



FMC Idaho LLC, Pocatello, Idaho

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

FINAL

NOVEMBER 2009
REVISED JANUARY 2010



EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This Executive Summary briefly describes the background and objectives for the additional 2008 Supplemental Remedial Investigation (SRI) Addendum field work performed by FMC Corporation at the FMC Plant Operable Unit (OU), a part of the Eastern Michaud Flats (EMF) Superfund Site, and summarizes the findings of this report. The EMF Site includes two adjacent phosphate ore processing facilities, owned and operated respectively by the J.R. Simplot Company (Simplot) and FMC Idaho LLC (FMC). The Simplot-owned properties at the Site are referred to as the Simplot Plant OU; the FMC-owned properties comprise the FMC Plant OU. The impacted areas owned by neither of the two companies is referred to as the Off-Plant Subarea. The 2008 SRI Addendum field work was limited to the Undeveloped Areas located south and west of the former processing areas of the FMC Plant Site and the FMC-owned properties north of Highway 30, collectively known as the Northern Properties, which are contained within the FMC Plant OU.

ES.2 2008 SRI FIELD INVESTIGATION BACKGROUND AND OBJECTIVES

Background. In June 2008, FMC submitted the *Draft SRI Report (MWH, 2008)* that included the results of the 2007 field investigations conducted at the FMC Plant Site. In August 2008, based on regulatory review and comment on the *Draft SRI Report*, the EPA requested that additional investigations be performed at FMC's Undeveloped Areas and the Northern Properties to gather data for further assessment of risks in these areas to support the Supplemental Feasibility Study (SFS). FMC agreed to perform additional investigations and collect soil samples from the following:

- The Southern and Western Undeveloped Areas (SUA and WUA) of the FMC Plant Site,
- The Northern Properties, and
- Ten background areas within 11 miles of the FMC Plant OU.

2008 SRI Field Work Objectives. The primary objective of the additional investigations on the FMC Plant OU was to collect surface soil samples in order to estimate risks to potential ecological and human receptors. The primary objective of the background investigation, which was performed at locations outside of the area potentially impacted by EMF facility operations, was to develop background concentrations for metal and radionuclide constituents with comparable sample support to those samples to be collected at the Northern Properties and Undeveloped Areas. Specifically, these data were used in conjunction with soil screening levels (SSLs) to develop Comparative Values (CVs) for screening the on-site sample data to determine the Chemicals and Radionuclides of Concern to be evaluated in the Supplemental Human Health and Ecological Risk Assessment Addenda. Additionally, the background concentrations were also used to evaluate incremental risks.

Sample Design. Composite soil samples were collected from several surface soil intervals throughout the SUA, WUA, and Parcels 1 through 6 of the Northern Properties. A total of eight composite samples were collected from 0-2 inch bgs, 2-6 inch bgs, and/or 0-6 inch bgs intervals depending on the area/parcel objectives (a maximum of 16 composite samples per area/parcel). The composite samples were analyzed for various metals, fluoride, and/or radionuclides again depending on the objectives of the area/parcel sampling. Each composite sample, regardless of the depth, was comprised of 20 discrete samples randomly collected throughout each area/parcel. Discrete samples, in addition to composite samples, also were collected at background locations. The sampling objectives, equipment, and procedures are describe in detail in the EPA-approved *SRI Work Plan Addendum - Field Modification #13, Additional Southern and Western Undeveloped Areas Field Investigations (MWH, 2008a)* and *SRI Work Plan Addendum - Field Modification #14, Northern FMC-Owned Properties and Background Soil Sampling (MWH, 2008b)*.

ES.3 FINDINGS OF THE 2008 SRI ADDENDUM

General Findings. The results discussed in this report support one primary and two corroborating general 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. Only radionuclides were sampled at both 0-to-2 inch bgs and 2-to-6 inch bgs sampling intervals. In every instance, the concentrations of the target radionuclides detected in soil samples collected from the 2-to-6 inch bgs interval were less than the concentrations of COCs detected in the shallower 0-to-2 inch bgs sampling interval. It would be expected that metals and fluoride concentrations would follow the same trend had they been analyzed.

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). Figure 4-1 depicts the relative locations of the SUA, WUA, Parcels 1 through 6 of the Northern Properties, the Simplot operating facility, and the FMC plant site together with an inset wind-rose diagram.

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).

Area/Parcel Findings:

Concentrations of detected constituents in sampled surface and subsurface soils were initially compared to risk-based CVs, developed from human health and ecological SSLs and background values. This screening provided the basis for which constituents were quantitatively evaluated in the Supplemental Ecological and/or Human Health Risk Assessments Addendum (Supplemental

ERA Addendum and Supplement HHRA Addendum). The findings of the Supplemental ERA and HHRA Addenda, which evaluated risks to current ecological and potential future human receptors from exposure to existing surface and subsurface materials, and groundwater, are summarized in Tables ES-1 and ES-2. 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.

The following discussion of the Supplemental HHRA findings groups the Undeveloped Areas and Northern Property parcels by the degree to which they pose potential impacts to human health:

- **Areas That Do Not Pose Human Health Risks In Excess of EPA's Acceptable Cumulative Lifetime Cancer Risk Range¹ or a Non-Cancer Hazard Quotient of 1.**
 - Southern Undeveloped Area
 - Western Undeveloped Area
- **Areas That Pose Risks to Hypothetical Future Residential Receptors In Excess of EPA's Acceptable Cumulative Lifetime Cancer Risk Range and/or a Non-Cancer Hazard Quotient of 1.** (cumulative lifetime cancer risks and non-cancer HQs do not exceed these thresholds for any of the future worker receptors)
 - Parcel 1
 - Parcel 2
 - Parcel 4
 - Parcel 5
 - Parcel 6
- **Areas That Pose Risks to Residential and Worker Receptors In Excess of EPA's Acceptable Cumulative Lifetime Cancer Risk Range and/or a Non-Cancer Hazard Quotient of 1.**
 - Parcel 3

The information presented in this *SRI Addendum Report* indicates that the human health and ecological risks associated with impacted shallow soils in the SUA, WUA and Northern

¹ EPA's acceptable range is generally defined as 1E-04 to 1E-06 but also includes an upperbound of 3E-04 as essentially equivalent to 1E-04 (see EPA's *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, OSWER No. 9200.4-18, 1997).

Properties are sufficiently understood to proceed into the CERCLA SFS. The inclusion of the information contained in this report along with the information presented in the *Final SRI Report* (MWH, 2009) and that presented in the *Groundwater Current Condition Report (GWCCR;* MWH , 2009a) related to site groundwater, indicates that the nature and extent of contamination associated with fill, impacted soils, and groundwater at the FMC Plant OU have been bound and the risks posed to human health and the environment are sufficiently understood to allow the CERCLA process to proceed to the SFS.

TABLE ES-1

SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES^a
 FMC Corporation, Pocatello, Idaho
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Parcel 1	RME Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL RME CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		RME	RME	RME	RME	RME	RME	RME	RME	RME	RME		
	Resident	BScr	BScr	BScr	2.E-08	BScr	1.E-04	2.E-05	1.E-05	7.E-09	BScr	2.E-04	-
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	7.E-05	1.E-05	NA	4.E-08	BScr	8.E-05	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	3.E-05	6.E-06	NA	NA	BScr	4.E-05	-
	Construction Worker	BScr	BScr	NA	BScr	NA	2.E-06	7.E-08	NA	9.E-08	NA	2.E-06	-
	Utility Worker	BScr	BScr	NA	BScr	NA	1.E-07	6.E-09	NA	7.E-09	NA	1.E-07	-
	RME Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL RME HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		RME	RME	RME	RME	RME							
	Resident	1.0	0.05	1.2	0.001	1.2						3.5	Cd, F
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
	Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-
	CTE Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL CTE CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE		
	Resident	BScr	BScr	BScr	3.E-09	BScr	2.E-05	2.E-06	3.E-06	8.E-10	BScr	3.E-05	-
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	2.E-05	1.E-06	NA	1.E-08	BScr	2.E-05	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	7.E-06	1.E-06	NA	NA	BScr	8.E-06	-
	Construction Worker	BScr	BScr	NA	BScr	NA	2.E-07	1.E-08	NA	1.E-08	NA	2.E-07	-
	Utility Worker	BScr	BScr	NA	BScr	NA	2.E-08	1.E-09	NA	1.E-09	NA	2.E-08	-
	CTE Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL CTE HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		CTE	CTE	CTE	CTE	CTE							
	Resident	0.3	0.004	0.1	0.001	0.8						1.3	Cd, F
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
	Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-

TABLE ES-1

SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES ^a
 FMC Corporation, Pocatello, Idaho
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Parcel 2	RME Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL RME CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		RME	RME	RME	RME	RME	RME	RME	RME	RME	RME		
	Resident	BScr	BScr	BScr	5.E-08	BScr	3.E-04	5.E-05	2.E-05	1.E-08	BScr	4.E-04	Ra-226, Pb-210
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	1.E-04	2.E-05	NA	1.E-07	BScr	2.E-04	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	7.E-05	1.E-05	NA	NA	BScr	8.E-05	-
	Construction Work	BScr	BScr	NA	BScr	NA	3.E-06	1.E-06	NA	8.E-07	NA	6.E-06	-
	Utility Work	BScr	BScr	NA	BScr	NA	3.E-07	1.E-07	NA	6.E-08	NA	4.E-07	-
	RME Chronic and Subchronic Non-Cancer Hazard Quotient	COCs										TOTAL RME HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		RME	RME	RME	RME	RME							
	Resident	3.3	0.1	20.9	0.004	1.2						25.6	Cd, F
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
	Construction Work	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Work	BScr	BScr	NA	BScr	NA						BScr	-
	CTE Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL CTE CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE		
	Resident	BScr	BScr	BScr	9.E-09	BScr	5.E-05	4.E-06	7.E-06	2.E-09	BScr	6.E-05	-
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	3.E-05	2.E-06	NA	2.E-08	BScr	4.E-05	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	1.E-05	3.E-06	NA	NA	BScr	2.E-05	-
	Construction Work	BScr	BScr	NA	BScr	NA	4.E-07	2.E-07	NA	1.E-07	NA	7.E-07	-
	Utility Work	BScr	BScr	NA	BScr	NA	4.E-08	2.E-08	NA	1.E-08	NA	7.E-08	-
	CTE Chronic and Subchronic Non-Cancer Hazard Quotient	COCs										TOTAL CTE HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		CTE	CTE	CTE	CTE	CTE							
	Resident	1.0	0.01	2.55	0.002	0.8						4.4	Cd, F
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
	Construction Work	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Work	BScr	BScr	NA	BScr	NA						BScr	-

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SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES^a
 FMC Corporation, Pocatello, Idaho
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Parcel 3	RME Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL RME CR	Risk Drivers*		
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion				
		RME	RME	RME	RME	RME	RME	RME	RME	RME	RME				
	Resident	BScr	BScr	BScr	8.E-08	1.E-03	6.E-04	7.E-05	3.E-05	3.E-08	BScr	2.E-03	As (GW), Ra-226		
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	2.E-04	3.E-04	3.E-05	NA	2.E-07	BScr	6.E-04	Ra-226, As (GW)		
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	2.E-04	1.E-04	2.E-05	NA	NA	BScr	4.E-04	As (GW), Ra-226		
	Construction Work	BScr	BScr	NA	2.E-06	NA	7.E-06	2.E-06	NA	1.E-06	NA	1.E-05	-		
	Utility Work	BScr	BScr	NA	1.E-07	NA	5.E-07	2.E-07	NA	1.E-07	NA	1.E-06	-		
	RME Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL RME HQ	Risk Drivers*		
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion									
		RME	RME	RME	RME	RME									
	Resident	5.7	0.2	44.6	0.006	11.5						62.0	Cd, As (GW)		
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	1.6						1.6	As (GW)		
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	1.8						1.8	As (GW)		
	Construction Work	0.2	0.03	NA	3.4	NA						3.7	Cd, As (GW)		
	Utility Work	0.02	0.007	NA	0.3	NA						0.3	-		
	CTE Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL CTE CR	Risk Drivers*		
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion				
		CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE				
	Resident	BScr	BScr	BScr	2.E-08	1.E-04	1.E-04	7.E-06	9.E-06	3.E-09	BScr	3.E-04	-		
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	5.E-05	7.E-05	4.E-06	NA	4.E-08	BScr	1.E-04	-		
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	5.E-05	3.E-05	4.E-06	NA	NA	BScr	8.E-05	-		
	Construction Work	BScr	BScr	NA	3.E-07	NA	9.E-07	3.E-07	NA	2.E-07	NA	2.E-06	-		
	Utility Work	BScr	BScr	NA	3.E-08	NA	9.E-08	3.E-08	NA	2.E-08	NA	2.E-07	-		
	CTE Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL CTE HQ	Risk Drivers*		
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion									
		CTE	CTE	CTE	CTE	CTE									
	Resident	1.8	0.02	5.43	0.004	5.7						13.0	Cd, As (GW)		
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	1.2						1.2	As (GW)		
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	1.2						1.2	As (GW)		
	Construction Work	0.04	0.004	NA	0.5	NA						0.5	-		
	Utility Work	0.004	0.001	NA	0.05	NA						0.06	-		

TABLE ES-1

SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES^a
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Exposure Pathway	COCs					ROCs					TOTAL RME CR	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
	RME	RME	RME	RME	RME	RME	RME	RME	RME	RME		
Resident	BScr	BScr	BScr	2.E-08	BScr	2.E-04	2.E-05	1.E-05	7.E-09	BScr	2.E-04	-
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	9.E-05	1.E-05	NA	5.E-08	BScr	1.E-04	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	4.E-05	6.E-06	NA	NA	BScr	5.E-05	-
Construction Worker	BScr	BScr	NA	BScr	NA	2.E-06	1.E-07	NA	1.E-07	NA	2.E-06	-
Utility Worker	BScr	BScr	NA	BScr	NA	2.E-07	8.E-09	NA	1.E-08	NA	2.E-07	-
RME Chronic and Subchronic Non-Cancer Hazard Quotient												
Exposure Pathway	COCs					TOTAL RME HQ	Risk Drivers*					
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
	RME	RME	RME	RME	RME							
Resident	1.3	0.05	2.07	0.001	1.5	5.0	Cd, F					
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2	0.2	-					
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2	0.2	-					
Construction Worker	BScr	BScr	NA	BScr	NA	BScr	-					
Utility Worker	BScr	BScr	NA	BScr	NA	BScr	-					
CTE Lifetime Cancer Risk (CR)												
Exposure Pathway	COCs					ROCs					TOTAL CTE CR	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE		
Resident	BScr	BScr	BScr	4.E-09	BScr	3.E-05	2.E-06	3.E-06	8.E-10	BScr	3.E-05	-
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	2.E-05	1.E-06	NA	1.E-08	BScr	2.E-05	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	8.E-06	1.E-06	NA	NA	BScr	9.E-06	-
Construction Worker	BScr	BScr	NA	BScr	NA	3.E-07	1.E-08	NA	2.E-08	NA	3.E-07	-
Utility Worker	BScr	BScr	NA	BScr	NA	3.E-08	1.E-09	NA	2.E-09	NA	3.E-08	-
CTE Chronic and Subchronic Non-Cancer Hazard Quotient												
Exposure Pathway	COCs					TOTAL CTE HQ	Risk Drivers*					
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
	CTE	CTE	CTE	CTE	CTE							
Resident	0.4	0.005	0.252	0.001	1.0	1.7	Cd, F					
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2	0.2	-					
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2	0.2	-					
Construction Worker	BScr	BScr	NA	BScr	NA	BScr	-					
Utility Worker	BScr	BScr	NA	BScr	NA	BScr	-					

Parcel 4

TABLE ES-1

SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES^a
 FMC Corporation, Pocatello, Idaho
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Exposure Pathway	COCs					ROCs					TOTAL RME CR	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
	RME	RME	RME	RME	RME	RME	RME	RME	RME	RME		
Resident	BScr	BScr	BScr	1.E-08	BScr	1.E-04	1.E-05	1.E-05	4.E-09	BScr	2.E-04	-
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	7.E-05	7.E-07	NA	7.E-09	BScr	7.E-05	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	3.E-05	4.E-07	NA	NA	BScr	3.E-05	-
Construction Worker	BScr	BScr	NA	BScr	NA	BScr	BScr	NA	BScr	NA	BScr	-
Utility Worker	BScr	BScr	NA	BScr	NA	BScr	BScr	NA	BScr	NA	BScr	-
RME Chronic and Subchronic Non-Cancer Hazard Quotient												
Exposure Pathway	COCs					ROCs					TOTAL RME HQ	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
Resident	0.5	0.02	0.69	0.001	1.2						2.4	Cd, F
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-
CTE Lifetime Cancer Risk (CR)												
Exposure Pathway	COCs					ROCs					TOTAL CTE CR	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
Resident	BScr	BScr	BScr	2.E-09	BScr	3.E-05	1.E-06	3.E-06	5.E-10	BScr	3.E-05	-
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	BScr	2.E-05	9.E-08	NA	2.E-09	BScr	2.E-05	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	BScr	7.E-06	1.E-07	NA	NA	BScr	8.E-06	-
Construction Worker	BScr	BScr	NA	BScr	NA	BScr	BScr	NA	BScr	NA	BScr	-
Utility Worker	BScr	BScr	NA	BScr	NA	BScr	BScr	NA	BScr	NA	BScr	-
CTE Chronic and Subchronic Non-Cancer Hazard Quotient												
Exposure Pathway	COCs					ROCs					TOTAL CTE HQ	Risk Drivers*
	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
Resident	0.2	0.002	0.084	0.0005	0.7						1.0	Cd, F
Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.2						0.2	-
Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.2						0.2	-
Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-

Parcel 5

TABLE ES-1

SUMMARY OF CANCER RISKS AND NON-CANCER HAZARD QUOTIENTS TO HYPOTHETICAL FUTURE HUMAN RECEPTORS ON THE FMC NORTHERN PROPERTIES^a
 FMC Corporation, Pocatello, Idaho
 (Page 6 of 6)

Parcel 6	RME Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL RME CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		RME	RME	RME	RME	RME	RME	RME	RME	RME	RME		
	Resident	BScr	BScr	BScr	3.E-08	5.E-04	3.E-04	4.E-05	2.E-05	1.E-08	BScr	8.E-04	As (GW), Ra-226
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	1.E-04	1.E-04	2.E-05	NA	9.E-08	BScr	3.E-04	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	1.E-04	6.E-05	9.E-06	NA	NA	BScr	2.E-04	-
	Construction Worker	BScr	BScr	NA	BScr	NA	3.E-06	2.E-07	NA	2.E-07	NA	4.E-06	-
	Utility Worker	BScr	BScr	NA	BScr	NA	2.E-07	1.E-08	NA	2.E-08	NA	3.E-07	-
	RME Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL RME HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		RME	RME	RME	RME	RME							
	Resident	2.3	0.07	7.01	0.002	5.6						15.1	Cd, As (GW)
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.8						0.8	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.9						0.9	-
	Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-
	CTE Lifetime Cancer Risk (CR)	COCs					ROCs					TOTAL CTE CR	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion	External Gamma Exposure	Incidental Soil Ingestion	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion		
		CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE	CTE		
	Resident	BScr	BScr	BScr	5.E-09	7.E-05	5.E-05	3.E-06	5.E-06	2.E-09	BScr	1.E-04	-
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	2.E-05	3.E-05	2.E-06	NA	2.E-08	BScr	6.E-05	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	2.E-05	1.E-05	2.E-06	NA	NA	BScr	4.E-05	-
	Construction Worker	BScr	BScr	NA	BScr	NA	4.E-07	2.E-08	NA	3.E-08	NA	5.E-07	-
	Utility Worker	BScr	BScr	NA	BScr	NA	4.E-08	2.E-09	NA	3.E-09	NA	5.E-08	-
	CTE Chronic and Subchronic Non-Cancer Hazard Quotient	COCs					ROCs					TOTAL CTE HQ	Risk Drivers*
	Exposure Pathway	Incidental Soil Ingestion	Dermal Absorption	Ingestion of Homegrown Produce	Fugitive Dust Inhalation	Groundwater Ingestion							
		CTE	CTE	CTE	CTE	CTE							
	Resident	0.7	0.01	0.85	0.001	2.8						4.4	Cd, As (GW)
	Outdoor Commercial/Industrial Work	BScr	BScr	NA	BScr	0.6						0.6	-
	Indoor Commercial/Industrial Work	BScr	NA	NA	NA	0.6						0.6	-
	Construction Worker	BScr	BScr	NA	BScr	NA						BScr	-
	Utility Worker	BScr	BScr	NA	BScr	NA						BScr	-

Notes:

RME = Reasonable maximum exposure.

CTE = Central tendency exposure.

BScr = COC/ROC concentrations are below screening levels.

NA = Not an applicable exposure route for the receptor of concern.

a) Risks for the southern and western undeveloped areas of the FMC Plant OU were not calculated in the Supplemental HHRA Addendum because all COPC concentrations were found to be below risk-based comparative values (CVs) in the initial screening assessment.

* The two COCs/ROCs contributing most significantly to exceedances of a cumulative 3E-04 cancer risk or a non-cancer hazard index of 1 are identified.

TABLE ES-2
INCREMENTAL HAZARD QUOTIENT SUMMARY FOR ECOLOGICAL RECEPTORS IN THE SAGEBRUSH STEPPE HABITAT OF THE UNDEVELOPED AREAS AND THE NORTHERN
PROPERTIES
FMC Corporation, Pocatello, Idaho
(Page 1 of 3)

(A) Mammalian Incremental Hazard Quotients

Measurement Endpoint Species	COPC	BKGD		SUA		WUA		Parcel 1		Parcel 2		Parcel 3		Parcel 4		Parcel 5		Parcel 6	
		NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ														
Deer Mouse	Cadmium	0.05	0.01	0.08	0.01	0.03	0.01	0.24	0.04	0.53	0.08	0.80	0.13	0.25	0.04	0.14	0.02	0.32	0.05
	Chromium	0.02	0.002	--	--	--	--	0.08	0.01	0.28	0.02	0.47	0.04	0.06	0.005	--	--	0.12	0.01
	Fluoride	0.08	0.05	0.07	0.04	0.03	0.02	0.22	0.13	0.52	0.31	0.79	0.47	0.28	0.17	0.15	0.09	0.50	0.30
	Lead	0.04	0.028	--	--	--	--	--	--	0.04	0.03	0.12	0.08	--	--	--	--	--	--
	Mercury	0.001	NA	0.001	NA	--	--	0.001	NA	0.005	NA	0.014	NA	0.0022	NA	0.001	NA	0.01	NA
	Selenium	0.01	0.01	--	--	--	--	--	--	0.08	0.07	0.13	0.12	0.04	0.03	--	--	0.07	0.06
	Vanadium	0.01	0.004	0.004	0.003	--	--	0.02	0.01	0.08	0.05	0.15	0.09	0.02	0.01	0.01	0.01	0.04	0.03
Zinc	0.03	0.03	--	--	--	--	0.02	0.02	0.03	0.03	0.04	0.03	0.01	0.01	0.01	0.01	0.02	0.02	
Pygmy Rabbit	Cadmium	0.04	0.01	0.09	0.01	0.04	0.01	0.25	0.04	0.52	0.08	0.78	0.12	0.26	0.04	0.15	0.02	0.33	0.05
	Chromium	0.02	0.001	--	--	--	--	0.06	0.005	0.22	0.02	0.37	0.03	0.05	0.004	--	--	0.10	0.01
	Fluoride	0.09	0.05	0.08	0.05	0.03	0.02	0.22	0.13	0.48	0.29	0.70	0.42	0.28	0.16	0.16	0.10	0.46	0.28
	Lead	0.03	0.02	--	--	--	--	--	--	0.03	0.02	0.10	0.07	--	--	--	--	--	--
	Mercury	0.001	NA	0.001	NA	--	--	0.001	NA	0.004	NA	0.011	NA	0.002	NA	0.001	NA	0.01	NA
	Selenium	0.01	0.01	--	--	--	--	--	--	0.06	0.05	0.10	0.09	0.03	0.03	--	--	0.05	0.05
	Vanadium	0.01	0.004	0.003	0.002	--	--	0.02	0.01	0.07	0.04	0.12	0.07	0.02	0.01	0.01	0.01	0.04	0.02
Zinc	0.02	0.02	--	--	--	--	0.02	0.02	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.02	0.02	
Mule Deer	Cadmium	0.004	0.001	0.01	0.001	0.004	0.001	0.03	0.004	0.05	0.01	0.08	0.01	0.03	0.004	0.02	0.003	0.03	0.01
	Chromium	0.002	0.0001	--	--	--	--	0.01	0.0005	0.02	0.002	0.04	0.003	0.005	0.0004	--	--	0.01	0.001
	Fluoride	0.01	0.005	0.01	0.005	0.003	0.002	0.02	0.01	0.05	0.03	0.07	0.04	0.03	0.02	0.02	0.01	0.05	0.03
	Lead	0.004	0.002	--	--	--	--	--	--	0.004	0.002	0.01	0.01	--	--	--	--	--	--
	Mercury	0.0001	NA	0.0001	NA	--	--	0.0001	NA	0.0004	NA	0.001	NA	0.0002	NA	0.0001	NA	0.001	NA
	Selenium	0.001	0.001	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.003	0.003	--	--	0.01	0.005
	Vanadium	0.001	0.0004	0.0003	0.0002	--	--	0.002	0.001	0.01	0.00	0.01	0.01	0.002	0.001	0.001	0.001	0.00	0.00
Zinc	0.005	0.004	--	--	--	--	0.002	0.002	0.003	0.002	0.00	0.00	0.001	0.001	0.001	0.001	0.002	0.002	
Coyote	Cadmium	0.01	0.001	0.02	0.003	0.005	0.001	0.07	0.01	0.18	0.03	0.28	0.04	0.07	0.01	0.03	0.01	0.10	0.02
	Chromium	0.004	0.0003	--	--	--	--	0.02	0.001	0.06	0.004	0.09	0.01	0.01	0.001	--	--	0.02	0.002
	Fluoride	0.04	0.02	0.05	0.03	0.02	0.01	0.17	0.10	0.49	0.29	0.84	0.50	0.22	0.13	0.10	0.06	0.47	0.28
	Lead	0.004	0.003	--	--	--	--	--	--	0.004	0.003	0.01	0.01	--	--	--	--	--	--
	Mercury	0.00002	NA	0.00001	NA	--	--	0.00002	NA	0.0001	NA	0.0002	NA	0.00003	NA	0.00002	NA	0.0001	NA
	Selenium	0.002	0.002	--	--	--	--	--	--	0.01	0.01	0.02	0.02	0.01	0.01	--	--	0.01	0.01
	Vanadium	0.001	0.001	0.001	0.0003	--	--	0.003	0.002	0.01	0.01	0.02	0.01	0.003	0.002	0.002	0.001	0.01	0.00
Zinc	0.02	0.02	--	--	--	--	0.004	0.003	0.01	0.01	0.01	0.01	0.002	0.002	0.001	0.001	0.003	0.003	
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.07	0.01	0.03	0.005	0.21	0.03	0.47	0.07	0.72	0.11	0.22	0.03	0.12	0.02	0.29	0.05
	Chromium	0.02	0.002	--	--	--	--	0.08	0.01	0.28	0.02	0.48	0.04	0.06	0.005	--	--	0.13	0.01
	Fluoride	0.09	0.05	0.07	0.04	0.03	0.02	0.23	0.14	0.54	0.32	0.81	0.48	0.29	0.18	0.16	0.10	0.52	0.31
	Lead	0.05	0.04	--	--	--	--	--	--	0.05	0.04	0.15	0.10	--	--	--	--	--	--
	Mercury	0.001	NA	0.001	NA	--	--	0.001	NA	0.005	NA	0.013	NA	0.002	NA	0.001	NA	0.01	NA
	Selenium	0.01	0.01	--	--	--	--	--	--	0.07	0.07	0.13	0.12	0.04	0.03	--	--	0.06	0.06
	Vanadium	0.01	0.005	0.004	0.003	--	--	0.02	0.01	0.09	0.05	0.17	0.10	0.02	0.01	0.01	0.01	0.05	0.03
Zinc	0.02	0.02	--	--	--	--	0.02	0.02	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.02	0.02	

Notes:

Incremental Hazard Quotients (IHQ) above 1 are shaded.
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated because the soil concentration was below the Comparative Value as defined in SRI Field Modifications 13 & 14.

TABLE ES-2
INCREMENTAL HAZARD QUOTIENT SUMMARY FOR ECOLOGICAL RECEPTORS IN THE SAGEBRUSH STEPPE HABITAT OF THE UNDEVELOPED AREAS AND THE NORTHERN
PROPERTIES
FMC Corporation, Pocatello, Idaho
(Page 2 of 3)

(B) Avian Hazard Quotient Summary

Measurement Endpoint Species	COPC	BKGD		SUA		WUA		Parcel 1		Parcel 2		Parcel 3		Parcel 4		Parcel 5		Parcel 6	
		NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ														
Sage Grouse	Cadmium	0.01	0.002	0.03	0.01	0.01	0.003	0.11	0.03	0.27	0.06	0.43	0.10	0.12	0.03	0.06	0.01	0.16	0.037
	Chromium	0.02	0.02	--	--	--	--	0.08	0.07	0.27	0.26	0.46	0.44	0.06	0.06	--	--	0.12	0.115
	Fluoride	0.20	0.05	0.24	0.06	0.09	0.02	0.75	0.18	1.93	0.47	3.11	0.76	0.96	0.23	0.49	0.12	1.85	0.451
	Lead	0.08	0.01	--	--	--	--	--	--	0.08	0.01	0.23	0.02	--	--	--	--	--	--
	Mercury	0.0001	NA	0.0001	NA	--	--	0.0001	NA	0.0005	NA	0.001	NA	0.0002	NA	0.0001	NA	0.001	NA
	Selenium	0.005	0.004	--	--	--	--	--	--	0.03	0.02	0.05	0.04	0.01	0.01	--	--	0.02	0.019
	Vanadium	0.02	0.01	0.01	0.01	--	--	0.05	0.04	0.22	0.16	0.41	0.29	0.06	0.04	0.03	0.02	0.12	0.082
Zinc	0.02	0.02	--	--	--	--	0.02	0.02	0.03	0.03	0.04	0.03	0.01	0.01	0.01	0.004	0.02	0.015	
Red-Tailed Hawk	Cadmium	0.005	0.001	0.01	0.002	0.003	0.001	0.04	0.01	0.11	0.03	0.18	0.04	0.05	0.01	0.02	0.005	0.06	0.01
	Chromium	0.01	0.005	--	--	--	--	0.02	0.02	0.07	0.07	0.12	0.11	0.02	0.01	--	--	0.03	0.03
	Fluoride	0.20	0.05	0.25	0.06	0.08	0.02	0.86	0.21	2.45	0.60	4.18	1.02	1.11	0.27	0.51	0.12	2.34	0.57
	Lead	0.02	0.002	--	--	--	--	--	--	0.02	0.002	0.05	0.005	--	--	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	--	--	0.00001	NA	0.00003	NA	0.0001	NA	0.00001	NA	0.00001	NA	0.00005	NA
	Selenium	0.001	0.001	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.003	0.003	--	--	0.01	0.005
	Vanadium	0.004	0.003	0.002	0.002	--	--	0.01	0.01	0.05	0.04	0.09	0.06	0.01	0.01	0.01	0.01	0.03	0.02
Zinc	0.03	0.03	--	--	--	--	0.01	0.004	0.01	0.01	0.01	0.01	0.003	0.002	0.001	0.001	0.005	0.004	
Bald Eagle	Cadmium	0.004	0.001	0.01	0.002	0.003	0.001	0.03	0.01	0.09	0.02	0.14	0.03	0.04	0.01	0.02	0.004	0.05	0.01
	Chromium	0.004	0.004	--	--	--	--	0.01	0.01	0.05	0.05	0.09	0.09	0.01	0.01	--	--	0.02	0.02
	Fluoride	0.15	0.04	0.20	0.05	0.06	0.01	0.66	0.16	1.89	0.46	3.22	0.78	0.85	0.21	0.40	0.10	1.80	0.44
	Lead	0.01	0.001	--	--	--	--	--	--	0.01	0.001	0.03	0.00	--	--	--	--	--	--
	Mercury	0.00001	NA	0.000004	NA	--	--	0.000004	NA	0.00002	NA	0.0001	NA	0.00001	NA	0.000005	NA	0.00004	NA
	Selenium	0.001	0.001	--	--	--	--	--	--	0.01	0.004	0.01	0.01	0.003	0.002	--	--	0.00	0.003
	Vanadium	0.003	0.002	0.002	0.001	--	--	0.01	0.01	0.04	0.03	0.07	0.05	0.01	0.01	0.01	0.00	0.02	0.01
Zinc	0.03	0.02	--	--	--	--	0.004	0.003	0.01	0.01	0.01	0.01	0.002	0.001	0.001	0.001	0.004	0.003	
Horned Lark	Cadmium	0.02	0.005	0.04	0.01	0.02	0.004	0.14	0.03	0.33	0.08	0.51	0.12	0.14	0.03	0.08	0.02	0.19	0.04
	Chromium	0.03	0.03	--	--	--	--	0.11	0.10	0.38	0.36	0.64	0.61	0.08	0.08	--	--	0.17	0.16
	Fluoride	0.20	0.05	0.25	0.06	0.09	0.02	0.84	0.20	2.24	0.55	3.68	0.90	1.07	0.26	0.53	0.13	2.15	0.52
	Lead	0.10	0.01	--	--	--	--	--	--	0.10	0.01	0.29	0.03	--	--	--	--	--	--
	Mercury	0.001	NA	0.0005	NA	--	--	0.0005	NA	0.002	NA	0.01	NA	0.001	NA	0.0005	NA	0.004	NA
	Selenium	0.01	0.01	--	--	--	--	--	--	0.05	0.04	0.10	0.07	0.03	0.02	--	--	0.05	0.04
	Vanadium	0.03	0.02	0.02	0.01	--	--	0.09	0.06	0.36	0.25	0.66	0.46	0.10	0.07	0.06	0.04	0.19	0.13
Zinc	0.03	0.02	--	--	--	--	0.03	0.02	0.04	0.03	0.05	0.04	0.02	0.01	0.01	0.01	0.03	0.02	

Notes:

Incremental Hazard Quotients (IHQ) above 1 are shaded.
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '--' Not evaluated because the soil concentration was below the Comparative Value as defined in SRI Field Modifications 13 & 14.

TABLE ES-2
INCREMENTAL HAZARD QUOTIENT SUMMARY FOR ECOLOGICAL RECEPTORS IN THE SAGEBRUSH STEPPE HABITAT OF THE UNDEVELOPED AREAS AND THE NORTHERN
PROPERTIES
FMC Corporation, Pocatello, Idaho
(Page 3 of 3)

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	SUA	WUA	Parcel 1	Parcel 2	Parcel 3	Parcel 4	Parcel 5	Parcel 6
			HQ	IHQ	IHQ	IHQ	IHQ	IHQ	IHQ	IHQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.10	0.05	0.22	0.38	0.51	0.23	0.16	0.28
	Chromium	PW	0.0001	--	--	0.0002	0.001	0.001	0.0002	--	0.0004
	Fluoride	Plant	0.47	0.34	0.15	0.89	1.47	1.69	1.07	0.72	1.44
	Lead	PW	0.01	--	--	--	0.01	0.02	--	--	--
	Mercury	PW	0.02	0.02	--	0.02	0.08	0.23	0.04	0.02	0.14
	Selenium	PW	0.16	--	--	--	0.96	1.71	0.48	--	0.83
		Plant	0.001	--	--	--	0.01	0.01	0.003	--	0.01
	Vanadium	PW	0.10	0.06	--	0.28	1.12	2.06	0.30	0.17	0.60
		Plant	0.02	0.01	--	0.06	0.25	0.45	0.07	0.04	0.13
	Zinc	Plant	0.22	--	--	0.03	0.04	0.02	0.01	0.01	0.03
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.03	0.02	0.07	0.11	0.14	0.07	0.05	0.08
	Chromium	PW	0.0001	--	--	0.0002	0.001	0.001	0.0002	--	0.0004
	Fluoride	Plant	0.28	0.16	0.07	0.47	0.84	0.997	0.58	0.37	0.82
	Lead	PW	0.01	--	--	--	0.01	0.02	--	--	--
	Mercury	PW	0.02	0.02	--	0.02	0.08	0.23	0.04	0.02	0.14
	Selenium	PW	0.16	--	--	--	0.96	1.71	0.48	--	0.83
		Plant	0.001	--	--	--	0.01	0.01	0.003	--	0.01
	Vanadium	PW	0.10	0.06	--	0.28	1.12	2.06	0.30	0.17	0.60
		Plant	0.02	0.01	--	0.06	0.25	0.45	0.07	0.04	0.13
	Zinc	Plant	0.07	--	--	0.02	0.02	0.02	0.01	0.01	0.02

Notes:

Incremental Hazard Quotients (IHQ) above 1 are shaded.

'--' Not evaluated because the soil concentration was below the Comparative Value as defined in SRI Field Modifications 13 & 14.

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ACRONYMS/ABBREVIATIONS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern and chain of custody
COPC	constituent of potential concern
CSM	Conceptual Site Model
CTE	central tendency exposure
CV	comparative value
EMF	Eastern Michaud Flats
EPA	Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
FMC	FMC Corporation
FSP	field sampling plan
ft	feet
GPS	Global Positioning System
HHRA	Human Health and Risk Assessment
HQ	hazard quotient
IDW	investigation derived waste
IHQ	incremental hazard quotient
ISOCs [®]	In Situ Object Counting System
LOAEL	lowest-observed-adverse-effect-level
MDC	minimum detectable concentration
mg/kg	milligrams per kilogram
mph	miles per hour
MS/MSD	matrix spike/matrix spike duplicate
MWH	MWH Americas, Inc.
NA	not applicable
NOAEL	no-observed-adverse-effect-level
NPL	National Priorities List

ORIA	Office of Radiation and Indoor Environments Laboratory
OU	operable unit
P4	elemental phosphorus
Pb-210	lead-210
PCDA	Power County Development Authority
pCi	picoCuries
PIC	pressurized ionization chamber
Ra-226	radium-226
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RI	Remedial Investigation
RME	reasonable maximum exposure
ROC	radionuclides of concern
ROD	Record of Decision
ROPC	Radiological COPC
RU	remediation unit
SFS	Supplemental Feasibility Study
SOP	Standard Operating Procedures
SOW	Statement of Work
SRI	Supplemental Remedial Investigation
SS	surface soil
SSL	soil screening level
SUA	southern underdeveloped area
TRV	toxicity reference value
U-238	uranium-238
UCL	upper confidence limit
USCS	unified soil classification system
USEPA	United States Environmental Protection Agency
VSP	Visual Sampling Plan
Work Plan	Supplemental Remedial Investigation Work Plan
WUA	western underdeveloped area

Section 1

INTRODUCTION

1.1 BACKGROUND AND 2008 SRI ADDENDUM OBJECTIVES

The FMC Plant Operable Unit (OU) is a part of the larger Eastern Michaud Flats (EMF) Superfund Site, and is located in southeastern Idaho, approximately 2.5 miles northwest of Pocatello, Idaho. The EMF Site was listed on the National Priorities List (NPL) on August 30, 1990. The EMF Site includes two adjacent production facilities, a former FMC Corporation elemental phosphorus processing plant that ceased operation in 2001 and a phosphate fertilizer processing facility operated by the J.R. Simplot Company which remains in operation. 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. The EMF Site is divided into three “Subareas:” 1) the FMC Subarea, consisting of the FMC plant and other FMC-owned properties at the site; 2) the Simplot Subarea, consisting of the Simplot plant and other Simplot-owned properties at the site; and 3) the Off-Plant Subarea, consisting of the remainder of the site.

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 Administrative Order on Consent (AOC) in October 2003 (SRI/SFS AOC) for a Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) at the FMC Plant OU. This was driven primarily by EPA’s finding that additional investigations and evaluations were needed at the plant areas that had been actively operated at the time of the 1996 RI/FS but where operations had terminated with the plant shutdown. These efforts targeted the data gaps identified in the *Scoping and Planning Memo* (BEI, 2004) and the *RI Update Memorandum* (BEI, 2004a), which were largely related to the former operating areas of the FMC Plant Site which are located south of Highway 30. The *SRI Work Plan* (MWH, 2007) and field work, which was performed in 2007, were accordingly focused on the FMC Plant Site property where the former elemental phosphorus processing facility was located. However, 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. While FMC owns the Tesco Property, FMC acquired that property after the 1998 Record of Decision (ROD) and is thus excluded from the areas defined as the FMC Plant OU. The Tesco property was not evaluated during the RI/FS and will not be addressed in this Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. It will instead be addressed under Resource Conservation and Recovery Act (RCRA) corrective action authorities.

In June 2008, FMC submitted the *Draft SRI Report* (MWH, 2008) that included the results of the 2007 field investigations conducted at the FMC Plant Site. In August 2008, based on regulatory review and comment on the *Draft SRI Report*, the EPA requested that additional investigations be performed at FMC’s Undeveloped Areas (located to the south and west of the former processing areas of the FMC Plant Site) and the FMC Northern Properties to gather data for further assessment of risks in these areas to support the SFS. FMC agreed to perform additional investigations and collect soil samples from the following:

- The Southern and Western Undeveloped Areas (SUA and WUA) of the FMC Plant Site
- FMC-owned properties north of Highway 30 (the Northern Properties), and
- Ten negotiated background areas within 11 miles of the FMC Plant OU.

The primary objective of the investigations on the FMC Plant OU was to collect surface soil samples in order to estimate risks to potential ecological and human receptors. The primary objective of the background investigation, which was performed at locations outside of the area impacted by EMF facility operations, was to further develop background concentrations for metal and radionuclide constituents with comparable sample support to those samples to be collected on the Northern Properties and Undeveloped Areas for comparison purposes in evaluating those areas. Following this additional work, FMC committed to provide EPA with an Addendum to the SRI report summarizing the methods and findings of these supplemental investigations. This SRI Addendum Report supplements the information, including the data, presented in the *Final SRI Report* (MWH, 2009), which was approved by EPA on May 26, 2009. This Addendum Report, along with the *Final SRI Report*, and the *Groundwater Current Conditions Report* (GWCCR, MWH 2009a) will support both the Supplemental Feasibility Study (SFS) Report, and ultimately the amended ROD for the FMC Plant OU as a whole.

