units not meeting these standards, and the standards are necessary to meet RAOs.
	Containment buildings	40 CFR Part 264/ 265 Subpart DD	Containment buildings that are used to store or treat RCRA hazardous waste must comply with the design and operating requirements specified in Part 264/ 265 Subpart DD	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and determined to be RCRA hazardous waste, and are then stored or treated in a containment building. May be relevant and appropriate to wastes generated by the remedial action that are non-hazardous but that would create similar risks if managed in containment buildings not meeting these

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
					standards, and the standards are necessary to meet RAOs.

Note: The next section of this list of potential RCRA ARARs discusses RCRA requirements associated with hazardous waste disposal. For RCRA requirements triggered by "disposal," it is important to note that as a threshold matter RCRA land disposal occurs only with respect to waste that is hazardous at the point of generation. For contaminated environmental media, the point of generation and thus the point of waste characterization is when the media are excavated during the remediation process. Secondly, whether RCRA hazardous waste "land disposal" occurs during remediation depends in part on how the waste is managed with respect to Areas of Contamination at the Site. As stated in EPA guidance: *" 'Land disposal' occurs when wastes from different AOCs are consolidated into one AOC; when wastes are moved outside an AOC (for treatment or storage) and returned to the same or a different AOC; or when wastes are excavated, placed in a separate hazardous waste management unit such as an incinerator or tank within the AOC, and then redeposited into the AOC."* This is stated at page 3 of "*Guide to Management of Investigation-Derived Wastes,"* OSWER 9345.3-03FS (January 15, 1992). Based on that EPA guidance, RCRA disposal does not occur when 1) wastes are moved and consolidated within the same AOC or unit, even if some degree of treatment occurs in the course of such consolidation ; 2) wastes are treated in-situ without excavation; or 3) wastes are capped or otherwise left in place. The cited EPA guidance also states as follows: *"Storing IDW in a container ('a portable device in which a material is stored, transported, treated, disposed of, or otherwise handled' (40 CFR 260.10)) within the AOC and then returning it to its source, however, is allowable without meeting the specified LDR treatment standards. Under the definition of 'hazardous waste management unit' (40 CFR 260.10), EPA states that 'a container alone does not constitute a unit; the unit includes the containers and the land or pad upon which they are placed.' Therefore, returning IDW that has been stored in containers (not tanks or other RCRA-regulated units) within the AOC to its source does not constitute land disposal, as long as containers are not managed in such a manner as to constitute a RCRA storage unit as defined in 40 CFR 260.10. In addition, sampling and direct replacement of wastes within an AOC do not constitute land disposal."* OSWER 9345.3-03FS (January 15, 1992), page 3 (emphasis in original). In addition to circumstances in which RCRA disposal requirements may be applicable, in other circumstances they may be relevant and appropriate where the CERCLA remediation waste is similar to but does not constitute RCRA hazardous waste or where the remediation waste is placed into a unit but not in one of the ways described above that make it RCRA "disposal." The evaluations presented below in this table discuss RCRA disposal requirements both as they would be applicable and also as they could be relevant and appropriate. Also, note that there are somewhat different criteria for applying ARARs to management and disposal of investigation-derived waste (IDW), such as the threshold criterion that ARARs apply to IDW only "to the extent practicable." See 55 Fed. Reg. 8756 (March 8, 1990); OSWER 9345.3-03FS (January 15, 1992), page 1.