This *SRI Addendum Report* provides both the analytical results and risk assessment findings associated with the field investigations conducted pursuant to the EPA-approved *SRI Work Plan Addendum - Field Modification #13, Additional Southern and Western Undeveloped Areas Field Investigations* (MWH, 2008a) and *SRI Work Plan Addendum - Field Modification #14, Northern FMC-Owned Properties and Background Soil Sampling* (MWH, 2008b).

1.2 SITE DESCRIPTIONS AND REGULATORY HISTORY

The subsections below describe the physical aspects (size, location, activities conducted on the site, etc.) of the areas that were sampled within the FMC Plant OU during the fall of 2008 including: the SUA, WUA, and the Northern Properties (i.e., the 6 parcels north of Highway 30) on the FMC Plant OU, and the background sites that were sampled concurrently. In addition, , regulatory background information is included as appropriate so that the reader can understand the rationale for sampling these areas at this point in the SRI process. The site-specific sampling objectives also are included in Section 1.3.

1.2.1 Southern and Western Undeveloped Areas

The undeveloped areas of the FMC Plant OU (as shown on Figure 1-2) consist of approximately 250 acres in the foothills of the Bannock Range (SUA) and an additional 250 acres in the western portion of the Plant site, west of the location of RCRA Ponds 17 and 18 (WUA). There are few roadways in both the SUA and WUA and both of these undeveloped areas are considered essentially “undisturbed” in that they were never used in plant operations, for raw material, for waste storage/accumulation, or as traffic corridors. Other than slag for road construction, the only potential impact from EMF site operations would have been from aerial deposition of FMC and Simplot plant stack and/or fugitive emissions.

During development of the *SRI/SFS Statement of Work (SOW)*, EPA requested further evaluation of potential ecological risks related to the FMC Plant OU. Following a site visit on May 15, 2003, EPA limited their concern over potential ecological risks to the undeveloped areas located to the west and south of the FMC Plant Site. EPA and its contractor determined that the developed/disturbed portions of the FMC Plant OU (i.e., those being investigated pursuant to the SRI) do not provide habitat suitable for potential terrestrial and/or aquatic receptors.

In 2003, at EPA's request, FMC completed an analysis that identified the relevant *Remedial Investigation (RI)* (BEI, 1996) and *EMF Baseline Ecological Risk Assessment (Baseline ERA)* (E&E, 1995) data that could be used to assess potential risks in the undeveloped areas. To characterize the undeveloped areas, EPA approved use of the data obtained during the *Baseline ERA* in the maximally impacted sagebrush steppe habitat sampling location situated immediately to the southwest of the FMC Plant Site (i.e., Bannock Hills SW). In addition, EPA approved use of the RI data from soil samples collected adjacent to the undeveloped areas. EPA also concurred that no major revisions to either the *Baseline ERA* methodology or Conceptual Site Model (CSM) were necessary. However, EPA requested a review of current toxicological data to update the toxicity reference values (TRVs) used in the *Baseline ERA*, and an update to the CSM by the addition of three wildlife receptors (bald eagle, pygmy rabbit, and Townsend's big-eared bat) which were not quantitatively evaluated in the *Baseline ERA*. Subsequently, the *Baseline ERA* methodology, together with the ERA and RI characterization data, the revised toxicity values, and the updated CSM receptors, were used to determine ecological risks in the undeveloped areas of the FMC Plant OU for the three chemicals of concern (COPCs) evaluated in the *Baseline ERA* (cadmium, fluoride and zinc) and two additional COPCs (vanadium and chromium). This assessment is documented in Section 5 of the *RI Update Memo* and the *SRI Report Appendix B*.

Subsequent to the *RI Update Memo* and during its review of the *SRI Report*, EPA raised concerns about the data used to evaluate ecological risks in the SUA and WUA of the FMC Plant OU and prepared a memorandum dated August 15, 2008 which stated that "*There have been significant analyses done based on RI soil samples on a limited number of contaminants in the FMC OU Undeveloped Southern and Western Portions. However, not a single soil sample has been taken in the actual undeveloped southern and eastern portions of the FMC OU....*" EPA also identified additional COPCs in addition to those previously evaluated in the *RI Update Memo* (cadmium, chromium, fluoride, vanadium and zinc). The additional COPCs are arsenic, lead, mercury and selenium.

To address the Agency's ecological concerns regarding these nine constituents, FMC agreed to collect surface soil samples in the undeveloped areas and analyze them for these COPCs in order to provide additional lines of evidence in the evaluation of potential ecological risks. As discussed during a meeting in August 2008, the evaluation is to be performed consistent with the methods and assumptions incorporated into the previous ecological assessment of the undeveloped areas, as documented in Section 5 of the *RI Update Memo*. At EPA's request, FMC also agreed to analyze the collected surface soil samples for the remaining target metal COPCs identified in the *SRI Work Plan* to evaluate potential human health risks to hypothetical future workers in the SUA and WUA of the FMC Plant OU. During the August 2008 discussions with the EPA, it was also agreed that ROPCs did not need to be further evaluated in the undeveloped

areas. Gamma dose measurements (measurements collected in a pressurized ion chamber [PIC]) were collected from both the SUA and WUA during the 2007 SRI. The results of these gamma measurements indicated that gamma throughout these areas was comparable to background as discussed in Sections 4.22 and 4.23 of the *Final SRI Report*.

1.2.2 Northern Properties

In addition to the FMC Plant Site, the FMC Plant OU also includes 206 acres owned by FMC located just north of the FMC Plant Site (excluding the Tesco property). These Northern Properties, as shown on Figure 1-3, along with the FMC Plant Site and all other properties extending over four miles to the southwest along Highway 30 are currently zoned “heavy industrial” by Power County. For purposes of the 2008 SRI Addendum activities, the FMC Northern Properties were divided into six (6) separate sampling parcels. These sampling parcels were identified using the following criteria:

- Historic soil sampling results (EMF RI and Secular Equilibrium Study);
- Historic and current land use;
- Potential/anticipated future land use (e.g., properties within the Power County Development Authority [Power County Development Authority; PCDA] development agreement);
- Surface characteristics; and
- Other man-made boundaries.
- The Conceptual Site Model (CSM), e.g., only potential releases due to aerial deposition, and
- Prevailing wind direction.

The individual FMC land areas (or parcels) to be sampled include three (3) parcels north of Highway 30 but south of Interstate 86 (I-86), and three (3) parcels north of I-86 as listed below.

- Parcel #1 – Western Sampling Parcel
- Parcel #2 – Central Sampling Parcel
- Parcel #3 – Eastern Sampling Parcel
- Parcel #4 – Northwestern Sampling Parcel
- Parcel #5 – Gravel Pit Sampling Parcel
- Parcel #6 – Batiste Spring Sampling Parcel

FMC has placed restrictive covenants that prohibit residential development on these parcels, with the exception of Parcel #6 (the Batiste Spring parcel which FMC acquired in 1996). The restrictive covenants were recorded with Power County. For purposes of the SRI and SFS, these sampling parcels will be treated as distinct decision units. While Parcel #6 was not owned by FMC at the time that the restrictive covenants were placed on the remainder of the FMC Northern Properties, it was owned at the time of the issuance of the 1998 ROD and is within the definition of the FMC Plant OU. FMC expects to place similar restrictive covenants on Parcel #6 consistent with the land use restrictions contemplated by the 1998 ROD and as a probable component of the remedy in the ROD amendment for the FMC Plant OU.

Numerous surface and subsurface soil samples were collected from the Northern Properties during 1992 and 1993 as part of the EMF RI and documented in Section 4 of the *RI Report*. These samples were analyzed for both metals and radionuclides. Radionuclide samples were also collected from these areas during the secular equilibrium study as documented in the *Assessment of Secular Equilibrium in EMF Site Soils Final Report* (FMC, 2006). These parcels were not sampled during the SRI field activities in 2007 because EMF RI sampling had previously been considered sufficient for characterization purposes. However, during meetings with the EPA in August 2008, FMC agreed to collect additional soil samples from these parcels.

1.2.3 Background Areas

During discussion in August 2008 regarding additional investigations in the SUA, WUA and Northern Properties, EPA performed a critical review of the RI data used to characterize background levels during the EMF RI. Specifically, the Agency's review determined that the background levels derived for metals from the EMF RI subsurface soil data collected within a three-mile radius of the EMF facilities are consistent with concentrations detected in five non-impacted surface soil samples collected over five miles to the east of the EMF facilities in the Pocatello Valley. The five surface soil samples were collected during Phase II of the RI sampling, but were not used in the RI characterization of background concentrations. However, in its recent review, EPA determined that these five data points could be used to ground truth the RI characterization of metal background levels. Based on the findings of its analysis, EPA concluded that the RI characterization of background metal concentrations was appropriate.

While no concerns over the quality of the RI analytical data were identified for metals, EPA did express concern over the precision of the RI analytical methods used to characterize target radionuclides. Therefore, new background samples were collected during the 2008 SRI Addendum field activities to address these data quality issues and to assist evaluation of surface soil samples collected from the Northern Properties and SUA/WUA.

A total of 10 background sampling locations were identified within the greater Pocatello area within a six to eleven-mile radius of the former FMC plant site as listed below and shown on Figure 1-4.

- Background #1 Rainbow Road Exit (west on I-86) - #1
- Background #2 Rainbow Road Exit (west on I-86) - #2
- Background #3 Pocatello Creek Road
- Background #4 Moon Light Mine Road (Maple Grove Lane)
- Background #5 Blackrock/Chinese Peak Trailhead - #1
- Background #6 Blackrock/Chinese Peak Trailhead - #2
- Background #7 Barton Road at Wildlife Road
- Background #8 Red Hill Trailhead (off Barton Road)
- Background #9 Highway Ponds #1 (above outcrop)
- Background #10 Highway Ponds #2 (southern end below outcrop)

The locations were selected based on representative soil types from the surrounding area including Michaud Flats, accessibility concerns, and proximity to the sample locations identified during the Phase II RI Surface Soil Investigation. Due to growth and expansion in the City of Pocatello in intervening years, most of the historic Portneuf Valley background sampling locations were no longer “undeveloped” or accessible. However, eight of the 10 background locations were proximate to these five sampling locations. The other two locations were selected to assure development of sufficient data to perform appropriate statistical testing of data, and also satisfy the requirements based on soil type, accessibility, and comparable distance from the EMF site to assure no site impact. All ten background sampling locations were visited by EPA’s contractor and a representative of the Shoshone-Bannock Tribes on October 8, 2008 and agreed upon prior to EPA’s approval of Field Modification #14.

1.3 SITE SPECIFIC OBJECTIVES

The general objective of the investigations during the 2008 SRI Addendum activities was to collect surface soil samples in order to evaluate risks to potential ecological and human receptors. However, within each investigation site-specific objectives and receptors were identified, as outlined below.

1.3.1 Southern and Western Undeveloped Areas

The primary objective of the 2008 addendum sampling in the SUA and WUA is to collect surface soil samples in order to gather analytical data for further evaluation of potential risks to ecological receptors in these undeveloped areas. In addition, the analytical data are being compared to worker soil screening levels (SSLs), as discussed in Section 3 of this Report, to confirm that levels are protective of hypothetical future worker exposure scenarios in these areas. The SSLs developed for the COPCs were updated in accordance with guidance that EPA has developed since completion of the *EMF HHRA* and *ERA*.

1.3.2 Northern Properties

The primary objective of the sampling in the Northern Properties is to collect and analyze surface soil samples to further evaluate ecological and human health risks to potential future receptors in these areas. The analytical data are being compared to ecological, residential and commercial/industrial worker SSLs, as discussed in Section 3 of this Report. Despite the fact that the Northern Properties are within an area zoned “heavy industrial” by Power County, which prohibits new residential development, and FMC previously recorded restrictive covenants preventing residential development of five of the six parcels, EPA mandated that these analytical data be evaluated for a residential exposure scenario. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate¹. Since land use restrictions and other

¹ Include estimates of risk for current and reasonably anticipated future land uses and potential future groundwater and surface water uses, without institutional controls. The baseline risk assessment is essentially an evaluation of the “no action” alternative (*i.e.*, an assessment of the risk associated with a site in the absence of any remedial action or control). While institutional controls do not actively clean up the contamination at a site, they can control exposure

institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for the baseline risk. Furthermore, select subsurface samples were collected from the parcel that exhibited the highest surface concentrations in the RI data set (Parcel 3) to evaluate subsurface risks to potential future site workers.

1.3.3 Background

While no concerns over the quality of the RI analytical data were identified for metals, EPA did express concern over the precision of the RI analytical methods used to characterize radium-226 and uranium-238 concentrations. These same concerns are also applicable to lead-210. Therefore, background samples were collected from 10 locations shown in Figure 1-4 for radium-226, uranium-238 and lead-210 during the 2008 SRI Addendum field activities to address these data quality issues, and to assist evaluation of surface soil samples collected from the Northern Properties. In addition, even though no quality concerns were expressed for the RI analytical metals data, the background samples were also analyzed for metals at the request of EPA.

1.4 REPORT ORGANIZATION

The organization of this SRI Addendum Report is based on the *Final SRI Report*. As this document is an addendum to the *Final SRI Report*, additional details on the FMC facility operations, previous environmental investigations with potential relevance to the EMF facilities, and physical characteristics of the FMC Plant Site and surrounding area based on the results of the EMF RI investigations and the SRI are not repeated here. This information can be found by referring to Sections 1 and 2 of the *Final SRI Report*. The SRI Addendum Report is organized as follows:

Section 1 describes a brief summary of the SRI Addendum activities scoping process and the objective of the SRI Addendum investigations.

Section 2 describes the field programs that were conducted during the SRI Addendum, including data collection equipment and procedures and sample analytical methods.

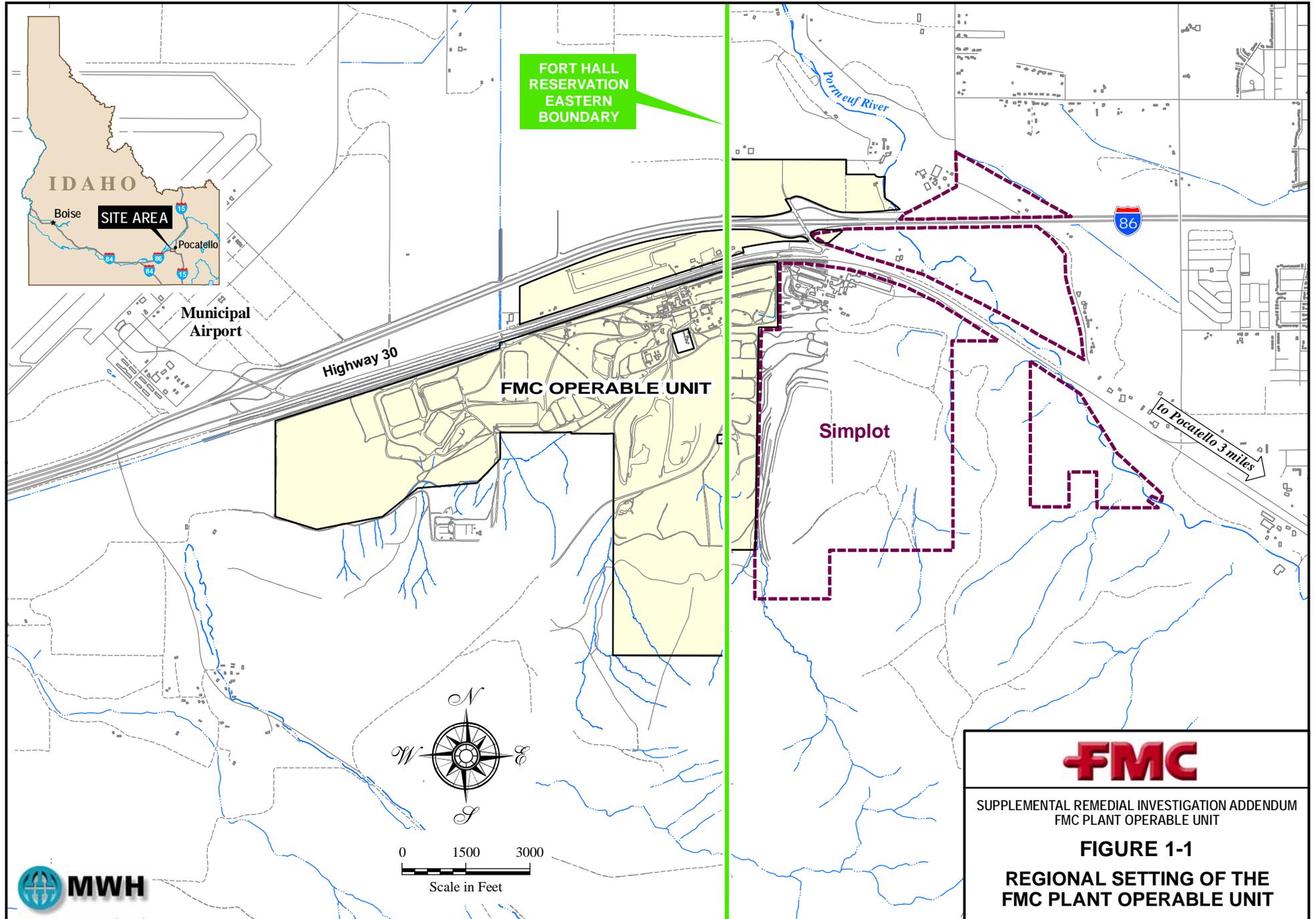
Section 3 describes on an exposure unit-specific basis the nature and extent of chemical constituents that appear to be associated with the FMC Plant OU activities. Concentrations of detected constituents in sampled surface and subsurface soils are initially compared to risk-based comparative values (CVs), developed from SSLs and background values, to provide the basis for quantitatively evaluating these constituents in the Supplemental Ecological and/or Human Health Risk Assessments Addendum (Supplemental ERA Addendum and Supplement HHRA Addendum). The findings of the Supplemental ERA and HHRA Addenda, which summarize risks to potential future receptors from exposure to existing surface and subsurface materials and groundwater, are also discussed.

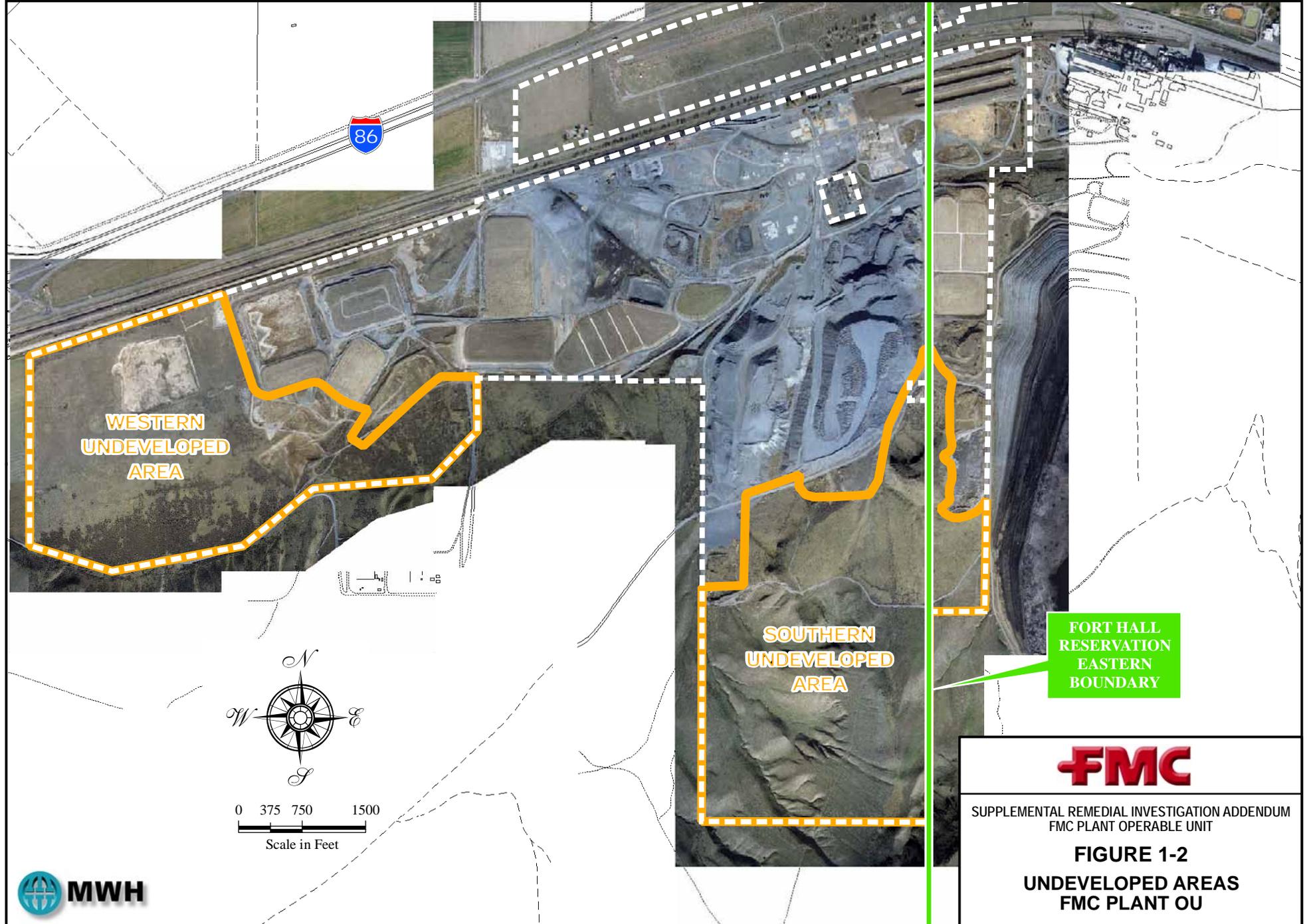
and, therefore, are considered to be limited action alternatives that may be evaluated during the remedy selection process.” (1990 NCP Preamble at 55 FR 8710).

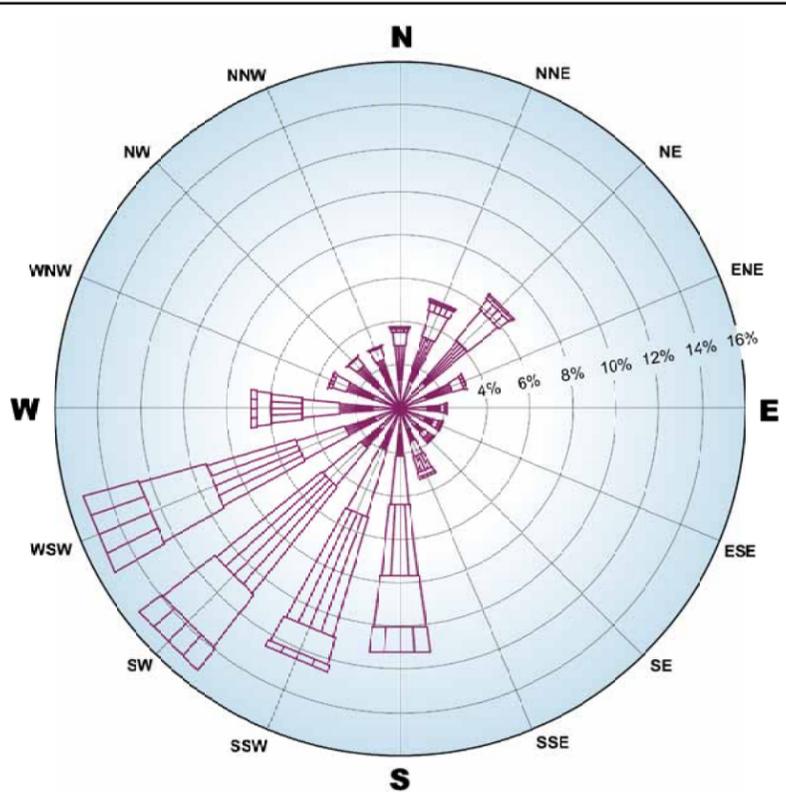
Section 4 summarizes the findings of each field program and presents the key conclusions for the program as a whole and, where appropriate, for individual areas.

Section 5 includes the references cited in this SRI Addendum Report.

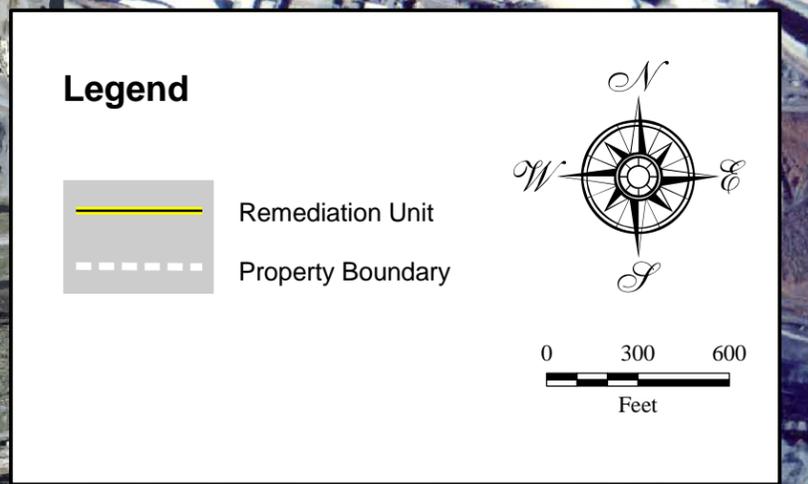
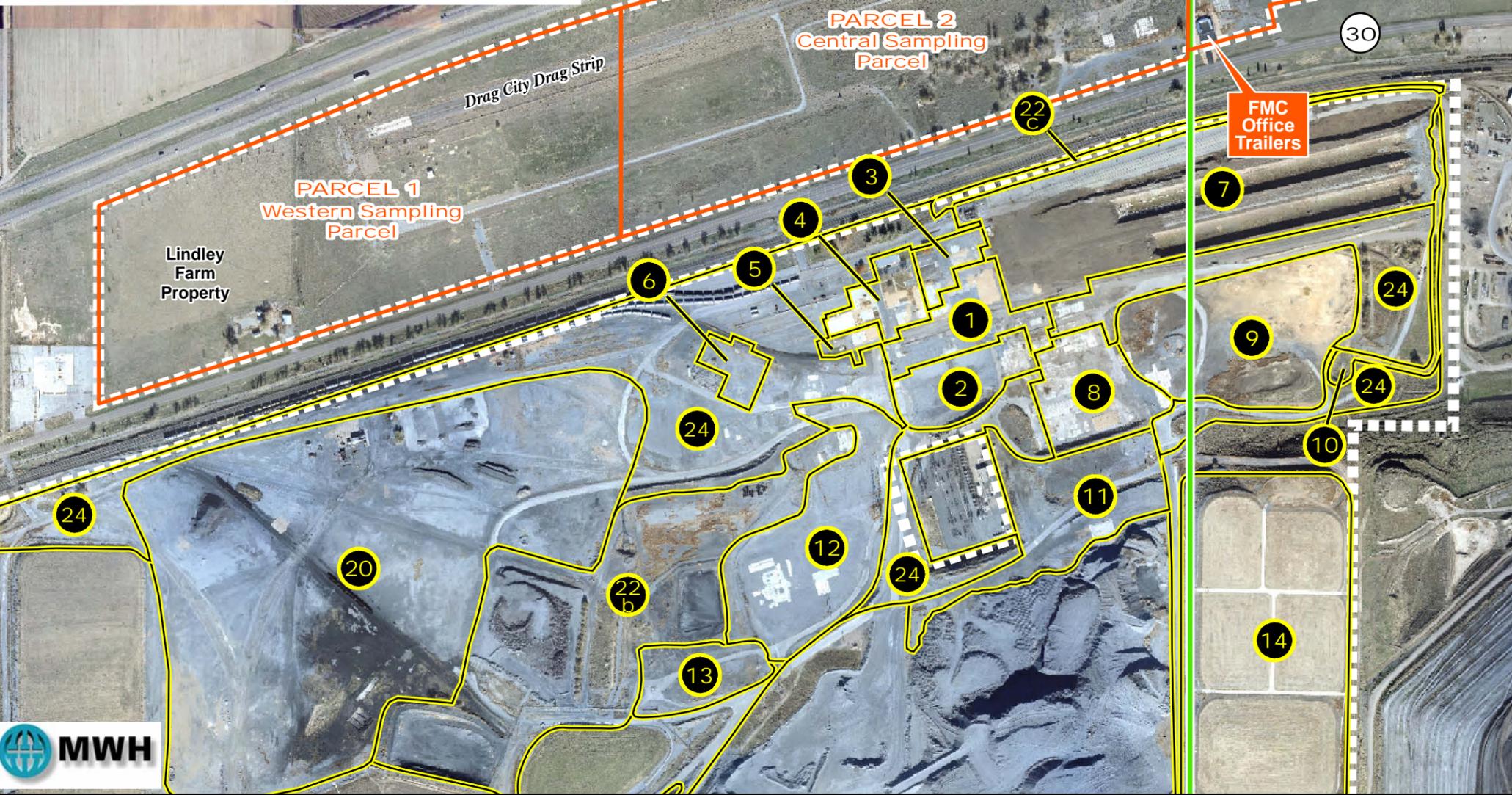
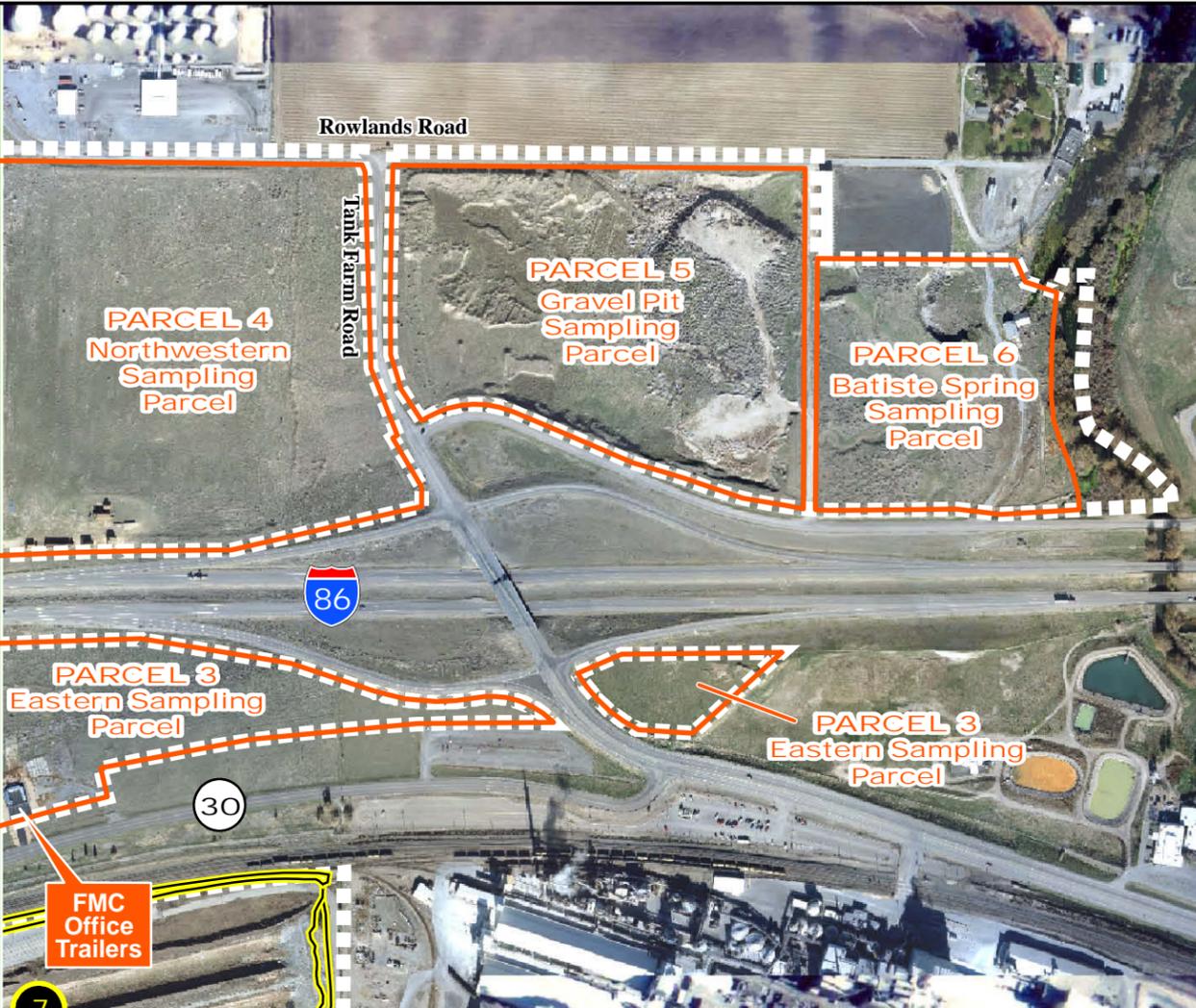
As required by the 2003 SOW, this SRI Addendum Report includes tabulated results and sample location figures, and includes as appendices the validated analytical results, field data, field observations and logs, the Supplemental Ecological and Human Health Risk Assessments (the Supplemental ERA Addendum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







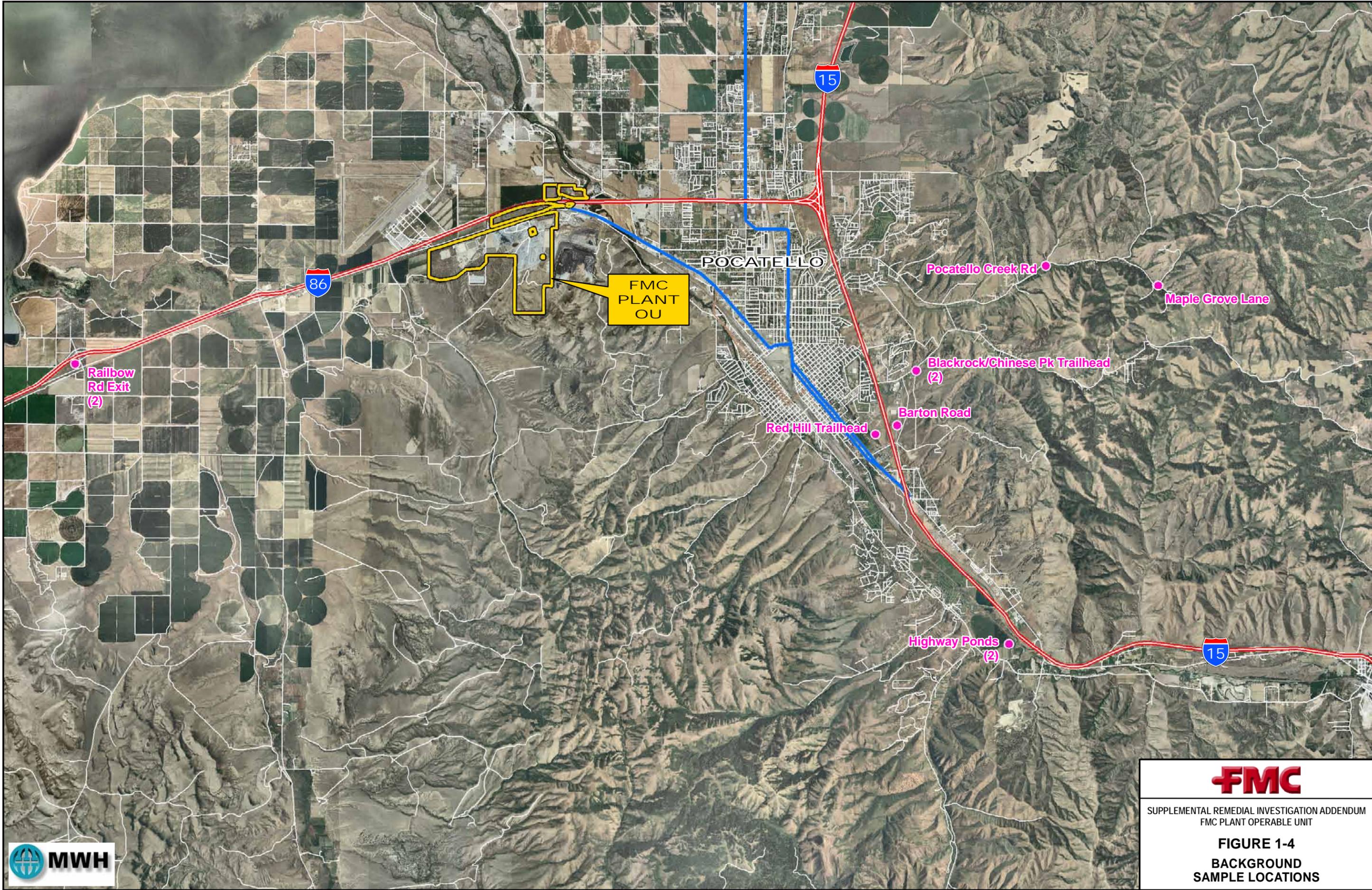
FORT HALL RESERVATION EASTERN BOUNDARY



SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 1-3
NORTHERN PARCEL
LOCATIONS





FMC
SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT
FIGURE 1-4
BACKGROUND
SAMPLE LOCATIONS

Section 2

SRI FIELD INVESTIGATION PROGRAMS AND TECHNIQUES

This section summarizes the SRI Addendum field programs that were conducted at the FMC Plant OU during the fall of 2008. The primary areas sampled were the: 1) Southern and Western Undeveloped Areas, 2) the Northern Properties, and 3) the 10 background locations. Discussed in this section are the sampling design for each SRI Addendum field program, and the equipment/procedures that were used during this field event. Because this work supplements the SRI field program initiated in 2007, where applicable, methods and procedures from the *SRI Work Plan* and *SRI Field Sampling Plan (SRI FSP; MWH, 2007)* are included by reference.

Field work performed was consistent with the objectives and procedures outlined in two EPA-approved SRI Work Plan addenda: 1) *Field Modification #13, Additional Southern and Western Undeveloped Areas Field Investigations for the FMC Plant OU (MWH, 2008b)* and 2) *Field Modification #14- the Northern FMC-Owned Properties and Background Soil Sampling Field Investigations for the FMC Plant OU (MWH, 2008c)*.

2.1 FIELD INVESTIGATION PROGRAMS AND RATIONALE

2.1.1 Southern and Western Undeveloped Areas

Visual Sampling Plan, v.4.3. (VSP) software was used to place 20-location square grids on a random origin across both the WUA and SUA. A total of eight 20-location grids were placed across each of the undeveloped areas as shown in Figures 2-1 and 2-2.

At each gridded location, the type of surface soil was identified and logged, and a surface soil sample was collected from 0-to-2 inches below ground surface (bgs). The soil samples were logged in general accordance with the Unified Soil Classification System (USCS). The samples from the 20 surface soil locations were combined and composited to create one (1) composite soil sample for each grid. This resulted in a total of eight (8) 20-increment composite soil samples that were submitted to the laboratory for chemical analyses of antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, fluoride, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, thallium, uranium, vanadium, and zinc.

2.1.2 Northern Properties (Excluding Parcel 5)

VSP was also used to place 20-location square grids on a random origin across each of the Northern Properties sampling parcels with the exception of Parcel 5. A total of eight 20-location grids were placed across each of the five (5) remaining parcels as shown in Figures 2-3, 2-4, 2-5A, 2-5B, 2-6, and 2-8.

For all gridded parcel locations, except for the berm in Parcel 5 discussed below, the type of surface soil was visually evaluated and logged in general accordance with the USCS. Two discrete surface soil samples of native materials were collected in each of the 20 locations; the first from the 0-to-2 inches bgs interval and the second from the 2-to-6 inches bgs interval. Soil samples at both intervals were collected from each of the 20 surface soil locations and were

combined and composited to create 1) one 20-increment composite soil sample from 0-to-2 inches bgs and 2) a second 20-increment composite soil sample from 2-to-6 inches bgs for a total of 2 composite samples from each of the eight (8) random origin grids. This resulted in a total of 16 composite soil samples from each parcel (8 from 0-to-2 inches bgs and 8 from 2-to-6 inches bgs) that were submitted to the laboratory for analyses.

Composite samples collected from the 0-to-2 inch bgs horizon were analyzed for fluoride, zinc, cadmium, chromium, arsenic, mercury, lead, vanadium, selenium, antimony, manganese, thallium, uranium, lead-210, radium-226, and uranium-238. Samples collected from the 2-to-6 inch bgs horizon were analyzed for target radionuclides (radium-226, lead-210, and uranium-238) only.

As discussed in *Field Modification #14- the Northern FMC-Owned Properties and Background Soil Sampling Field Investigations for the FMC Plant OU (MWH, 2008b)*, the vertical boundary from the surface to six inches below the surface (i.e., bottom of each sample interval) was collected because the radiological cancer slope factors for evaluating risks from external exposure to gamma radiation assume uniform contamination to a depth of 6 inches. However, as discussed in the Supplemental HHRA Addendum (Appendix D), the 0-2 inch data were ultimately used to characterize radiological risks via this pathway in conjunction with external gamma cancer slope factors modified to account for this shallower sample depth.

2.1.2.1 Parcel 5 of the Northern Properties

In Parcel 5 (Gravel Pit), top soil had been removed and stockpiled/bermed around the perimeter of the sampling parcel prior to the gravel excavation during the 1950s. The excavated gravel pit is currently being backfilled with clean construction fill from construction sites in the Pocatello area (but not from any materials from the FMC Plant Site). The stockpiled topsoil material will be used to reclaim Parcel 5 after backfilling of the gravel pit is completed. Based on this future land use, and the fact that the stockpiled topsoil will be redistributed as topsoil once the gravel pit is backfilled, the stockpiled topsoil as well as undisturbed areas of the parcel were sampled. A total of three 20-increment samples were collected from the stockpiled topsoil and undisturbed areas of the parcel. These locations were randomly selected in the field and sampling locations are shown on Figure 2-7. No samples were collected from within the gravel pit or in areas that contain backfilled material. Discrete samples from 0-to-6 inches bgs were collected from each of the 20 surface soil locations and combined to create one (1) composite soil sample from each of the three (3) grids.

A total of 3 composite soil samples from Parcel 5 were submitted to the laboratory. Samples from the 0-to-6 inch bgs horizon were analyzed for fluoride, zinc, cadmium, chromium, arsenic, mercury, lead, vanadium, selenium, antimony, manganese, thallium, uranium, lead-210, radium-226, and uranium-238.

2.1.2.2 Additional Soil Sampling in Parcel 3 of the Northern Properties

In addition to surface soil sampling, subsurface investigations were also conducted within Parcel 3. The surface RI data indicate that Parcel 3 was most impacted by aerial deposition of FMC and

Simplot stack and/or fugitive emissions. In order to evaluate whether COPCs associated with this aerial deposition have migrated into subsurface soils, a subsurface investigation was performed using a backhoe to collect 0-to-10 feet bgs composite samples from three (3) locations within this sample parcel. The three (3) evenly distributed test pit excavation locations in Parcel 3 were randomly selected and are shown in Figure 2-9. The proposed sampling design remains consistent with the sampling and compositing methods described in the *SRI Work Plan Addendum*. A total of three (3) composite samples were analyzed for antimony, arsenic, cadmium, chromium, fluoride, lead, lead-210, manganese, mercury, radium-226, selenium, thallium, uranium, uranium-238, vanadium, and zinc.

2.1.3 Background Areas

A total of 10 background sampling locations were identified within the greater Pocatello area within a 6 to 11-mile radius of the former FMC plant site. The locations were selected based on representative soil types from the surrounding area including Michaud Flats and accessibility concerns. The 10 background locations included the following:

- Background #1 Rainbow Road Exit (west on I-86) - #1
- Background #2 Rainbow Road Exit (west on I-86) - #2
- Background #3 Pocatello Creek Road
- Background #4 Moon Light Mine Road (Maple Grove Lane)
- Background #5 Blackrock/Chinese Peak Trailhead - #1
- Background #6 Blackrock/Chinese Peak Trailhead - #2
- Background #7 Barton Road at Wildlife Road
- Background #8 Red Hill Trailhead (off Barton Road)
- Background #9 Highway Ponds #1 (above outcrop)
- Background #10 Highway Ponds #2 (southern end below outcrop)

Background sampling locations were accessible to the public (e.g., highway and/or county road right-of-ways, Bureau of Land Management [BLM] land) or written permission was granted by the property owner. Final sampling locations were surveyed using a GPS and locations are presented on Figure 2-10.

The proposed sampling design remained consistent with the sampling and compositing methods described in the *SRI Work Plan Addendum*. In each of the 10 background locations, twenty (20) discrete soil samples were collected from 2 intervals (0-to-2 inches and 2-to-6 inches bgs) for later compositing and one (1) discrete sample was collected for immediate submittal to the laboratory.

At each background location, a single 10 foot by 10 foot (10 ft x 10 ft) area was selected for sample collection and a grid was established by marking each of the sample locations with a pin flag. In this square area, as shown on Figure 2-10, two discrete surface soil samples of native materials were collected from 20 unique locations; the first from the 0-to-2 inches bgs interval and the second from the 2-to-6 inches bgs interval. The two sample intervals collected from each of the 20 locations were combined and composited to create: 1) one 20-increment

composite soil sample from 0-to-2 inches bgs and 2) a second 20-increment composite soil sample from 2-to-6 inches bgs for a total of 2 composite samples from each background location. When the background field program was completed, this resulted in a total of 20 composite soil samples (10 samples from 0-2 inches bgs and 10 samples from 2-6 inches bgs) from the 10 background locations that were submitted to the laboratory for analyses.

In addition, one (1) discrete 0-to-2 inch bgs sample and one (1) discrete 2-to-6 inch bgs sample were collected from the center of each 10 foot by 10 foot grid area. Again when completed, this resulted in a total of 20 discrete soil samples (10 samples from 0-2 inches bgs and 10 samples from 2-6 inches bgs) from the 10 background locations that were submitted to the laboratory for analyses.

The 10 composite and 10 discrete samples collected from the 0-to-2 inch bgs horizon were analyzed for antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, fluoride, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, thallium, uranium, vanadium, and zinc, lead-210, radium-226, and uranium-238. The 10 composite and 10 discrete samples collected from the 2-to-6 inch bgs horizon were analyzed for target radionuclides (radium-226, lead-210, and uranium-238).

2.2 FIELD EQUIPMENT AND PROCEDURES

Discrete and composite samples were collected from all the areas sampled during the fall 2008 SRI field program. Below the equipment and procedures used to collect those samples are explained in detail. In general, the field equipment and procedures followed those outlined in the *SRI FSP* and standard operating procedures (SOPs) discussed in Appendix B of that document. The field forms, field log books, GPS sample coordinates as well as chain-of-custody forms for the 2008 field activities are presented in Appendix A.

2.2.1 Surface Sampling

Discrete and composite samples were collected during the 2008 SRI field program. Individual discrete soil sample locations within each grid were located using a GPS unit with sub-meter accuracy. Gridded sample locations that were located on slag roadways (or any disturbed area) were not sampled at that location. When the original sample location was not deemed to be native material, the location was moved to native soil by randomly selecting a direction (north, south, east, or west) and moving five feet in that direction as described in the *SRI FSP*. This process was repeated until a new native soil sample location was determined. Individual (discrete) surface soil samples in each of the 20 locations that comprised the composite sample were collected according to SOP-15 of the *SRI FSP*. In order to collect the soil samples, the top layer of vegetative debris was carefully removed, when present, in order to expose the surface of the soil column. Extraneous material (e.g., larger rocks, leaves, sticks) was removed at the time of sample collection per the instruction of the laboratory.

In order to remove the surface vegetative material, field teams utilized a decontaminated spade or removed the material by hand using a clean pair of disposable gloves. A three inch-by-three inch-by-2 inch (3" x 3" x 2") metal frame was then laid on the soil surface to mark the extent of

each excavation prior to soil removal, and then hammered into the soil using a large rubber dead blow hammer. In the SUA and WUA, the field teams then carefully removed soil from the top 0-to-2 inches within the metal frame at each sample location using a decontaminated spade and decontaminated measuring cup. For background sampling and sampling within the Northern Properties, an additional eight ounce (oz) sample was excavated within the 2-to-6 inch bgs interval using a different decontaminated spade and measuring cup. In Parcel 5, one eight oz soil sample was collected at each location from 0-to-6 inches bgs. The excavated soils were placed in Zip-lock® bags and labeled so that the compositing could occur upon the return to the on-site compositing area.

Individual surface soil samples were hand delivered to the on-site compositing area. Each of the discrete surface soil samples in each grid was composited into one sample by the methods and procedures described in SOP-16A of the *SRI FSP*

The composited soil samples were placed into new, appropriately-sized sample jars provided by the laboratory. One soil jar was submitted for each 20 increment composite surface soil sample to the off-site laboratory.

Sample Labeling, Handling, Shipment, and Analyses. Composite soil samples were labeled, handled, and shipped following the sample handling protocols described in Section 5 and SOP-12 of the *SRI FSP*. Sample identification/labeling is discussed in more detail in section 2.2.3 below. All non-dedicated sample equipment was decontaminated according to SOP-3 of the *SRI FSP*. Equipment rinseate blanks and source water samples were collected according to Section 6 of the *SRI FSP*.

Composite samples collected from the 0-to-2 inch bgs interval, 2-to-6 inch bgs interval, and 0-to-6 inch bgs interval (in Parcel 5 only) were collected as discussed above. These samples were analyzed for target radionuclides, target metals, and/or fluoride according to the methods and procedures outlined in the *SRI FSP Field Modification #15, Revisions to the SRI Work Plan Total Fluoride Analysis (MWH, 2009b)* as summarized below.

- Target metals – EPA Method 6020
- Mercury – EPA Method 7471
- Fluoride – Bellack distillation extraction and EPA Method 340.2
- Lead-210 (Pb-210) – scintillation counting
- Radium-226 (Ra-226) – radon emanation
- Uranium-238 (U-238) – alpha spectroscopy.

Replicate soil samples were collected at a rate of approximately ten percent. Matrix spike/matrix spike duplicate (MS/MSD) samples were collected a rate of five percent or one per area. Equipment rinseate samples were collected at a frequency of one per week. Weekly equipment rinseate samples were collected on different types of sampling equipment such mixing bowls, spoons and incremental samplers.

Samples were shipped to designated off-site laboratories for analysis by the overnight carrier Federal Express and were maintained under chain of custody protocol. All soil and water samples were analyzed by Paragon Analytics of Fort Collins, Colorado and ALS Laboratory Group (formerly DataChem Laboratories, Inc.) of Salt Lake City, Utah. Data was independently validated by Laboratory Data Consultants (LDC) of Sacramento, California. The laboratory data reports and LDC validation reports are provided in Appendix B. The Data Verification and Validation Report is presented in Appendix C.

It should be noted that after all of the samples were analyzed for fluoride it was discovered that the samples were analyzed for soluble fluoride, which is what was wanted for the original 2007 SRI. However, for the 2008 SRI addendum, total fluoride (fluoride) data was needed for risk assessment purposes. Therefore the *SRI Work Plan* was modified (EPA-approved Field Modification #15) to add the Bellack distillation preparation method and the EPA 340.2 analytical method. The modification also incorporated a holding time of 180 days for the total fluoride samples. All samples were analyzed for total fluoride within holding times using this method. The validated fluoride data reported and evaluated in this document are for total fluoride not soluble fluoride.

In addition, during the analysis of radium-226, it was noted that low recoveries of matrix spike/matrix spike duplicate (MS/MSD) samples for radium-226 were reported. This resulted in re-analysis of a first batch of 20 soil samples. The re-analysis used a smaller aliquot size of 2 g, which is the same aliquot size used during the 2007 SRI activities. The re-analysis resulted in acceptable matrix spike recoveries. Based on this, all radium-226 analyses were run using the smaller aliquot size. All radium-226 reanalysis were performed within holding times and the data underwent validation by LDC as discussed in Appendix C.

2.2.2 Subsurface Sampling (Parcel 3 of the Northern Properties)

In addition to the surface soil samples collected in Parcel 3, three additional test pit excavations were completed using a standard motorized rubber-tired backhoe with an extendable arm. A detailed description of trenching, excavations and safety considerations are found in SOP-11 of the *SRI FSP*. Site personnel such as geologists, subcontractors and visitors were not permitted in the excavations.

At the excavations, subsurface soil samples were collected from the backhoe bucket with a decontaminated spoon and placed into new sealable plastic bags. Soil was removed from the test pit in approximately two (2)-foot lifts. From each of the 2-foot lifts, twenty (20) scoops of material were collected and composited until a depth of ten (10) feet bgs was reached. After sampling and logging was completed, the excavation was backfilled with soil from the excavation in the approximate order that it was removed and compacted with the backhoe bucket. After the completion of each excavation, the backhoe bucket was decontaminated using a portable steam cleaner. Decontamination activities were completed at the FMC facility.

The 0-to-10-foot subsurface soil samples were hand delivered to the on-site compositing area. Each soil sample was subsampled using the methods and procedures described in SOP-16A of the *SRI FSP*. The soil samples were placed into new, appropriately-sized sample jars provided

by the laboratory. One soil jar was submitted per subsurface soil sample to the off-site laboratory.

One replicate soil sample and one MS/MSD sample were collected from one of the test pits. All subsurface soil samples collected from the excavations were sampled for the same suite of constituents (target metals, fluoride, and target radionuclides) as the surface soil samples from the Northern Properties. The samples were collected, handled, and analyzed according to the methods and procedures specified for the surface soil samples as discussed in Section 2.2.1 above.

2.2.3 Sample Identification

2.2.3.1 Southern and Western Undeveloped Areas and Northern Properties Samples

The sample identification scheme for the WUA, SUA, and Northern Property composite samples from the 0-to-2-inch and 2-to-6-inch intervals, and the 0-to-6-inch interval for Parcel 5 is discussed below.

- *Composite samples* have individual soil location designations and samples were recorded sequentially at each area. The composite sample designation includes the area from which it came (SUA, WUA, and PARCEL1 through PARCEL6), the sample type (SS), followed by the acronym “C” for composite, and finally the depth interval where the individual samples were collected example, the fourth composite comprised of twenty (20) surface sample locations collected from the SUA was designated “SUA-SSC004(0-2 in)” and the fourth composite samples from Parcel #2 comprised of soil collected from twenty (20) surface sample locations collected was designated “PARCEL2-SSC004(0-2 in) and PARCEL2-SSC004(2-6 in).”

2.2.3.2 Background Samples

The abbreviated names for each background location used in the background sample identification labels were the following:

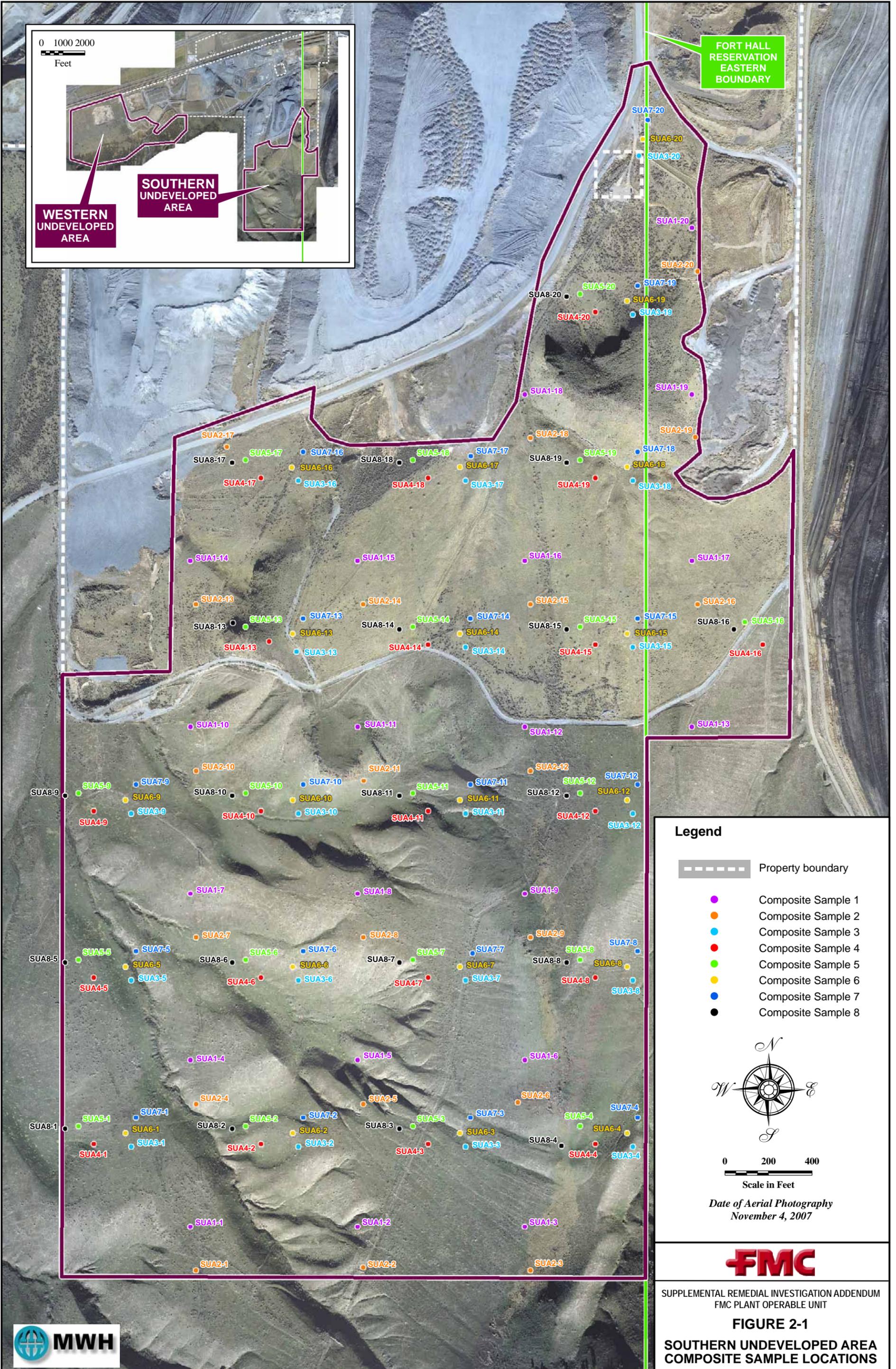
- *Background #1 - Rainbow Road Exit #1 - RRE1*
- *Background #2 - Rainbow Road Exit #2 – RRE2*
- *Background #3 - Pocatello Creek Road - PCR*
- *Background #4 - Maple Grove Lane - MGL*
- *Background #5 - Blackrock/Chinese Peak Trailhead - #1 – BLRK1*
- *Background #6 - Blackrock/Chinese Peak Trailhead - #2 –BLRK2*
- *Background #7 - Barton Road at Wildlife Road - BRT*
- *Background #8 - Red Hill Trailhead (off Barton Road) - REDH*
- *Background #9 - Highway Ponds #1 (above outcrop) – HWYP1*
- *Background #10 - Highway Ponds #2 (southern end below outcrop) – HWP2*

The sample identification scheme for the discrete and composite background samples collected from the 0-to-2-inch and 2-to-6-inch intervals at each of the 10 background locations is discussed below.

- *Discrete samples* were collected from the center of each sampling grid and were designated by the area from which it came from (see designations above), the background location # (BCK 1 to 10), the sample type – soil sample (SS) followed by the acronym “D” for discrete, and finally the depth interval where the individual samples were collected. For example, the discrete samples collected from background location number five at Blackrock/Chinese Peak trailhead - #1 were designated “BLRK1BCK5-SSD (0-2 in) and BLRK1BCK5-SSD (2-6 in).”
- *Composite samples* were designated similarly to the discrete samples discussed above. The composite sample designation includes the area from which it came from (see designations above), the background location # (BCK 1 to 10), the sample type – soil sample (SS) followed by the acronym “C” for composite, and finally the depth interval where the individual samples were collected. For example, the composite comprised of 20 surface sample locations collected from the background location number one at Rainbow Road Exit #1 was designated “RRE1BCK1-SSC001(0-2 in) and RRE1BCK1-SSC001(2-6 in).”

2.2.4 Investigation Derived Waste

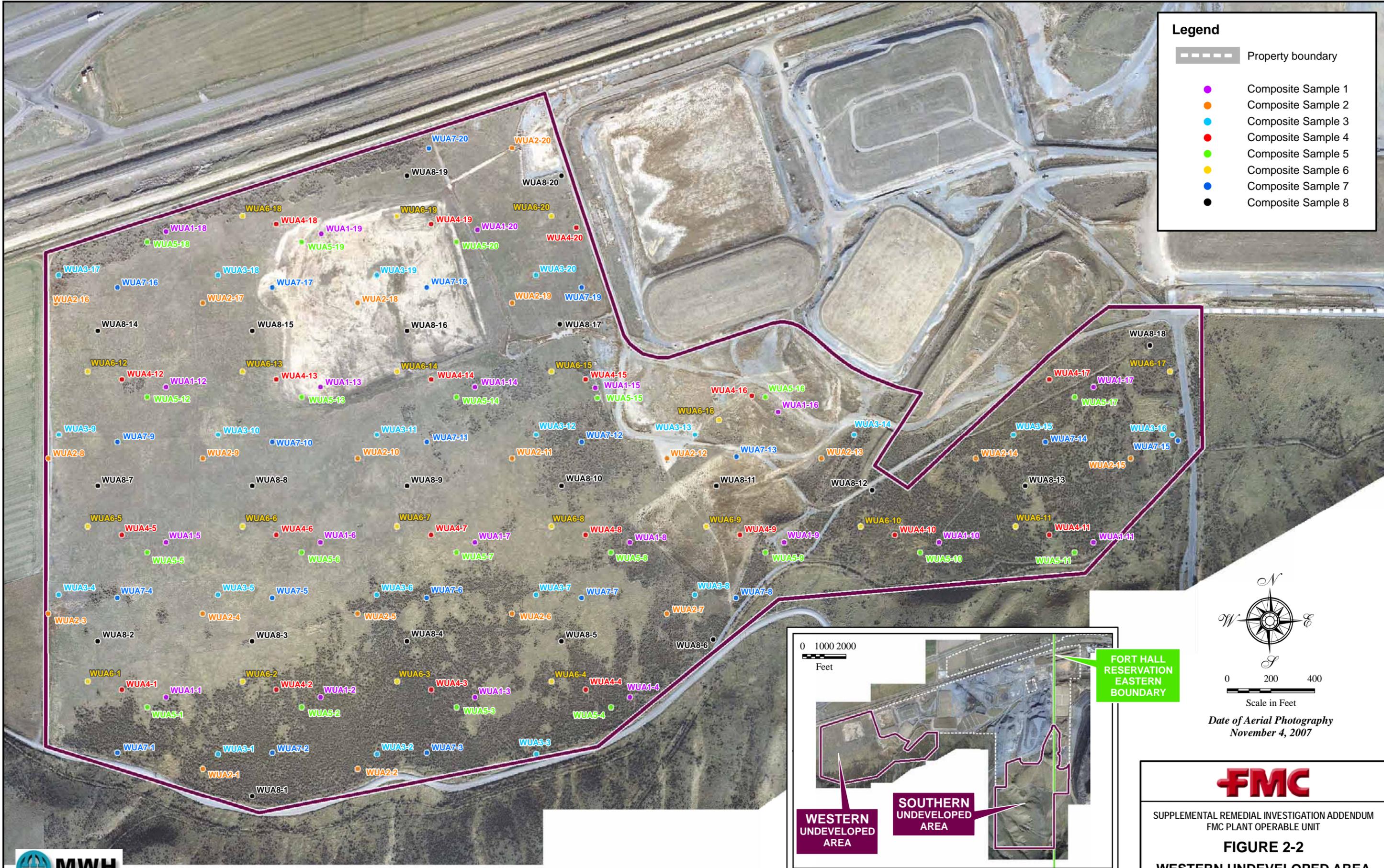
The NCP, codified in 40 Code of Federal Regulations (CFR) Part 300, requires that investigation derived waste (IDW) generated during a CERCLA site investigation be managed in compliance with all applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the urgency of the situation. As in most site investigations, IDW was generated during 2008 SRI Addendum field investigation. The IDW was characterized and handled according to the methods and procedures identified in the *SRI FSP* and the *SRI Report*. No hazardous waste was generated during the SRI Addendum activities.





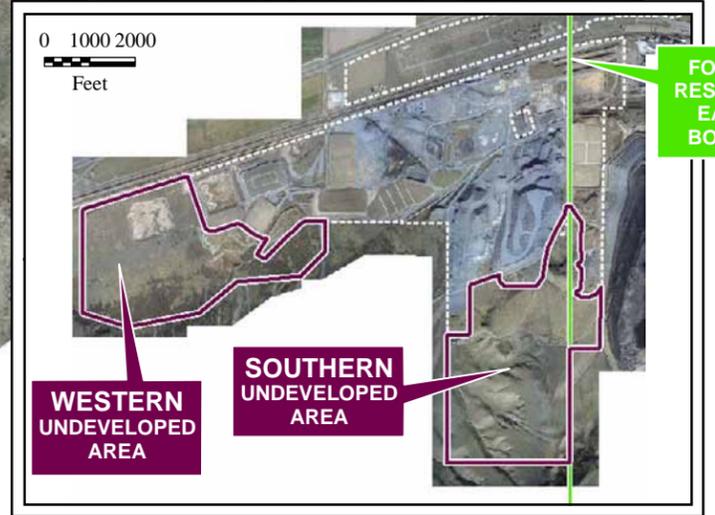
Legend

- Property boundary
- Composite Sample 1
- Composite Sample 2
- Composite Sample 3
- Composite Sample 4
- Composite Sample 5
- Composite Sample 6
- Composite Sample 7
- Composite Sample 8



0 200 400
Scale in Feet

Date of Aerial Photography
November 4, 2007



SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-2
WESTERN UNDEVELOPED AREA
COMPOSITE SAMPLE LOCATIONS

Legend

-  Property boundary
-  Historic soil sample location
-  Composite Sample 1
-  Composite Sample 2
-  Composite Sample 3
-  Composite Sample 4
-  Composite Sample 5
-  Composite Sample 6
-  Composite Sample 7
-  Composite Sample 8



0 100 200
Feet



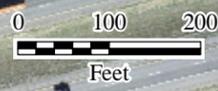
FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-3
PARCEL 1
SAMPLE LOCATIONS

Legend

-  Property boundary
-  Historic soil sample location
-  Composite Sample 1
-  Composite Sample 2
-  Composite Sample 3
-  Composite Sample 4
-  Composite Sample 5
-  Composite Sample 6
-  Composite Sample 7
-  Composite Sample 8



FILE Fig 2-04_Parcel2 Sample Locations_609.mxd 6/17/09



SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-4
PARCEL 2
SAMPLE LOCATIONS

FILE Fig 2-05A_Parcel 3A Surface Sample Locations_609.mxd 6/17/09



FORT HALL RESERVATION EASTERN BOUNDARY



PARCEL 3

Legend

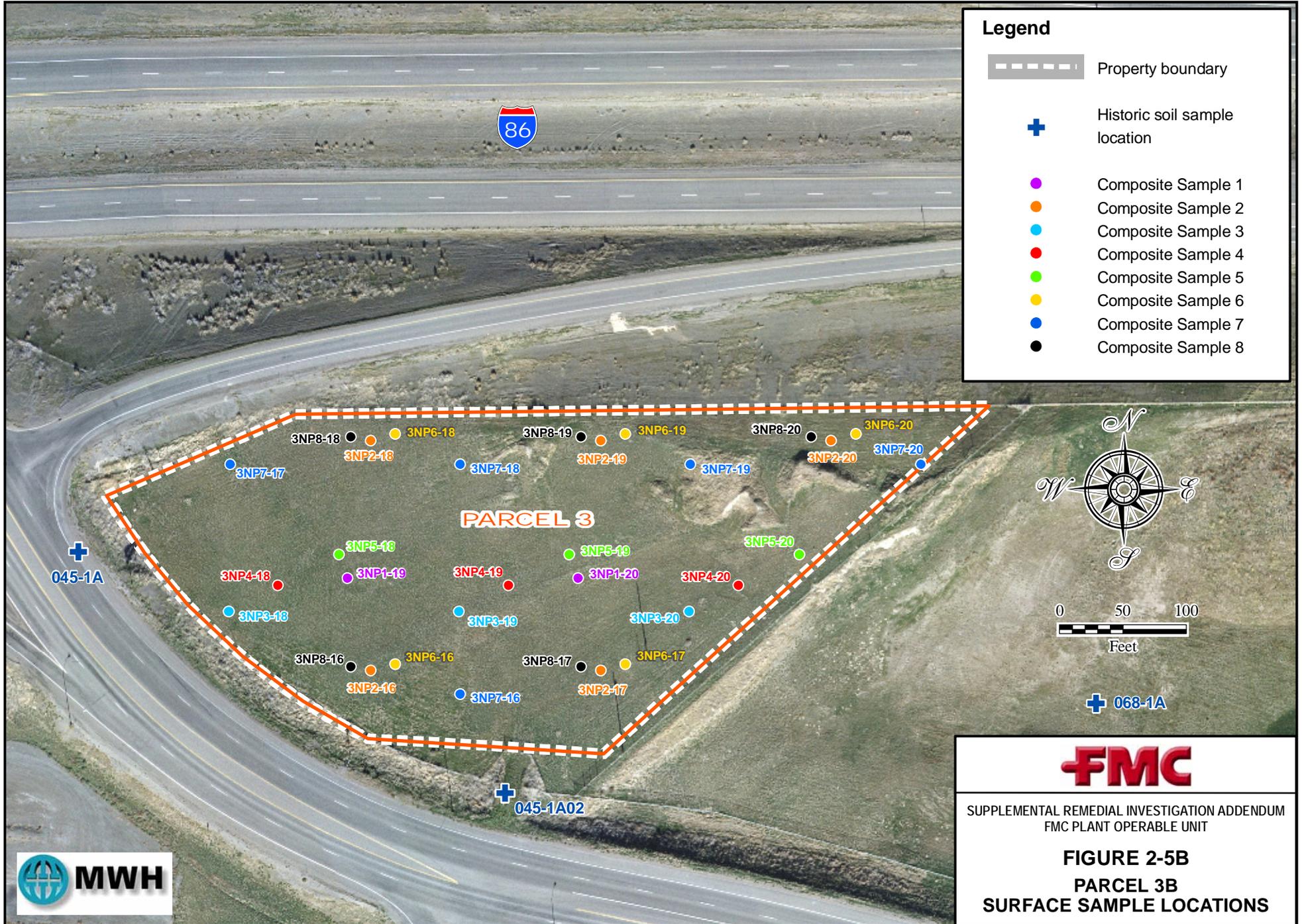
- Property boundary
- Historic soil sample location
- Composite Sample 1
- Composite Sample 2
- Composite Sample 3
- Composite Sample 4
- Composite Sample 5
- Composite Sample 6
- Composite Sample 7
- Composite Sample 8



SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-5A
PARCEL 3A
SURFACE SAMPLE LOCATIONS





FORT HALL RESERVATION EASTERN BOUNDARY

Legend

- Property boundary
- Historic soil sample location
- Composite Sample 1
- Composite Sample 2
- Composite Sample 3
- Composite Sample 4
- Composite Sample 5
- Composite Sample 6
- Composite Sample 7
- Composite Sample 8

0 90 180 Feet



FILE Fig 2-06_Parcel 4 Sample Locations_609.mxd 6/17/09



FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-6
PARCEL 4
SAMPLE LOCATIONS



Legend

-  Property boundary
-  Historic soil sample location
-  Composite Sample 1
-  Composite Sample 2
-  Composite Sample 3



0 70 140
Feet

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-7
PARCEL 5
SAMPLE LOCATIONS





Legend

- Property boundary
- Historic soil sample location
- Composite Sample 1
- Composite Sample 2
- Composite Sample 3
- Composite Sample 4
- Composite Sample 5
- Composite Sample 6
- Composite Sample 7
- Composite Sample 8

0 50 100
Feet

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-8
PARCEL 6
SAMPLE LOCATIONS





FORT HALL RESERVATION EASTERN BOUNDARY



TEST PIT NO. 1

315-1A

293-1A01

TEST PIT NO. 2

PARCEL 3

293-1A04

045-1A03

TEST PIT NO. 3

293-1A

293-1A02



293-1A03

Legend

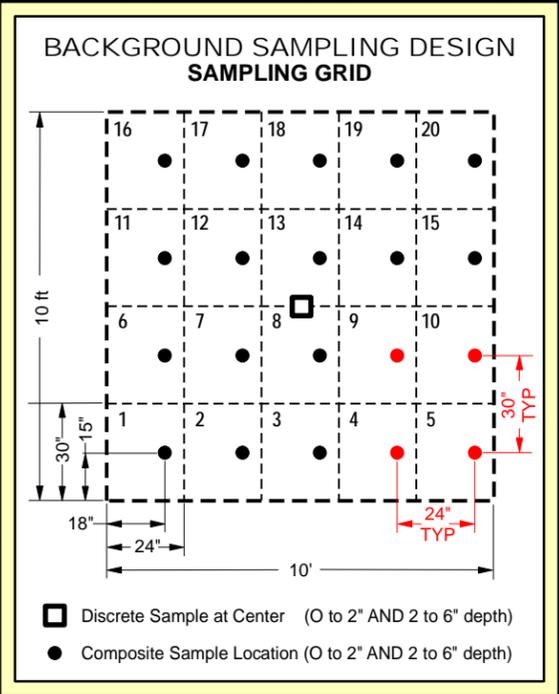
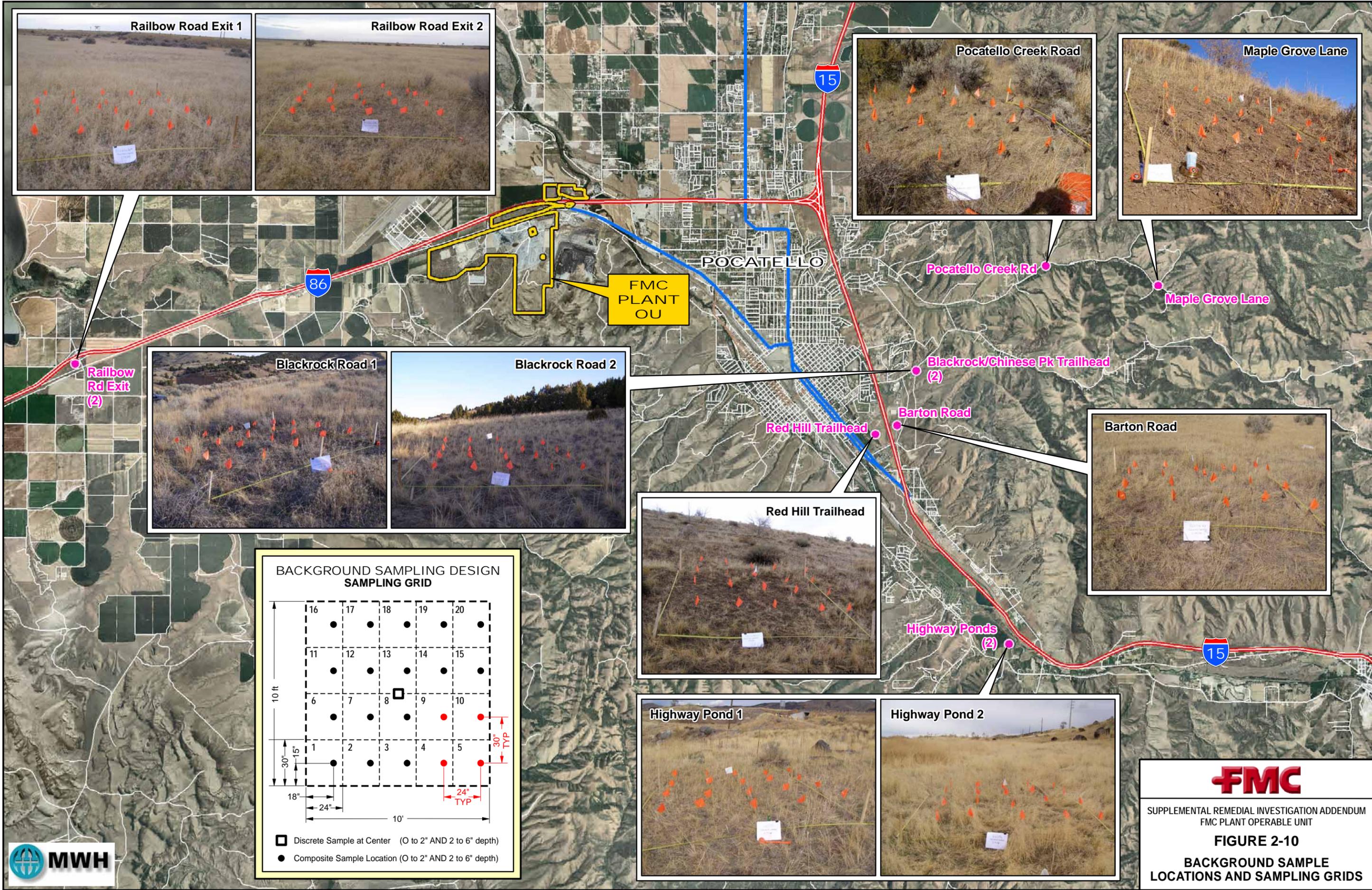
- Property boundary
- Historic soil sample location
- Subsurface composite sample (0-10 ft)



SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 2-9
PARCEL 3 SUBSURFACE
SAMPLE LOCATIONS





FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
 FMC PLANT OPERABLE UNIT

FIGURE 2-10
 BACKGROUND SAMPLE
 LOCATIONS AND SAMPLING GRIDS

Section 3

EVALUATION OF AREA SPECIFIC FINDINGS

3.1 INTRODUCTION

The SRI Addendum activities were conducted to collect and analyze surface samples of native soils to further evaluate potential risks to current ecological and potential future human health receptors in the SUA, WUA, and Northern Properties. Background studies also were performed to characterize background concentrations, such that incremental risks could be evaluated in the Supplemental ERA and HHRA Addenda. In addition, EPA Region 10 had the opportunity to collect and demonstrate in-situ gamma-ray measurement techniques for surface contamination. Although EPA's study was out of the scope of the SRI Addendum investigations, the methods and findings of the study are discussed at the end of this section.

The results from the scoped SRI Addendum investigations are presented and discussed below as they apply to each area or parcel. The background soil sampling effort is assessed first, because the results of the background investigation are initially used, in conjunctions with SSLs, to develop risk-based CVs for screening the analytical results from each sampled area or parcel within the FMC Plant OU. Following the discussion of background, conditions within each area or parcel are evaluated in the following subsections:

- 1) Site Description – discusses the area's historic activities that may have led to potential contamination;
- 2) Problem Statements – includes rationale for the field programs conducted within the area from the EPA-approved *SRI Work Plan Addendum*;
- 3) Investigation Results – presents summary data tables from the 2008 SRI sampling activities. These results are compared to risk-based ecological and human health CVs (i.e., SSLs + background), developed in the approved *SRI Work Plan Addenda*. Those constituents found to exceed the ecological and/or human health CVs are identified as Chemicals of Concern/Radionuclides of Concern (COCs/ROCs) for quantitative evaluation in the Supplemental ERA and/or HHRA Addenda.
- 4) Contamination Assessment – presents evaluations and implications of the results in each of the investigation areas, including potential ecological and human health risks associated with current and hypothetical future exposures to COCs/ROCs within surface and subsurface soils and groundwater.

3.2 BACKGROUND SOIL SAMPLING RESULTS AND EVALUATION

A total of 10 background sampling locations were identified within the greater Pocatello area within a 6 to 11-mile radius of the former FMC plant site. Composite and discrete samples were collected from each sampling location at 0-to-2-inch and 2-to-6-inch bgs sampling intervals, and analyzed for target metals, fluoride and radionuclides as described in Section 2. Figure 2-10 depicts the areas that were sampled in the greater Pocatello area. The analytical results are shown in Table 3-1, *Background Data for Southern and Western Undeveloped Areas and*

Northern Properties of the FMC Plant OU – Sample Data Summary. In addition, this table also shows the 95% upper confidence limit (UCL) on the mean and 95th percentile background concentrations that were calculated for each analyte.

The calculated 95% UCL concentrations within the 0-to-2 inch bgs sampling interval are generally similar between composite and discrete samples. For example, the 95% UCL concentration of antimony was reported at 0.28 mg/kg in both the composite and discrete samples. 95% UCL concentrations of 18.7 and 19.0 mg/kg were calculated for nickel in the composite and discrete samples, respectively. Other constituents analyzed from 0-to-2 inch bgs sampling interval showed consistent 95% UCL concentrations between composite and discrete samples with the exception of one outlier, lead, which was calculated as 23.9 mg/kg in the composite samples and 90.2 mg/kg in the discrete samples. However, as agreed with EPA, the composite sample data are being used to characterize background concentrations and risks in this SRI Addendum Report. Consequently, the high-biased lead concentration in the discrete background data set has no impact on the findings of this report.

Soil samples collected from both the 0-to-2 inch bgs and the 2-to-6 inch bgs sampling intervals were analyzed for radionuclides. Similar to the consistencies observed in the 0-to-2 inch bgs interval, the 95% UCL concentrations of radionuclides in the 2-to-6 inch bgs interval were generally consistent between the composite and discrete samples as shown in Table 3-1.

In accordance with the decision rules presented in the EPA-approved *SRI Work Plan Addenda*, the 95% UCL background soils concentrations were combined with ecological and human health SSLs to develop comparative values (CVs; 95% UCL + SSLs), against which the soil data collected from the SUA, WUA, and Northern Properties were screened. The human health and ecological SSLs used in the development of the CVs are presented in Tables 3-2 and 3-3. The findings of these screening evaluations, along with the results of the subsequent HHRA and ERA performed to evaluate risks for constituents that exceeded the CVs, are discussed in more detail in the following subsections.

3.3 SOUTHERN UNDEVELOPED AREA SOIL SAMPLING RESULTS AND EVALUATION

3.3.1 SUA Site Description

The Southern Undeveloped Area (SUA) of the FMC Plant OU consists of approximately 250 acres in the foothills of the Bannock Range as shown on Figure 2-1. Other than a few roadways, the SUA is considered relatively “undisturbed” in that it was never used in plant operations, for raw material, for waste storage/accumulation, or for traffic corridors. Other than slag for road construction, the only potential impact from EMF site operations would have been from deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive emissions from the Simplot plant. It is presumed that SUA slag roadways are comparable to and will therefore be included with RU 23 Roadways (i.e., roads outside RU boundaries).

3.3.2 SUA Problem Statement

The following field program was performed in the SUA. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- **Risk Assessment** - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in the SUA to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors in these areas.

3.3.3 SUA Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across the SUA were analyzed for target metals and fluoride, and the mean concentration of each COPC/ROPC in the composite samples was calculated. Per the decision rules specified in the EPA-approved *SRI Work Plan Addendum*, the mean concentrations were compared to site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Future Worker CV Comparison. As shown in Table 3-4, *Southern Undeveloped Area Sample Data Summary and Evaluation Against Ecological and Worker Comparative Values*, the mean concentrations for analytes in the SUA were all several orders of magnitude below the future worker CVs.

Ecological CV Comparison. As shown in Table 3-4, the mean concentrations of five (5) of the nine (9) analytes of potential ecological concern to EPA are below their respective ecological CVs, including: arsenic, chromium, lead, selenium and zinc. However, the mean concentrations of four (4) ecological COPCs were found to exceed their corresponding ecological CV, including:

- Cadmium was reported at 7.9 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Fluoride was reported at 683 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Mercury was reported at 0.034 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Vanadium mean concentration was 28.6 mg/kg, which slightly exceeds its ecological CV of 27.4 mg/kg.

Summary. 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), Table 3-5 identifies the constituents that were carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- Human Health Risk Assessment (Future Workers) – none
- Ecological Risk Assessment – cadmium, fluoride, mercury, and vanadium

3.3.4 SUA Risk Characterization and Uncertainty Discussion

Human Health Assessment. A human health risk assessment was not performed for the SUA because, as previously discussed, none of the soil COPCs exceeded their respective worker CVs. In addition, groundwater is unlikely to be impacted at levels exceeding the CVs for groundwater COPCs given the SUA lies hydraulically upgradient at a sufficient distance from identified and potential sources of groundwater impacts on both the FMC Plant Site and Simplot Plant OU.

Ecological Assessment. As shown in Table 3-6, which summarizes the results of the Supplemental ERA Addendum, the quantitative evaluation of ecological risks in SUA determined that none of the COCs, namely cadmium, fluoride, mercury and vanadium, exceeds a hazard quotient (HQ) of one for either total (HQ) or incremental (IHQ) risk.

Summary. Based on the findings of the Supplemental ERA and HHRA Addenda, no Remedial Action Objectives (RAOs) are exceeded in the SUA and thus it will not be forwarded to the SFS for evaluation of remedial alternatives.