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
On-site disposal of hazardous waste excavated or otherwise generated by the CERCLA remedial action	Location standards for RCRA hazardous waste TSD facilities	40 CFR §§265.18 (interim status standard) and 264.18 (applicable to RCRA Part B permitted facilities)	Part 265 interim status standard: RCRA hazardous waste generally cannot be placed in a salt dome, salt bed formation, underground mine, or cave. Part 264 permit standard: the interim status standard summarized above, and added seismic and floodplain standards as follows: 1) new TSD facilities must not be located within 61 meters (200 feet) of a Holocene era fault, and 2) TSD facilities located in a 100-year floodplain must be designed, operated and maintained to prevent washout of hazardous waste	ARAR	The TSD facility location standards would be applicable (Part 265) or relevant and appropriate (Part 264, which applies only to permitted facilities and not those like FMC Pocatello that have not yet been issued a Part B permit) with respect to any on-site storage, treatment or disposal of waste materials that 1) are excavated or otherwise generated as part of the CERCLA remedial action, 2) are determined to be RCRA hazardous waste and 3) whose treatment, storage or disposal would normally require a RCRA permit. These location standards also may be relevant and appropriate to units treating or otherwise managing CERCLA remediation waste that is not RCRA hazardous waste, if the risks of releases from those units caused by being located in the prohibited areas are similar to the risks meant to be prevented by the location standards, and these requirements are necessary to meet site RAOs.
	Minimum technological requirements (MTRs)	40 CFR §§264.221/ 265.221 (surface impoundments)	New surface impoundments and landfills whose	ARAR	Applicable to any waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
	for surface impoundments or landfills into which hazardous waste would be placed	and 40 CFR §§264.301/ 265.301 (landfills)	construction commenced after July 29, 1992, and replacements that began reuse after that date, must have two or more liners and a leachate collection and removal system installed between the liners		determined to be a hazardous waste, and which are then placed into a surface impoundment or landfill that is subject to the MTRs. The MTR requirements also may be relevant and appropriate where the remediation waste is not RCRA hazardous but presents risks of contaminant migration to the subsurface that the MTRs are designed to prevent, and these requirements are necessary to meet site RAOs.
	Alternate standards for land placement of hazardous remediation wastes	40 CFR §§264.552 and 264.554	Hazardous wastes generated from facility remediation can be placed on land under alternate standards specified for Corrective Action Management Units (40 CFR §264.552) and Remediation Waste Staging Piles (40 CFR §264.554)	ARAR	Applicable to hazardous wastes excavated or otherwise generated from the remedial action that are subject to these alternate standards. May be relevant and appropriate to wastes generated from the remedial action that are not hazardous but that present risks from land placement similar to risks from hazardous waste that these standards are designed to prevent, and application of these standards is necessary to meet site RAOs.
	Land Disposal Restriction (LDR) treatment	40 CFR Part 268	Wastes that are RCRA hazardous at the point of generation generally must	ARAR	Applicable to waste materials that are excavated or otherwise generated as part of the CERCLA remedial action and

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
	requirements		be de-characterized and treated, before land placement or disposal, using the technologies and meeting the standards specified at 40 CFR §268.40. For most wastes this includes meeting the Universal Treatment Standards (UTSs) specified at 40 CFR §268.48. Soils exhibiting a hazardous waste characteristic or containing a listed waste may meet LDR requirements through the alternate treatment standards established on May 26, 1998 under the LDR Phase IV rule, codified at 40 CFR §268.49.		determined to be RCRA hazardous waste, and then disposed to the land through a means that is not exempt from LDR treatment requirements [examples of exemptions include wastewater treatment units discharging to a POTW or under an NPDES permit, see 40 CFR §268.1(c)(4)]. Not applicable to land placement of waste materials generated by the remedial action, whether RCRA hazardous or not, if the placement does not constitute RCRA disposal (e.g., consolidation within a single AOC). Also not applicable to soils and other environmental media that are not excavated and are instead left in place, because environmental media are not RCRA wastes until they are generated through excavation. May be relevant and appropriate to land disposal of waste materials excavated or otherwise generated by the remedial action that are not RCRA hazardous waste, based on factors including 1) whether land placement of such materials without treatment would be inconsistent with the site RAOs and 2) the extent to which the waste is found in a more complex matrix (such as in

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
					combination with debris and/or other types of waste) than what was assumed in developing the LDR treatment standards.
Closure and post-closure standards for hazardous waste management units	General RCRA performance standard for hazardous waste management unit closures	40 CFR §§264.111/ 265.111 and 40 CFR §§ 264.114/ 265.114	Waste management units that handled RCRA hazardous waste must be closed and receive post-closure care to minimize the need for further maintenance and to control, minimize or eliminate later escape of hazardous waste and constituents to the extent necessary to protect human health and the environment. In addition, equipment, structures and soil that become contaminated from contact with RCRA hazardous waste must be properly disposed of or decontaminated.	ARAR	Applicable to any storage, treatment or disposal units (and associated equipment, structures and soil) that would be used to manage waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate with respect to units that were used to manage non-hazardous remediation waste, where such waste presented risks similar to those from RCRA-regulated hazardous waste, and where meeting the general and specific closure and post-closure care standards (discussed in this table below) would address such risks and be necessary to meet site RAOs.