3.4 WESTERN UNDEVELOPED AREA SOIL SAMPLING RESULTS AND EVALUATION

3.4.1 WUA Site Description

The Western Undeveloped Area (WUA) of the FMC Plant OU consists of approximately 250 acres in the western portion of the Plant site located to the west of RCRA Ponds 17 and 18 as shown on Figure 2-2. There are a few roadways in the WUA as well as a borrow pit that was used for RCRA pond closure construction. However, the WUA is considered relatively “undisturbed” in that it was never used in plant operations, for raw material, for waste storage/accumulation, or as traffic corridors. Other than slag for road construction, the only potential impact from EMF site operations would have been from deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive emissions from the Simplot plant. It is presumed that slag roadways are comparable to and included with RU 23 Roadways (i.e., roads outside RU boundaries).

3.4.2 WUA Problem Statement

The following field program was performed in the WUA. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in the WUA to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors in these areas.

3.4.3 WUA Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across the WUA were analyzed for target metals and fluoride, and the mean concentration of each COPC/ROPC in the composite sample was calculated. Per the EPA-approved decision rules, these mean concentrations were compared to site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Future Worker CV Comparison. As shown in Table 3-7, *Western Undeveloped Area Sample Data Summary and Evaluation Against Ecological and Worker Comparative Values*, the mean concentrations for analytes in the WUA are all several orders of magnitude below the future worker CVs.

Ecological CV Comparison. As shown in Table 3-7, the mean concentration of the seven (7) of the nine (9) analytes of potential ecological concern to EPA are below their respective ecological CVs, including: arsenic, chromium, lead, mercury, selenium, vanadium, and zinc. However, the mean concentrations of two (2) ecological COPCs were found to exceed their corresponding ecological CV, including:

- Cadmium was reported at 3.2 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Fluoride was reported at 434 mg/kg, exceeding its ecological CV of 302 mg/kg.

Summary. Based on application of the decision rules from the *SRI Work Plan Addendum* to the validated data from the WUA, Table 3-5 identifies which constituents were carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- Human Health Risk Assessment (Future Workers) – none
- Ecological Risk Assessment – cadmium and fluoride

3.4.4 WUA Risk Characterization and Uncertainty Discussion

Human Health Assessment. A human health risk assessment was not performed for the WUA because, as previously discussed, none of the soil COPCs exceeded their respective worker CVs. In addition, groundwater is unlikely to be impacted at levels exceeding the CVs for groundwater COPCs given the WUA lies hydraulically upgradient at a sufficient distance from identified and potential sources of groundwater impacts on both the FMC Plant Site and Simplot Plant OU.

Ecological Assessment. As shown in Table 3-8, which summarizes the results of the Supplemental ERA Addendum, the quantitative evaluation of ecological risks in WUA determined that none of the COCs, namely cadmium and fluoride, exceeds a HQ of one (1) for either total (HQ) or incremental (IHQ) risk.

Summary. Based on the findings of the Supplemental ERA and HHRA Addenda, no RAOs are exceeded in the WUA and thus it will not be forwarded to the SFS for evaluation of remedial alternatives.

3.5. NORTHERN PROPERTIES - PARCEL 1 (WESTERN SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.5.1 Parcel 1 Site Description

The western sampling parcel is approximately 52 acres in size and includes the former Lindley farm and the western portion of the drag strip as shown on Figure 2-3. This sampling parcel is generally bounded by I-86 to the north, the central sampling parcel boundary to the east, Highway 30 to the south, and the Tesco Property boundary to the west. This entire sampling parcel is located within the boundaries of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. This sampling parcel has been disturbed by historical agricultural and road construction activities.

The western one-third of this parcel was formerly the Lindley farm and contained a farmhouse, grain silos, pumphouse, garage, and farm land. FMC purchased this property in 1985 and demolished the farmhouse in 1995. The other farm structures remain on the site. The eastern two-thirds of this parcel contain a World War II-era landing strip built and used by the US Army Air Force. After World War II, the landing strip was acquired by the City of Pocatello and used as the Pocatello Municipal Airport. After moving to the new (current) airport location, the City of Pocatello leased the landing strip to Drag City to be used as a drag strip.

Upon purchase of the property in 1990, FMC continued the lease to Drag City until 1999. The landing strip/drag strip remains on the site. Drag City installed roads to allow public access to the drag strip that are constructed of purchased slag. Other than slag used in road construction, there are no records or knowledge that any FMC plant materials, or wastes, were ever stored or placed within this parcel. It is presumed that slag roadways are comparable to and included with RU 23 Roadways (i.e., roads outside RU boundaries). Based upon the prevailing wind direction and EMF RI sampling, this sampling parcel is presumed to be the least likely to have been impacted by deposition of both historical FMC stack and fugitive emissions, and historical and current stack and fugitive dust emissions from the Simplot plant.

3.5.2 Parcel 1 Problem Statement

The following field program was performed in Parcel 1. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 1 to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.

3.5.3 Parcel 1 Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across Parcel 1 were analyzed for target metals, radionuclides and fluoride. In addition, the eight 2-to-6-inch bgs composite samples were analyzed for target radionuclides.

The mean concentration of each COPC/ROPC in the 0-to-2-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-9a, *Northern Parcel 1 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: antimony, arsenic, chromium, lead, manganese, mercury, selenium, thallium, uranium, and zinc.

The mean concentrations of six (6) analytes were found to exceed their corresponding residential CV from the 0-to-2 inch bgs sampling interval.

- Cadmium was reported at 30.9 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 1,773 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 5.4 pCi/g, exceeding its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 2.07 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Uranium-238 was reported at 2.61 pCi/g, exceeding its residential CV of 1.66 pCi/g.
- Vanadium mean concentration was 71.0 mg/kg, which exceeds its residential CV of 58.6 mg/kg.

Of the three target radionuclides collected from the 2-to-6 inch bgs sampling interval, two (radium-226 and uranium-238) were below the residential CV. The only radionuclide collected from the 2-to-6 inch bgs sampling interval that exceeds its residential CV is listed below.

- Lead-210 was reported at 2.09 pCi/g, exceeding its residential CV of 1.6 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-9b, *Northern Parcel 1 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of

several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, cadmium, chromium, fluoride, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

Only three (3) analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 0-to-2 inches bgs sampling interval:

- Lead-210 was reported at 5.4 pCi/g, exceeding its commercial/industrial CV of 3.0 pCi/g.
- Radium-226 was reported at 2.07 pCi/g, exceeding its commercial/industrial CV of 0.98 pCi/g and its construction worker CV of 1.9 pCi/g.
- Uranium-238 was reported at 2.61 pCi/g, exceeding its commercial/industrial CV of 2.3 pCi/g.

None of the three target radionuclides collected from the 2-to-6 inch bgs sampling interval exceeded the worker CVs.

Ecological CV Comparison. As shown in Table 3-9a, the mean concentrations of three (3) of the analytes of potential ecological concern to EPA are below their respective ecological CVs, including: arsenic, lead, and selenium. However, the mean concentrations of six (6) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 30.9 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Chromium was reported at 59.0 mg/kg, exceeding its ecological CV of 39.9 mg/kg
- Fluoride was reported at 1,773 mg/kg, exceeding its ecological CV of 302 mg/kg
- Mercury was reported at 0.034 mg/kg, exceeding its ecological CV of 0.023 mg/kg
- Vanadium mean concentration was 71.0 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 347 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. The mean concentrations of six (6) analytes were reported to exceed residential CVs and the mean concentrations of six (6) analytes were reported to exceed ecological CVs in Parcel 1 from the 0-to-2 inch bgs sampling interval. Three (3) analytes exceeded both the residential CV and ecological CV. The three (3) target radionuclide analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV and their residential human health CV within the 0-to-2 inches bgs sampling interval. Lead-210 was the only analyte to exceed a CV (residential CV only) in the 2-to-6-inch bgs sampling interval. Lead-210 was reported at a mean concentration of 2.09 pCi/g in the 2-to-6 inch bgs interval, a concentration significantly less than the lead-210 concentration reported in the 0-to-2 inch bgs sampling interval (5.4 pCi/g). This decreasing trend between the 0-to-2-inch bgs and 2-to-6 inch bgs intervals was also reported for radium-226 and uranium-238.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 1, Table 3-5 identifies which constituents will be carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 1 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for Well 501 collected from November 2006 to May 2009.

3.5.4 Parcel 1 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial and, as a follow-up to the Baseline HHRA, FMC recorded restrictive covenants with Power County that prohibit residential development of Parcel 1, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing the baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-10, the cumulative RME total lifetime cancer risks for all receptors evaluated in the Supplemental HHRA (hypothetical future residents and future workers) were found to be within EPA's acceptable risk range.¹ Specifically, the HHRA estimated that cumulative RME total lifetime cancer risks to the two most highly exposed receptors, hypothetical future residents and future outdoor workers, are 2E-04 and 8E-05, respectively. Radium-226 via the external exposure to gamma radiation pathway was found to drive these risks, comprising over 80% of the cumulative total cancer risk estimates for these receptors. A quantitative uncertainty assessment of the external gamma exposure pathway, performed using the 0-to-6-inch bgs data in combination with unmodified HEAST cancer slope factors, estimated

¹ EPA's acceptable range is generally defined as 1E-04 to 1E-06 but also includes an upperbound of 3E-04 as essentially equivalent to 1E-04 (see EPA's *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, OSWER No. 9200.4-18, 1997).

9% lower total lifetime cancer risks than the 0-to-2-inch bgs data with modified HEAST slope factors for Parcel 1, further supporting the conclusion that cumulative RME total lifetime cancer risks are within EPA's acceptable risk range for all receptors.

It is also noteworthy that the external gamma RME lifetime cancer risk associated with background concentrations accounts for over 65% of the total residential and outdoor worker cancer risk estimates for this exposure pathway. Consequently, cumulative RME incremental cancer risk estimates (i.e., total minus background risks) are significantly lower than the cumulative total cancer risks; e.g., 7E-05 for hypothetical future residents and 3E-05 for future outdoor workers.

In addition, cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be well below 1E-04 for all evaluated receptors; e.g., 3E-05 for hypothetical future residents and 2E-05 for future outdoor workers.

As also shown in Table 3-10, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 1 (HQ = 3.5) is driven by homegrown produce ingestion (HQ = 1.2), groundwater ingestion (HQ = 1.2) and incidental soil ingestion (HQ = 1.0). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to cadmium (HQ = 1.7) and fluoride (HQ = 1.1). By contrast, the cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors (HQ = 1.3) is driven by the groundwater ingestion pathway (HQ = 0.8); i.e., the cumulative total CTE HQ associated with exposure to soils and homegrown produce is less than 1.

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all worker receptors evaluated.

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-11, which summarizes the results of the Supplemental ERA Addendum, the quantitative evaluation of ecological risks in Parcel 1 determined that there are no mammalian incremental HQ exceedances. Although the plant total HQ for fluoride in sagebrush slightly exceeds 1, foliar deposition, rather than plant uptake, likely contributed to the exceedance since the RI sagebrush samples used to perform this evaluation were unwashed. As measured in the BERA, foliar deposition represents 13-22% of the cadmium and zinc plant concentrations. It is likely that the marginal fluoride total HQ exceedance in sagebrush would be reduced by a similar amount in washed sagebrush. Nonetheless, the incremental HQ for fluoride did not exceed one.

In avian receptors, only one of the COCs, namely fluoride, slightly exceeds a total no-observed-adverse-effect-level (NOAEL) HQ of one in two of the four avian receptors, i.e. the red-tailed hawk (1.06) and the horned lark (1.04). However, the total lowest-observed-adverse-effect-level (LOAEL) HQ is below one for both of these receptors. Moreover, both the NOAEL and LOAEL incremental HQs are below one for all avian species evaluated. A comprehensive discussion of the methods and assumptions that were used to perform the ERA is provided in Appendix E.

Summary. In summary, 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 incremental risks above a level of concern.

3.6 NORTHERN PROPERTIES - PARCEL 2 (CENTRAL SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.6.1 Parcel 2 Site Description

The central sampling parcel is approximately 52 acres in size and includes the eastern portion of the Drag City drag strip and the location of the former Pilot House Restaurant. This sampling parcel is bounded by I-86 to the north, the Fort Hall Reservation boundary to the east, Highway 30 to the south, and the western sampling parcel boundary to the west as shown on Figure 2-4. This entire parcel is located within the boundaries of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. However, this sampling parcel has been disturbed by historical agricultural, commercial and road construction activities.

The western portion of this Central Sampling Parcel contains the Drag City drag strip as previously described. The eastern portion of this sampling parcel contains the Pilot House Restaurant pumphouse, a Shoshone Bannock air sampling station, and several concrete foundations from the Pilot House Restaurant. Upon purchase of the property in 1990, FMC continued to lease to the Pilot House Restaurant until 1995. The Pilot House Restaurant buildings were demolished in 1997. Other than slag used in access road construction, there is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel. It is presumed that slag roadways are comparable to and included with RU 23 Roadways (i.e., roads outside RU boundaries). Based upon the prevailing wind direction and EMF RI sampling, this sampling parcel has been impacted by deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant.

3.6.2 Parcel 2 Problem Statement

The following field program was performed in Parcel 2. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 2 to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.

3.6.3 Parcel 2 Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across Parcel 2 were analyzed for target metals, radionuclides and fluoride. In addition, the eight 2-to-6-inch bgs composite samples were analyzed for target radionuclides.

The mean concentration of each COPC/ROPC in the 0-to-2-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-12a, *Northern Parcel 2 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: antimony, arsenic, chromium, lead, manganese, mercury, selenium, and zinc.

The mean concentrations of eight (8) analytes were found to exceed their corresponding residential CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 79.1 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 4,869 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 10.3 pCi/g, exceeding its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 5.1 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Thallium was reported at 1.0 mg/kg, exceeding its residential CV of 0.64 mg/kg.
- Uranium was reported at 17.9 mg/kg, exceeding its residential CV of 5.3 mg/kg.
- Uranium-238 was reported at 6.9 pCi/g, exceeding its residential CV of 1.66 pCi/g.
- Vanadium mean concentration was 216.3 mg/kg, which exceeds its residential CV of 58.6 mg/kg.

All three radionuclides collected from the 2-to-6 inch bgs sampling interval exceeded their respective residential CV and are listed below:

- Lead-210 was reported at 4.05 pCi/g, exceeding its residential CV of 1.6 pCi/g.
- Radium-226 was reported at 2.16 pCi/g, exceeding its residential CV of 1.35 pCi/g.
- Uranium-238 was reported at 3.62 pCi/g, exceeding its residential CV of 1.77 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-12b, *Northern Parcel 2 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, cadmium, chromium, fluoride, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

Only three (3) analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 0-to-2 inches bgs sampling interval:

- Lead-210 was reported at 10.3 pCi/g, exceeding its commercial/industrial CV of 3.0 pCi/g and its construction worker CV of 9.5 pCi/g.
- Radium-226 was reported at 5.1 pCi/g, exceeding its commercial/industrial CV of 0.98 pCi/g and its construction worker CV of 1.9 pCi/g.
- Uranium-238 was reported at 6.9 pCi/g, exceeding its commercial/industrial CV of 2.3 pCi/g.

All three (3) radionuclides, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 2-to-6 inches bgs sampling interval:

- Lead-210 was reported at 4.05 pCi/g, exceeding its commercial/industrial CV of 2.1 pCi/g.
- Radium-226 was reported at 2.16 pCi/g, exceeding its commercial/industrial CV of 1.36 pCi/g.
- Uranium-238 was reported at 3.62 pCi/g, exceeding its commercial/industrial CV of 2.4 pCi/g.

Ecological CV Comparison. As shown in Table 3-12a, the mean concentrations of only one (1) of the analytes of potential ecological concern to EPA is below its respective ecological CV and is arsenic. The mean concentrations of eight (8) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 79.1 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Chromium was reported at 164.4 mg/kg, exceeding its ecological CV of 39.9 mg/kg.
- Fluoride was reported at 4,869 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Lead was reported at 44.0 mg/kg, exceeding its ecological CV of 34.9 mg/kg.
- Mercury was reported at 0.091 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Selenium was reported at 1.95 mg/kg, exceeding its ecological CV of 0.82 mg/kg.
- Vanadium mean concentration was 216.3 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 542 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. Eight (8) analytes exceeded their ecological CVs. Of those eight (8), three (3) analytes exceeded the residential CV in addition to the ecological CV, and five (5) analytes exceeded the residential CV only. No metals or fluoride exceeded a worker CV. All three target radionuclides exceeded a worker CV in both the 0-to-2 and 2-to-6 inch bgs sampling intervals.

Similar to data from Parcel 1, lead-210, radium-226, and uranium-238 demonstrate a significant decrease in mean concentration between 0-to-2 and 2-to-6 inch bgs sampling intervals, indicating that radionuclide contamination is predominantly surficial.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 2, Table 3-5 identifies which constituents will be carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 2 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for Well 501 collected from November 2006 to May 2009.

3.6.4 Parcel 2 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial and, as a follow-up to the Baseline HHRA, FMC recorded restrictive covenants with Power County that prohibit residential development of Parcel 2, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing the baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-13, cumulative RME total lifetime cancer risks to hypothetical future residents were found to exceed EPA's acceptable risk range. Specifically, the Supplemental HHRA estimated a cumulative RME total lifetime cancer risk of 4E-04 for this receptor. Radium-226 via the external exposure to gamma radiation pathway was found to drive this risk,

comprising over 80% of the cumulative total cancer risk estimates for hypothetical future residents. A quantitative uncertainty assessment of the external gamma exposure pathway, performed using the 0-to-6-inch bgs data in combination with unmodified HEAST cancer slope factors, estimated 7% higher total lifetime cancer risks than the 0-to-2-inch bgs data with modified HEAST slope factors for Parcel 2, which is not substantively different from the results of the primary analysis.

Cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be within EPA's acceptable risk range ($6E-05$) for hypothetical future residents.

With respect to the worker scenarios, cumulative total RME and CTE lifetime cancer risk estimates were found to be within EPA's acceptable risk range for all worker receptors evaluated. Specifically, the Supplemental HHRA estimated cumulative RME and CTE total lifetime cancer risks of $2E-04$ and $4E-05$, respectively, for the most highly exposed future outdoor commercial/industrial worker receptor.

As also shown in Table 3-13, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 2 ($HQ = 25.6$) is driven by homegrown produce ingestion ($HQ = 20.9$). HQs above one were also calculated for incidental soil ingestion ($HQ = 3.3$) and groundwater ingestion ($HQ = 1.2$). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to cadmium ($HQ = 22.2$) and fluoride ($HQ = 1.8$). Similarly, the cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors ($HQ = 4.4$) is driven by homegrown produce ingestion ($HQ = 2.5$), as well as substantial contributions from incidental soil ingestion ($HQ = 1.0$) and groundwater ingestion ($HQ = 0.8$).

With respect to the homegrown produce pathway, as discussed further in Appendix D, the RME exposure estimates used to evaluate cadmium intake from homegrown produce rely on the 95th percentile "consumers only" child ingestion rate from the nationwide population of gardeners. These intake rates are extremely conservative because they represent upperbound (95th percentile) ingestion rates for the sub-set of the general population that consumes the most homegrown produce. Upperbound homegrown produce ingestion rates for children within the general population are significantly lower. In addition, use of data for the nationwide population of gardeners represents an exposure likely to be overly conservative for the Pocatello area. Not only is Pocatello a semi-arid environment, it is also a much lower hardiness zone (Zone 4) than most of the US. These factors shorten the growing season and likely lower the yield from the gardens. Additionally, the methodology to estimate cadmium concentrations in homegrown produce remains uncertain. As is shown in the Supplemental HHRA, the background uptake factor used in the assessment of the RME and CTE cadmium produce concentrations resulted in nearly an order of magnitude higher risk than the measured uptake factor from the impacted areas sampled during the Baseline Ecological Risk assessment (E&E 1995).

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all worker receptors evaluated.

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-14, which summarizes the results of the Supplemental ERA Addendum in Appendix E, the quantitative evaluation of ecological risks in Parcel 2 determined that there are no mammalian HQs in excess of 1.

For avian receptors, only one of the COCs, namely fluoride, marginally exceeds a total NOAEL HQ of one for each of the avian receptors evaluated; however, the total LOAEL HQ is below one for each of these receptors. Similarly, the incremental NOAEL HQs marginally exceed one for all avian receptors, but no incremental LOAEL HQ exceeds one.

Plant incremental HQs marginally exceed one for fluoride in unwashed sagebrush, but not wheatgrass. However, because the unwashed fraction as measured in the BERA represents 13-22% of the cadmium and zinc plant concentrations, it is likely that the marginal fluoride exceedance in unwashed sagebrush would be reduced by at least a similar amount in washed sagebrush.

Summary. In summary, 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 incremental 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 incremental 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.

3.7 NORTHERN PROPERTIES - PARCEL 3 (EASTERN SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.7.1 Parcel 3 Site Description

The eastern sampling parcel consists of approximately 15 acres and includes all FMC-owned property east of the Fort Hall Reservation boundary and south of I-86, including the small separate property east of Tank Farm Road. This sampling parcel is generally bounded by I-86 to the north, Simplot property to the east, Highway 30 to the south, and the Fort Hall Reservation boundary to the west as shown on Figures 2-5A and 2-5B. This sampling parcel is separated from sampling parcel #2 immediately to the west as it is part of the PCDA development agreement.

This parcel was not used as part of the FMC phosphorus manufacturing operations, but has been disturbed by historical agricultural and road construction (Highway 30 and I-86) activities. There is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel. The FMC office trailers and parking area are currently located on this parcel

as is a concrete foundation that was the former location of the Idaho grain inspection station. The Idaho grain inspection station was originally leased from the City of Pocatello.

Upon purchasing the property in 1990, FMC continued the lease to the Idaho grain inspection station until 1996. The Idaho grain inspection station building was demolished in late 1996 or 1997. Of the six (6) sampling parcels described in this addendum, this sampling parcel is most directly downwind and adjacent to EMF operations, and is therefore presumed to be the most impacted by deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant.

3.7.2 Parcel 3 Problem Statement

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

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 3 to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.
- Subsurface Investigation - Verify through subsurface soil sampling that there are no human health risks to future site workers in Parcel #3 as a result of vertical migration of COPCs associated with historical aerial deposition.

3.7.3 Investigation Results

As stated in the problem statements above, both surface and subsurface investigations were performed in Parcel 3. Results from both investigations are discussed below.

3.7.3.1 Parcel 3 Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across Parcel 3 were analyzed for target metals, radionuclides and fluoride. In addition, the eight 2-to-6-inch bgs composite samples were analyzed for target radionuclides.

The mean concentration of each COPC/ROPC in the 0-to-2-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-15a, *Northern Parcel 3 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: arsenic, chromium, lead, manganese, mercury, selenium, and zinc.

The mean concentrations of nine (9) analytes were found to exceed their corresponding residential CV from the 0-to-2 inch bgs sampling interval:

- Antimony was reported at 3.74 mg/kg, which slightly exceeds its residential CV of 3.4 mg/kg.
- Cadmium was reported at 136.9 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 8,225 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 16.6 pCi/g, exceeding its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 11.1 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Thallium was reported at 1.63 mg/kg, exceeding its residential CV of 0.64 mg/kg.
- Uranium was reported at 36.2 mg/kg, exceeding its residential CV of 5.3 mg/kg.
- Uranium-238 was reported at 13.23 pCi/g, exceeding its residential CV of 1.66 pCi/g.
- Vanadium mean concentration was 411.9 mg/kg, exceeding its residential CV of 58.6 mg/kg.

All three (3) radionuclides collected from the 2-to-6 inch bgs sampling interval exceed their corresponding residential CVs and are listed below:

- Lead-210 was reported at 4.3 pCi/g, exceeding its residential CV of 1.6 pCi/g.
- Radium-226 was reported at 2.9 pCi/g, exceeding its residential CV of 1.35 pCi/g.
- Uranium-238 was reported at 4.1 pCi/g, exceeding its residential CV of 1.77 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-15b, *Northern Parcel 3 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, chromium, fluoride, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

Four (4) analytes, cadmium, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 0-to-2 inches bgs sampling interval:

- Cadmium was reported at 136.9 mg/kg, exceeding its construction worker CV of 82.0 mg/kg.
- Lead-210 was reported at 16.6 pCi/g, exceeding its commercial/industrial CV of 3.0 pCi/g and its construction worker CV of 9.5 pCi/g.

- Radium-226 was reported at 11.1 pCi/g, exceeding its commercial/industrial CV of 0.98 pCi/g and its construction worker CV of 1.9 pCi/g.
- Uranium-238 was reported at 13.2 pCi/g, exceeding its commercial/industrial CV of 2.3 pCi/g.

All three (3) analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 2-to-6 inches bgs sampling interval:

- Lead-210 was reported at 4.28 pCi/g, exceeding its commercial/industrial CV of 2.1 pCi/g.
- Radium-226 was reported at 2.94 pCi/g, exceeding its commercial/industrial CV of 1.36 pCi/g and its construction worker CV of 2.3 pCi/g.
- Uranium-238 was reported at 4.1 pCi/g, exceeding its commercial/industrial CV of 2.4 pCi/g.

Ecological CV Comparison. As shown in Table 3-15a, the mean concentrations of only one (1) of the analytes of potential ecological concern to EPA is below its respective ecological CV and is arsenic. The mean concentrations of eight (8) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 136.9 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Chromium was reported at 288.8 mg/kg, exceeding its ecological CV of 39.9 mg/kg.
- Fluoride was reported at 8,225 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Lead was reported at 67.3 mg/kg, exceeding its ecological CV of 34.9 mg/kg.
- Mercury was reported at 0.228 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Selenium was reported at 3.39 mg/kg, exceeding its ecological CV of 0.82 mg/kg.
- Vanadium mean concentration was 411.9 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 703 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. Nine (9) analytes exceeded their residential CVs. Eight (8) analytes exceeded their ecological CVs. Of those eight (8), three (3) analytes exceeded the residential CV in addition to the ecological CV. One metal, cadmium, exceeded a worker CV (construction worker CV). All three target radionuclides exceeded a worker CV in both the 0-to-2 and 2-to-6 inch bgs sampling intervals. Again, mean concentrations of the radionuclides are much lower in the 2-to-6 inch bgs sampling interval compared to surface samples.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 3, Table 3-5 identifies which constituents will be carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 3 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for Well 517 collected from November 2006 to May 2009.

Subsurface Soil Sample Results. From the three test pit samples as shown in Figure 2-9, all metal, fluoride, and radiological analytes investigated reported mean concentrations several orders of magnitude below both their respective construction worker CV as well as their commercial/industrial worker CV as shown in Table 3-16, *Northern Parcel 3 Test Pit Sample Data Summary and Evaluation Against Worker Comparative Values*. Therefore, no constituents will be carried forward into the quantitative human health risk assessment.

3.7.4 Parcel 3 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial and, as a follow-up to the Baseline HHRA, FMC recorded restrictive covenants with Power County that prohibit residential development of Parcel 3, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-17, cumulative RME total lifetime cancer risks to the most exposed receptors, i.e. hypothetical future residents and future outdoor workers, were found to exceed EPA's acceptable risk range. Specifically, the Supplemental HHRA estimated cumulative RME total lifetime cancer risks of 2E-03 and 6E-04, respectively, for these receptors. Radium-226 via the external exposure to gamma radiation pathway and arsenic via the groundwater ingestion pathway were found to drive these risks, comprising over 90% of the cumulative total cancer risk estimates for both hypothetical future residents and future outdoor workers. A quantitative uncertainty assessment of the external gamma exposure pathway, performed using the 0-to-6-inch bgs data in combination with unmodified HEAST cancer slope factors, estimated 11% lower total lifetime cancer risks than the 0-to-2-inch bgs data with modified HEAST slope factors for Parcel 3. However, cumulative RME total lifetime cancer risks to hypothetical future

residents and future outdoor workers using the 0-to-6-inch bgs data to characterize external gamma exposures remain in exceedance of EPA's acceptable risk range.

Cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be within EPA's acceptable risk range for both hypothetical future residents (3E-04) and future outdoor workers (1E-04). In addition, cumulative total RME and CTE lifetime cancer risk estimates were found to be within EPA's acceptable risk range for all other future worker receptors evaluated.

For workers in particular, the CTE exposure assumptions are considered more realistic than the RME assumptions for the Pocatello area. For example, the EPA default RME factors assume that an outdoor worker is exposed 8 hours per day, 225 days per year for 25 years. Rather than being representative of a highest reasonably expected exposure, as the RME scenario is intended, these assumptions are considered improbably conservative for southeast Idaho, due to the extreme winter weather conditions. Instead, the CTE assumption that an outdoor worker is exposed for 8 hours per day, 225 days per year for 6.6 years is considered to be a more realistic characterization of upperbound exposure to this receptor. A comparable CTE evaluation combining an assumed lower exposure frequency (days/year) for a longer exposure duration (years) would yield the same results, based on cumulative exposure time.

Further, neither the RME nor the CTE estimates consider shielding for outdoor workers, which would be provided by the vehicles and ground-cover (e.g., parking lots) almost certain to be present should commercial/industrial development occur. Similarly, the EPA default 60% shielding from office buildings assumed for indoor workers is likely low-biased. In fact, pressurized ion chamber (PIC) function test measurements made during the 2007 SRI field activities in the parking lot upon which the FMC office trailers are currently located in Parcel 3 verify that a typical asphalt paving section for parking lots in the Pocatello area (2 inches of hot rolled asphalt over 4 inches of compacted natural aggregate base) provides a high degree of gamma radiation shielding, and is protective of outdoor and indoor workers under the RME risk scenario. In fact, the PIC gamma dose measurements taken in the FMC office trailer parking lot were equivalent to background levels.

As also shown in Table 3-17, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 3 (HQ = 62.0) is driven by homegrown produce ingestion (HQ = 44.6). HQs above 1 were also estimated for groundwater ingestion (HQ = 11.5) and incidental soil ingestion (HQ = 5.7). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to cadmium in soils (HQ = 46.6) and arsenic in groundwater (HQ = 10.0). By contrast, the cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors (HQ = 13.0) is driven by groundwater ingestion (HQ = 5.7), homegrown produce ingestion (HQ = 5.4) and, to a lesser extent, incidental soil ingestion (HQ = 1.8).

Cumulative total RME non-cancer HQs of 1.8 and 1.6 are estimated for future indoor and outdoor commercial/industrial workers, respectively. These HQs are associated with the groundwater ingestion pathway, and are primarily related to arsenic exposure. The total HQ from soil-related exposure pathways only are below 1 for both of these receptors.

A cumulative total RME non-cancer HQ of 3.7 is estimated for hypothetical construction workers in Parcel 3. Over 90% of this HQ is associated with cadmium via the fugitive dust inhalation pathway. The significance of the estimated RME HQ exceeding 1 must be caveated by the extent to which conservative assumptions likely overestimate the actual risk. First, in the absence of a sub-chronic reference concentration (RfC) for cadmium, the chronic RfC was conservatively used to characterize the inhalation toxicity for this sub-chronic exposure. Also, the degree to which cadmium is absorbed from inhaled particles is dependent upon both the particle size and chemical form present. Impacted fugitive dust emissions from Parcel 3 would be comprised predominantly of ore particles, since emissions from the EMF ore handling areas were primarily responsible for impacts on the FMC northern properties, particularly for Parcel 3. Generally, fugitive emissions, including the original releases, are composed of large particle sizes which would be larger than those which formed the basis for the RfC. In fact, the ATSDR Toxicological Profile for Cadmium (ATSDR, 2008) evaluated the effect of particle size and composition, and demonstrated lower toxicity for larger particulates, and for particulates composed of cadmium oxide rather than cadmium sulfide (due to the higher solubility of CdS compared to CdO). Based on the fact that the SRI of the FMC Plant Site determined that native soils directly underlying the ore stockpile have not been impacted by cadmium, it is likely that the mineralogical forms of cadmium within ore generally have a low solubility. Also, the construction worker risk estimate was developed assuming that heavy construction activities are taking place with no dust control measures. Implementation of a dust control program as part of any construction project on Parcel 3 would effectively mitigate any concerns over this exposure pathway. To further illustrate the conservatism in the assessment, a cumulative total non-cancer HQ of 0.5 is estimated for hypothetical future construction workers under the more likely CTE scenario.

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all other worker receptors evaluated.

Finally, while groundwater risks were included in the discussion above, it is also worth noting that the 95% UCL and mean concentrations of arsenic (0.0468 mg/L and 0.0363 mg/L) and nitrate (11.1 mg/L and 10.5 mg/L) in Well 517 exceed the Maximum Contaminant Levels (MCL) for these COCs (0.01 mg/L and 10 mg/L, respectively).

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-18, which summarizes the results of the Supplemental ERA Addendum in Appendix E, the quantitative evaluation of ecological risks in Parcel 3 determined that there are no mammalian HQs in excess of one.

For avian receptors, only one of the COCs, namely fluoride, exceeds a total and incremental NOAEL HQ of one in all four avian species. However, only the red-tailed hawk has a total and incremental LOAEL HQ slightly above one. A reduction in the conservative assumption of the bioavailable fraction of fluoride to 0.5, a value suggested by the National Research Council

(1980) instead of the value of 0.65 used in the ERA, would have reduced the incremental LOAEL HQ to less than one.

Plant incremental HQs marginally exceed one for fluoride in unwashed sagebrush, but not wheatgrass (although the total HQ exceeds one for wheatgrass). However, because the unwashed fraction as measured in the BERA represents 13-22% of the cadmium and zinc plant concentrations, it is likely that the marginal fluoride exceedance in vegetation would be reduced by at least a similar amount in washed sagebrush.

Summary. In summary, 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 incremental HQs, and a LOAEL incremental 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.

3.8 NORTHERN PROPERTIES - PARCEL 4 (NORTHWESTERN SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.8.1 Parcel 4 Site Description

The northwestern sampling parcel is approximately 40 acres in size and has historically been used only for agricultural purposes (currently used for hay storage). This sampling parcel is generally bounded by Tank Farm Road to the east and north, I-86 to the south, and one of the City of Pocatello's municipal sewage sludge land application areas to the west as shown on Figure 2-6. This parcel is entirely outside the boundary of the Fort Hall Reservation and is part of the PCDA development agreement. The City of Pocatello acquired this property from the US Government after World War II. FMC purchased this parcel from the City of Pocatello in 1950. This parcel was not used as part of the FMC phosphorus manufacturing operations. There is no record or knowledge that any FMC plant materials or wastes were ever stored or placed within this parcel. Based upon EMF RI sampling, this sampling parcel is presumed to be minimally impacted by deposition of historical FMC stack and fugitive emissions and historical and current stack and fugitive dust emissions from the Simplot plant.

3.8.2 Parcel 4 Problem Statement

The following field program was performed in the Parcel 4. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 4 to ensure that potential remedies at the

FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.

3.8.3 Parcel 4 Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across Parcel 4 were analyzed for target metals, radionuclides and fluoride. In addition, the eight 2-to-6-inch bgs composite samples were analyzed for target radionuclides.

The mean concentration of each COPC/ROPC in the 0-to-2-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-19a, *Northern Parcel 4 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: antimony, arsenic, chromium, lead, manganese, mercury, selenium, thallium, and zinc.

The mean concentrations of seven (7) analytes were found to exceed their corresponding residential CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 33.0 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 2,338 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 4.8 pCi/g, exceeding its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 2.6 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Uranium was reported at 7.1 mg/kg, exceeding its residential CV of 5.3 mg/kg.
- Uranium-238 was reported at 3.41 pCi/g, exceeding its residential CV of 1.66 pCi/g.
- Vanadium mean concentration was 74.3 mg/kg, exceeding its residential CV of 58.6 mg/kg.

Of the three target radionuclides collected from the 2-to-6 inch bgs sampling interval, two (2) (radium-226 and uranium-238) were below the residential CV. The only radionuclide collected from the 2-to-6 inch bgs sampling interval that exceeds its residential CV is listed below:

- Lead-210 was reported at 2.06 pCi/g, exceeding its residential CV of 1.6 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the

SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-19b, *Northern Parcel 4 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, cadmium, chromium, fluoride, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

Only three (3) analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 0-to-2 inches bgs sampling interval.

- Lead-210 was reported at 4.8 pCi/g exceeding its commercial/industrial CV of 3.0 pCi/g.
- Radium-226 was reported at 2.6 pCi/g exceeding its commercial/industrial CV of 0.98 pCi/g and its construction worker CV of 1.9 pCi/g.
- Uranium-238 was reported at 3.41 pCi/g exceeding its commercial/industrial CV of 2.3 pCi/g.

None of the three target radionuclides collected from the 2-to-6 inch bgs sampling interval exceeds a worker CV.

Ecological CV Comparison. As shown in Table 3-19a, the mean concentrations of two (2) analytes of potential ecological concern to EPA are below their respective ecological CVs and included arsenic and lead. However, the mean concentrations of seven (7) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 33.0 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Chromium was reported at 48.4 mg/kg, exceeding its ecological CV of 39.9 mg/kg.
- Fluoride was reported at 2,338 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Mercury was reported at 0.051 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Selenium was reported at 1.11 mg/kg, exceeding its ecological CV of 0.82 mg/kg.
- Vanadium mean concentration was 74.3 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 208 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. Seven (7) analytes exceeded their residential CV and seven (7) analytes exceeded their ecological CVs. Three (3) analytes exceeded the residential CV in addition to the ecological CV. No metals or fluoride exceeded a worker CV. All three target radionuclides exceeded a worker CV in the 0-to-2 inch bgs sampling interval. One (1) radionuclide, lead-210, exceeded its residential CV in the 2-to-6 inch bgs sampling interval. Similar to the other parcels, the mean concentrations of the radionuclides are much lower in the 2-to-6 inch bgs sampling interval compared to surface samples.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 4, Table 3-5 identifies which constituents will be 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, 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 4 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for Well 502 collected from November 2006 to May 2009.

3.8.4 Parcel 4 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial and, as a follow-up to the Baseline HHRA, FMC recorded restrictive covenants with Power County that prohibit residential development of Parcel 4, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing the baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-20, cumulative RME total lifetime cancer risks for all receptors evaluated in the Supplemental HHRA (hypothetical future residents and future workers) were within EPA's acceptable risk range. Specifically, the HHRA estimated that cumulative RME total lifetime cancer risks to the two most highly exposed receptors, hypothetical future residents and future outdoor workers, are 2E-04 and 1E-04, respectively. Radium-226 via the external exposure to gamma radiation pathway was found to drive these risks, comprising over 80% of the cumulative total cancer risk estimates for these receptors. A quantitative uncertainty assessment of the external gamma exposure pathway, performed using the 0-to-6-inch bgs data in combination with unmodified HEAST cancer slope factors, estimated 19.5% lower total lifetime cancer risks than the 0-to-2-inch bgs data with modified HEAST slope factors for Parcel

4, reinforcing the conclusion that cumulative RME total lifetime cancer risks are within EPA's acceptable risk range for all receptors.

It is also noteworthy that the external gamma RME lifetime cancer risk associated with background concentrations accounts for over 50% of the total residential and outdoor worker cancer risk estimates for this exposure pathway. Consequently, cumulative RME incremental cancer risk estimates (i.e., total minus background risks) are significantly lower than the cumulative total cancer risks; e.g., 1E-04 for hypothetical future residents and 5E-05 for future outdoor workers).

In addition, cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be well below 1E-04 for all evaluated receptors; e.g., 3E-05 for hypothetical future residents and 2E-05 for future outdoor workers.

As also shown in Table 3-20, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 4 (HQ = 5.0) is driven by homegrown produce ingestion (HQ = 2.1), groundwater ingestion (HQ = 1.5) and incidental soil ingestion (HQ = 1.3). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to cadmium (HQ = 2.6) and fluoride (HQ = 1.5). By contrast, the cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors (HQ = 1.7) is driven by the groundwater ingestion pathway (HQ = 1.0); i.e., the cumulative total CTE HQ associated with exposure to soils and homegrown produce is less than 1..

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all worker receptors evaluated.

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-21, which summarizes the results of the Supplemental ERA Addendum located in Appendix E, the quantitative evaluation of ecological risks in Parcel 4 determined that there are no mammalian HQs in excess of one.

For avian receptors, only one of the COCs, namely fluoride, exceeds a total NOAEL HQ of one in all four avian species. However, the incremental NOAEL HQ is only slightly above one in two receptors, the red-tailed hawk and the horned lark. No total or incremental LOAEL HQs exceed one for any of the avian receptors.

Plant total HQs and incremental HQs marginally exceed one for fluoride in unwashed sagebrush, but not wheatgrass. However, because the unwashed fraction as measured in the BERA represents 13-22% of the cadmium and zinc plant concentrations, it is likely that the marginal fluoride exceedance in vegetation would be reduced by at least a similar amount in washed sagebrush.

Summary. In summary, 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 incremental

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 incremental 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.

3.9 NOTHERN PROPERTIES - PARCEL 5 (GRAVEL PIT SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.9.1 Parcel 5 Site Description

The gravel pit sampling parcel is approximately 31 acres in size and has the same ownership history as Parcel 4. This sampling parcel is generally bounded by Rowlands Lane to the north, a gated, non-public dirt road to the east, Batiste Road to the south, and Tank Farm Road to the west as shown on Figure 2-7. This sampling parcel is entirely outside the boundary of Fort Hall Reservation and is part of the PCDA development agreement. This parcel was used to support the FMC phosphorus manufacturing operations in that much of the parcel was excavated in the 1950s to a depth of approximately 20 feet to recover gravel as a plant raw material (silica). Top soil was removed and stockpiled around the perimeter of the sampling parcel prior to the gravel excavation and remains stockpiled to the present. The excavated gravel pit currently is being backfilled with clean construction debris by Mickelsen Construction from construction sites in the Pocatello area. This type of landfill is exempt from landfill permitting regulations in the State of Idaho. According to the agreement with Mickelsen Construction, once backfilling is complete, the stockpiled topsoil will be placed over the reclaimed area. It should be noted that there is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel, either historically during plant operation or during the plant demolition. Based upon EMF RI sampling, this sampling parcel is presumed to be minimally impacted by deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant.

3.9.2 Parcel 5 Problem Statement

The following field program was performed in Parcel 5. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- **Risk Assessment** - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 5 to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.

3.9.3 Parcel 5 Risk Assessment Screening Results

Surface Soil Sample Results. The three 0-to-6-inch bgs composite samples collected across the bermed areas of Parcel 5 were analyzed for target metals, radionuclides and fluoride.

The mean concentration of each COPC/ROPC in the 0-to-6-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-22a, *Northern Parcel 5 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: antimony, arsenic, chromium, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

The mean concentrations of five (5) analytes were found to exceed their corresponding residential CV from the 0-to-6 inch bgs sampling interval:

- Cadmium was reported at 17.3 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 1,350 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 2.7 pCi/g, which slightly exceeds its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 1.7 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Uranium-238 was reported at 2.13 pCi/g, exceeding its residential CV of 1.66 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-22b, *Northern Parcel 5 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, cadmium, chromium, fluoride, lead, lead-210, manganese, mercury, selenium, thallium, uranium, uranium-238, vanadium, and zinc.

Only one (1) analyte, radium-226, was reported in exceedance of a worker CV within the 0-to-6 inches bgs sampling interval:

- Radium-226 was reported at 1.74 pCi/g, exceeding its commercial/industrial CV of 0.98 pCi/g.

Ecological CV Comparison. As shown in Table 3-22a, the mean concentrations of several of the analytes of potential ecological concern to EPA are below their respective ecological CVs, including: arsenic, chromium, lead, and selenium. However, the mean concentrations of five (5) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-6 inch bgs sampling interval:

- Cadmium was reported at 17.3 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Fluoride was reported at 1,350 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Mercury was reported at 0.041 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Vanadium mean concentration was 54.0 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 138 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. Five (5) analytes exceeded their residential CV and five (5) analytes exceeded their ecological CV. Two (2) analytes exceeded both the residential CV and the ecological CV. No metals or fluoride exceeded a worker CV. Only one radionuclide, radium-226, exceeded a worker CV in the 0-to-6 inch bgs sampling interval.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 5, Table 3-5 identifies which constituents will be 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 5 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for Well TW-11S collected from November 2006 to May 2009.

3.9.4 Parcel 5 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial and, as a follow-up to the Baseline HHRA, FMC recorded restrictive covenants with Power County that prohibit residential development of Parcel 5, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The

reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing the baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-23, cumulative RME total lifetime cancer risks for all receptors evaluated in the Supplemental HHRA (hypothetical future residents and future workers) were within EPA's acceptable risk range. Specifically, the HHRA estimated that cumulative RME total lifetime cancer risks to the two most highly exposed receptors, hypothetical future residents and future outdoor workers, are $2E-04$ and $7E-05$, respectively. Radium-226 via the external exposure to gamma radiation pathway was found to drive these risks, comprising over 85% of the cumulative total cancer risk estimates for these receptors.

An uncertainty assessment of risks via the external gamma exposure pathway was not conducted for Parcel 5 because, per the *SRI Work Plan Addendum*, all samples were collected from 0-to-6-inches bgs from the bermed soils that surround the gravel pit within the area. Consequently, external gamma risks in Parcel 5 were evaluated using 0-to-6-inch bgs data along with the non-modified HEAST cancer slope factors.

It is also noteworthy that the external gamma RME lifetime cancer risk associated with background concentrations accounts for nearly 70% of the total residential and outdoor worker cancer risk estimates for this exposure pathway. Consequently, cumulative RME incremental cancer risk estimates (i.e., total minus background risks) are significantly lower than the cumulative total cancer risks; e.g., $5E-05$ for hypothetical future residents and $2E-05$ for future outdoor workers).

In addition, cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be well below $1E-04$ for all evaluated receptors; e.g., $3E-05$ for hypothetical future residents and $2E-05$ for future outdoor workers.

As also shown in Table 3-23, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 5 ($HQ = 2.4$) is driven by groundwater ingestion ($HQ = 1.2$), in addition to contributions from homegrown produce ingestion ($HQ = 0.7$) and incidental soil ingestion ($HQ = 0.5$). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to fluoride ($HQ = 1.1$) and cadmium ($HQ = 0.9$). The cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors ($HQ = 1.0$) is driven by the groundwater ingestion pathway ($HQ = 0.7$); i.e., the cumulative total CTE HQ associated with exposure to soils and homegrown produce is less than 1.

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all worker receptors evaluated.

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-24, which summarizes the results of the Supplemental ERA Addendum located in Appendix E, the quantitative evaluation of ecological risks in Parcel 5 determined that none of the COCs, namely cadmium, fluoride, mercury, vanadium and zinc, exceeds an incremental HQ of one for any receptor: plant, avian or mammalian. Although the fluoride total HQ for unwashed sagebrush exceeds one, it is likely associated with foliar deposition which represents 13-22% of the cadmium and zinc plant concentrations.

Summary. In summary, 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 incremental risks above a level of concern.

3.10 NORTHERN PROPERTIES - PARCEL 6 (BASTISTE SPRING SAMPLING PARCEL) SOIL SAMPLING RESULTS AND EVALUATION

3.10.1 Parcel 6 Site Description

The Batiste Spring sampling parcel was purchased by FMC from the Union Pacific Railroad in 1996 and is approximately 16 acres in size. This sampling parcel is generally bounded by the Rowland property to the north, the Portneuf River to the east, Batiste Road to the south, and a gated, non-public dirt road to the west as shown on Figure 2-8. This sampling parcel is entirely outside the boundary of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. There is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel. This parcel contains the Batiste Spring pumphouse, springhouse, and access roads. Based upon EMF RI sampling, this sampling parcel is presumed to be minimally impacted by deposition of historical FMC stack and fugitive emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant.

3.10.2 Parcel 6 Problem Statement

The following field program was performed in the Parcel 6. The problem statement that identifies the data gap for the program was defined by the *SRI Work Plan Addendum* and is set forth below.

- Risk Assessment - Verify through surface soil sampling that there are no unacceptable ecological risks or human health risks in Parcel 6 to ensure that potential remedies at the FMC Plant OU are protective of current ecological and potential future human receptors that may be present in these areas.

3.10.3 Parcel 6 Risk Assessment Screening Results

Surface Soil Sample Results. The eight 0-to-2-inch bgs composite samples collected across Parcel 6 were analyzed for target metals, radionuclides and fluoride. In addition, the eight 2-to-6-inch bgs composite samples were analyzed for target radionuclides.

The mean concentration of each COPC/ROPC in the 0-to-2-inch bgs composite samples was calculated and compared to residential, site worker and ecological CVs in order to screen constituents for inclusion in the human health and ecological risk evaluations.

Residential CV Comparison. As shown in Table 3-25a, *Northern Parcel 6 Sample Data Summary and Evaluation Against Ecological and Residential Comparative Values* and Table 3-25b, the mean concentrations of several of the analytes of potential concern to human health are below their respective residential CVs, including: antimony, arsenic, chromium, lead, manganese, mercury, selenium, thallium, and zinc.

The mean concentrations of seven (7) analytes were found to exceed their corresponding residential CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 45.1 mg/kg, exceeding its residential CV of 7.7 mg/kg.
- Fluoride was reported at 4,575 mg/kg, exceeding its residential CV of 772 mg/kg.
- Lead-210 was reported at 8.2 pCi/g, exceeding its residential CV of 2.5 pCi/g.
- Radium-226 was reported at 4.9 pCi/g, exceeding its residential CV of 0.97 pCi/g.
- Uranium was reported at 16.3 mg/kg, exceeding its residential CV of 5.3 mg/kg.
- Uranium-238 was reported at 6.83 pCi/g, exceeding its residential CV of 1.66 pCi/g.
- Vanadium mean concentration was 127.5 mg/kg, exceeding its residential CV of 58.6 mg/kg.

The radionuclides collected from the 2-to-6 inch bgs sampling interval that exceed their corresponding residential CVs are listed below:

- Lead-210 was reported at 2.56 pCi/g, exceeding its residential CV of 1.6 pCi/g.
- Radium-226 was reported at 1.52 pCi/g, exceeding its residential CV of 1.35 pCi/g.
- Uranium-238 was reported at 2.22 pCi/g, exceeding its residential CV of 1.77 pCi/g.

The residential screening summarized above was performed in accordance with the decision rules specified in the EPA-Approved SRI Work Plan Addendum for the Northern Properties, and the findings were previously reported to the Agencies in an Interim Data Deliverable. Following submittal of the Interim Data Deliverable, EPA expressed concern that the homegrown fruit and vegetable exposure pathway was not included in the screening. Consequently, a separate screening analysis was performed for this pathway. This analysis confirmed the Baseline HHRA finding that cadmium is the primary constituent of concern via this pathway; however, lead-210 and radium-226 also exceeded CVs. Additional information regarding the comparison of the SRI data to homegrown fruit and vegetable CVs is provided in Section 3.3 and Attachment A of the Supplemental HHRA Addendum (Appendix D).

Future Worker CV Comparison. As shown in Table 3-25b, *Northern Parcel 6 Sample Data Summary and Evaluation Against Worker Comparative Values*, the mean concentrations of several of the analytes of potential concern to human health are below their respective worker CVs, including: antimony, arsenic, cadmium, chromium, fluoride, lead, manganese, mercury, selenium, thallium, uranium, vanadium, and zinc.

Three (3) analytes, lead-210, radium-226, and uranium-238, were reported in exceedance of a worker CV within the 0-to-2 inches bgs sampling interval:

- Lead-210 was reported at 8.2 pCi/g, exceeding its commercial/industrial CV of 3.0 pCi/g.
- Radium-226 was reported at 4.9 pCi/g, exceeding its commercial/industrial CV of 0.98 pCi/g and its construction worker CV of 1.9 pCi/g.
- Uranium-238 was reported at 6.83 pCi/g, exceeding its commercial/industrial CV of 2.3 pCi/g.

Two (2) analytes, lead-210 and radium-226, were reported in exceedance of a worker CV within the 2-to-6 inches bgs sampling interval:

- Lead-210 was reported at 2.56 pCi/g, exceeding its commercial/industrial CV of 2.1 pCi/g.
- Radium-226 was reported at 1.52 pCi/g, exceeding its commercial/industrial CV of 1.36 pCi/g.

Ecological CV Comparison. As shown in Table 3-25a, the mean concentrations of two (2) analytes of potential ecological concern to EPA are below their respective ecological CVs, including: arsenic and lead. However, the mean concentrations of seven (7) ecological COPCs were found to exceed their corresponding ecological CV from the 0-to-2 inch bgs sampling interval:

- Cadmium was reported at 45.1 mg/kg, exceeding its ecological CV of 1.1 mg/kg.
- Chromium was reported at 83.0 mg/kg, exceeding its ecological CV of 39.9 mg/kg.
- Fluoride was reported at 4,575 mg/kg, exceeding its ecological CV of 302 mg/kg.
- Mercury was reported at 0.139 mg/kg, exceeding its ecological CV of 0.023 mg/kg.
- Selenium was reported at 1.77 mg/kg, exceeding its ecological CV of 0.82 mg/kg.
- Vanadium mean concentration was 127.5 mg/kg, which exceeds its ecological CV of 27.4 mg/kg.
- Zinc was reported at 323 mg/kg, exceeding its ecological CV of 112 mg/kg.

Summary. Seven (7) analytes exceeded their residential CV and seven (7) analytes exceeded their ecological CV. Three (3) analytes exceeded both the residential CV and ecological CV. No metals or fluoride exceeded a worker CV. All three target radionuclides exceeded a worker CV in the 0-to-2 inch sampling interval. Two (2) radionuclides exceeded a worker CV in the 2-to-6 inch bgs sampling interval. Similar to the other parcels, the mean concentrations of the radionuclides are much lower in the 2-to-6 inch bgs sampling interval compared to the surface samples.

Based on the application of the decision rules from the *SRI Work Plan Addendum* to the validated soil data from Parcel 6, Table 3-5 identifies which constituents will be carried forward into the quantitative human health and/or ecological risk assessments. This information is summarized below:

- 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

With respect to the residential assessment, based on the separate homegrown fruit and vegetable pathway screening, risks via this pathway are evaluated in the Supplemental HHRA Addendum for cadmium, lead-210 and radium-226.

Finally, risks from residential and worker exposure to groundwater in Parcel 6 are evaluated in the HHRA for the COCs identified in Table 7-5 of the *GWCCR* (arsenic, fluoride, manganese, nitrate, elemental phosphorus, selenium, uranium and vanadium) using data for the Batiste Spring well collected from November 2006 to May 2009.

3.10.4 Parcel 6 Risk Characterization and Uncertainty Discussion

Human Health Assessment. Despite the fact that the FMC northern properties are zoned heavy industrial, EPA required that potential risks to hypothetical residential receptors be evaluated in the Supplemental HHRA Addendum. The reason for this is that baseline risk assessments are intended to characterize site risks absent any remedial action, in order to determine what, if any, remedial actions are appropriate. Since land use restrictions and other institutional controls constitute remedial action, their effect in limiting residential use is not a consideration for characterizing the baseline risk. In addition, potential risks to hypothetical future commercial/industrial, construction and utility workers were also evaluated consistent with EPA guidance documents concerning risk assessments for reasonably anticipated future land uses. The soil investigation results were screened against CVs, as discussed above, to determine what constituents in surface soils were carried forward into the Supplemental HHRA Addendum. COCs identified in the *GWCCR* were also carried forward into the evaluation of groundwater risks within the Supplemental HHRA Addendum.

As shown in Table 3-26, cumulative RME total lifetime cancer risks to hypothetical future residents were found to exceed EPA's acceptable risk range. Specifically, the Supplemental HHRA estimated a cumulative RME total lifetime cancer risk of $8E-04$ for this receptor. Radium-226 via the external exposure to gamma radiation pathway and arsenic via the groundwater ingestion pathway were found to drive this risk, comprising over 90% of the cumulative total cancer risk estimates for hypothetical future residents. A quantitative uncertainty assessment of the external gamma exposure pathway, performed using the 0-to-6-inch bgs data in combination with unmodified HEAST cancer slope factors, estimated 13% lower total lifetime cancer risks than the 0-to-2-inch bgs data with modified HEAST slope

factors for Parcel 6. For soil-related exposures alone (i.e., not including groundwater exposures), use of the 0-to-6-inch bgs data would result in cumulative RME total lifetime cancer risks to hypothetical future residents ($3E-04$) within EPA's acceptable risk range.

Cumulative total lifetime cancer risks under the more realistic CTE scenario were found to be within EPA's acceptable risk range ($1E-04$) for hypothetical future residents. In addition, cumulative total RME and CTE lifetime cancer risk estimates were found to be within EPA's acceptable risk range for all worker receptors evaluated. Specifically, the Supplemental HHRA estimated cumulative RME and CTE total lifetime cancer risks of $3E-04$ and $6E-05$, respectively, for the most highly exposed future outdoor commercial/industrial worker receptor.

As also shown in Table 3-26, the cumulative total RME non-cancer risk estimate to hypothetical future residential receptors in Parcel 6 ($HQ = 15.1$) is driven by homegrown produce ingestion ($HQ = 7.0$), groundwater ingestion ($HQ = 5.6$) and incidental soil ingestion ($HQ = 2.3$). The cumulative total RME non-cancer HQ is primarily associated with assumed exposure to cadmium in soils ($HQ = 7.7$) and arsenic in groundwater ($HQ = 4.6$). By contrast, the cumulative total HQ under the more realistic CTE scenario for hypothetical future residential receptors ($HQ = 4.4$) is driven by groundwater ingestion ($HQ = 2.8$), and, to a lesser extent, homegrown produce ingestion ($HQ = 0.9$) and incidental soil ingestion ($HQ = 0.7$).

Cumulative total and incremental RME and CTE non-cancer HQ estimates were found to be below 1 for all worker receptors evaluated.

Finally, while groundwater risks were included in the discussion above, it is worth noting that the 95% UCL and mean concentrations of arsenic in the Batiste Springs well (0.0217 mg/L and 0.0173 mg/L, respectively) exceed the Maximum Contaminant Level (MCL) of 0.01 mg/L.

A comprehensive discussion of the methods and assumptions that were used to perform the HHRA is provided in Appendix D.

Ecological Assessment. As shown in Table 3-27, which summarizes the results of the Supplemental ERA Addendum in Appendix E, the quantitative evaluation of ecological risks in Parcel 6 determined that there are no mammalian HQs in excess of one.

For avian receptors, only one of the COCs, namely fluoride, marginally exceeds a total NOAEL HQ of one in all avian receptors. However, in all cases, the total LOAEL HQ is below one. Similarly, the incremental NOAEL HQs exceed one for all avian receptors, but none of the incremental LOAEL HQs exceed one.

Plant incremental HQs marginally exceed one for fluoride in unwashed sagebrush, but not wheatgrass, although the total HQ exceeds one in wheatgrass. However, because the unwashed fraction as measured in the BERA represents 13-22% of the cadmium and zinc plant concentrations, it is likely that the marginal fluoride exceedance in vegetation would be reduced by at least a similar amount in washed sagebrush. Plant total HQs or incremental HQs do not exceed one for any other COC.

Summary. In summary, 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 incremental 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 incremental 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.

3.11 IN-SITU GAMMA STUDY RESULTS AND EVALUATION

In November 2008, personnel from the Environmental Protection Agency's (EPA) Office of Radiation and Indoor Environments Laboratory (ORIA) applied in-situ gamma-ray measurement technology at FMC Plant OU Northern Properties and SRI Addendum background areas. The work was conducted to evaluate the applicability of in-situ measurements in characterizing radioactive contamination in surface soils at the EMF Offsite OU as documented in EPA's work plan provided in Appendix F-1.

The ORIA employed a Canberra Model GX10021 ISOCs® (In-situ Object Counting System) to obtain the in-situ measurements, fitted with an XtRa germanium detector, coupled to an Inspector 2000 multichannel analyzer. The ISOCs is a battery-operated field deployable gamma spectrometer that provides spectra representing discrete counts of gamma energy. The spectra are then converted to radionuclide concentrations by applying efficiency calculations using Monte Carlo statistical methods and object-defined geometry templates in the Canberra analysis software.

The ORIA also employed two Reuter Stokes Model RS-112 pressurized ion chambers (PIC) to collect ambient exposure rates during the field program. One was installed at an air monitoring station immediately west of the FMC office trailer compound on Northern Property Parcel 2 and the other was used to collect measurements at each in-situ measurement location.

The ORIA's objectives were to:

- Determine in-situ concentrations of uranium series radionuclides in surface soils, by way of direct measurements of bismuth-214 and protactinium-234m (surrogate radionuclides in the uranium series, radium-226 and uranium-238, respectively)
- Evaluate the effects of atmospheric near-surface radon
- Determine minimum collection times
- Evaluate the vertical distribution of contamination
- Evaluate interference from the nearby waste piles

To accomplish the first EPA objective, ORIA obtained 18 integrated measurements with the ISOCs, each from approximately 18 inches above ground surface. The measurements were

taken in background areas and several Northern Property parcels. The results are documented in EPA's report and evaluation documents provided in Appendix F-2, Appendix F-3, and Appendix F-4. Bismuth-214 concentrations ranged from 0.8 to 25.6 picocuries per gram (pCi/g) and averaged 6.1 pCi/g (dry mass). Protactinium concentrations ranged from 4.1 to 26.7 pCi/g and averaged 10.2 pCi/g in the 10 measurements exceeding MDCs.

EPA requested that FMC include discussion of this data in this SRI Addendum Report. Discussion is presented below in two broad areas: (1) Comparison to the laboratory analytical results for the soil samples collected in comparable areas during the SRI Addendum field work, and (2) Consideration should additional sampling for radiological constituents be conducted in the future on FMC Northern Properties or nearby locations. Appendix F-5 includes a more detailed review of the ORIA effort which was prepared by ERG, FMC's contractor with substantial radiological expertise.

Comparison to the laboratory analytical results for the soil samples collected in comparable areas during the SRI Addendum field work. The in-situ measurements can be best compared to laboratory analytical results in discrete soil samples collected at five background locations: EPA Location No. 2, 3, 16, 17, and 18 are proximal to (but not co-located with) discrete soil samples that were collected at background locations during the SRI Addendum field work. The other in-situ measurements were collected at discrete locations in the Northern Properties of the FMC Plant OU. However, in these areas, only composite samples of 20 increments over large areas were analyzed during the SRI Addendum activities. Therefore, it is difficult to make a direct comparison between the in-situ measurements and the composite analytical samples collected over several acres. Nonetheless, the discrete locations at which in-situ measurements were collected can be mapped to fall within one of the parcels over which composite samples were collected, although not as directly comparable. Table 3-28 presents the laboratory analyses of the soil samples collected in the SRI Addendum field work and the "corresponding" in-situ data collected by ORIA. Figures F-1 through F-6 in Appendix F-6 depict the location of the SRI Addendum samples and the ORIA samples (although as noted in ORIA's report, not all of the in-situ measurement locations were differentially corrected using the GPS).

Comparing the in-situ measurements with five "corresponding" samples the bismuth-214 in-situ measurements generally exceeded the laboratory analytical results for radium-226 and the protactinium-234m in-situ measurements generally were similar or lower than the laboratory analytical results for uranium-238. While any direct comparison is not precise due to the differences in sampling methodology and handling of uncertainty assumptions in the in-situ technique, the laboratory analytical data generally supports the overall accuracy of the in-situ data, or conversely, the in-situ data serves to further support the accuracy of the laboratory analytical data.

Consideration should additional ISOC sampling for radiological constituents be conducted in the future on FMC Northern Properties or nearby locations. The germanium detector, in the form of ISOCs is useful for point measurements and is generally not used to characterize large areas where no prior characterizations have been conducted. The germanium detector in the form of ISOCs is superior to other technologies in resolution of the various gamma energies,

hence its strength in sorting out the various radionuclides in a mixture, e.g., discerning the peaks of Pa-234m, Bi-214, Pb-214. In-situ measurements are most valuable when the radionuclide mix is variable across the site; i.e., the measurements could be used to discern the relative types and magnitudes of complex mixes of gamma-emitters such as cesium-137, cobalt-60, and natural decay series, which does not appear to be the case at the EMF Site. However, in-situ measurements represent an average over a large area (~10 ft radius) with the emissions originating near the detector being much more influential on the results than emissions originating far from the detector. In-situ measurements are most accurate for areas uniformly contaminated over the areal extent and depth, and these measurements are highly dependent on the contamination depth profile. For areas where contamination is variable, large errors can result if contamination is at the edge of view of the detector; over response occurs if contamination is beneath the detector. Nonetheless, in-situ measurements, among other tools, can be useful in site characterization.

Several of the uncertainties from ISOCs measurements compared to sampling and analysis arise from 1) varying radon releases from soil when measuring radon progeny concentrations, 2) averaging gamma-ray emissions over relatively large areas, 3) heterogeneities in soil/material types (radon emanation from phosphate ore was six times higher than as determined by flux measurements obtained during the SRI) contaminant concentrations, moisture content, and site topography, and 4) the presence of gamma emissions from nearby or buried sources.

TABLE 3-1
BACKGROUND DATA FOR SOUTHERN/WESTERN UNDEVELOPED AREAS AND NORTHERN PROPERTIES OF THE FMC PLANT OU - SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
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Analyte					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Total Fluoride	Lead	Lead-210	Lithium
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg
EPA's Baseline HHRA Soil Background (95th Percentile)					2.2	7.7	188	1	12.8	1.90	27.5	7.6	12.6	600	29.1	3.03	16.1
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix													
RRE1BCK1-SSC001	RRE1BCK1-SSC001 (0-2)	10/31/2008	0 - 2	Soil	0.23 T	3.1	110	0.51 T	2.1 T	0.6 T	11	4.6	20	240	20	1.79 ± 0.45 B	11
RRE2BCK2-SSC001	RRE2BCK2-SSC001 (0-2)	11/3/2008	0 - 2	Soil	0.22 T	2.8	110	0.61 T	2 T	0.66 T	12	5	20	280	20	1.52 ± 0.39 B	11
PCRBCK3-SSC001	PCRBCK3-SSC001 (0-2)	10/31/2008	0 - 2	Soil	0.25 T	4.1	110	0.64 T	<10	0.45 T	13	5.2	12	280	11	1.84 ± 0.46 B	13
MGLBCK4-SSC001	MGLBCK4-SSC001 (0-2)	10/31/2008	0 - 2	Soil	0.31 T	9.6	230	0.52 T	3.5 T	0.43 T	11	24	18	150 J-	27	1.79 ± 0.45	11
BLRK1BCK5-SSC001	BLRK1BCK5-SSC001 (0-2)	10/31/2008	0 - 2	Soil	0.33 T	3.5	130	0.66 T	9.2 T	0.7 T	13	5	14	290 J-	27	2.14 ± 0.53	11
BLRK2BCK6-SSC001	BLRK2BCK6-SSC001 (0-2)	10/31/2008	0 - 2	Soil	0.21 T	4.3	130	0.57 T	7.2 T	0.73 T	13	5	11	330 J-	20	1.84 ± 0.46	11
BLRK2BCK6-SSC001 Dup	BLRK2BCK6-SSC201 (0-2)	10/31/2008	0 - 2	Soil	0.19 T	4.2	130	0.56 T	6.7 T	0.7 T	13	4.9	10	310 J-	20	1.80 ± 0.45	11
BRTBCK7-SSC001	BRTBCK7-SSC001 (0-2)	11/3/2008	0 - 2	Soil	0.35 T,UB	16 B	170 B	0.63 T,B	4.3 T	0.66 T,B	16 B	5.6 B	16 B	280	22 B	2.29 ± 0.57 B	15 B
REDHBCK8-SSC001	REDHBCK8-SSC001 (0-2)	11/4/2008	0 - 2	Soil	0.6 T,UB	12 B	140 B	0.57 T,B	5 T	0.68 T,B	15 B	5.2 B	29 B	350 J-,B	24 B	1.97 ± 0.49	13 B
HWYP1BCK9-SSC001	HWYP1BCK9-SSC001 (0-2)	11/4/2008	0 - 2	Soil	0.27 T,UB	3.6 B	140 B	0.62 T,B	<10	0.83 T,B	13 B	5.4 B	19 B	290	23 B	2.09 ± 0.52 B	11 B
HWYP2BCK10-SSC001	HWYP2BCK10-SSC001 (0-2)	11/4/2008	0 - 2	Soil	0.24 T,UB	4.6 B	150 B	0.68 T,B	7.6 T	0.77 T,B	13 B	5.9 B	17 B	220	17 B	1.51 ± 0.38 B	14 B
Composite 0 - 2" Soil Background (Mean)					0.26	6.4	142	0.60	5.1	0.65	13.0	7.1	17.6	270	21.1	1.88	12.1
Composite 0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	164	0.63	6.0	0.72	13.9	10.9	20.6	302	23.9	2.02	13.0
Composite 0 - 2" Soil Background (95th Percentile)					0.32	14.2	203	0.67	8.5	0.80	15.6	15.9	25.0	337	27.0	2.22	14.6
RRE1BCK1-SSD	RRE1BCK1-SSD (0-2)	10/31/2008	0 - 2	Soil	0.2 T	3	110	0.52 T	9.5 T	0.56 T	11	4.4	24	250 J-	20	1.88 ± 0.47	9.9
RRE2BCK2-SSD	RRE2BCK2-SSD (0-2)	11/3/2008	0 - 2	Soil	0.24 T	2.9	110	0.59 T	1.7 T	0.59 T	12	5.1	18	240	18	1.71 ± 0.43 B	11
PCRBCK3-SSD	PCRBCK3-SSD (0-2)	10/31/2008	0 - 2	Soil	0.26 T	4.6	110	0.64 T	7.2 T	0.4 T	13	5.2	11	250 J-	11	1.69 ± 0.42	11
MGLBCK4-SSD	MGLBCK4-SSD (0-2)	10/31/2008	0 - 2	Soil	0.35 T	9.2	280	0.52 T	4.1 T	0.38 T	12	22	18	180 J-	27	1.50 ± 0.38	12
BLRK1BCK5-SSD	BLRK1BCK5-SSD (0-2)	10/31/2008	0 - 2	Soil	0.31 T	3.6	130	0.66 T	9.3 T	0.78 T	14	5.2	14	310 J-	29	1.98 ± 0.49	11
BLRK2BCK6-SSD	BLRK2BCK6-SSD (0-2)	10/31/2008	0 - 2	Soil	0.24 T	5.1	140	0.57 T	6.5 T	0.3 T	13	5	9.2	410 J-	9.3	0.75 ± 0.21	12
BLRK2BCK6-SSD Dup	BLRK2BCK96-SSD (0-2)	11/4/2008	0 - 2	Soil	0.31 T,UB	4.4 B	120 B	0.56 T,B	<10	0.58 T,B	13 B	5.3 B	9.9 B	300 J-,B	18 B	1.65 ± 0.41	12 B
BRTBCK7-SSD	BRTBCK7-SSD (0-2)	10/31/2008	0 - 2	Soil	0.24 T	11	160	0.63 T	10	0.47 T	14	5.4	13	250 J-	16	1.26 ± 0.32	14
REDHBCK8-SSD	REDHBCK8-SSD (0-2)	11/4/2008	0 - 2	Soil	1.4 UB	10 B	150 B	0.62 T,B	4.8 T	0.62 T,B	14 B	5.1 B	17 B	370 J-,B	150 B	1.88 ± 0.47	13 B
HWYP1BCK9-SSD	HWYP1BCK9-SSD (0-2)	11/4/2008	0 - 2	Soil	0.3 T,UB	3.6 B	150 B	0.7 T,B	1.5 T	0.95 T,B	13 B	5.4 B	18 B	290	27 B	2.52 ± 0.63 B	12 B
HWYP2BCK10-SSD	HWYP2BCK10-SSD (0-2)	11/4/2008	0 - 2	Soil	0.24 T,UB	4.3 B	160 B	0.67 T,B	8 T	0.58 T,B	14 B	6 B	18 B	340	16 B	1.78 ± 0.45 B	15 B
Discrete 0 - 2" Soil Background (Mean)					0.26	5.7	149	0.61	6.3	0.58	13.0	6.9	16.1	284	32.8	1.74	12.1
Discrete 0 - 2" Soil Background (95% UCL on Mean)					0.28	8.3	179	0.65	8.1	0.68	13.6	10.3	18.5	318	90.2	1.96	13.0
Discrete 0 - 2" Soil Background (95th Percentile)					0.33	10.6	226	0.69	9.8	0.87	14.0	14.8	21.3	363	95.5	2.28	14.6
RRE1BCK1-SSC001	RRE1BCK1-SSC001 (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.91 ± 0.25 UB	NA
RRE2BCK2-SSC001	RRE2BCK2-SSC001 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.82 ± 0.23 UB	NA
PCRBCK3-SSC001	PCRBCK3-SSC001 (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.08 ± 0.29 UB	NA
MGLBCK4-SSC001	MGLBCK4-SSC001 (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.79 ± 0.44	NA
BLRK1BCK5-SSC001	BLRK1BCK5-SSC001 (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.97 ± 0.25	NA
BLRK2BCK6-SSC001	BLRK2BCK6-SSC001 (2-6)	10/30/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.75 ± 0.2	NA
BLRK2BCK6-SSC001 Dup	BLRK2BCK6-SSC201 (2-6)	10/30/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.82 ± 0.22	NA
BRTBCK7-SSC001	BRTBCK7-SSC001 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.07 ± 0.28 UB	NA
REDHBCK8-SSC001	REDHBCK8-SSC001 (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.07 ± 0.28	NA
HWYP1BCK9-SSC001	HWYP1BCK9-SSC001 (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.99 ± 0.26	NA
HWYP2BCK10-SSC001	HWYP2BCK10-SSC001 (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.00 ± 0.27 UB	NA
Composite 2 - 6" Soil Background (Mean)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.05	NA
Composite 2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.17	NA
Composite 2 - 6" Soil Background (95th Percentile)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.47	NA
RRE1BCK1-SSD	RRE1BCK1-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.06 ± 0.28	NA
RRE2BCK2-SSD	RRE2BCK2-SSD (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 ± 0.26 UB	NA
PCRBCK3-SSD	PCRBCK3-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.79 ± 0.21	NA
MGLBCK4-SSD	MGLBCK4-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.98 ± 0.49	NA
BLRK1BCK5-SSD	BLRK1BCK5-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.81 ± 0.22	NA
BLRK2BCK6-SSD	BLRK2BCK6-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.53 ± 0.38	NA
BLRK2BCK6-SSD Dup	BLRK2BCK96-SSD (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.84 ± 0.23	NA
BRTBCK7-SSD	BRTBCK7-SSD (2-6)	10/31/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.26 ± 0.32	NA
REDHBCK8-SSD	REDHBCK8-SSD (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.10 ± 0.29	NA
HWYP1BCK9-SSD	HWYP1BCK9-SSD (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.83 ± 0.23 UB	NA
HWYP2BCK10-SSD	HWYP2BCK10-SSD (2-6)	11/4/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.20 ± 0.31	NA
Discrete 2 - 6" Soil Background (95th Percentile)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.11	NA
Discrete 2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.32	NA
Discrete 2 - 6" Soil Background (95th Percentile)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.66	NA

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

NE Not established

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

UB Analyte considered not detected based on associated blank data.

J- Data are estimated, potentially biased low, due to associated quality control data.

TABLE 3-1
BACKGROUND DATA FOR SOUTHERN/WESTERN UNDEVELOPED AREAS AND NORTHERN PROPERTIES OF THE FMC PLANT OU - SAMPLE DATA SUMMARY
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

		Analyte				Manganese	Mercury	Molybdenum	Nickel	Radium-226	Selenium	Silver	Thallium	Uranium	Uranium-238	Vanadium	Zinc
		Units				mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
EPA's Baseline HHRA Soil Background (95th Percentile)						482	0.160	2.15	15.5	3.88	1.36	1.90	0.27	NE	3.88	45.4	52.8
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix													
RRE1BCK1-SSC001	RRE1BCK1-SSC001 (0-2)	10/31/2008	0 - 2	Soil		380	0.017 T	0.59 T	10	0.55 ± 0.16	0.34 T	0.12 T	0.12 T	0.51 T	0.69 ± 0.21	15	67
RRE2BCK2-SSC001	RRE2BCK2-SSC001 (0-2)	11/3/2008	0 - 2	Soil		410	0.018 T	0.57 T	11	0.60 ± 0.15	0.35 T	0.098 T	0.11 T	0.48 T	0.71 ± 0.21	17 B	71
PCRBCK3-SSC001	PCRBCK3-SSC001 (0-2)	10/31/2008	0 - 2	Soil		440	0.011 T	0.4 T	13	0.55 ± 0.21	0.18 T	0.074 T	0.11 T	0.46 T	0.85 ± 0.25	18	49
MGLBCK4-SSC001	MGLBCK4-SSC001 (0-2)	10/31/2008	0 - 2	Soil		1300	0.014 T	0.47 T	34	0.99 ± 0.26	0.16 T	0.052 T	0.076 T	1	1.21 ± 0.32	13	62
BLRK1BCK5-SSC001	BLRK1BCK5-SSC001 (0-2)	10/31/2008	0 - 2	Soil		480	0.023 T	0.48 T	13	0.88 ± 0.2	0.33 T	0.11 T	0.14 T	0.56 T	0.69 ± 0.21	18	60
BLRK2BCK6-SSC001	BLRK2BCK6-SSC001 (0-2)	10/31/2008	0 - 2	Soil		380	0.034	0.37 T	12	1.14 ± 0.26	0.25 T	0.087 T	0.12 T	0.63 T	0.78 ± 0.23	18	51
BLRK2BCK6-SSC001 Dup	BLRK2BCK6-SSC201 (0-2)	10/31/2008	0 - 2	Soil		380	0.015 T	0.37 T	12	0.63 ± 0.16	<2	0.094 T	0.11 T	0.62 T	0.79 ± 0.23	18	50
BRTBCK7-SSC001	BRTBCK7-SSC001 (0-2)	11/3/2008	0 - 2	Soil		500 B	0.019 T	0.8 T,UB	13	0.36 ± 0.15	0.28 T,UB	0.1 T,UB	0.17 T,UB	0.54 T,UB	0.84 ± 0.31	24 B	61
REDHBCK8-SSC001	REDHBCK8-SSC001 (0-2)	11/4/2008	0 - 2	Soil		420 B	0.023 T	1.1 ,UB	12	1.36 ± 0.28	0.22 T,UB	0.11 T,UB	0.17 T,UB	0.54 T,UB	0.63 ± 0.21	21 B	64
HWYP1BCK9-SSC001	HWYP1BCK9-SSC001 (0-2)	11/4/2008	0 - 2	Soil		500 B	0.024 T	0.5 T,UB	12	0.55 ± 0.19	0.17 T,UB	0.11 T,UB	0.13 T,UB	0.58 T,UB	0.77 ± 0.22	17 B	69
HWYP2BCK10-SSC001	HWYP2BCK10-SSC001 (0-2)	11/4/2008	0 - 2	Soil		570 B	0.024 T	0.62 T,UB	13	1.04 ± 0.23	0.28 T,UB	0.089 T,UB	0.13 T,UB	0.52 T,UB	0.69 ± 0.21	18 B	68
Composite 0 - 2" Soil Background (Mean)						538	0.020	0.48	14.3	0.78	0.26	0.10	0.12	0.58	0.79	17.9	62.1
Composite 0 - 2" Soil Background (95% UCL on Mean)						710	0.023	0.53	18.7	0.953	0.30	0.10	0.13	0.66	0.88	19.6	66.5
Composite 0 - 2" Soil Background (95th Percentile)						971	0.024	0.58	24.6	1.22	0.35	0.12	0.14	0.83	1.05	22.7	70.1
RRE1BCK1-SSD	RRE1BCK1-SSD (0-2)	10/31/2008	0 - 2	Soil		380	0.015 T	0.54 T	10	0.28 ± 0.10	0.17 T	0.092 T	0.088 T	0.46 T	0.8 ± 0.22	14	70
RRE2BCK2-SSD	RRE2BCK2-SSD (0-2)	11/3/2008	0 - 2	Soil		420	0.018 T	0.57 T	11	0.67 ± 0.15	0.31 T	0.096 T	0.11 T	0.46 T	0.78 ± 0.23	16	63
PCRBCK3-SSD	PCRBCK3-SSD (0-2)	10/31/2008	0 - 2	Soil		430	0.0067 T	0.38 T	13	0.84 ± 0.20	0.16 T	0.071 T	0.12 T	0.49 T	0.92 ± 0.27	18	48
MGLBCK4-SSD	MGLBCK4-SSD (0-2)	10/31/2008	0 - 2	Soil		1500	0.018 T	0.5 T	35	0.2	0.16 T	0.05 T	0.093 T	1.1	1.35 ± 0.34	13	61
BLRK1BCK5-SSD	BLRK1BCK5-SSD (0-2)	10/31/2008	0 - 2	Soil		480	0.018 T	0.51 T	13	0.62 ± 0.17	0.25 T	0.1 T	0.14 T	0.59 T	0.72 ± 0.26	19	61
BLRK2BCK6-SSD	BLRK2BCK6-SSD (0-2)	10/31/2008	0 - 2	Soil		350	0.011 T	0.41 T	13	1.06 ± 0.23	0.17 T	0.072 T	0.12 T	0.67 T	0.67 ± 0.27	19	39
BLRK2BCK6-SSD Dup	BLRK2BCK96-SSD (0-2)	11/4/2008	0 - 2	Soil		360 B	0.016 T	0.4 T,UB	12	0.59 ± 0.15	0.15 T,UB	0.085 T,UB	0.12 T,UB	0.58 T,UB	0.78 ± 0.24	18 B	47
BRTBCK7-SSD	BRTBCK7-SSD (0-2)	10/31/2008	0 - 2	Soil		470	0.015 T	0.54 T	12	0.81 ± 0.17	0.14 T	0.082 T	0.16 T	0.5 T	0.62 ± 0.2	19	51
REDHBCK8-SSD	REDHBCK8-SSD (0-2)	11/4/2008	0 - 2	Soil		410 B	0.017 T	1 B,UB	12	0.80 ± 0.18	0.24 T,UB	0.13 T,UB	0.16 T,UB	0.51 T,UB	0.76 ± 0.22	21 B	60
HWYP1BCK9-SSD	HWYP1BCK9-SSD (0-2)	11/4/2008	0 - 2	Soil		520 B	0.0013 T	0.55 T,UB	12	0.78 ± 0.16	0.29 T,UB	0.12 T,UB	0.13 T,UB	0.58 T,UB	0.96 ± 0.27	19 B	76
HWYP2BCK10-SSD	HWYP2BCK10-SSD (0-2)	11/4/2008	0 - 2	Soil		610 B	0.0017 T	0.64 T,UB	13	0.217 ± 0.065	0.16 T,UB	0.1 T,UB	0.13 T,UB	0.52 T,UB	0.84 ± 0.25	18 B	68
Discrete 0 - 2" Soil Background (Mean)						558	0.012	0.50	14.4	0.60	0.21	0.08	0.13	0.59	0.85	17.6	60.1
Discrete 0 - 2" Soil Background (95% UCL on Mean)						771	0.015	0.54	19.0	0.972	0.22	0.09	0.13	0.68	0.97	19.0	66.0
Discrete 0 - 2" Soil Background (95th Percentile)						1100	0.018	0.56	25.1	0.83	0.30	0.10	0.16	0.91	1.17	20.1	73.3
RRE1BCK1-SSC001	RRE1BCK1-SSC001 (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.74 ± 0.19	NA	NA	NA	NA	0.47 ± 0.18	NA	NA
RRE2BCK2-SSC001	RRE2BCK2-SSC001 (2-6)	11/3/2008	2 - 6	Soil		NA	NA	NA	NA	0.87 ± 0.22	NA	NA	NA	NA	0.74 ± 0.22	NA	NA
PCRBCK3-SSC001	PCRBCK3-SSC001 (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.69 ± 0.17	NA	NA	NA	NA	0.78 ± 0.23	NA	NA
MGLBCK4-SSC001	MGLBCK4-SSC001 (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	2.14 ± 0.44	NA	NA	NA	NA	1.37 ± 0.34	NA	NA
BLRK1BCK5-SSC001	BLRK1BCK5-SSC001 (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	1.00 ± 0.22	NA	NA	NA	NA	0.86 ± 0.24	NA	NA
BLRK2BCK6-SSC001	BLRK2BCK6-SSC001 (2-6)	10/30/2008	2 - 6	Soil		NA	NA	NA	NA	0.339 ± 0.094	NA	NA	NA	NA	0.83 ± 0.23	NA	NA
BLRK2BCK6-SSC001 Dup	BLRK2BCK6-SSC201 (2-6)	10/30/2008	2 - 6	Soil		NA	NA	NA	NA	0.96 ± 0.20 J-	NA	NA	NA	NA	1.02 ± 0.27	NA	NA
BRTBCK7-SSC001	BRTBCK7-SSC001 (2-6)	11/3/2008	2 - 6	Soil		NA	NA	NA	NA	0.53 ± 0.13	NA	NA	NA	NA	0.97 ± 0.31	NA	NA
REDHBCK8-SSC001	REDHBCK8-SSC001 (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	1.13 ± 0.24	NA	NA	NA	NA	0.89 ± 0.26	NA	NA
HWYP1BCK9-SSC001	HWYP1BCK9-SSC001 (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	1.56 ± 0.34	NA	NA	NA	NA	0.81 ± 0.24	NA	NA
HWYP2BCK10-SSC001	HWYP2BCK10-SSC001 (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	0.84 ± 0.18	NA	NA	NA	NA	0.86 ± 0.25	NA	NA
Composite 2 - 6" Soil Background (Mean)						NA	NA	NA	NA	1.01	NA	NA	NA	NA	0.87	NA	NA
Composite 2 - 6" Soil Background (95% UCL on Mean)						NA	NA	NA	NA	1.335	NA	NA	NA	NA	1.00	NA	NA
Composite 2 - 6" Soil Background (95th Percentile)						NA	NA	NA	NA	1.88	NA	NA	NA	NA	1.19	NA	NA
RRE1BCK1-SSD	RRE1BCK1-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.47 ± 0.13	NA	NA	NA	NA	0.9 ± 0.31	NA	NA
RRE2BCK2-SSD	RRE2BCK2-SSD (2-6)	11/3/2008	2 - 6	Soil		NA	NA	NA	NA	0.82 ± 0.18	NA	NA	NA	NA	0.72 ± 0.22	NA	NA
PCRBCK3-SSD	PCRBCK3-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.2	NA	NA	NA	NA	0.72 ± 0.22	NA	NA
MGLBCK4-SSD	MGLBCK4-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	1.06 ± 0.23	NA	NA	NA	NA	1.26 ± 0.31	NA	NA
BLRK1BCK5-SSD	BLRK1BCK5-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.60 ± 0.15	NA	NA	NA	NA	0.97 ± 0.27	NA	NA
BLRK2BCK6-SSD	BLRK2BCK6-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.58 ± 0.13	NA	NA	NA	NA	0.92 ± 0.26	NA	NA
BLRK2BCK6-SSD Dup	BLRK2BCK96-SSD (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	0.06 ± 0.038	NA	NA	NA	NA	0.76 ± 0.23	NA	NA
BRTBCK7-SSD	BRTBCK7-SSD (2-6)	10/31/2008	2 - 6	Soil		NA	NA	NA	NA	0.88 ± 0.19	NA	NA	NA	NA	0.8 ± 0.23	NA	NA
REDHBCK8-SSD	REDHBCK8-SSD (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	0.37 ± 0.12	NA	NA	NA	NA	0.82 ± 0.24	NA	NA
HWYP1BCK9-SSD	HWYP1BCK9-SSD (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	0.88 ± 0.20	NA	NA	NA	NA	0.78 ± 0.23	NA	NA
HWYP2BCK10-SSD	HWYP2BCK10-SSD (2-6)	11/4/2008	2 - 6	Soil		NA	NA	NA	NA	0.66 ± 0.16	NA	NA	NA	NA	0.77 ± 0.23	NA	NA
Discrete 2 - 6" Soil Background (95th Percentile)						NA	NA	NA	NA	0.63	NA	NA	NA	NA	0.86	NA	NA
Discrete 2 - 6" Soil Background (95% UCL on Mean)						NA	NA	NA	NA	0.79	NA	NA	NA	NA	0.95	NA	NA
Discrete 2 - 6" Soil Background (95th Percentile)						NA	NA	NA	NA	0.98	NA	NA	NA	NA	1.13	NA	NA

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

NE Not established

T Analyte was positively identified but the reported concentration is estimated; reported concentra

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

UB Analyte considered not detected based on associated blank data.