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
	Closure and post-closure standards for specific units: **tanks**	40 CFR §§264.197/ 265.197	Tank systems that managed RCRA hazardous waste must be closed by removal or decontamination of waste residues and contaminated structures and equipment and unless clean closed must receive post-closure care.	ARAR	Applicable to any tank system that would be used to manage waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for any tanks that were used to manage non-hazardous remediation waste, where such waste presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to meet RAOs.
	Closure and post-closure standards for specific units: **land treatment facilities**	40 CFR §§264.280/ 265.280	Land treatment facilities that managed RCRA hazardous waste must be closed in a manner that controls migration of hazardous waste and constituents into the groundwater, controls the release of contaminated run-off into surface water, controls the release of airborne particulate contaminants by wind	ARAR	Applicable to any land treatment facility that would be used to manage waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for any land treatment facility that was used to manage non-hazardous remediation waste, where such waste presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to

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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
			erosion, and meets the other requirements specified in the cited regulation including for post-closure care		meet RAOs.
	Closure and post-closure standards for specific units: **landfills**	40 CFR §§264.310/ 265.310	Landfills that manage RCRA hazardous waste must be closed by installation of a cover that 1) provides long-term minimization of liquids migration through the impoundment, 2) functions with minimal maintenance, 3) promotes drainage and minimizes erosion, 4) accommodates settling and subsidence without impairing the cover, and 5) has a permeability less than or equal to the permeability of any bottom liner system or natural subsoils. Post-closure care also must be provided.	ARAR	Applicable to any landfill that would be used to manage waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for any landfill that was used to manage non-hazardous remediation waste, where such waste presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to meet RAOs.

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
	Closure and post-closure standards for specific units: **incinerators**	40 CFR §264.351	At closure, all RCRA hazardous waste and residues must be removed from the incinerator. No post-closure care required because all hazardous wastes and residues must be removed at closure.	ARAR	Applicable to any incinerator that would be used to treat waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for any incinerator that was used to treat non-hazardous remediation waste, where the waste remaining in the unit presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to meet RAOs.
	Closure and post-closure standards for specific units: **miscellaneous units**	40 CFR Part 264 Subpart X	Miscellaneous units must be closed in accordance with the requirements set forth in pertinent unit-specific Part 264 regulations and must meet the post-closure care standards specified at 40 CFR §264.603	ARAR	Applicable to any miscellaneous unit that would be used to treat waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for any miscellaneous unit that was used to treat non-hazardous remediation waste, where such waste unit presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to

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RCRA REGULATORY REQUIREMENTS THAT MAY CONSTITUTE ARARS FOR FMC PLANT OU REMEDIAL ACTION SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
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Subject	Requirement	Regulatory citation	Description	Potentially applicable or relevant and appropriate (ARAR) or to be considered (TBC)	Evaluation
					meet RAOs.
	Closure and post-closure standards for specific units: **containment buildings**	40 CFR §§264.1102/ 265.1102	Containment buildings that stored or treated RCRA hazardous waste must be closed by removal or decontamination of waste residues and contaminated structures and equipment. If it is impracticable to complete such remove or decontamination, post-closure care must be provided.	ARAR	Applicable to any containment building that would be used to store or treat waste materials excavated or otherwise generated by the CERCLA remedial action that were determined to be RCRA hazardous waste. May be relevant and appropriate for containment buildings used for storing or treating non-hazardous remediation waste, where such waste presented risks similar to those presented by RCRA-regulated hazardous waste, and where meeting this closure standard would be necessary to meet RAOs.
Corrective action program	Facilities that are required to obtain a RCRA permit for hazardous waste treatment, storage or disposal must carry out a corrective action program	40 CFR §§264.100, 264.101, and 264.92	Corrective action must ensure protection of human health and the environment and attainment of groundwater protection standard with respect to facility releases of hazardous wastes or constituents	ARAR	Applicable to the contiguous FMC-owned property within the FMC Plant OU because FMC has applied for a RCRA permit for its facility. Also applicable based on application of RCRA corrective action requirements as part of this remedial action under the EPA One Cleanup Program.