J- Data are estimated, potentially biased low, due to associated quality control data.

TABLE 3-2
HUMAN HEALTH SOIL SCREENING LEVELS
FOR EVALUATING THE SUA/WUA
AND NORTHERN PROPERTIES (mg/kg or pCi/g)^{a,b}
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
(Page 1 of 1)

Constituents	Region 10 Residential SSL ^c	Commercial/Industrial Worker SSL ^d	Construction Worker SSL ^d	Utility Worker SSL ^d
Antimony	3.1	454	104	1,355
Arsenic	0.39	1.8 ^f	14.6	173
Barium	1500	61729	8,355	108,617
Beryllium	16.0	645	61.0	792
Boron	1600	222538	5,213	67,768
Cadmium	7.0	860	81.3	1,057
Chromium	280	1000000	550,729	1,000,000
Cobalt	2.3	553	52.2	679
Copper	310	42016	22,036	286,470
Fluoride	470	68093	33,044	429,569
Lead	400	800	800	800
Lead-210	0.45	0.94 ^f	7.4	96.7
Lithium	16.0	22711	11,911	154,848
Manganese	180	23538	77,102	1,000,000
Mercury	2.3	340	464	6,033
Molybdenum	39.0	5674	2,754	35,797
Nickel	160	6447	404	5,249
Radium-226	0.013	0.023 ^f	0.93 ^f	12.3
Selenium	39.0	5,674	2,754	35,797
Silver	39.0	5,674	2,754	35797.393
Thallium	0.51	77.2	374	4,868
Uranium ^e	4.6	681	250	3,254
Uranium-238	0.78	1.4 ^f	20.6	267
Vanadium	39.0	7,949	3,503	45,544
Zinc	2300	340,467	165,219	1,000,000

- a) The surface soil CV will consist of the Region 10 residential SSL + 95% UCL background concentration.
- b) The sub-surface soil CV will consist of the lowest worker SSL + 95% UCL background concentration.
- c) EPA Region 10 guidance recommends use of Region 6 screening levels. EPA Region 6 currently recommends use of EPA Region 3's Risk Based Concentration (RBC) Table for chemicals and EPA's Preliminary Remediation Goals website (<http://epa-prgs.ornl.gov/radionuclides/>) for radionuclides. Per EPA Region 10 guidance, residential SSLs established at a cancer risk
- d) Worker SSLs taken from Table 1-7 of the SRI Report (MWH, 2008)
- e) EPA Region 3 residential SSL and SRI commercial/industrial worker SSLs amended to reflect a 5-fold decrease in the chronic oral RfD for uranium (EPA, 2008).
- f) Per the decision rules specified in SRI Addenda #s 13 and 14, worker SSLs lower than background do not default to the background level as was assumed for the FMC Plant Site.

TABLE 3-3
ECOLOGICAL SOIL SCREENING LEVELS FOR EVALUATING THE SUA/WUA
AND NORTHERN PROPERTIES (mg/kg or pCi/g)a,b
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

	Plants	Invert	Avian	Wildlife - mammals	Lowest SSL
Arsenic	18	NA	43	46	18
Cadmium	32	140	0.77	0.36	0.36
Chromium	NA	NA	26	34	26
Fluoride	NA	NA	NA	NA	NA
Lead	120	1700	11	56	11
Mercury	NA	NA	NA	NA	NA
Selenium	0.52	4.1	1.2	0.63	0.52
Vanadium	NA	NA	7.8	280	7.8
Zinc	160	120	46	79	46

NA= Not available.

- a) The ecological CV will consist of the lowest eco SSL + 95% UCL background concentration or background if no SSL is
- b) Ecological SSLs provided by Ms. Jean Zodrow, EPA Region 10

TABLE 3-4
SOUTHERN UNDEVELOPED AREA SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND WORKER COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 2)

Analyte					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Total Fluoride	Lead	
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	164	0.63	6.0	0.72	13.9	10.9	20.6	302	23.9	
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	61893	645	222544	860	1000014	563	42036	68396	824	
Construction Worker Comparative Value (CV)^a					105	24.9	8519	61.6	5219	82.0	550743	63.1	22057	33346	824	
Ecological Comparative Value (CV)^b					-	28.4	-	-	-	1.1	39.9	-	-	302.2	34.9	
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix												
SUA-SSC001	SUA-SSC001 (0-2)	10/10/08	0 - 2	Soil		0.39 T,UB	3.5 B	130 B	0.63 T,B	8.4 T,UB	7.9	21 B	4.3	10 B	520 B	12
SUA-SSC002	SUA-SSC002 (0-2)	10/10/08	0 - 2	Soil		0.28 T,UB	3.8 B	130 B	0.6 T,B	8.3 T,UB	7.4	20 B	4.5	11 B	940 B	14
SUA-SSC003	SUA-SSC003 (0-2)	10/10/08	0 - 2	Soil		0.24 T,UB	3.7 B	130 B	0.61 T,B	7.9 T,UB	6.9	19 B	4.5	11 B	550 B	13
SUA-SSC004	SUA-SSC004 (0-2)	10/10/08	0 - 2	Soil		0.24 T,J-,UB	3.5 B	130 B	0.63 T,B	7.4 T,UB	8.9	21 B	4.3 J	11 J,B	600 B	14
SUA-SSC004 Dup	SUA-SSC204 (0-2)	10/10/08	0 - 2	Soil		0.32 T,UB	3.6 B	130 B	0.62 T,B	8.8 T,UB	8.6	22 B	4.4	11 B	530 B	14
SUA-SSC005	SUA-SSC005 (0-2)	10/10/08	0 - 2	Soil		0.33 T,UB	3.7 B	140 B	0.62 T,B	8.1 T,UB	7.1	19 B	4.3	11 B	610 B	13
SUA-SSC006	SUA-SSC006 (0-2)	10/10/08	0 - 2	Soil		0.22 T,UB	3.3 B	120 B	0.52 T,B	6.6 T,UB	5.6	15 B	4.3	9.4 B	620 B	11
SUA-SSC007	SUA-SSC007 (0-2)	10/15/08	0 - 2	Soil		0.32 T,UB	3.9 B	130 B	0.57 T,B	8.1 T,UB	11	23 B	4.2	11 B	1000 B	13
SUA-SSC008	SUA-SSC008 (0-2)	10/15/08	0 - 2	Soil		0.25 T,UB	3.7 B	130 B	0.61 T,B	8.4 T,UB	8.5	20 B	4.4	11 B	660 B	14
Mean Concentration					0.29	3.6	130	0.60	8.0	7.9	19.8	4.4	10.7	683	13.0	
95% UCL on Mean Concentration					NC	3.8	134	0.63	NC	9.0	21.4	4.4	11.1	819	13.7	

^a Worker CVs established as the 95% UCL on mean background concentration + soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

 Mean concentration exceeds both worker and ecological CVs.

 Mean concentration exceeds the worker CV.

 Mean concentration exceeds the ecological CV.

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low, due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-4
SOUTHERN UNDEVELOPED AREA SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND WORKER COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 2 of 2)

Analyte					Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc	
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
0 - 2" Soil Background (95% UCL on Mean)					13.0	710	0.023	0.53	18.7	0.30	0.10	0.13	0.66	19.6	66.5	
Commercial/Industrial Worker Comparative Value (CV)^a					22724	24248	340	5675	6465	5675	5675	77.3	682	7969	340533	
Construction Worker Comparative Value (CV)^a					11924	77812	464	2754	423	2754	2754	375	251	3523	165285	
Ecological Comparative Value (CV)^b					-	-	0.023	-	-	0.82	-	-	-	27.4	112	
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix												
SUA-SSC001	SUA-SSC001 (0-2)	10/10/08	0 - 2	Soil		11	430 B	0.03 T,B	0.78 T,UB	13	1.3 T,B	0.41 T,B	0.31 T	1.9 B	30	99 B
SUA-SSC002	SUA-SSC002 (0-2)	10/10/08	0 - 2	Soil		11	430 B	0.043 B	0.66 T,UB	13	0.47 T,UB	0.37 T,B	0.25 T	1.7 B	29	95 B
SUA-SSC003	SUA-SSC003 (0-2)	10/10/08	0 - 2	Soil		10	450 B	0.03 T,B	0.6 T,UB	13	0.4 T,UB	0.32 T,B	0.24 T	1.6 B	27	89 B
SUA-SSC004	SUA-SSC004 (0-2)	10/10/08	0 - 2	Soil		9.6	450 B	0.036 B	0.61 T,UB	12	0.45 T,UB	0.44 T,B	0.24 T	1.9 J,B	28	110 J,B
SUA-SSC004 Dup	SUA-SSC204 (0-2)	10/10/08	0 - 2	Soil		11	460 B	0.03 T,B	0.74 T,UB	13	0.49 T,UB	0.42 T,B	0.26 T	2 B	31	110 B
SUA-SSC005	SUA-SSC005 (0-2)	10/10/08	0 - 2	Soil		9.7	470 B	0.029 T,B	0.64 T,UB	12	0.42 T,UB	0.36 T,B	0.23 T	1.6 B	27	89 B
SUA-SSC006	SUA-SSC006 (0-2)	10/10/08	0 - 2	Soil		9.2	440 B	0.028 T,B	0.5 T,UB	11	0.43 T,UB	0.27 T,B	0.21 T	1.4 B	23	78 B
SUA-SSC007	SUA-SSC007 (0-2)	10/15/08	0 - 2	Soil		9.9	420 B	0.046 B	0.77 T,UB	13	2.1 B	0.49 T,B	0.35 T	2.6 B	34	120 B
SUA-SSC008	SUA-SSC008 (0-2)	10/15/08	0 - 2	Soil		9.8	440 B	0.034 B	0.66 T,UB	13	0.54 T,B	0.39 T,B	0.24 T	1.8 B	29	100 B
Mean Concentration					10.1	442	0.034	0.66	12.6	0.77	0.38	0.26	1.8	28.6	97.5	
95% UCL on Mean Concentration					10.5	453	0.039	NC	13.0	1.27	0.43	0.29	2.1	30.7	106.3	

^a Worker CVs established as the 95% UCL on mean background concentration + soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

Mean concentration exceeds both worker and ecological CVs.

Mean concentration exceeds the worker CV.

Mean concentration exceeds the ecological CV.

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low, due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-5
SUMMARY OF CONSTITUENTS EXCEEDING COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Assessment Type	Surface Soil	
	Southern Undeveloped Area (SUA)	Western Undeveloped Area (WUA)
Ecological Risk Assessment	Cd, F, Hg, V	Cd, F
Human Health Risk Assessment - Workers	None	None

Assessment Type	Surface Soil						Subsurface Soil
	Parcel 1	Parcel 2	Parcel 3	Parcel 4	Parcel 5	Parcel 6	Parcel 3 TP
Ecological Risk Assessment	Cd, Cr, F, Hg, V, Zn	Cd, Cr, F, Pb, Hg, Se, V, Zn	Cd, Cr, F, Pb, Hg, Se, V, Zn	Cd, Cr, F, Hg, Se, V, Zn	Cd, F, Hg, V, Zn	Cd, Cr, F, Hg, Se, V, Zn	NA
Human Health Risk Assessment- Residential	Cd*, F, V, U-238, Pb-210*, Ra-226*	Cd*, F, Tl, U, V, U-238, Pb-210*, Ra-226*	Sb, Cd*, F, Tl, U, V, U-238, Pb-210*, Ra-226*	Cd*, F, U, V, U-238, Pb-210*, Ra-226*	Cd*, F, U-238, Pb-210*, Ra-226*	Cd*, F, U, V, U-238, Pb-210*, Ra-226*	NA
Human Health Risk Assessment- Workers	U-238, Pb-210, Ra-226	U-238, Pb-210, Ra-226	Cd, U-238, Pb-210, Ra-226	U-238, Pb-210, Ra-226	Ra-226	U-238, Pb-210, Ra-226	None

* Constituent also exceeds risk-based CV for homegrown produce consumption.

**TABLE 3-6
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR SUA
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		SUA		SUA	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.12	0.02	0.08	0.01
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.08	0.05	0.15	0.09	0.07	0.04
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	0.01	0.01	0.004	0.003
Pygmy Rabbit	Cadmium	0.04	0.01	0.13	0.02	0.09	0.01
	Chromium	0.02	0.001	--	--	--	--
	Fluoride	0.09	0.05	0.16	0.10	0.08	0.05
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	0.01	0.01	0.004	0.002
Mule Deer	Cadmium	0.004	0.001	0.01	0.002	0.01	0.001
	Chromium	0.002	0.0001	--	--	--	--
	Fluoride	0.01	0.01	0.02	0.01	0.01	0.005
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	0.0002	NA	0.0001	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.001	0.0004	0.001	0.001	0.0003	0.0002
Coyote	Cadmium	0.007	0.001	0.02	0.004	0.02	0.003
	Chromium	0.004	0.0003	--	--	--	--
	Fluoride	0.04	0.02	0.09	0.05	0.05	0.03
	Lead	0.004	0.003	--	--	--	--
	Mercury	0.00002	NA	0.00003	NA	0.00001	NA
	Selenium	0.002	0.002	--	--	--	--
	Vanadium	0.001	0.001	0.002	0.001	0.001	0.0003
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.12	0.02	0.07	0.01
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.09	0.05	0.16	0.10	0.07	0.04
	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.005	0.01	0.01	0.004	0.003
Zinc	0.02	0.02	--	--	--	--	

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		SUA		SUA	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.04	0.01	0.03	0.01
	Chromium	0.02	0.02	--	--	--	--
	Fluoride	0.20	0.05	0.44	0.11	0.24	0.06
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	0.0002	NA	0.0001	NA
	Selenium	0.005	0.004	--	--	--	--
	Vanadium	0.02	0.01	0.03	0.02	0.01	0.01
Red-Tailed Hawk	Cadmium	0.005	0.001	0.02	0.004	0.01	0.002
	Chromium	0.01	0.01	--	--	--	--
	Fluoride	0.20	0.05	0.45	0.11	0.25	0.06
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.00001	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.004	0.003	0.01	0.005	0.002	0.002
Bald Eagle	Cadmium	0.004	0.001	0.01	0.003	0.01	0.002
	Chromium	0.004	0.004	--	--	--	--
	Fluoride	0.15	0.04	0.35	0.08	0.20	0.05
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.000004	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.003	0.002	0.01	0.004	0.002	0.001
Horned Lark	Cadmium	0.02	0.01	0.06	0.01	0.04	0.01
	Chromium	0.03	0.03	--	--	--	--
	Fluoride	0.20	0.05	0.46	0.11	0.25	0.06
	Lead	0.10	0.01	--	--	--	--
	Mercury	0.001	NA	0.001	NA	0.0005	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.03	0.02	0.05	0.03	0.02	0.01
Zinc	0.03	0.02	--	--	--	--	

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD		SUA	
			HQ	HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.15	0.10	--
	Chromium	PW	0.0001	--	--	--
	Fluoride	Plant	0.47	0.82	0.34	--
	Lead	PW	0.01	--	--	--
	Mercury	PW	0.02	0.04	0.02	--
	Selenium	PW	0.16	--	--	--
	Vanadium	Plant	0.001	--	--	--
		PW	0.10	0.15	0.06	--
		Plant	0.02	0.03	0.01	--
		Plant	0.22	--	--	--
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.08	0.03	--
	Chromium	PW	0.0001	--	--	--
	Fluoride	Plant	0.28	0.43	0.16	--
	Lead	PW	0.01	--	--	--
	Mercury	PW	0.02	0.04	0.02	--
	Selenium	PW	0.16	--	--	--
	Vanadium	Plant	0.001	--	--	--
		PW	0.10	0.15	0.06	--
		Plant	0.02	0.03	0.01	--
		Plant	0.07	--	--	--

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 -- Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

TABLE 3-7
 WESTERN UNDEVELOPED AREA SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 2)

Analyte					Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Total Fluoride	Lead
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	164	0.63	6.0	0.72	13.9	10.9	20.6	302	23.9
Commercial/Industrial Worker Comparative Value (CV) ^a					454	12.1	61893	645	222544	860	1000014	563	42036	68396	824
Construction Worker Comparative Value (CV) ^a					105	24.9	8519	61.6	5219	82.0	550743	63.1	22057	33346	824
Ecological Comparative Value (CV) ^b					-	28.4	-	-	-	1.1	39.9	-	-	302	34.9
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix											
WUA-SSC001	WUA-SSC001 (0-2)	10/16/08	0 - 2	Soil	0.15 T,UB	3.2 B	130 B	0.71 T,B	8.3 T,UB	3.5	16 B	5.1	13 B	360 B	12
WUA-SSC002	WUA-SSC002 (0-2)	10/16/08	0 - 2	Soil	0.15 T,UB	3.1 B	130 B	0.67 T,B	8.5 T,UB	3	16 B	5.1	12 B	370 B	12
WUA-SSC003	WUA-SSC003 (0-2)	10/20/08	0 - 2	Soil	0.13 T,J-,UB	3.1 B	130 B	0.64 T,B	7.1 T,J,UB	3.1	15 B	4.8	12 J,B	470 J-	11
WUA-SSC003 Dup	WUA-SSC203 (0-2)	10/20/08	0 - 2	Soil	0.24 T,UB	3.2 B	130 B	0.68 T,B	8.5 T,UB	3.2	16 B	5	12 B	440	11
WUA-SSC004	WUA-SSC004 (0-2)	10/20/08	0 - 2	Soil	0.2 T,UB	3.3 B	130 B	0.68 T,B	8.4 T,UB	3.3	16 B	5	12 B	460	11
WUA-SSC005	WUA-SSC005 (0-2)	10/21/08	0 - 2	Soil	0.17 T,UB	3.5 B	140 B	0.71 T,B	8.5 T,UB	3.6	17 B	5.1	12 B	490	11
WUA-SSC006	WUA-SSC006 (0-2)	10/21/08	0 - 2	Soil	0.14 T,UB	3.2 B	130 B	0.66 T,B	6.7 T,UB	3.1	14 B	4.9	11 B	460	11
WUA-SSC007	WUA-SSC007 (0-2)	10/22/08	0 - 2	Soil	0.14 T,UB	3.2 B	130 B	0.66 T,B	7.7 T,UB	3.2	16 B	5	11 B	450	11
WUA-SSC008	WUA-SSC008 (0-2)	10/21/08	0 - 2	Soil	0.14 T,UB	3.3 B	140 B	0.77 T,B	8.8 T,UB	2.4	16 B	5.5	13 B	430	12
Mean Concentration					0.16	3.2	133	0.69	8.1	3.2	15.8	5.1	12.0	434	11.4
95% UCL on Mean Concentration					NC	3.3	136	0.72	NC	3.4	16.4	5.2	12.5	465	11.7

^a Worker CVs established as the 95% UCL on mean background concentration + soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

Mean concentration exceeds both worker and ecological CVs.

Mean concentration exceeds the worker CV.

Mean concentration exceeds the ecological CV.

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low, due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-7
 WESTERN UNDEVELOPED AREA SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 2 of 2)

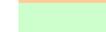
Analyte					Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc	
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
0 - 2" Soil Background (95% UCL on Mean)					13.0	710	0.023	0.53	18.7	0.30	0.10	0.13	0.66	19.6	66.5	
Commercial/Industrial Worker Comparative Value (CV)^a					22724	24248	340	5675	6465	5675	5675	77.3	682	7969	340533	
Construction Worker Comparative Value (CV)^a					11924	77812	464	2754	423	2754	2754	375	251	3523	165285	
Ecological Comparative Value (CV)^b					-	-	0.023	-	-	0.82	-	-	-	27.4	112	
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix												
WUA-SSC001	WUA-SSC001 (0-2)	10/16/08	0 - 2	Soil		12	500 B	0.021 T,B	0.41 T,UB	13	0.28 T,UB	0.2 T,B	0.2 T	1 B	22	76 B
WUA-SSC002	WUA-SSC002 (0-2)	10/16/08	0 - 2	Soil		12	510 B	0.02 T,B	0.39 T,UB	13	0.26 T,UB	0.18 T,B	0.2 T	0.93 T,B	21	73 B
WUA-SSC003	WUA-SSC003 (0-2)	10/20/08	0 - 2	Soil		10	470 B	0.018 T,J,B	0.37 T,UB	12	0.37 T,UB	0.18 T,B	0.19 T	0.89 T,J,B	19	68 J,B
WUA-SSC003 Dup	WUA-SSC203 (0-2)	10/20/08	0 - 2	Soil		11	480 B	0.018 T,J,B	0.45 T,UB	13	0.35 T,UB	0.19 T,B	0.19 T	0.95 T,B	22	71 B
WUA-SSC004	WUA-SSC004 (0-2)	10/20/08	0 - 2	Soil		12	470 B	0.019 T,B	0.44 T,UB	13	0.34 T,UB	0.2 T,B	0.2 T	1 B	23	73 B
WUA-SSC005	WUA-SSC005 (0-2)	10/21/08	0 - 2	Soil		12	500 B	0.017 T,B	0.45 T,UB	13	0.41 T,UB	0.19 T,B	0.21 T	1 B	24	74 B
WUA-SSC006	WUA-SSC006 (0-2)	10/21/08	0 - 2	Soil		11	470 B	0.016 T,B	0.35 T,UB	12	0.31 T,UB	0.18 T,B	0.18 T	0.94 T,B	19	67 B
WUA-SSC007	WUA-SSC007 (0-2)	10/22/08	0 - 2	Soil		11	470 B	0.018 T,B	0.41 T,UB	13	0.34 T,UB	0.18 T,B	0.18 T	0.93 T,B	22	69 B
WUA-SSC008	WUA-SSC008 (0-2)	10/21/08	0 - 2	Soil		13	530 B	0.019 T,B	0.38 T,UB	14	0.37 T,UB	0.16 T,B	0.21 T	0.85 T,B	21	71 B
Mean Concentration					11.7	491	0.019	0.41	12.9	0.33	0.18	0.20	0.95	21.6	71.6	
95% UCL on Mean Concentration					12.2	506	0.020	NC	13.3	NC	0.19	0.20	0.98	22.6	73.6	

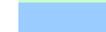
^a Worker CVs established as the 95% UCL on mean background concentration + soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

 Mean concentration exceeds both worker and ecological CVs.

 Mean concentration exceeds the worker CV.

 Mean concentration exceeds the ecological CV.

mg/kg milligrams per kilogram.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low, due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

**TABLE 3-8
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR WUA
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		WUA		WUA	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.08	0.01	0.03	0.01
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.08	0.05	0.11	0.06	0.03	0.02
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	--	--	--	--
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	--	--	--	--
Pygmy Rabbit	Cadmium	0.04	0.01	0.08	0.01	0.04	0.01
	Chromium	0.02	0.001	--	--	--	--
	Fluoride	0.09	0.05	0.12	0.07	0.03	0.02
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	--	--	--	--
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	--	--	--	--
Mule Deer	Cadmium	0.004	0.001	0.01	0.001	0.004	0.001
	Chromium	0.002	0.0001	--	--	--	--
	Fluoride	0.01	0.01	0.01	0.01	0.003	0.002
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	--	--	--	--
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.001	0.0004	--	--	--	--
Coyote	Cadmium	0.007	0.001	0.01	0.00	0.01	0.001
	Chromium	0.004	0.0003	--	--	--	--
	Fluoride	0.04	0.02	0.06	0.03	0.02	0.01
	Lead	0.004	0.003	--	--	--	--
	Mercury	0.00002	NA	--	--	--	--
	Selenium	0.002	0.002	--	--	--	--
	Vanadium	0.001	0.001	--	--	--	--
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.08	0.01	0.03	0.005
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.09	0.05	0.12	0.07	0.03	0.02
	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	--	--	--	--
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.005	--	--	--	--
Zinc	0.02	0.02	--	--	--	--	

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		WUA		WUA	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.02	0.01	0.01	0.003
	Chromium	0.02	0.02	--	--	--	--
	Fluoride	0.20	0.05	0.28	0.07	0.09	0.02
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	--	--	--	--
	Selenium	0.005	0.004	--	--	--	--
	Vanadium	0.02	0.01	--	--	--	--
Red-Tailed Hawk	Cadmium	0.005	0.001	0.01	0.002	0.003	0.001
	Chromium	0.01	0.01	--	--	--	--
	Fluoride	0.20	0.05	0.28	0.07	0.08	0.02
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	--	--	--	--
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.004	0.003	--	--	--	--
Bald Eagle	Cadmium	0.004	0.001	0.01	0.001	0.003	0.001
	Chromium	0.004	0.004	--	--	--	--
	Fluoride	0.15	0.04	0.21	0.05	0.06	0.01
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	--	--	--	--
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.003	0.002	--	--	--	--
Horned Lark	Cadmium	0.02	0.01	0.04	0.01	0.02	0.004
	Chromium	0.03	0.03	--	--	--	--
	Fluoride	0.20	0.05	0.29	0.07	0.09	0.02
	Lead	0.10	0.01	--	--	--	--
	Mercury	0.001	NA	--	--	--	--
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.03	0.02	--	--	--	--
Zinc	0.03	0.02	--	--	--	--	

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	WUA	WUA
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.11	0.05
	Chromium	PW	0.0001	--	--
	Fluoride	Plant	0.47	0.63	0.15
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	--	--
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	--	--
		Plant	0.02	--	--
		Plant	0.22	--	--
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.07	0.02
	Chromium	PW	0.0001	--	--
	Fluoride	Plant	0.28	0.34	0.07
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	--	--
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	--	--
		Plant	0.02	--	--
		Plant	0.07	--	--

TABLE 3-9a
NORTHERN PARCEL 1 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV)^a					3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV)^b					-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL1-SSC001	PARCEL1-SSC001 (0-2)	11/3/2008	0 - 2	Soil	0.54 T,UB	3.8 B	35	60 B	1700	30	6.8 ± 1.6 B	380 B	0.039	2.52 ± 0.48	0.79 T	0.63 T,B	5.8 B	3 ± 0.62	72 B	370 B
PARCEL1-SSC002	PARCEL1-SSC002 (0-2)	11/3/2008	0 - 2	Soil	0.5 T,UB	3.9 B	33	55 B	980	27	5.7 ± 1.4 B	410 B	0.04	1.47 ± 0.32	0.85 T	0.58 T,B	5.3 B	2.69 ± 0.55	67 B	330 B
PARCEL1-SSC003	PARCEL1-SSC003 (0-2)	11/4/2008	0 - 2	Soil	0.55 T,UB	6.9 ,B	29	56	1700 J-,B	24	5.2 ± 1.3	460 ,B	0.044	2.08 ± 0.4	0.53 T,UB	0.65 T	4.1 ,B	2.26 ± 0.49	68	340 ,B
PARCEL1-SSC004	PARCEL1-SSC004 (0-2)	11/5/2008	0 - 2	Soil	0.55 T,UB	4 ,B	35	59	1900 J-,B	30	5.1 ± 1.2	430 ,B	0.03 T	1.6 ± 0.32	0.52 T,UB	0.71 T	4.7 ,B	2.14 ± 0.47	72	380 ,B
PARCEL1-SSC005	PARCEL1-SSC005 (0-2)	11/5/2008	0 - 2	Soil	0.46 T,UB	3.6 ,B	22	52	1600 J-,B	22	4.7 ± 1.1	400 ,B	0.021 T	2.27 ± 0.44	0.59 T,UB	0.5 T	5 ,B	3 ± 0.62	62	250 ,B
PARCEL1-SSC006	PARCEL1-SSC006 (0-2)	11/6/2008	0 - 2	Soil	0.62 T,UB	3.9 ,B	32	62	2500 D,J-,B	28	5.6 ± 1.4	420 ,B	0.035	1.81 ± 0.37	0.58 T,UB	0.62 T	5.8 ,B	3.56 ± 0.73	75	360 ,B
PARCEL1-SSC007	PARCEL1-SSC007 (0-2)	11/6/2008	0 - 2	Soil	0.6 T,J-,UB	4.2 ,B	34 ,J-	66	1700	33 ,J-	5.4 ± 1.3	440 ,B	0.037	2.36 ± 0.46	0.82 T,B	0.64 T	5.6 ,B	2.43 ± 0.53	81 ,J-	360 ,B
PARCEL1-SSC007 Dup	PARCEL1-SSC207 (0-2)	11/6/2008	0 - 2	Soil	0.65 T,UB	4.5 ,B	36	70	2100 D	31	5.1 ± 1.2	450 ,B	0.033	2.18 ± 0.42	0.77 T,B	0.69 T	5.8 ,B	2.11 ± 0.47	85	550 ,B
PARCEL1-SSC008	PARCEL1-SSC008 (0-2)	11/6/2008	0 - 2	Soil	0.48 T,UB	3.8 ,B	26	60	1900 D	27	4.9 ± 1.2	440 ,B	0.031 T	2.52 ± 0.5	0.53 T,UB	0.56 T	5.5 ,B	1.98 ± 0.44	69	290 ,B
Mean Concentration					0.54	4.3	30.9	59.0	1773	27.5	5.4	423	0.034	2.07	0.65	0.61	5.2	2.61	71.0	347
95% UCL on Mean Concentration					NC	5.0	34.1	62.3	2055	29.7	5.8	441	0.039	2.34	0.81	0.66	5.6	2.98	75.2	388
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Residential Human Health Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	1.6	NA	NA	1.35	NA	NA	NA	1.77	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL1-SSC001	PARCEL1-SSC001 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.83 ± 0.7 B	NA	NA	0.69 ± 0.16	NA	NA	NA	2.14 ± 0.49	NA	NA
PARCEL1-SSC002	PARCEL1-SSC002 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.89 ± 0.47 B	NA	NA	1.52 ± 0.32	NA	NA	NA	1.23 ± 0.31	NA	NA
PARCEL1-SSC003	PARCEL1-SSC003 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.11 ± 0.52	NA	NA	1.16 ± 0.24	NA	NA	NA	1.16 ± 0.3	NA	NA
PARCEL1-SSC004	PARCEL1-SSC004 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.4 ± 0.59	NA	NA	1.34 ± 0.29	NA	NA	NA	1.25 ± 0.32	NA	NA
PARCEL1-SSC005	PARCEL1-SSC005 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.88 ± 0.47	NA	NA	0.99 ± 0.21	NA	NA	NA	1.17 ± 0.32	NA	NA
PARCEL1-SSC006	PARCEL1-SSC006 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.77 ± 0.44	NA	NA	<0.2	NA	NA	NA	1.29 ± 0.32	NA	NA
PARCEL1-SSC007	PARCEL1-SSC007 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.28 ± 0.56	NA	NA	1.39 ± 0.29	NA	NA	NA	1.81 ± 0.43	NA	NA
PARCEL1-SSC007 Dup	PARCEL1-SSC207 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.02 ± 0.5	NA	NA	1.51 ± 0.31	NA	NA	NA	1.27 ± 0.32	NA	NA
PARCEL1-SSC008	PARCEL1-SSC008 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.66 ± 0.42	NA	NA	1.05 ± 0.22	NA	NA	NA	1.01 ± 0.27	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.09	NA	NA	1.05	NA	NA	NA	1.35	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	2.34	NA	NA	1.30	NA	NA	NA	1.60	NA	NA

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-9b
NORTHERN PARCEL 1 SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL1-SSC001	PARCEL1-SSC001 (0-2)	11/3/2008	0 - 2	Soil	0.54 T,UB	3.8 B	35	60 B	1700	30	6.8 ± 1.6 B	380 B	0.039	2.52 ± 0.48	0.79 T	0.63 T,B	5.8 B	3 ± 0.62	72 B	370 B
PARCEL1-SSC002	PARCEL1-SSC002 (0-2)	11/3/2008	0 - 2	Soil	0.5 T,UB	3.9 B	33	55 B	980	27	5.7 ± 1.4 B	410 B	0.04	1.47 ± 0.32	0.85 T	0.58 T,B	5.3 B	2.69 ± 0.55	67 B	330 B
PARCEL1-SSC003	PARCEL1-SSC003 (0-2)	11/4/2008	0 - 2	Soil	0.55 T,UB	6.9 ,B	29	56	1700 J-,B	24	5.2 ± 1.3	460 ,B	0.044	2.08 ± 0.4	0.53 T,UB	0.65 T	4.1 ,B	2.26 ± 0.49	68	340 ,B
PARCEL1-SSC004	PARCEL1-SSC004 (0-2)	11/5/2008	0 - 2	Soil	0.55 T,UB	4 ,B	35	59	1900 J-,B	30	5.1 ± 1.2	430 ,B	0.03 T	1.6 ± 0.32	0.52 T,UB	0.71 T	4.7 ,B	2.14 ± 0.47	72	380 ,B
PARCEL1-SSC005	PARCEL1-SSC005 (0-2)	11/5/2008	0 - 2	Soil	0.46 T,UB	3.6 ,B	22	52	1600 J-,B	22	4.7 ± 1.1	400 ,B	0.021 T	2.27 ± 0.44	0.59 T,UB	0.5 T	5 ,B	3 ± 0.62	62	250 ,B
PARCEL1-SSC006	PARCEL1-SSC006 (0-2)	11/6/2008	0 - 2	Soil	0.62 T,UB	3.9 ,B	32	62	2500 D,J-,B	28	5.6 ± 1.4	420 ,B	0.035	1.81 ± 0.37	0.58 T,UB	0.62 T	5.8 ,B	3.56 ± 0.73	75	360 ,B
PARCEL1-SSC007	PARCEL1-SSC007 (0-2)	11/6/2008	0 - 2	Soil	0.6 T,J-,UB	4.2 ,B	34 ,J-	66	1700	33 ,J-	5.4 ± 1.3	440 ,B	0.037	2.36 ± 0.46	0.82 T,B	0.64 T	5.6 ,B	2.43 ± 0.53	81 ,J-	360 ,B
PARCEL1-SSC007 Dup	PARCEL1-SSC207 (0-2)	11/6/2008	0 - 2	Soil	0.65 T,UB	4.5 ,B	36	70	2100 D	31	5.1 ± 1.2	450 ,B	0.033	2.18 ± 0.42	0.77 T,B	0.69 T	5.8 ,B	2.11 ± 0.47	85	550 ,B
PARCEL1-SSC008	PARCEL1-SSC008 (0-2)	11/6/2008	0 - 2	Soil	0.48 T,UB	3.8 ,B	26	60	1900 D	27	4.9 ± 1.2	440 ,B	0.031 T	2.52 ± 0.5	0.53 T,UB	0.56 T	5.5 ,B	1.98 ± 0.44	69	290 ,B
Mean Concentration					0.54	4.3	30.9	59.0	1773	27.5	5.4	423	0.034	2.07	0.65	0.61	5.2	2.61	71.0	347
95% UCL on Mean Concentration					NC	5.0	34.1	62.3	2055	29.7	5.8	441	0.039	2.34	0.81	0.66	5.6	2.98	75.2	388
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Commercial/Industrial Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	2.1	NA	NA	1.36	NA	NA	NA	2.4	NA	NA
Construction Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	8.6	NA	NA	2.3	NA	NA	NA	21.6	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL1-SSC001	PARCEL1-SSC001 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.83 ± 0.7 B	NA	NA	0.69 ± 0.16	NA	NA	NA	2.14 ± 0.49	NA	NA
PARCEL1-SSC002	PARCEL1-SSC002 (2-6)	11/3/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.89 ± 0.47 B	NA	NA	1.52 ± 0.32	NA	NA	NA	1.23 ± 0.31	NA	NA
PARCEL1-SSC003	PARCEL1-SSC003 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.11 ± 0.52	NA	NA	1.16 ± 0.24	NA	NA	NA	1.16 ± 0.3	NA	NA
PARCEL1-SSC004	PARCEL1-SSC004 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.4 ± 0.59	NA	NA	1.34 ± 0.29	NA	NA	NA	1.25 ± 0.32	NA	NA
PARCEL1-SSC005	PARCEL1-SSC005 (2-6)	11/5/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.88 ± 0.47	NA	NA	0.99 ± 0.21	NA	NA	NA	1.17 ± 0.32	NA	NA
PARCEL1-SSC006	PARCEL1-SSC006 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.77 ± 0.44	NA	NA	<0.2	NA	NA	NA	1.29 ± 0.32	NA	NA
PARCEL1-SSC007	PARCEL1-SSC007 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.28 ± 0.56	NA	NA	1.39 ± 0.29	NA	NA	NA	1.81 ± 0.43	NA	NA
PARCEL1-SSC007 Dup	PARCEL1-SSC207 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.02 ± 0.5	NA	NA	1.51 ± 0.31	NA	NA	NA	1.27 ± 0.32	NA	NA
PARCEL1-SSC008	PARCEL1-SSC008 (2-6)	11/6/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.66 ± 0.42	NA	NA	1.05 ± 0.22	NA	NA	NA	1.01 ± 0.27	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.09	NA	NA	1.05	NA	NA	NA	1.35	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	2.34	NA	NA	1.30	NA	NA	NA	1.60	NA	NA

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2

- Constituent not considered to be a COPC.

 Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

 Mean concentration exceeds the commercial/industrial worker CV.

 Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-10

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 1
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 3)

Exposure Pathways	Exposure Scenario													
	Resident (a)							Outdoor Commercial/Industrial Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	2.E-08	4.E-10	2.E-08	3.E-09	7.E-11	3.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total COPC Lifetime Cancer Risk	2.E-08	4.E-10	2.E-08	3.E-09	7.E-11	3.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
ROCs														
External Exposure to Gamma Radiation	1.E-04	9.E-05	5.E-05	2.E-05	1.E-05	9.E-06	Ra-226, U-238	7.E-05	5.E-05	2.E-05	2.E-05	1.E-05	6.E-06	Ra-226
Incidental Soil Ingestion	2.E-05	8.E-06	1.E-05	2.E-06	7.E-07	1.E-06	Pb-210, Ra-226	1.E-05	4.E-06	7.E-06	1.E-06	4.E-07	8.E-07	Pb-210
Ingestion of Homegrown Produce	1.E-05	5.E-06	7.E-06	3.E-06	1.E-06	2.E-06	Pb-210	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	7.E-09	2.E-09	4.E-09	8.E-10	3.E-10	5.E-10	-	4.E-08	2.E-08	3.E-08	1.E-08	4.E-09	7.E-09	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total ROPC Lifetime Cancer Risk	2.E-04	1.E-04	7.E-05	3.E-05	2.E-05	1.E-05	Ra-226, Pb-210	8.E-05	5.E-05	3.E-05	2.E-05	1.E-05	7.E-06	Ra-226, Pb-210
Total Lifetime Cancer Risk														
2.E-04 1.E-04 7.E-05 3.E-05 2.E-05 1.E-05 Ra-226, Pb-210 8.E-05 5.E-05 3.E-05 2.E-05 1.E-05 7.E-06 Ra-226, Pb-210														
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	1.0	0.1	0.9	0.3	0.03	0.3	Cd, F	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.05	0.001	0.05	0.004	0.00009	0.004	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	1.2	0.1	1.1	0.1	0.02	0.1	Cd	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.001	0.00004	0.001	0.0008	0.00003	0.0008	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>1.2</u>	<u>0.6</u>	<u>0.6</u>	<u>0.8</u>	<u>0.4</u>	<u>0.4</u>	F, U	<u>0.2</u>	<u>0.08</u>	<u>0.08</u>	<u>0.2</u>	<u>0.08</u>	<u>0.09</u>	-
Total Non-Cancer Hazard Quotient	3.5	0.8	2.6	1.3	0.45	0.8	Cd, F	0.2	0.08	0.08	0.2	0.08	0.09	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-10

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 1
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 2 of 3)

Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs														
External Exposure to Gamma Radiation	3.E-05	2.E-05	1.E-05	7.E-06	4.E-06	3.E-06	Ra-226	2.E-06	1.E-06	5.E-07	2.E-07	1.E-07	8.E-08	-
Incidental Soil Ingestion	6.E-06	2.E-06	4.E-06	1.E-06	4.E-07	8.E-07	Pb-210	7.E-08	3.E-08	4.E-08	1.E-08	4.E-09	6.E-09	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	9.E-08	4.E-08	6.E-08	1.E-08	5.E-09	8.E-09	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>4.E-05</i>	<i>2.E-05</i>	<i>1.E-05</i>	<i>8.E-06</i>	<i>4.E-06</i>	<i>3.E-06</i>	<i>Ra-226, Pb-210</i>	<i>2.E-06</i>	<i>1.E-06</i>	<i>6.E-07</i>	<i>2.E-07</i>	<i>1.E-07</i>	<i>1.E-07</i>	-
Total Lifetime Cancer Risk	4.E-05	2.E-05	1.E-05	8.E-06	4.E-06	3.E-06	Ra-226, Pb-210	2.E-06	1.E-06	6.E-07	2.E-07	1.E-07	1.E-07	-
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>0.2</u>	<u>0.09</u>	<u>0.09</u>	<u>0.2</u>	<u>0.09</u>	<u>0.09</u>	-	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	0.2	0.09	0.09	0.2	0.09	0.09	-	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

BScr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-10

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 1
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 3 of 3)

Exposure Pathways	Exposure Scenario						
	Utility Worker						
	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs							
External Exposure to Gamma Radiation	1.E-07	8.E-08	4.E-08	2.E-08	1.E-08	8.E-09	-
Incidental Soil Ingestion	6.E-09	2.E-09	3.E-09	1.E-09	4.E-10	6.E-10	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	7.E-09	3.E-09	4.E-09	1.E-09	5.E-10	8.E-10	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>1.E-07</i>	<i>9.E-08</i>	<i>5.E-08</i>	<i>2.E-08</i>	<i>1.E-08</i>	<i>1.E-08</i>	-
Total Lifetime Cancer Risk							
	1.E-07	9.E-08	5.E-08	2.E-08	1.E-08	1.E-08	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

**TABLE 3-11
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 1
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 1		Parcel 1	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.28	0.04	0.24	0.04
	Chromium	0.02	0.002	0.10	0.01	0.08	0.01
	Fluoride	0.08	0.05	0.30	0.18	0.22	0.13
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	0.003	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	0.03	0.02	0.02	0.01
Pygmy Rabbit	Cadmium	0.04	0.01	0.29	0.05	0.25	0.04
	Chromium	0.02	0.001	0.08	0.01	0.06	0.005
	Fluoride	0.09	0.05	0.31	0.18	0.22	0.13
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	0.02	0.01	0.02	0.01
Mule Deer	Cadmium	0.004	0.001	0.03	0.005	0.03	0.004
	Chromium	0.002	0.0001	0.01	0.001	0.01	0.0005
	Fluoride	0.01	0.01	0.03	0.02	0.02	0.01
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	0.0002	NA	0.0001	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.001	0.0004	0.002	0.001	0.002	0.001
Coyote	Cadmium	0.007	0.001	0.07	0.01	0.07	0.01
	Chromium	0.004	0.0003	0.02	0.002	0.02	0.001
	Fluoride	0.04	0.02	0.21	0.13	0.17	0.10
	Lead	0.004	0.003	--	--	--	--
	Mercury	0.00002	NA	0.00004	NA	0.00002	NA
	Selenium	0.002	0.002	--	--	--	--
	Vanadium	0.001	0.001	0.004	0.002	0.003	0.002
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.26	0.04	0.21	0.03
	Chromium	0.02	0.002	0.10	0.01	0.08	0.01
	Fluoride	0.09	0.05	0.32	0.19	0.23	0.14
	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.005	0.03	0.02	0.02	0.01
Zinc	0.02	0.02	0.04	0.04	0.02	0.02	

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 1		Parcel 1	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.12	0.03	0.11	0.03
	Chromium	0.02	0.02	0.10	0.09	0.08	0.07
	Fluoride	0.20	0.05	0.95	0.23	0.75	0.18
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	0.0002	NA	0.0001	NA
	Selenium	0.005	0.004	--	--	--	--
	Vanadium	0.02	0.01	0.07	0.05	0.05	0.04
Red-Tailed Hawk	Cadmium	0.005	0.001	0.05	0.01	0.04	0.01
	Chromium	0.01	0.01	0.02	0.02	0.02	0.02
	Fluoride	0.20	0.05	1.06	0.26	0.86	0.21
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.00001	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.004	0.003	0.02	0.01	0.01	0.01
Bald Eagle	Cadmium	0.004	0.001	0.04	0.01	0.03	0.01
	Chromium	0.004	0.004	0.02	0.02	0.01	0.01
	Fluoride	0.15	0.04	0.81	0.20	0.66	0.16
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.000004	NA
	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.003	0.002	0.01	0.01	0.01	0.01
Horned Lark	Cadmium	0.02	0.01	0.16	0.04	0.14	0.03
	Chromium	0.03	0.03	0.14	0.13	0.11	0.10
	Fluoride	0.20	0.05	1.04	0.25	0.84	0.20
	Lead	0.10	0.01	--	--	--	--
	Mercury	0.001	NA	0.001	NA	0.0005	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.03	0.02	0.12	0.08	0.09	0.06
Zinc	0.03	0.02	0.06	0.04	0.03	0.02	

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 1	Parcel 1
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.28	0.22
	Chromium	PW	0.0001	0.0003	0.0002
	Fluoride	Plant	0.47	1.37	0.89
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.04	0.02
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	0.38	0.28
		Plant	0.02	0.08	0.06
		Plant	0.22	0.25	0.03
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.12	0.07
	Chromium	PW	0.0001	0.0003	0.0002
	Fluoride	Plant	0.28	0.75	0.47
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.04	0.02
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	0.38	0.28
		Plant	0.02	0.08	0.06
		Plant	0.07	0.09	0.02

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 -- Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

TABLE 3-12a
 NORTHERN PARCEL 2 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV)^a					3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV)^b					-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL2-SSC001	PARCEL2-SSC001 (0-2)	11/6/2008	0 - 2	Soil	2.2 B	7 J,B	94 J	220 J	6000 D,B	48	13.2 ± 3.2	310 J,B	0.1	6.7 ± 1.2	2.3 J,B	1.2	21 B	8.8 ± 1.6	280 ,J	670 J,B
PARCEL2-SSC002	PARCEL2-SSC002 (0-2)	11/7/2008	0 - 2	Soil	1.5 UB	6.2 B	57	120	4300 D,B	35	9.0 ± 2.2	260 B	0.084	4.94 ± 0.92	1.6 T,B	0.72 T	14 B	6.3 ± 1.2	160	400 B
PARCEL2-SSC003	PARCEL2-SSC003 (0-2)	11/7/2008	0 - 2	Soil	1.6 UB	6.5 B	69	140	4700 D,B	38	8.6 ± 2.1	320 B	0.085	4.67 ± 0.87	1.7 T,B	0.85 T	16 B	5.6	180	490 B
PARCEL2-SSC004	PARCEL2-SSC004 (0-2)	11/7/2008	0 - 2	Soil	2 UB	6.8 J,B	87 J	160 J	4400 D,B	51	10.7 ± 2.6	310 J,B	0.066	3.46 ± 0.65	1.9 T,J,B	1.1	19 B	6.8 ± 1.2	220 ,J	580 J,B
PARCEL2-SSC005	PARCEL2-SSC005 (0-2)	11/10/2008	0 - 2	Soil	2.3 J-,B	7.2 J,B	99 J	200 J	4700 D,B	46 J-	10.9 ± 2.6	310 J,B	0.081	4.5 ± 0.87	2.3 J-,B	1.2	21 J-,B	6.8 ± 1.2	260 ,J	640 J,B
PARCEL2-SSC005 Dup	PARCEL2-SSC205 (0-2)	11/10/2008	0 - 2	Soil	1.9 UB	6.7 J,B	85 J	190 J	6000 D,B	40	10.9 ± 2.6	270 J,B	0.14	3.69 ± 0.72	2.1 J,B	1	19 B	7.6 ± 1.4	240 ,J	550 J,B
PARCEL2-SSC006	PARCEL2-SSC006 (0-2)	11/11/2008	0 - 2	Soil	1.7 UB	6.6 B	69	140 B	4000 D	44	9.0 ± 2.2	320 B	0.094	5.24 ± 0.97	1.8 T,B	0.94 T	15 B	5.7 ± 1.1	190 ,B	490
PARCEL2-SSC007	PARCEL2-SSC007 (0-2)	11/10/2008	0 - 2	Soil	1.7 UB	6.3 B	79	150	4800 D,B	49	9.2 ± 2.2	310 B	0.08	4.69 ± 0.9	2 B,B	0.96 T	18 B	5.7 ± 1.1	200	510 B
PARCEL2-SSC008	PARCEL2-SSC008 (0-2)	11/11/2008	0 - 2	Soil	2.2 UB	7.3 J,B	86 J	190 J,B	5400 D	44	11.4 ± 2.7	300 J,B	0.11	7.2 ± 1.3	2.1 J,B	1.1	20 J,B	9.1 ± 1.6	250 ,B	600 J
Mean Concentration					1.88	6.7	79.1	164.4	4869	44.0	10.3	303	0.091	5.1	1.95	1.00	17.9	6.90	216.3	542
95% UCL on Mean Concentration					2.24	7.0	87.9	187.1	5316	47.7	11.3	316	0.102	6.0	2.11	1.10	19.6	7.83	243.7	599
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Residential Human Health Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	1.6	NA	NA	1.35	NA	NA	NA	1.77	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL2-SSC001	PARCEL2-SSC001 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.3 ± 1.5	NA	NA	1.49 ± 0.31	NA	NA	NA	4.96 ± 0.96	NA	NA
PARCEL2-SSC002	PARCEL2-SSC002 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.87 ± 0.7	NA	NA	1.86 ± 0.38	NA	NA	NA	2.78 ± 0.6	NA	NA
PARCEL2-SSC003	PARCEL2-SSC003 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.1 ± 1.0	NA	NA	2.52 ± 0.49	NA	NA	NA	3.45 ± 0.69	NA	NA
PARCEL2-SSC004	PARCEL2-SSC004 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.0 ± 0.73	NA	NA	1.51 ± 0.33	NA	NA	NA	2.39 ± 0.51	NA	NA
PARCEL2-SSC005	PARCEL2-SSC005 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.1 ± 1.0	NA	NA	2.42 ± 0.49	NA	NA	NA	3.34 ± 0.66	NA	NA
PARCEL2-SSC005 Dup	PARCEL2-SSC205 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.72 ± 0.91	NA	NA	0.127 ± 0.052	NA	NA	NA	3.15 ± 0.65	NA	NA
PARCEL2-SSC006	PARCEL2-SSC006 (2-6)	11/11/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.07 ± 0.99	NA	NA	1.88 ± 0.41	NA	NA	NA	3.73 ± 0.75	NA	NA
PARCEL2-SSC007	PARCEL2-SSC007 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.56 ± 0.87	NA	NA	2.09 ± 0.42	NA	NA	NA	3.85 ± 0.76	NA	NA
PARCEL2-SSC008	PARCEL2-SSC008 (2-6)	11/11/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.6 ± 1.4	NA	NA	4.65 ± 0.87	NA	NA	NA	4.58 ± 0.89	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	4.05	NA	NA	2.16	NA	NA	NA	3.62	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	4.71	NA	NA	2.97	NA	NA	NA	4.20	NA	NA

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-12b
 NORTHERN PARCEL 2 SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL2-SSC001	PARCEL2-SSC001 (0-2)	11/6/2008	0 - 2	Soil	2.2 B	7 J,B	94 J	220 J	6000 D,B	48	13.2 ± 3.2	310 J,B	0.1	6.7 ± 1.2	2.3 J,B	1.2	21 B	8.8 ± 1.6	280 ,J	670 J,B
PARCEL2-SSC002	PARCEL2-SSC002 (0-2)	11/7/2008	0 - 2	Soil	1.5 UB	6.2 B	57	120	4300 D,B	35	9.0 ± 2.2	260 B	0.084	4.94 ± 0.92	1.6 T,B	0.72 T	14 B	6.3 ± 1.2	160	400 B
PARCEL2-SSC003	PARCEL2-SSC003 (0-2)	11/7/2008	0 - 2	Soil	1.6 UB	6.5 B	69	140	4700 D,B	38	8.6 ± 2.1	320 B	0.085	4.67 ± 0.87	1.7 T,B	0.85 T	16 B	5.6	180	490 B
PARCEL2-SSC004	PARCEL2-SSC004 (0-2)	11/7/2008	0 - 2	Soil	2 UB	6.8 J,B	87 J	160 J	4400 D,B	51	10.7 ± 2.6	310 J,B	0.066	3.46 ± 0.65	1.9 T,J,B	1.1	19 B	6.8 ± 1.2	220 ,J	580 J,B
PARCEL2-SSC005	PARCEL2-SSC005 (0-2)	11/10/2008	0 - 2	Soil	2.3 J-,B	7.2 J,B	99 J	200 J	4700 D,B	46 J-	10.9 ± 2.6	310 J,B	0.081	4.5 ± 0.87	2.3 J-,B	1.2	21 J-,B	6.8 ± 1.2	260 ,J	640 J,B
PARCEL2-SSC005 Dup	PARCEL2-SSC205 (0-2)	11/10/2008	0 - 2	Soil	1.9 UB	6.7 J,B	85 J	190 J	6000 D,B	40	10.9 ± 2.6	270 J,B	0.14	3.69 ± 0.72	2.1 J,B	1	19 B	7.6 ± 1.4	240 ,J	550 J,B
PARCEL2-SSC006	PARCEL2-SSC006 (0-2)	11/11/2008	0 - 2	Soil	1.7 UB	6.6 B	69	140 B	4000 D	44	9.0 ± 2.2	320 B	0.094	5.24 ± 0.97	1.8 T,B	0.94 T	15 B	5.7 ± 1.1	190 ,B	490
PARCEL2-SSC007	PARCEL2-SSC007 (0-2)	11/10/2008	0 - 2	Soil	1.7 UB	6.3 B	79	150	4800 D,B	49	9.2 ± 2.2	310 B	0.08	4.69 ± 0.9	2 B,B	0.96 T	18 B	5.7 ± 1.1	200	510 B
PARCEL2-SSC008	PARCEL2-SSC008 (0-2)	11/11/2008	0 - 2	Soil	2.2 UB	7.3 J,B	86 J	190 J,B	5400 D	44	11.4 ± 2.7	300 J,B	0.11	7.2 ± 1.3	2.1 J,B	1.1	20 J,B	9.1 ± 1.6	250 ,B	600 J
Mean Concentration					1.88	6.7	79.1	164.4	4869	44.0	10.3	303	0.091	5.1	1.95	1.00	17.9	6.90	216.3	542
95% UCL on Mean Concentration					2.24	7.0	87.9	187.1	5316	47.7	11.3	316	0.102	6.0	2.11	1.10	19.6	7.83	243.7	599
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Commercial/Industrial Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	2.1	NA	NA	1.36	NA	NA	NA	2.4	NA	NA
Construction Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	8.6	NA	NA	2.3	NA	NA	NA	21.6	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL2-SSC001	PARCEL2-SSC001 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.3 ± 1.5	NA	NA	1.49 ± 0.31	NA	NA	NA	4.96 ± 0.96	NA	NA
PARCEL2-SSC002	PARCEL2-SSC002 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.87 ± 0.7	NA	NA	1.86 ± 0.38	NA	NA	NA	2.78 ± 0.6	NA	NA
PARCEL2-SSC003	PARCEL2-SSC003 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.1 ± 1.0	NA	NA	2.52 ± 0.49	NA	NA	NA	3.45 ± 0.69	NA	NA
PARCEL2-SSC004	PARCEL2-SSC004 (2-6)	11/7/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.0 ± 0.73	NA	NA	1.51 ± 0.33	NA	NA	NA	2.39 ± 0.51	NA	NA
PARCEL2-SSC005	PARCEL2-SSC005 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.1 ± 1.0	NA	NA	2.42 ± 0.49	NA	NA	NA	3.34 ± 0.66	NA	NA
PARCEL2-SSC005 Dup	PARCEL2-SSC205 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.72 ± 0.91	NA	NA	0.127 ± 0.052	NA	NA	NA	3.15 ± 0.65	NA	NA
PARCEL2-SSC006	PARCEL2-SSC006 (2-6)	11/11/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.07 ± 0.99	NA	NA	1.88 ± 0.41	NA	NA	NA	3.73 ± 0.75	NA	NA
PARCEL2-SSC007	PARCEL2-SSC007 (2-6)	11/10/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.56 ± 0.87	NA	NA	2.09 ± 0.42	NA	NA	NA	3.85 ± 0.76	NA	NA
PARCEL2-SSC008	PARCEL2-SSC008 (2-6)	11/11/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.6 ± 1.4	NA	NA	4.65 ± 0.87	NA	NA	NA	4.58 ± 0.89	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	4.05	NA	NA	2.16	NA	NA	NA	3.62	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	4.71	NA	NA	2.97	NA	NA	NA	4.20	NA	NA

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2.

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-13

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 2
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho

(Page 1 of 3)

Exposure Pathways	Exposure Scenario													
	Resident (a)							Outdoor Commercial/Industrial Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	5.E-08	4.E-10	5.E-08	9.E-09	7.E-11	9.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total COPC Lifetime Cancer Risk	5.E-08	4.E-10	5.E-08	9.E-09	7.E-11	9.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
ROCs														
External Exposure to Gamma Radiation	3.E-04	9.E-05	2.E-04	5.E-05	1.E-05	3.E-05	Ra-226, U-238	1.E-04	5.E-05	1.E-04	3.E-05	1.E-05	2.E-05	Ra-226, U-238
Incidental Soil Ingestion	5.E-05	8.E-06	4.E-05	4.E-06	7.E-07	3.E-06	Pb-210, Ra-226	2.E-05	4.E-06	2.E-05	2.E-06	4.E-07	2.E-06	Pb-210, Ra-226
Ingestion of Homegrown Produce	2.E-05	5.E-06	2.E-05	7.E-06	1.E-06	5.E-06	Pb-210, Ra-226	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	1.E-08	2.E-09	1.E-08	2.E-09	3.E-10	1.E-09	-	1.E-07	2.E-08	8.E-08	2.E-08	4.E-09	2.E-08	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total ROPC Lifetime Cancer Risk	4.E-04	1.E-04	3.E-04	6.E-05	2.E-05	4.E-05	Ra-226, Pb-210	2.E-04	5.E-05	1.E-04	4.E-05	1.E-05	3.E-05	Ra-226, Pb-210
Total Lifetime Cancer Risk														
	4.E-04	1.E-04	3.E-04	6.E-05	2.E-05	4.E-05	Ra-226, Pb-210	2.E-04	5.E-05	1.E-04	4.E-05	1.E-05	3.E-05	Ra-226, Pb-210
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	3.3	0.1	3.2	1.0	0.04	1.0	F, Cd	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.1	0.001	0.1	0.01	0.00009	0.01	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	20.9	0.1	20.8	2.5	0.02	2.5	Cd	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.004	0.00005	0.003	0.002	0.00003	0.002	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>1.2</u>	<u>0.6</u>	<u>0.6</u>	<u>0.8</u>	<u>0.4</u>	<u>0.4</u>	F, U	<u>0.2</u>	<u>0.08</u>	<u>0.08</u>	<u>0.2</u>	<u>0.08</u>	<u>0.09</u>	-
Total Non-Cancer Hazard Quotient	25.6	0.9	24.7	4.4	0.46	3.9	Cd, F	0.2	0.08	0.08	0.2	0.08	0.09	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-13

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 2
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho

(Page 2 of 3)

Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs														
External Exposure to Gamma Radiation	7.E-05	2.E-05	4.E-05	1.E-05	4.E-06	1.E-05	Ra-226	3.E-06	1.E-06	2.E-06	4.E-07	1.E-07	3.E-07	Ra-226
Incidental Soil Ingestion	1.E-05	2.E-06	9.E-06	3.E-06	4.E-07	2.E-06	Pb-210, Ra-226	1.E-06	3.E-07	1.E-06	2.E-07	4.E-08	2.E-07	Pb-210
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	8.E-07	1.E-07	7.E-07	1.E-07	2.E-08	9.E-08	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>8.E-05</i>	<i>2.E-05</i>	<i>5.E-05</i>	<i>2.E-05</i>	<i>4.E-06</i>	<i>1.E-05</i>	<i>Ra-226, Pb-210</i>	<i>6.E-06</i>	<i>1.E-06</i>	<i>4.E-06</i>	<i>7.E-07</i>	<i>2.E-07</i>	<i>6.E-07</i>	-
Total Lifetime Cancer Risk	8.E-05	2.E-05	5.E-05	2.E-05	4.E-06	1.E-05	Ra-226, Pb-210	6.E-06	1.E-06	4.E-06	7.E-07	2.E-07	6.E-07	Ra-226, Pb-210
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>0.2</u>	<u>0.09</u>	<u>0.09</u>	<u>0.2</u>	<u>0.09</u>	<u>0.09</u>	-	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	0.2	0.09	0.09	0.2	0.09	0.09	-	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

BScr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-13

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 2
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho

(Page 3 of 3)

Exposure Pathways	Exposure Scenario						Risk Drivers*
	Utility Worker						
	RME			CTE			
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs							
External Exposure to Gamma Radiation	3.E-07	8.E-08	2.E-07	4.E-08	1.E-08	3.E-08	-
Incidental Soil Ingestion	1.E-07	2.E-08	9.E-08	2.E-08	4.E-09	2.E-08	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	6.E-08	1.E-08	5.E-08	1.E-08	2.E-09	9.E-09	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>4.E-07</i>	<i>1.E-07</i>	<i>3.E-07</i>	<i>7.E-08</i>	<i>2.E-08</i>	<i>6.E-08</i>	-
Total Lifetime Cancer Risk							
	4.E-07	1.E-07	3.E-07	7.E-08	2.E-08	6.E-08	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

**TABLE 3-14
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 2
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 2		Parcel 2	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.57	0.09	0.53	0.08
	Chromium	0.02	0.002	0.30	0.02	0.28	0.02
	Fluoride	0.08	0.05	0.60	0.36	0.52	0.31
	Lead	0.04	0.03	0.08	0.06	0.04	0.03
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.09	0.08	0.08	0.07
	Vanadium	0.01	0.004	0.09	0.06	0.08	0.05
Pygmy Rabbit	Zinc	0.03	0.03	0.06	0.06	0.03	0.03
	Cadmium	0.04	0.01	0.56	0.09	0.52	0.08
	Chromium	0.02	0.001	0.24	0.02	0.22	0.02
	Fluoride	0.09	0.05	0.57	0.34	0.48	0.29
	Lead	0.03	0.02	0.07	0.05	0.03	0.02
	Mercury	0.001	NA	0.01	NA	0.004	NA
	Selenium	0.01	0.01	0.07	0.06	0.06	0.05
Mule Deer	Vanadium	0.01	0.004	0.07	0.04	0.07	0.04
	Zinc	0.02	0.02	0.05	0.05	0.03	0.03
	Cadmium	0.004	0.001	0.06	0.01	0.05	0.01
	Chromium	0.002	0.0001	0.02	0.002	0.02	0.002
	Fluoride	0.01	0.01	0.06	0.04	0.05	0.03
	Lead	0.004	0.002	0.01	0.005	0.004	0.002
	Mercury	0.0001	NA	0.0005	NA	0.0004	NA
Coyote	Selenium	0.001	0.001	0.01	0.01	0.01	0.01
	Vanadium	0.001	0.0004	0.01	0.005	0.01	0.004
	Zinc	0.005	0.004	0.01	0.01	0.003	0.00
	Cadmium	0.007	0.001	0.18	0.03	0.18	0.03
	Chromium	0.004	0.0003	0.06	0.005	0.06	0.004
	Fluoride	0.04	0.02	0.53	0.32	0.49	0.29
	Lead	0.004	0.003	0.01	0.01	0.004	0.003
Townsend's Big Eared Bat	Mercury	0.00002	NA	0.0001	NA	0.0001	NA
	Selenium	0.002	0.002	0.01	0.01	0.01	0.01
	Vanadium	0.001	0.001	0.01	0.01	0.01	0.01
	Zinc	0.02	0.02	0.03	0.03	0.01	0.01
	Cadmium	0.05	0.01	0.52	0.08	0.47	0.07
	Chromium	0.02	0.002	0.31	0.02	0.28	0.02
	Fluoride	0.09	0.05	0.63	0.38	0.54	0.32
Townsend's Big Eared Bat	Lead	0.05	0.04	0.10	0.07	0.05	0.04
	Mercury	0.001	NA	0.01	NA	0.005	NA
	Selenium	0.01	0.01	0.08	0.08	0.07	0.07
	Vanadium	0.01	0.005	0.10	0.06	0.09	0.05
	Zinc	0.02	0.02	0.05	0.05	0.03	0.03

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 2		Parcel 2	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.28	0.07	0.27	0.06
	Chromium	0.02	0.02	0.29	0.28	0.27	0.26
	Fluoride	0.20	0.05	2.13	0.52	1.93	0.47
	Lead	0.08	0.01	0.16	0.02	0.08	0.01
	Mercury	0.0001	NA	0.001	NA	0.0005	NA
	Selenium	0.005	0.004	0.03	0.03	0.03	0.02
	Vanadium	0.02	0.01	0.24	0.17	0.22	0.16
Red-Tailed Hawk	Zinc	0.02	0.02	0.06	0.04	0.03	0.03
	Cadmium	0.005	0.001	0.12	0.03	0.11	0.03
	Chromium	0.01	0.01	0.07	0.07	0.07	0.07
	Fluoride	0.20	0.05	2.65	0.65	2.45	0.60
	Lead	0.02	0.002	0.03	0.003	0.02	0.002
	Mercury	0.00001	NA	0.00004	NA	0.00003	NA
	Selenium	0.001	0.001	0.01	0.01	0.01	0.01
Bald Eagle	Vanadium	0.004	0.003	0.05	0.04	0.05	0.04
	Zinc	0.03	0.03	0.04	0.03	0.01	0.01
	Cadmium	0.004	0.001	0.09	0.02	0.09	0.02
	Chromium	0.004	0.004	0.06	0.06	0.05	0.05
	Fluoride	0.15	0.04	2.04	0.50	1.89	0.46
	Lead	0.01	0.001	0.02	0.00	0.01	0.001
	Mercury	0.00001	NA	0.00	NA	0.00002	NA
Horned Lark	Selenium	0.001	0.001	0.01	0.005	0.01	0.004
	Vanadium	0.003	0.002	0.04	0.03	0.04	0.03
	Zinc	0.03	0.02	0.03	0.02	0.01	0.01
	Cadmium	0.02	0.01	0.35	0.08	0.33	0.08
	Chromium	0.03	0.03	0.41	0.39	0.38	0.36
	Fluoride	0.20	0.05	2.45	0.60	2.24	0.55
	Lead	0.10	0.01	0.20	0.02	0.10	0.01
Horned Lark	Mercury	0.001	NA	0.003	NA	0.002	NA
	Selenium	0.01	0.01	0.06	0.05	0.05	0.04
	Vanadium	0.03	0.02	0.39	0.27	0.36	0.25
	Zinc	0.03	0.02	0.07	0.05	0.04	0.03

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 2	Parcel 2
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.44	0.38
	Chromium	PW	0.0001	0.0009	0.0008
	Fluoride	Plant	0.47	1.95	1.47
	Lead	PW	0.01	0.01	0.01
	Mercury	PW	0.02	0.11	0.08
	Selenium	PW	0.16	1.12	0.96
	Vanadium	Plant	0.001	0.007	0.01
		PW	0.10	1.22	1.12
		Plant	0.02	0.27	0.25
		Plant	0.22	0.26	0.04
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.16	0.11
	Chromium	PW	0.0001	0.0009	0.0008
	Fluoride	Plant	0.28	1.12	0.84
	Lead	PW	0.01	0.01	0.01
	Mercury	PW	0.02	0.11	0.08
	Selenium	PW	0.16	1.12	0.96
	Vanadium	Plant	0.001	0.007	0.01
		PW	0.10	1.22	1.12
		Plant	0.02	0.27	0.25
		Plant	0.07	0.09	0.02

TABLE 3-15a
 NORTHERN PARCEL 3 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

					Analyte	Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
					Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)						0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV)^a						3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV)^b						-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																	
PARCEL3-SSC001	PARCEL3-SSC001 (0-2)	11/12/2008	0 - 2	Soil		3.5 B	9.6 J,B	130 J	250 J,B	8800 D	41	16.1 ± 3.9	290 J,B	0.21	10.6 ± 1.9	3.1 J,B	1.5	33 B	11.4 ± 2.2	370 J,B	640 J
PARCEL3-SSC002	PARCEL3-SSC002 (0-2)	11/13/2008	0 - 2	Soil		3.4 B	9.6 J,B	130 J	280 J	7900 D,B	42	15.7 ± 3.8	270 J,B	0.22	14.4 ± 2.6	3.3 J,B	1.5	35 B	13.5 ± 2.4	400 J	680 J,B
PARCEL3-SSC003	PARCEL3-SSC003 (0-2)	11/13/2008	0 - 2	Soil		3.6 B	9.5 J,B	130 J	270 J,B	7200 D	66	16.9 ± 4.1	290 J,B	0.22	10.7 ± 1.9	3.4 J,B	1.6	34 B	12.7 ± 2.4	390 J,B	710 J
PARCEL3-SSC004	PARCEL3-SSC004 (0-2)	11/12/2008	0 - 2	Soil		3.9 B	9.9 J,B	140 J	300 J,B	7100 D	50	17.3 ± 4.2	270 J,B	0.23	4.02 ± 0.75	3.5 J,B	1.7	37 B	13.2 ± 2.3	420 J,B	700 J
PARCEL3-SSC005	PARCEL3-SSC005 (0-2)	11/12/2008	0 - 2	Soil		3.5 B	9.7 J,B	130 J	270 J,B	7500 D	41	15.0 ± 3.6	280 J,B	0.22	14.1 ± 2.6	3.2 J,B	1.5	34 B	12.8 ± 2.4	390 J,B	680 J
PARCEL3-SSC006	PARCEL3-SSC006 (0-2)	11/14/2008	0 - 2	Soil		4.1 B	10 J,B	150 J	320 J,B	8800 D	150	18.3 ± 4.4	260 J,B	0.23	14 ± 2.5	3.5 J,B	1.8	41 B	14.5 ± 2.5	450 J,B	750 J
PARCEL3-SSC007	PARCEL3-SSC007 (0-2)	11/13/2008	0 - 2	Soil		3.9 B	9.9 J,B	140 J	300 J	9000 D,B	49	16.1 ± 3.9	270 J,B	0.25	12.7 ± 2.3	3.7 J,B	1.7	37 B	13.5 ± 2.3	430 J	730 J,B
PARCEL3-SSC008	PARCEL3-SSC008 (0-2)	11/14/2008	0 - 2	Soil		4.1 J,B	10 J-,B	150 J	330 J,B	10000 D,J	150 J	16.8 ± 4.0	260 J,B	0.25	7.3 ± 1.3 J-	3.5 J-,B	1.7	39 B	14.3 ± 2.5	460 J,B	730 J
PARCEL3-SSC008 Dup	PARCEL3-SSC208 (0-2)	11/14/2008	0 - 2	Soil		4 B	9.7 J,B	140 J	310 J,B	9000 D	48	18.3 ± 4.4	270 J,B	0.24	9.9 ± 1.8	3.4 J,B	1.7	38 B	14.2 ± 2.5	430 J,B	730 J
Mean Concentration						3.74	9.8	136.9	288.8	8225	67.3	16.6	274	0.228	11.1	3.39	1.63	36.2	13.23	411.9	703
95% UCL on Mean Concentration						3.93	9.9	142.2	305.7	8837	93.2	17.4	282	0.237	13.5	3.52	1.70	38.0	13.88	431.2	726
2 - 6" Soil Background (95% UCL on Mean)						NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Residential Human Health Comparative Value (CV)^a						NA	NA	NA	NA	NA	NA	1.6	NA	NA	1.35	NA	NA	NA	1.77	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																	
PARCEL3-SSC001	PARCEL3-SSC001 (2-6)	11/13/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	3.62 ± 0.88	NA	NA	2.07 ± 0.4	NA	NA	NA	3.66 ± 0.85	NA	NA
PARCEL3-SSC002	PARCEL3-SSC002 (2-6)	11/13/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	5.2 ± 1.3	NA	NA	3.24 ± 0.61	NA	NA	NA	4.49 ± 0.88	NA	NA
PARCEL3-SSC003	PARCEL3-SSC003 (2-6)	11/13/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	3.09 ± 0.76	NA	NA	1.75 ± 0.36	NA	NA	NA	2.99 ± 0.72	NA	NA
PARCEL3-SSC004	PARCEL3-SSC004 (2-6)	11/12/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	5.1 ± 1.2	NA	NA	3.98 ± 0.76	NA	NA	NA	4.5	NA	NA
PARCEL3-SSC005	PARCEL3-SSC005 (2-6)	11/12/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	4.3 ± 1.0	NA	NA	3.53 ± 0.67	NA	NA	NA	4.15 ± 0.93	NA	NA
PARCEL3-SSC006	PARCEL3-SSC006 (2-6)	11/14/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	4.2 ± 1.0	NA	NA	2.3 ± 0.47	NA	NA	NA	4.36 ± 0.83	NA	NA
PARCEL3-SSC007	PARCEL3-SSC007 (2-6)	11/13/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	4.3 ± 1.0	NA	NA	3.53 ± 0.68	NA	NA	NA	4.2 ± 0.81	NA	NA
PARCEL3-SSC008	PARCEL3-SSC008 (2-6)	11/14/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	4.5 ± 1.1	NA	NA	3.47 ± 0.65	NA	NA	NA	4.59 ± 0.9	NA	NA
PARCEL3-SSC008 Dup	PARCEL3-SSC208 (2-6)	11/14/2008	2 - 6	Soil		NA	NA	NA	NA	NA	NA	4.4 ± 1.1	NA	NA	2.77 ± 0.56	NA	NA	NA	4.32 ± 0.82	NA	NA
Mean Concentration						NA	NA	NA	NA	NA	NA	4.3	NA	NA	2.9	NA	NA	NA	4.10	NA	NA
95% UCL on Mean Concentration						NA	NA	NA	NA	NA	NA	4.8	NA	NA	3.5	NA	NA	NA	4.44	NA	NA

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-15b
 NORTHERN PARCEL 3 SURFACE SOIL SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL3-SSC001	PARCEL3-SSC001 (0-2)	11/12/2008	0 - 2	Soil	3.5 B	9.6 J,B	130 J	250 J,B	8800 D	41	16.1 ± 3.9	290 J,B	0.21	10.6 ± 1.9	3.1 J,B	1.5	33 B	11.4 ± 2.2	370 J,B	640 J
PARCEL3-SSC002	PARCEL3-SSC002 (0-2)	11/13/2008	0 - 2	Soil	3.4 B	9.6 J,B	130 J	280 J	7900 D,B	42	15.7 ± 3.8	270 J,B	0.22	14.4 ± 2.6	3.3 J,B	1.5	35 B	13.5 ± 2.4	400 J	680 J,B
PARCEL3-SSC003	PARCEL3-SSC003 (0-2)	11/13/2008	0 - 2	Soil	3.6 B	9.5 J,B	130 J	270 J,B	7200 D	66	16.9 ± 4.1	290 J,B	0.22	10.7 ± 1.9	3.4 J,B	1.6	34 B	12.7 ± 2.4	390 J,B	710 J
PARCEL3-SSC004	PARCEL3-SSC004 (0-2)	11/12/2008	0 - 2	Soil	3.9 B	9.9 J,B	140 J	300 J,B	7100 D	50	17.3 ± 4.2	270 J,B	0.23	4.02 ± 0.75	3.5 J,B	1.7	37 B	13.2 ± 2.3	420 J,B	700 J
PARCEL3-SSC005	PARCEL3-SSC005 (0-2)	11/12/2008	0 - 2	Soil	3.5 B	9.7 J,B	130 J	270 J,B	7500 D	41	15.0 ± 3.6	280 J,B	0.22	14.1 ± 2.6	3.2 J,B	1.5	34 B	12.8 ± 2.4	390 J,B	680 J
PARCEL3-SSC006	PARCEL3-SSC006 (0-2)	11/14/2008	0 - 2	Soil	4.1 B	10 J,B	150 J	320 J,B	8800 D	150	18.3 ± 4.4	260 J,B	0.23	14 ± 2.5	3.5 J,B	1.8	41 B	14.5 ± 2.5	450 J,B	750 J
PARCEL3-SSC007	PARCEL3-SSC007 (0-2)	11/13/2008	0 - 2	Soil	3.9 B	9.9 J,B	140 J	300 J	9000 D,B	49	16.1 ± 3.9	270 J,B	0.25	12.7 ± 2.3	3.7 J,B	1.7	37 B	13.5 ± 2.3	430 J	730 J,B
PARCEL3-SSC008	PARCEL3-SSC008 (0-2)	11/14/2008	0 - 2	Soil	4.1 J,B	10 J-,B	150 J	330 J,B	10000 D,J	150 J	16.8 ± 4.0	260 J,B	0.25	7.3 ± 1.3 J-	3.5 J-,B	1.7	39 B	14.3 ± 2.5	460 J,B	730 J
PARCEL3-SSC008 Dup	PARCEL3-SSC208 (0-2)	11/14/2008	0 - 2	Soil	4 B	9.7 J,B	140 J	310 J,B	9000 D	48	18.3 ± 4.4	270 J,B	0.24	9.9 ± 1.8	3.4 J,B	1.7	38 B	14.2 ± 2.5	430 J,B	730 J
Mean Concentration					3.74	9.76	136.9	288.8	8225	67.3	16.6	274.4	0.23	11.1	3.39	1.6	36.2	13.2	411.9	702.5
95% UCL on Mean Concentration					3.93	9.88	142.2	305.7	8837	93.2	17.4	281.9	0.24	13.5	3.52	1.7	38.0	13.9	431.2	726.2
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Commercial/Industrial Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	2.1	NA	NA	1.36	NA	NA	NA	2.4	NA	NA
Construction Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	8.6	NA	NA	2.3	NA	NA	NA	21.6	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL3-SSC001	PARCEL3-SSC001 (2-6)	11/13/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.62 ± 0.88	NA	NA	2.07 ± 0.4	NA	NA	NA	3.66 ± 0.85	NA	NA
PARCEL3-SSC002	PARCEL3-SSC002 (2-6)	11/13/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.2 ± 1.3	NA	NA	3.24 ± 0.61	NA	NA	NA	4.49 ± 0.88	NA	NA
PARCEL3-SSC003	PARCEL3-SSC003 (2-6)	11/13/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.09 ± 0.76	NA	NA	1.75 ± 0.36	NA	NA	NA	2.99 ± 0.72	NA	NA
PARCEL3-SSC004	PARCEL3-SSC004 (2-6)	11/12/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.1 ± 1.2	NA	NA	3.98 ± 0.76	NA	NA	NA	4.5	NA	NA
PARCEL3-SSC005	PARCEL3-SSC005 (2-6)	11/12/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.3 ± 1.0	NA	NA	3.53 ± 0.67	NA	NA	NA	4.15 ± 0.93	NA	NA
PARCEL3-SSC006	PARCEL3-SSC006 (2-6)	11/14/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.2 ± 1.0	NA	NA	2.3 ± 0.47	NA	NA	NA	4.36 ± 0.83	NA	NA
PARCEL3-SSC007	PARCEL3-SSC007 (2-6)	11/13/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.3 ± 1.0	NA	NA	3.53 ± 0.68	NA	NA	NA	4.2 ± 0.81	NA	NA
PARCEL3-SSC008	PARCEL3-SSC008 (2-6)	11/14/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.5 ± 1.1	NA	NA	3.47 ± 0.65	NA	NA	NA	4.59 ± 0.9	NA	NA
PARCEL3-SSC008 Dup	PARCEL3-SSC208 (2-6)	11/14/2008	2 - 6	Soil	NA	NA	NA	NA	NA	NA	4.4 ± 1.1	NA	NA	2.77 ± 0.56	NA	NA	NA	4.32 ± 0.82	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	4.28	NA	NA	2.94	NA	NA	NA	4.10	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	4.75	NA	NA	3.48	NA	NA	NA	4.44	NA	NA

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2.

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-16
 NORTHERN PARCEL 3 TEST PIT SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV) ^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV) ^a					105	24.9	82.0	550743	33346	824	9.5	77812	464	1.88	2754	375	251	21.5	3523	165285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL3-TP1C	PARCEL3-TP1C (0-10)	11/5/2008	0 - 10	Soil	0.094 T,UB	3.6 B	0.46 T	11	420 J-,B	8.9	0.88 ± 0.24	390 B	0.012 T	1.01 ± 0.21	<2	0.13 T	0.84 T,B	1.01 ± 0.27	17	41 B
PARCEL3-TP2C	PARCEL3-TP2C (0-10)	11/5/2008	0 - 10	Soil	0.1 T,J-,UB	4.4 B	0.53 T	10	450 J-,B	8.4	0.88 ± 0.24	360 B	0.012 T	0.58 ± 0.13	0.097 T,UB	0.13 T	1 B,J,B	0.95 ± 0.28	18	41 B
PARCEL3-TP2C Dup	PARCEL3-TP10C (0-10)	11/5/2008	0 - 10	Soil	0.2 T,UB	4.7 B	0.66 T	12	390 J-,B	8.6	0.76 ± 0.21	370 B	0.014 T	1.32 ± 0.29	0.19 T,UB	0.13 T	1.1 B	0.85 ± 0.25	20	43 B
PARCEL3-TP3C	PARCEL3-TP3C (0-10)	11/5/2008	0 - 10	Soil	0.16 T,UB	4.2 B	1.9	13	470 J-,B	8.4	0.97 ± 0.26	340 B	0.015 T	0.99 ± 0.21	0.19 T,UB	0.13 T	1.3 B	0.99 ± 0.28	21	45 B
Mean Concentration					0.13	4.12	0.99	11.67	437	8.60	0.89	365.00	0.01	0.98	0.14	0.13	1.06	0.97	19.00	42.67
95% UCL on Mean Concentration					NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2.