TABLE 4-2

1998 ROD REMEDIAL ACTION OBJECTIVES – FMC SUBAREA[1]
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation, Pocatello, Idaho

	Remedial Action Objective
A	Reduce the exposure to radon that would occur in future buildings constructed within the plant area under a future industrial scenario
B	Prevent external exposure to radionuclides in soils at levels that pose estimated excess risk greater than 1x10-4, or site-specific background levels where that is not practical.
C	Prevent ingestion of soils containing Contaminants of Concern (COCs) at levels that pose estimated excess risks above 1x10-4, a non-cancer risk HQ of 1, or site-specific background levels where that is not practical.
D	Reduce the release and migration of COCs to the groundwater from facility sources that may result in concentrations in groundwater exceeding risk-based concentration (RBCs) or chemical specific Applicable or relevant and Appropriate Requirement (ARAR), specifically Maximum Contaminant Levels (MCLs).
E	Prevent potential ingestion of groundwater containing COCs having concentrations exceeding RBCs or MCLs (chemical specific ARARs) (see Table 36). The RBCs shown in Table 36 correspond to a cancer risk of 10-6 or a Hazard Index of 1.0.
F	Restore groundwater that has been impacted by site sources to meet all RBCs or MCLs for the COCs.

[1] Record of Decision for the Eastern Michaud Flat Superfund Site. EPA Region 10, June 1998.

TABLE 4-3

FMC PLANT OU REMEDIAL ACTION OBJECTIVES and GENERAL RESPONSE ACTIONS by MEDIUM
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation - Pocatello, Idaho
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Environmental Medium	Potential Future Receptors	Potential Exposure Pathways	Constituents of Concern[a] to be Addressed in the SFS	Remedial Action Objectives	General Response Actions
Soils and Solids	Outdoor Commercial/Industrial Worker Indoor Commercial/Industrial Worker Construction Worker Utility Worker Hypothetical Resident (Northern Properties)	1) Exposure to External Gamma Radiation	radium-226, potassium-40, lead-210, uranium-238	Prevent exposure via all viable pathways (external gamma radiation, incidental soil ingestion, dermal absorption, and fugitive dust inhalation) to soils and solids contaminated with COCs that would result in an unacceptable risk to human health assuming current or reasonably anticipated future land use.	• No Action • Institutional Controls • Containment • Removal/Disposal • Ex-situ Treatment • In-situ Treatment
		2) Incidental Ingestion	lead-210, polonium-210, potassium-40, radium-226, uranium-238, antimony, arsenic, cadmium, elemental phosphorus, lead, thallium, vanadium, coke-related PAHs		
		3) Inhalation of Fugitive Dust	lead-210, polonium-210, radium-226, arsenic, cadmium, lead, nickel, vanadium		
		4) Dermal Absorption	arsenic, cadmium, coke-related PAHs		
		5) Exposure to Fire and Inhalation of airborne phosphorus reaction products	elemental phosphorus (P4)	Prevent direct exposure to elemental phosphorus under conditions that may spontaneously combust, posing a fire hazard, and resultant air emissions that represent a significant risk to human health and the environment.	
Groundwater	Outdoor Commercial/Industrial Worker Indoor Commercial/Industrial Worker Construction Worker Utility Worker Maintenance Worker Hypothetical Resident (Northern Properties)	1) Ingestion	arsenic, fluoride, manganese, nitrate, selenium, elemental phosphorus (P4), thallium, and vanadium	Reduce the release and migration of COCs to the groundwater from facility sources that may result in concentrations in groundwater exceeding risk-based concentrations (RBCs) or chemical-specific ARARs, specifically Maximum Contaminant Levels (MCLs), or reduce to site-specific background concentrations if those are higher. Prevent potential ingestion of groundwater containing COCs having concentrations exceeding RBCs or MCLs (chemical-specific ARARs), or site-specific background concentrations if those are higher. Restore groundwater that has been impacted by site sources to meet RBCs or MCLs for the COCs, or site specific background levels where those are higher, wherever practicable and within a timeframe that is reasonable given the particular circumstances of the site.	• No Action • Institutional Controls • Containment • Removal/Disposal • Ex-situ Treatment • In-situ Treatment

TABLE 4-3

FMC PLANT OU REMEDIAL ACTION OBJECTIVES and GENERAL RESPONSE ACTIONS by MEDIUM
SUPPLEMENTAL FEASIBILITY STUDY WORK PLAN
FMC Corporation - Pocatello, Idaho

Environmental Medium	Potential Future Receptors	Potential Exposure Pathways	Constituents of Concern[a] to be Addressed in the SFS	Remedial Action Objectives	General Response Actions
Surface Water [b]	Aquatic Receptor	1) Aquatic respiration	total phosphorus	Reduce the release and migration of COCs to surface water from facility sources that result in concentrations exceeding risk based concentrations (RBCs) or chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs), including water quality criteria (WQC) pursuant to the Clean Water Act.	• No Action • Institutional Controls • Containment • Removal/Disposal • Ex-situ Treatment • In-situ Treatment

(a) These are constituents of concern that do not meet the RAOs and therefore must be addressed in the SFS.

(b) This environmental medium has been added to this list beyond the 1998 ROD RAOs.

TABLE 4-4

PRELIMINARY REMEDIATION GOALS FOR FUTURE OUTDOOR COMMERCIAL/INDUSTRIAL WORKERS ON THE FMC PLANT OU[a]
FMC Corporation - Pocatello, Idaho
(Page 1 of 1)

COC/ROC	Outdoor Commercial/Industrial Worker Preliminary Remediation Goals[b]	
	Concentration (mg/kg or pCi/g)	Basis
Chemicals (mg/kg)		
Inorganics:		
Arsenic	1.9E+02	(Carc; TCR = 1.1E-04)
Cadmium	8.3E+02	(NC; THQ = 1)
Fluoride	1.0E+05	(NC; THQ = 1)[d]
Radionuclides (pCi/g) [c]		
Lead-210	6.7E+01	(Carc; TCR = 1.0E-04)
Radium-226	3.8E+00	(Carc; TCR = 1.5E-04)

NC = Non carcinogenic effect drives remediation goal.

Carc = Carcinogenic effect drives remediation goal.

THQ = Total hazard quotient.

TCR = Total cancer risk.

a) Remediation goals based on non-carcinogenic effects equivalent to a hazard quotient of 1 for all pathways combined; remediation goals based on cancer risks calculated as the 95% UCL background concentration + the concentration equivalent to a 1E-04 cancer risk for all pathways combined.

b) Remediation goals only provided for worker risk-driving COCs/ROCs on the FMC Plant Site or Northern Properties.

c) The cited radionuclide remediation goals are relevant to the 0-to-6 inch bgs depth interval (or greater). 0-to-2 inch bgs sample data would be compared to remediation goals calculated using modified 0-to-2 inch HEAST cancer slope factors for the external gamma pathway (6.8E+01 pCi/g for lead-210 and 5.7E+00 pCi/g for radium-226).

d) The soil ingestion remediation goal for fluoride incorporates a bioavailability factor of 0.65 (Clay and Sutie, 1985; NRC, 1980).

TABLE 4-5

PRELIMINARY REMEDIATION GOALS FOR FUTURE CONSTRUCTION WORKERS ON THE FMC PLANT OU[a]

FMC Corporation - Pocatello, Idaho

COC/ROC	Construction Worker Preliminary Remediation Goals[b]	
	Concentration (mg/kg or pCi/g)	**Basis**
Chemicals (mg/kg)		
Inorganics:		
Arsenic	1.5E+02	(NC; THQ = 1)
Cadmium	3.9E+01	(NC; THQ = 1)
Fluoride	4.9E+04	(NC; THQ = 1)[d]
Radionuclides (pCi/g) [c]		
Lead-210	6.1E+02	(Carc; TCR = 1.0E-04)
Radium-226	1.0E+02	(Carc; TCR = 1.0E-04)

NC = Non carcinogenic effect drives remediation goal.

Carc = Carcinogenic effect drives remediation goal.

THQ = Total hazard quotient.

TCR = Total cancer risk.

a) Remediation goals based on non-carcinogenic effects equivalent to a hazard quotient of 1 for all pathways combined; remediation goals based on cancer risks calculated as the 95% UCL background concentration + the concentration equivalent to a 1E-04 cancer risk for all pathways combined.

b) Remediation goals only provided for worker risk-driving COCs/ROCs on the FMC Plant Site or Northern Properties.

c) The cited radionuclide remediation goals are relevant to the 0-to-6 inch bgs depth interval (or greater). 0-to-2 inch bgs sample data would be compared to remediation goals calculated using modified 0-to-2 inch HEAST cancer slope factors for the external gamma pathway (6.2E+02 pCi/g for lead-210 and 1.8E+02 pCi/g for radium-226).

d) The soil ingestion remediation goal for fluoride incorporates a bioavailability factor of 0.65 (Clay and Sutie, 1985; NRC, 1980).

TABLE 4-6

PRELIMINARY REMEDIATION GOALS FOR HYPOTHETICAL FUTURE RESIDENTS ON THE FMC NORTHERN PROPERTIES[a]
FMC Corporation - Pocatello, Idaho

COC/ROC	Residential Preliminary Remediation Goals[b]	
	Concentration (mg/kg or pCi/g)	**Basis**
Chemicals (mg/kg)		
Inorganics:		
Cadmium[c]	Not Determined	-
Fluoride	7.2E+03	(NC; THQ = 1)[e]
Radionuclides (pCi/g) [d]		
Radium-226	2.5E+00	(Carc; TCR = 1.9E-4)

NC = Non carcinogenic effect drives remediation goal.
Carc = Carcinogenic effect drives remediation goal.
THQ = Total hazard quotient.
TCR = Total cancer risk.

a) Remediation goals based on non-carcinogenic effects equivalent to a hazard quotient of 1 for all pathways combined; remediation goals based on cancer risks calculated as the 95% UCL background concentration + the concentration equivalent to a 1x10-4 cancer risk for all pathways combined.

b) Remediation goals only provided for residential risk-driving COCs/ROCs on the FMC Northern Properties.
c) A remediation goal for cadmium has not been determined because it is not required to complete the SFS. If it is subsequently determined that a residential remediation goal is required for cadmium the home grown produce ingestion pathway will be considered.

d) The cited radium-226 remediation goal is relevant to the 0-to-6 inch bgs depth interval (or greater). 0-to-2 inch bgs sample data would be compared to a remediation goal calculated using a modified 0-to-2 inch HEAST cancer slope factors for the external gamma pathway (3.4E+00 pCi/g for radium-226).
e) The soil ingestion remediation goal for fluoride incorporates a bioavailability factor of 0.65 (Clay and Sutie, 1985; NRC, 1980).

TABLE 4-7

RATIO OF COC/ROC EXPOSURE POINT CONCENTRATIOS FOR PREDOMINANT FILL MATERIALS TO OUTDOOR COMMERCIAL/INDUSTRIAL WORKER REMEDIATION GOALS
FMC Corporation - Pocatello, Idaho

Constituent	Outdoor Commercial/Industrial Worker Remediation Goal	RUs 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 20, 21, 22b, 22c, 23 and 24		RUs 7 and 19		RUs 8, 9 and 15		RU 16		Northern Property Parcel 3	
		Predominant Fill Material: Slag		Predominant Fill Materials: Slag and Ore		Predominant Fill Materials: Slag, Ore and Calcined Ore		Predominant Fill Materials: Calciner Pond Solids and Slag		Predominant Contamination Mechanism: Aerial Deposition of Fugitive Dusts from Ore Handing Area	
		EPC	EPC to Remediation Goal Ratio	EPC	EPC to Remediation Goal Ratio	EPC	EPC to Remediation Goal Ratio	EPC	EPC to Remediation Goal Ratio	EPC	EPC to Remediation Goal Ratio
COCs (mg/kg) [a]											
Arsenic	1.9E+02	-	-	1.46E+01	7.83E-02	1.46E+01	7.83E-02	1.43E+01	7.67E-02	-	-
Cadmium	8.3E+02	-	-	1.25E+02	1.50E-01	1.25E+02	1.50E-01	5.38E+02	6.48E-01	-	-
Fluoride	1.0E+05	-	-	-	-	-	-	1.30E+03	1.26E-02	-	-
Lead	0.0E+00	-	-	-	-	-	-	-	-	-	-
Nickel	1.6E+04	-	-	-	-	-	-	-	-	-	-
Thallium	7.7E+01	-	-	-	-	-	-	3.40E+02	4.41E+00	-	-
Vanadium	7.9E+03	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	2.3E+01	-	-	-	-	-	-	-	-	-	-
ROCs (pCi/g) [b]											
Radium-226	3.8E+00	2.51E+01	6.68E+00	2.96E+01	7.89E+00	2.96E+01	7.89E+00	2.51E+01	6.68E+00	6.82E+00	1.82E+00
Lead-210	6.7E+01	1.30E+01	1.93E-01	3.63E+01	5.40E-01	3.63E+01	5.40E-01	3.41E+01	5.07E-01	8.95E+00	1.33E-01
Polonium-210	2.2E+02	-	-	-	-	-	-	4.58E+02	-	-	-
Potassium-40	2.9E+03	-	-	-	-	-	-	7.04E+01	-	-	-

Denotes COC/ROC with largest ratio between EPC and outdoor commercial/industrial worker remediation goal.

\- No EPC is presented because the COC/ROC does not exceed screening levels for the predominant fill materials within this RU or property parcel.

a) Elemental phosphorus is not identified as a COC because it is not a predominant fill material in RUs 1, 2, 12, 13, 22b, 22c and underground piping.

b) ROC remediation goals are applicable to samples collected from 0-6 inches (or greater).