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-17

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 3
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 3)

Exposure Pathways	Exposure Scenario													
	Resident (a)							Outdoor Commercial/Industrial Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	8.E-08	4.E-10	8.E-08	2.E-08	7.E-11	2.E-08	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	1.E-03	1.E-04	9.E-04	1.E-04	2.E-05	1.E-04	As	2.E-04	3.E-05	2.E-04	5.E-05	7.E-06	4.E-05	As
Total COPC Lifetime Cancer Risk	1.E-03	1.E-04	9.E-04	1.E-04	2.E-05	1.E-04	As	2.E-04	3.E-05	2.E-04	5.E-05	7.E-06	4.E-05	As
ROCs														
External Exposure to Gamma Radiation	6.E-04	9.E-05	5.E-04	1.E-04	1.E-05	8.E-05	Ra-226, U-238	3.E-04	5.E-05	3.E-04	7.E-05	1.E-05	6.E-05	Ra-226, U-238
Incidental Soil Ingestion	7.E-05	8.E-06	7.E-05	7.E-06	7.E-07	6.E-06	Pb-210, Ra-226	3.E-05	4.E-06	3.E-05	4.E-06	4.E-07	4.E-06	Pb-210, Ra-226
Ingestion of Homegrown Produce	3.E-05	5.E-06	3.E-05	9.E-06	1.E-06	8.E-06	Pb-210, Ra-226	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	3.E-08	2.E-09	2.E-08	3.E-09	3.E-10	3.E-09	-	2.E-07	2.E-08	2.E-07	4.E-08	4.E-09	4.E-08	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total ROPC Lifetime Cancer Risk	7.E-04	1.E-04	6.E-04	1.E-04	2.E-05	1.E-04	Ra-226, Pb-210	3.E-04	5.E-05	3.E-04	7.E-05	1.E-05	6.E-05	Ra-226, Pb-210
Total Lifetime Cancer Risk														
2.E-03 2.E-04 1.E-03 3.E-04 4.E-05 2.E-04 As, Ra-226 6.E-04 8.E-05 5.E-04 1.E-04 2.E-05 1.E-04 Ra-226, As														
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	5.7	0.2	5.6	1.8	0.05	1.8	F, Cd	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.2	0.001	0.2	0.02	0.00009	0.02	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	44.6	0.1	44.4	5.4	0.02	5.4	Cd	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.006	0.00005	0.006	0.004	0.00003	0.004	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	11.5	2.0	9.5	5.7	0.9	4.8	As, F	1.6	0.3	1.3	1.2	0.2	1.0	As
Total Non-Cancer Hazard Quotient	62.0	2.2	59.8	13.0	1.0	12.0	Cd, As	1.6	0.3	1.3	1.2	0.2	1.0	As

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-17

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 3
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 2 of 3)

Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	2.E-06	9.E-09	2.E-06	3.E-07	1.E-09	3.E-07	-
<u>Ingestion of Groundwater</u>	2.E-04	3.E-05	2.E-04	5.E-05	8.E-06	4.E-05	As	NA	NA	NA	NA	NA	NA	-
Total COPC Lifetime Cancer Risk	2.E-04	3.E-05	2.E-04	5.E-05	8.E-06	4.E-05	As	2.E-06	9.E-09	2.E-06	3.E-07	1.E-09	3.E-07	-
ROCs														
External Exposure to Gamma Radiation	1.E-04	2.E-05	1.E-04	3.E-05	4.E-06	2.E-05	Ra-226, U-238	7.E-06	1.E-06	6.E-06	9.E-07	1.E-07	7.E-07	Ra-226
Incidental Soil Ingestion	2.E-05	2.E-06	2.E-05	4.E-06	4.E-07	4.E-06	Pb-210, Ra-226	2.E-06	3.E-07	2.E-06	3.E-07	4.E-08	3.E-07	Pb-210
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	1.E-06	1.E-07	1.E-06	2.E-07	2.E-08	2.E-07	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Total ROPC Lifetime Cancer Risk	2.E-04	2.E-05	1.E-04	3.E-05	4.E-06	3.E-05	Ra-226, Pb-210	1.E-05	1.E-06	9.E-06	1.E-06	2.E-07	1.E-06	-
Total Lifetime Cancer Risk														
	4.E-04	6.E-05	3.E-04	8.E-05	1.E-05	7.E-05	As, Ra-226	1.E-05	1.E-06	1.E-05	2.E-06	2.E-07	1.E-06	Ra-226, Pb-210
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	0.2	0.001	0.2	0.04	0.0002	0.04	Cd
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	0.03	0.0001	0.03	0.004	0.00002	0.004	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	3.40	0.02	3.4	0.5	0.002	0.5	Cd
<u>Ingestion of Groundwater</u>	1.8	0.3	1.5	1.2	0.2	1.0	As	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	1.8	0.3	1.5	1.2	0.2	1.0	As	3.7	0.0	3.7	0.5	0.00	0.5	Cd

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-17

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 3
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 3 of 3)

Exposure Pathways	Exposure Scenario						
	Utility Worker						
	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	1.E-07	7.E-10	1.E-07	3.E-08	1.E-10	3.E-08	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>1.E-07</i>	<i>7.E-10</i>	<i>1.E-07</i>	<i>3.E-08</i>	<i>1.E-10</i>	<i>3.E-08</i>	-
ROCs							
External Exposure to Gamma Radiation	5.E-07	8.E-08	4.E-07	9.E-08	1.E-08	7.E-08	-
Incidental Soil Ingestion	2.E-07	2.E-08	2.E-07	3.E-08	4.E-09	3.E-08	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	1.E-07	1.E-08	1.E-07	2.E-08	2.E-09	2.E-08	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>8.E-07</i>	<i>1.E-07</i>	<i>7.E-07</i>	<i>1.E-07</i>	<i>2.E-08</i>	<i>1.E-07</i>	-
Total Lifetime Cancer Risk							
	1.E-06	1.E-07	8.E-07	2.E-07	2.E-08	1.E-07	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
COCs							
Incidental Soil Ingestion	0.02	0.0001	0.02	0.004	0.00002	0.004	-
Dermal Absorption	0.007	0.00003	0.007	0.001	0.00001	0.001	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.3	0.001	0.3	0.05	0.0002	0.05	Cd
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	0.3	0.00	0.3	0.06	0.000	0.05	Cd

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-18
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 3
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 3		Parcel 3	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.85	0.13	0.80	0.13
	Chromium	0.02	0.002	0.49	0.04	0.47	0.04
	Fluoride	0.08	0.05	0.87	0.52	0.79	0.47
	Lead	0.04	0.03	0.16	0.11	0.12	0.08
	Mercury	0.001	NA	0.02	NA	0.01	NA
	Selenium	0.01	0.01	0.15	0.13	0.13	0.12
	Vanadium	0.01	0.004	0.16	0.10	0.15	0.09
	Zinc	0.03	0.03	0.07	0.06	0.04	0.03
Pygmy Rabbit	Cadmium	0.04	0.01	0.82	0.13	0.78	0.12
	Chromium	0.02	0.001	0.39	0.03	0.37	0.03
	Fluoride	0.09	0.05	0.79	0.47	0.70	0.42
	Lead	0.03	0.02	0.14	0.09	0.10	0.07
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.11	0.10	0.10	0.09
	Vanadium	0.01	0.004	0.13	0.08	0.12	0.07
	Zinc	0.02	0.02	0.06	0.05	0.03	0.03
Mule Deer	Cadmium	0.004	0.001	0.09	0.01	0.08	0.01
	Chromium	0.002	0.0001	0.04	0.003	0.04	0.003
	Fluoride	0.01	0.01	0.08	0.05	0.07	0.04
	Lead	0.004	0.002	0.01	0.01	0.01	0.01
	Mercury	0.0001	NA	0.001	NA	0.001	NA
	Selenium	0.001	0.001	0.01	0.01	0.01	0.01
	Vanadium	0.001	0.0004	0.01	0.01	0.01	0.01
	Zinc	0.005	0.004	0.01	0.01	0.003	0.003
Coyote	Cadmium	0.007	0.001	0.29	0.05	0.28	0.04
	Chromium	0.004	0.0003	0.10	0.01	0.09	0.01
	Fluoride	0.04	0.02	0.88	0.52	0.84	0.50
	Lead	0.004	0.003	0.02	0.01	0.01	0.01
	Mercury	0.00002	NA	0.0002	NA	0.0002	NA
	Selenium	0.002	0.002	0.02	0.02	0.02	0.02
	Vanadium	0.001	0.001	0.02	0.01	0.02	0.01
	Zinc	0.02	0.02	0.03	0.03	0.01	0.01
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.78	0.12	0.72	0.11
	Chromium	0.02	0.002	0.50	0.04	0.48	0.04
	Fluoride	0.09	0.05	0.90	0.54	0.81	0.48
	Lead	0.05	0.04	0.20	0.14	0.15	0.10
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.14	0.13	0.13	0.12
	Vanadium	0.01	0.005	0.17	0.11	0.17	0.10
	Zinc	0.02	0.02	0.06	0.05	0.03	0.03

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 3		Parcel 3	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.44	0.10	0.43	0.10
	Chromium	0.02	0.02	0.48	0.46	0.46	0.44
	Fluoride	0.20	0.05	3.31	0.81	3.11	0.76
	Lead	0.08	0.01	0.31	0.03	0.23	0.02
	Mercury	0.0001	NA	0.001	NA	0.001	NA
	Selenium	0.005	0.004	0.06	0.04	0.05	0.04
	Vanadium	0.02	0.01	0.43	0.30	0.41	0.29
	Zinc	0.02	0.02	0.06	0.05	0.04	0.03
Red-Tailed Hawk	Cadmium	0.005	0.001	0.19	0.04	0.18	0.04
	Chromium	0.01	0.01	0.12	0.12	0.12	0.11
	Fluoride	0.20	0.05	4.37	1.07	4.18	1.02
	Lead	0.02	0.002	0.06	0.01	0.05	0.005
	Mercury	0.00001	NA	0.0001	NA	0.0001	NA
	Selenium	0.001	0.001	0.01	0.01	0.01	0.01
	Vanadium	0.004	0.003	0.10	0.07	0.09	0.06
	Zinc	0.03	0.03	0.04	0.03	0.01	0.01
Bald Eagle	Cadmium	0.004	0.001	0.15	0.03	0.14	0.03
	Chromium	0.004	0.004	0.09	0.09	0.09	0.09
	Fluoride	0.15	0.04	3.37	0.82	3.22	0.78
	Lead	0.01	0.001	0.05	0.005	0.03	0.004
	Mercury	0.00001	NA	0.0001	NA	0.0001	NA
	Selenium	0.001	0.001	0.01	0.01	0.01	0.01
	Vanadium	0.003	0.002	0.07	0.05	0.07	0.05
	Zinc	0.03	0.02	0.03	0.03	0.01	0.01
Horned Lark	Cadmium	0.02	0.01	0.54	0.12	0.51	0.12
	Chromium	0.03	0.03	0.67	0.64	0.64	0.61
	Fluoride	0.20	0.05	3.89	0.95	3.68	0.90
	Lead	0.10	0.01	0.39	0.04	0.29	0.03
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.10	0.08	0.10	0.07
	Vanadium	0.03	0.02	0.69	0.48	0.66	0.46
	Zinc	0.03	0.02	0.08	0.06	0.05	0.04

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 3	Parcel 3
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.56	0.51
	Chromium	PW	0.0001	0.0014	0.0014
	Fluoride	Plant	0.47	2.17	1.69
	Lead	PW	0.01	0.03	0.02
	Mercury	PW	0.02	0.25	0.23
	Selenium	PW	0.16	1.86	1.71
		Plant	0.001	0.011	0.01
	Vanadium	PW	0.10	2.16	2.06
		Plant	0.02	0.47	0.45
	Zinc	Plant	0.22	0.26	0.04
	Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.18
Chromium		PW	0.0001	0.0014	0.0014
Fluoride		Plant	0.28	1.27	0.997
Lead		PW	0.01	0.03	0.02
Mercury		PW	0.02	0.25	0.23
Selenium		PW	0.16	1.86	1.71
		Plant	0.001	0.011	0.01
Vanadium		PW	0.10	2.16	2.06
		Plant	0.02	0.47	0.45
Zinc		Plant	0.07	0.09	0.02

TABLE 3-19a
 NORTHERN PARCEL 4 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV)^a					3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV)^b					-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL4-SSC001	PARCEL4-SSC001 (0-2)	10/22/08	0 - 2	Soil	0.58 T,UB	4.4 B	26	39 B	2100 D	16	4.3 ± 1.0	330 B	0.042 B	2.47 ± 0.5	0.81 T	0.38 T,B	6 B	3.78 ± 0.77	63 B	170 B
PARCEL4-SSC002	PARCEL4-SSC002 (0-2)	10/21/08	0 - 2	Soil	0.53 T,UB	4.5 B	30	44 B	2400 D	15	5.1 ± 1.2	320 B	0.043 B	3.26 ± 0.62	1 T	0.42 T,B	6.3 B	2.89 ± 0.62	67 B	190 B
PARCEL4-SSC003	PARCEL4-SSC003 (0-2)	10/23/08	0 - 2	Soil	0.52 T,UB	4.6 B	30	44 B	1900 D	16	4.7 ± 1.1	300 B	0.04 B	2.59 ± 0.49	1.1 T	0.38 T,B	6.2 B	2.94 ± 0.62	67 B	190 B
PARCEL4-SSC004	PARCEL4-SSC004 (0-2)	10/23/08	0 - 2	Soil	0.68 T,J-,UB	5.2 J,B	42	56 B	2900 D	20	6.0 ± 1.4	330 B	0.06 B	2.11 ± 0.4	1.3 T,J-	0.51 T,B	9.3 B	3.94 ± 0.78	90 B	250 J,B
PARCEL4-SSC004 Dup	PARCEL4-SSC204 (0-2)	10/23/08	0 - 2	Soil	0.67 T,UB	5 B	40	54 B	2300 D	19	5.5 ± 1.3	320 B	0.06 B	4.1 ± 0.8	1.2 T	0.49 T,B	8.7 B	3.84 ± 0.77	86 B	240 B
PARCEL4-SSC005	PARCEL4-SSC005 (0-2)	10/23/08	0 - 2	Soil	0.6 T,UB	4.7 B	35	49 B	1900 D	16	4.9 ± 1.2	310 B	0.048 B	2.38 ± 0.46	1.2 T	0.42 T,B	7.4 B	3.77 ± 0.75	74 B	210 B
PARCEL4-SSC006	PARCEL4-SSC006 (0-2)	10/24/08	0 - 2	Soil	0.6 T,UB	4.6 B	34	54 B	2400 D,J-	16	1.54 ± 0.41	320 B	0.059	3.06 ± 0.59	1.2 T	0.42 T,B	7.5 B	3.36 ± 0.74	80 B	220 B
PARCEL4-SSC007	PARCEL4-SSC007 (0-2)	10/24/08	0 - 2	Soil	0.7 T,UB	5 B	35	52 B	2800 D,J-	17	6.1 ± 1.5	330 B	0.053	3.81 ± 0.71	1.2 T	0.46 T,B	7.5 B	3.54 ± 0.72	80 B	220 B
PARCEL4-SSC008	PARCEL4-SSC008 (0-2)	10/24/08	0 - 2	Soil	0.57 T,UB	4.7 B	33	50 B	2600 D,J-	17	5.9 ± 1.4	350 B	0.064	<0.2	1.1 T	0.44 T,B	7.1 B	3.08 ± 0.62	75 B	220 B
Mean Concentration					0.60	4.7	33.0	48.4	2338	16.6	4.8	323	0.051	2.6	1.11	0.43	7.1	3.41	74.3	208
95% UCL on Mean Concentration					NC	4.9	36.0	52.1	2564	17.5	5.7	333	0.057	3.2	1.20	0.45	7.8	3.67	79.8	224
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Residential Human Health Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	1.6	NA	NA	1.35	NA	NA	NA	1.77	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL4-SSC001	PARCEL4-SSC001 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.83 ± 0.46	NA	NA	1.08 ± 0.23	NA	NA	NA	1.77 ± 0.42	NA	NA
PARCEL4-SSC002	PARCEL4-SSC002 (2-6)	10/22/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.52 ± 0.38	NA	NA	0.359 ± 0.093	NA	NA	NA	1.64 ± 0.38	NA	NA
PARCEL4-SSC003	PARCEL4-SSC003 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.72 ± 0.43	NA	NA	0.73 ± 0.18	NA	NA	NA	1.45 ± 0.36	NA	NA
PARCEL4-SSC004	PARCEL4-SSC004 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.72 ± 0.43	NA	NA	1.17 ± 0.24	NA	NA	NA	1.46 ± 0.35	NA	NA
PARCEL4-SSC004 Dup	PARCEL4-SSC204 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.68 ± 0.42	NA	NA	1.24 ± 0.27	NA	NA	NA	1.44 ± 0.34	NA	NA
PARCEL4-SSC005	PARCEL4-SSC005 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.30 ± 0.34	NA	NA	0.86 ± 0.19	NA	NA	NA	0.85 ± 0.24	NA	NA
PARCEL4-SSC006	PARCEL4-SSC006 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.8 ± 1.4	NA	NA	0.98 ± 0.23	NA	NA	NA	1.17 ± 0.31	NA	NA
PARCEL4-SSC007	PARCEL4-SSC007 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.48 ± 0.38	NA	NA	1.32 ± 0.27	NA	NA	NA	1.46 ± 0.36	NA	NA
PARCEL4-SSC008	PARCEL4-SSC008 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.11 ± 0.31	NA	NA	0.82 ± 0.21	NA	NA	NA	0.96 ± 0.26	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.06	NA	NA	0.92	NA	NA	NA	1.34	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	4.42	NA	NA	1.12	NA	NA	NA	1.56	NA	NA

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-2

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-19b
 NORTHERN PARCEL 4 SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL4-SSC001	PARCEL4-SSC001 (0-2)	10/22/08	0 - 2	Soil	0.58 T,UB	4.4 B	26	39 B	2100 D	16	4.3 ± 1.0	330 B	0.042 B	2.47 ± 0.5	0.81 T	0.38 T,B	6 B	3.78 ± 0.77	63 B	170 B
PARCEL4-SSC002	PARCEL4-SSC002 (0-2)	10/21/08	0 - 2	Soil	0.53 T,UB	4.5 B	30	44 B	2400 D	15	5.1 ± 1.2	320 B	0.043 B	3.26 ± 0.62	1 T	0.42 T,B	6.3 B	2.89 ± 0.62	67 B	190 B
PARCEL4-SSC003	PARCEL4-SSC003 (0-2)	10/23/08	0 - 2	Soil	0.52 T,UB	4.6 B	30	44 B	1900 D	16	4.7 ± 1.1	300 B	0.04 B	2.59 ± 0.49	1.1 T	0.38 T,B	6.2 B	2.94 ± 0.62	67 B	190 B
PARCEL4-SSC004	PARCEL4-SSC004 (0-2)	10/23/08	0 - 2	Soil	0.68 T,J-,UB	5.2 J,B	42	56 B	2900 D	20	6.0 ± 1.4	330 B	0.06 B	2.11 ± 0.4	1.3 T,J-	0.51 T,B	9.3 B	3.94 ± 0.78	90 B	250 J,B
PARCEL4-SSC004 Dup	PARCEL4-SSC204 (0-2)	10/23/08	0 - 2	Soil	0.67 T,UB	5 B	40	54 B	2300 D	19	5.5 ± 1.3	320 B	0.06 B	4.1 ± 0.8	1.2 T	0.49 T,B	8.7 B	3.84 ± 0.77	86 B	240 B
PARCEL4-SSC005	PARCEL4-SSC005 (0-2)	10/23/08	0 - 2	Soil	0.6 T,UB	4.7 B	35	49 B	1900 D	16	4.9 ± 1.2	310 B	0.048 B	2.38 ± 0.46	1.2 T	0.42 T,B	7.4 B	3.77 ± 0.75	74 B	210 B
PARCEL4-SSC006	PARCEL4-SSC006 (0-2)	10/24/08	0 - 2	Soil	0.6 T,UB	4.6 B	34	54 B	2400 D,J-	16	1.54 ± 0.41	320 B	0.059	3.06 ± 0.59	1.2 T	0.42 T,B	7.5 B	3.36 ± 0.74	80 B	220 B
PARCEL4-SSC007	PARCEL4-SSC007 (0-2)	10/24/08	0 - 2	Soil	0.7 T,UB	5 B	35	52 B	2800 D,J-	17	6.1 ± 1.5	330 B	0.053	3.81 ± 0.71	1.2 T	0.46 T,B	7.5 B	3.54 ± 0.72	80 B	220 B
PARCEL4-SSC008	PARCEL4-SSC008 (0-2)	10/24/08	0 - 2	Soil	0.57 T,UB	4.7 B	33	50 B	2600 D,J-	17	5.9 ± 1.4	350 B	0.064	<0.2	1.1 T	0.44 T,B	7.1 B	3.08 ± 0.62	75 B	220 B
Mean Concentration					0.60	4.7	33.0	48.4	2338	16.6	4.8	323	0.051	2.6	1.11	0.43	7.1	3.41	74.3	208
95% UCL on Mean Concentration					NC	4.9	36.0	52.1	2564	17.5	5.7	333	0.057	3.2	1.20	0.45	7.8	3.67	79.8	224
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Commercial/Industrial Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	2.1	NA	NA	1.36	NA	NA	NA	2.4	NA	NA
Construction Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	8.6	NA	NA	2.3	NA	NA	NA	21.6	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL4-SSC001	PARCEL4-SSC001 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.83 ± 0.46	NA	NA	1.08 ± 0.23	NA	NA	NA	1.77 ± 0.42	NA	NA
PARCEL4-SSC002	PARCEL4-SSC002 (2-6)	10/22/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.52 ± 0.38	NA	NA	0.359 ± 0.093	NA	NA	NA	1.64 ± 0.38	NA	NA
PARCEL4-SSC003	PARCEL4-SSC003 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.72 ± 0.43	NA	NA	0.73 ± 0.18	NA	NA	NA	1.45 ± 0.36	NA	NA
PARCEL4-SSC004	PARCEL4-SSC004 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.72 ± 0.43	NA	NA	1.17 ± 0.24	NA	NA	NA	1.46 ± 0.35	NA	NA
PARCEL4-SSC004 Dup	PARCEL4-SSC204 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.68 ± 0.42	NA	NA	1.24 ± 0.27	NA	NA	NA	1.44 ± 0.34	NA	NA
PARCEL4-SSC005	PARCEL4-SSC005 (2-6)	10/23/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.30 ± 0.34	NA	NA	0.86 ± 0.19	NA	NA	NA	0.85 ± 0.24	NA	NA
PARCEL4-SSC006	PARCEL4-SSC006 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	5.8 ± 1.4	NA	NA	0.98 ± 0.23	NA	NA	NA	1.17 ± 0.31	NA	NA
PARCEL4-SSC007	PARCEL4-SSC007 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.48 ± 0.38	NA	NA	1.32 ± 0.27	NA	NA	NA	1.46 ± 0.36	NA	NA
PARCEL4-SSC008	PARCEL4-SSC008 (2-6)	10/24/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.11 ± 0.31	NA	NA	0.82 ± 0.21	NA	NA	NA	0.96 ± 0.26	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.06	NA	NA	0.92	NA	NA	NA	1.34	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	4.42	NA	NA	1.12	NA	NA	NA	1.56	NA	NA

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-20

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 4
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
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Exposure Pathways	Exposure Scenario													
	Resident (a)							Outdoor Commercial/Industrial Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	2.E-08	4.E-10	2.E-08	4.E-09	7.E-11	4.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total COPC Lifetime Cancer Risk	2.E-08	4.E-10	2.E-08	4.E-09	7.E-11	4.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
ROCs														
External Exposure to Gamma Radiation	2.E-04	9.E-05	8.E-05	3.E-05	1.E-05	1.E-05	Ra-226, U-238	9.E-05	5.E-05	4.E-05	2.E-05	1.E-05	9.E-06	Ra-226
Incidental Soil Ingestion	2.E-05	8.E-06	2.E-05	2.E-06	7.E-07	1.E-06	Pb-210, Ra-226	1.E-05	4.E-06	7.E-06	1.E-06	4.E-07	7.E-07	Pb-210
Ingestion of Homegrown Produce	1.E-05	5.E-06	6.E-06	3.E-06	1.E-06	2.E-06	Pb-210	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	7.E-09	2.E-09	5.E-09	8.E-10	3.E-10	6.E-10	-	5.E-08	2.E-08	3.E-08	1.E-08	4.E-09	8.E-09	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total ROPC Lifetime Cancer Risk	2.E-04	1.E-04	1.E-04	3.E-05	2.E-05	2.E-05	Ra-226, Pb-210	1.E-04	5.E-05	5.E-05	2.E-05	1.E-05	1.E-05	Ra-226, Pb-210
Total Lifetime Cancer Risk														
	2.E-04	1.E-04	1.E-04	3.E-05	2.E-05	2.E-05	Ra-226, Pb-210	1.E-04	5.E-05	5.E-05	2.E-05	1.E-05	1.E-05	Ra-226, Pb-210
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	1.3	0.1	1.2	0.4	0.04	0.4	F, Cd	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.05	0.001	0.05	0.005	0.00009	0.004	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	2.1	0.1	1.9	0.3	0.02	0.2	Cd	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.001	0.00004	0.001	0.0009	0.00003	0.0009	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>1.5</u>	<u>0.6</u>	<u>1.0</u>	<u>1.0</u>	<u>0.4</u>	<u>0.7</u>	F, U	<u>0.2</u>	<u>0.08</u>	<u>0.1</u>	<u>0.2</u>	<u>0.07</u>	<u>0.1</u>	F
Total Non-Cancer Hazard Quotient	5.0	0.8	4.2	1.7	0.41	1.3	Cd, F	0.2	0.08	0.1	0.2	0.07	0.1	F

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-20

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 4
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
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Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs														
External Exposure to Gamma Radiation	4.E-05	2.E-05	2.E-05	8.E-06	4.E-06	4.E-06	Ra-226	2.E-06	1.E-06	9.E-07	3.E-07	1.E-07	1.E-07	-
Incidental Soil Ingestion	6.E-06	2.E-06	4.E-06	1.E-06	4.E-07	7.E-07	Pb-210	1.E-07	3.E-08	7.E-08	1.E-08	4.E-09	9.E-09	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	1.E-07	4.E-08	9.E-08	2.E-08	5.E-09	1.E-08	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>5.E-05</i>	<i>2.E-05</i>	<i>2.E-05</i>	<i>9.E-06</i>	<i>4.E-06</i>	<i>5.E-06</i>	<i>Ra-226, Pb-210</i>	<i>2.E-06</i>	<i>1.E-06</i>	<i>1.E-06</i>	<i>3.E-07</i>	<i>1.E-07</i>	<i>1.E-07</i>	-
Total Lifetime Cancer Risk	5.E-05	2.E-05	2.E-05	9.E-06	4.E-06	5.E-06	Ra-226, Pb-210	2.E-06	1.E-06	1.E-06	3.E-07	1.E-07	1.E-07	-
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>0.2</u>	<u>0.08</u>	<u>0.1</u>	<u>0.2</u>	<u>0.08</u>	<u>0.1</u>	F	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	0.2	0.08	0.1	0.2	0.08	0.1	F	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

BScr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-20

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 4
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 3 of 3)

Exposure Pathways	Exposure Scenario						
	Utility Worker						
	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs							
External Exposure to Gamma Radiation	2.E-07	8.E-08	7.E-08	3.E-08	1.E-08	1.E-08	-
Incidental Soil Ingestion	8.E-09	2.E-09	5.E-09	1.E-09	4.E-10	9.E-10	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	1.E-08	3.E-09	7.E-09	2.E-09	5.E-10	1.E-09	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>2.E-07</i>	<i>9.E-08</i>	<i>8.E-08</i>	<i>3.E-08</i>	<i>1.E-08</i>	<i>1.E-08</i>	-
Total Lifetime Cancer Risk							
	2.E-07	9.E-08	8.E-08	3.E-08	1.E-08	1.E-08	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

**TABLE 3-21
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 4
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 4		Parcel 4	
Measurement Endpoint Species	COPC	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.29	0.05	0.25	0.04
	Chromium	0.02	0.002	0.08	0.01	0.06	0.005
	Fluoride	0.08	0.05	0.36	0.21	0.28	0.17
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	0.004	NA	0.002	NA
	Selenium	0.01	0.01	0.05	0.05	0.04	0.03
	Vanadium	0.01	0.004	0.03	0.02	0.02	0.01
Pygmy Rabbit	Cadmium	0.04	0.01	0.30	0.05	0.26	0.04
	Chromium	0.02	0.001	0.07	0.01	0.05	0.004
	Fluoride	0.09	0.05	0.36	0.21	0.28	0.16
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	0.003	NA	0.002	NA
	Selenium	0.01	0.01	0.04	0.04	0.03	0.03
	Vanadium	0.01	0.004	0.02	0.01	0.02	0.01
Mule Deer	Cadmium	0.004	0.001	0.03	0.005	0.03	0.004
	Chromium	0.002	0.000	0.01	0.001	0.005	0.0004
	Fluoride	0.01	0.01	0.04	0.02	0.03	0.02
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	0.0003	NA	0.0002	NA
	Selenium	0.001	0.001	0.004	0.004	0.003	0.003
	Vanadium	0.001	0.0004	0.002	0.001	0.002	0.001
Coyote	Cadmium	0.007	0.001	0.08	0.01	0.07	0.01
	Chromium	0.004	0.0003	0.02	0.001	0.01	0.001
	Fluoride	0.04	0.02	0.26	0.16	0.22	0.13
	Lead	0.004	0.003	--	--	--	--
	Mercury	0.00002	NA	0.0001	NA	0.00003	NA
	Selenium	0.002	0.002	0.01	0.01	0.01	0.01
	Vanadium	0.001	0.001	0.004	0.003	0.003	0.002
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.27	0.04	0.22	0.03
	Chromium	0.02	0.002	0.09	0.01	0.06	0.005
	Fluoride	0.09	0.05	0.38	0.23	0.29	0.18
	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	0.004	NA	0.002	NA
	Selenium	0.01	0.01	0.05	0.04	0.04	0.03
	Vanadium	0.01	0.005	0.03	0.02	0.02	0.01
Zinc	0.02	0.02	0.04	0.03	0.01	0.01	

(B) Avian Hazard Quotient Summary

AVIAN		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 4		Parcel 4	
Measurement Endpoint Species	COPC	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.13	0.03	0.12	0.03
	Chromium	0.02	0.02	0.08	0.08	0.06	0.06
	Fluoride	0.20	0.05	1.15	0.28	0.96	0.23
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	0.0004	NA	0.0002	NA
	Selenium	0.005	0.004	0.02	0.01	0.01	0.01
	Vanadium	0.02	0.01	0.08	0.06	0.06	0.04
Red-Tailed Hawk	Cadmium	0.005	0.001	0.05	0.01	0.05	0.01
	Chromium	0.01	0.01	0.02	0.02	0.02	0.01
	Fluoride	0.20	0.05	1.30	0.32	1.11	0.27
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	0.00002	NA	0.00001	NA
	Selenium	0.001	0.001	0.004	0.003	0.003	0.003
	Vanadium	0.004	0.003	0.02	0.01	0.01	0.01
Bald Eagle	Cadmium	0.004	0.001	0.04	0.01	0.04	0.01
	Chromium	0.004	0.004	0.02	0.02	0.01	0.01
	Fluoride	0.15	0.04	1.01	0.25	0.85	0.21
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	0.00002	NA	0.00001	NA
	Selenium	0.001	0.001	0.003	0.003	0.003	0.002
	Vanadium	0.003	0.002	0.01	0.01	0.01	0.01
Horned Lark	Cadmium	0.02	0.01	0.17	0.04	0.14	0.03
	Chromium	0.03	0.03	0.11	0.11	0.08	0.08
	Fluoride	0.20	0.05	1.28	0.31	1.07	0.26
	Lead	0.10	0.01	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	0.04	0.03	0.03	0.02
	Vanadium	0.03	0.02	0.13	0.09	0.10	0.07
Zinc	0.03	0.02	0.04	0.03	0.02	0.01	

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 4	Parcel 4
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.29	0.23
	Chromium	PW	0.0001	0.0002	0.0002
	Fluoride	Plant	0.47	1.54	1.07
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.06	0.04
	Selenium	PW	0.16	0.64	0.48
	Vanadium	Plant	0.001	0.004	0.003
		PW	0.10	0.40	0.30
		Plant	0.02	0.09	0.07
		Zinc	Plant	0.22	0.25
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.12	0.07
	Chromium	PW	0.0001	0.0002	0.0002
	Fluoride	Plant	0.28	0.85	0.58
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.06	0.04
	Selenium	PW	0.16	0.64	0.48
	Vanadium	Plant	0.001	0.004	0.003
		PW	0.10	0.40	0.30
		Plant	0.02	0.09	0.07
		Zinc	Plant	0.07	0.08

TABLE 3-22a
 NORTHERN PARCEL 5 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV) ^a					3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV) ^b					-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL5-SSC001	PARCEL5-SSC001 (0-6)	11/17/2008	0 - 6	Soil	0.66 T,UB	4.6 B	19	35 B	1300	18	3.01 ± 0.73	350 B	0.04	1.73 ± 0.35	0.64 T,B	0.32 T	5.2 B	2.21 ± 0.47	55 B	150
PARCEL5-SSC002	PARCEL5-SSC002 (0-6)	11/18/2008	0 - 6	Soil	0.71 T,UB	4.5 B	18	36 B	1500 D	19	2.49 ± 0.61	350 B	0.047	1.64 ± 0.32	0.63 T,B	0.31 T	4.9 B	2.13 ± 0.47	56 B	140
PARCEL5-SSC003	PARCEL5-SSC003 (0-6)	11/18/2008	0 - 6	Soil	0.67 T,J-,UB	4.7 B	16 J-	37 B	1200	18	2.48 ± 0.61	350 B	0.035	1.96 ± 0.39	0.68 T,B	0.3 T	4.5 B	2.12 ± 0.47	56 J-,B	130 J-
PARCEL5-SSC003 Dup	PARCEL5-SSC203 (0-6)	11/18/2008	0 - 6	Soil	0.55 T,UB	4.1 B	14	29 B	1300	16	2.48 ± 0.61	350 B	0.034	1.72 ± 0.38	0.75 T,B	0.3 T	3.9 B	1.97 ± 0.44	46 B	120
Mean Concentration					0.66	4.5	17.3	34.7	1350	18.0	2.7	350	0.041	1.7	0.66	0.31	4.8	2.13	54.0	138
95% UCL on Mean Concentration					NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2.

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-3.

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-22b
NORTHERN PARCEL 5 SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL5-SSC001	PARCEL5-SSC001 (0-6)	11/17/2008	0 - 6	Soil	0.66 T,UB	4.6 B	19	35 B	1300	18	3.01 ± 0.73	350 B	0.04	1.73 ± 0.35	0.64 T,B	0.32 T	5.2 B	2.21 ± 0.47	55 B	150
PARCEL5-SSC002	PARCEL5-SSC002 (0-6)	11/18/2008	0 - 6	Soil	0.71 T,UB	4.5 B	18	36 B	1500 D	19	2.49 ± 0.61	350 B	0.047	1.64 ± 0.32	0.63 T,B	0.31 T	4.9 B	2.13 ± 0.47	56 B	140
PARCEL5-SSC003	PARCEL5-SSC003 (0-6)	11/18/2008	0 - 6	Soil	0.67 T,J-,UB	4.7 B	16 J-	37 B	1200	18	2.48 ± 0.61	350 B	0.035	1.96 ± 0.39	0.68 T,B	0.3 T	4.5 B	2.12 ± 0.47	56 J-,B	130 J-
PARCEL5-SSC003 Dup	PARCEL5-SSC203 (0-6)	11/18/2008	0 - 6	Soil	0.55 T,UB	4.1 B	14	29 B	1300	16	2.48 ± 0.61	350 B	0.034	1.72 ± 0.38	0.75 T,B	0.3 T	3.9 B	1.97 ± 0.44	46 B	120
Mean Concentration					0.66	4.5	17.3	34.7	1350	18.0	2.66	350	0.041	1.74	0.66	0.31	4.8	2.13	54.0	138
95% UCL on Mean Concentration					NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2.

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-23

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 5
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 3)

Exposure Pathways	Exposure Scenario													
	Resident (a)							Outdoor Commercial/Industrial Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	1.E-08	4.E-10	9.E-09	2.E-09	7.E-11	2.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total COPC Lifetime Cancer Risk	1.E-08	4.E-10	9.E-09	2.E-09	7.E-11	2.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	-
ROCs														
External Exposure to Gamma Radiation	1.E-04	9.E-05	4.E-05	3.E-05	1.E-05	1.E-05	Ra-226, U-238	7.E-05	5.E-05	2.E-05	2.E-05	1.E-05	8.E-06	Ra-226
Incidental Soil Ingestion	1.E-05	8.E-06	3.E-06	1.E-06	7.E-07	4.E-07	Pb-210	7.E-07	4.E-07	3.E-07	9.E-08	4.E-08	5.E-08	-
Ingestion of Homegrown Produce	1.E-05	5.E-06	5.E-06	3.E-06	1.E-06	1.E-06	Pb-210	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	4.E-09	2.E-09	1.E-09	5.E-10	3.E-10	2.E-10	-	7.E-09	4.E-09	3.E-09	2.E-09	8.E-10	1.E-09	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Total ROPC Lifetime Cancer Risk	2.E-04	1.E-04	5.E-05	3.E-05	2.E-05	1.E-05	Ra-226, Pb-210	7.E-05	5.E-05	2.E-05	2.E-05	1.E-05	8.E-06	Ra-226
Total Lifetime Cancer Risk														
2.E-04 1.E-04 5.E-05 3.E-05 2.E-05 1.E-05 Ra-226, Pb-210 7.E-05 5.E-05 2.E-05 2.E-05 1.E-05 8.E-06 Ra-226														
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	0.5	0.1	0.4	0.2	0.02	0.1	F, Cd	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.02	0.001	0.02	0.002	0.00009	0.002	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	0.7	0.1	0.6	0.1	0.02	0.1	Cd	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.0007	0.00004	0.0007	0.0005	0.00003	0.0004	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>1.2</u>	<u>0.5</u>	<u>0.7</u>	<u>0.7</u>	<u>0.3</u>	<u>0.4</u>	F, U	<u>0.2</u>	<u>0.06</u>	<u>0.1</u>	<u>0.2</u>	<u>0.06</u>	<u>0.1</u>	F
Total Non-Cancer Hazard Quotient	2.4	0.7	1.7	1.0	0.34	0.6	Cd, F	0.2	0.06	0.1	0.2	0.06	0.1	F

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-23

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 5
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 2 of 3)

Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs														
External Exposure to Gamma Radiation	3.E-05	2.E-05	9.E-06	7.E-06	4.E-06	3.E-06	Ra-226	BScr	BScr	BScr	BScr	BScr	BScr	-
Incidental Soil Ingestion	4.E-07	2.E-07	2.E-07	1.E-07	4.E-08	5.E-08	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>3.E-05</i>	<i>2.E-05</i>	<i>9.E-06</i>	<i>8.E-06</i>	<i>4.E-06</i>	<i>3.E-06</i>	<i>Ra-226</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
Total Lifetime Cancer Risk														
	3.E-05	2.E-05	9.E-06	8.E-06	4.E-06	3.E-06	Ra-226	BScr	BScr	BScr	BScr	BScr	BScr	-
Chronic and Subchronic Non-Cancer Hazard Quotient														
COCs														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>0.2</u>	<u>0.07</u>	<u>0.1</u>	<u>0.2</u>	<u>0.07</u>	<u>0.1</u>	F	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	0.2	0.07	0.1	0.2	0.07	0.1	F	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-23

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 5
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 3 of 3)

Exposure Pathways	Exposure Scenario						Risk Drivers*
	Utility Worker						
	RME			CTE			
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
ROCs							
External Exposure to Gamma Radiation	BScr	BScr	BScr	BScr	BScr	BScr	-
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
Total Lifetime Cancer Risk							
	BScr	BScr	BScr	BScr	BScr	BScr	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
COCs							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	NA	NA	NA	NA	NA	NA	-
Total Non-Cancer Hazard Quotient	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.

Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.

NA = Not an applicable exposure route for the receptor of concern.

* The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

**TABLE 3-24
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 5
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 5		Parcel 5	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.19	0.03	0.14	0.02
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.08	0.05	0.23	0.14	0.15	0.09
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	0.003	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.004	0.02	0.01	0.01	0.01
Pygmy Rabbit	Zinc	0.03	0.03	0.04	0.04	0.01	0.01
	Cadmium	0.04	0.01	0.19	0.03	0.15	0.02
	Chromium	0.02	0.001	--	--	--	--
	Fluoride	0.09	0.05	0.25	0.15	0.16	0.10
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	0.002	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
Mule Deer	Vanadium	0.01	0.004	0.02	0.01	0.01	0.01
	Zinc	0.02	0.02	0.03	0.03	0.01	0.01
	Cadmium	0.004	0.001	0.02	0.003	0.02	0.003
	Chromium	0.002	0.0001	--	--	--	--
	Fluoride	0.01	0.01	0.03	0.02	0.02	0.01
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	0.0002	NA	0.0001	NA
Coyote	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.001	0.0004	0.002	0.001	0.001	0.001
	Zinc	0.005	0.004	0.01	0.005	0.001	0.001
	Cadmium	0.007	0.001	0.04	0.01	0.03	0.01
	Chromium	0.004	0.0003	--	--	--	--
	Fluoride	0.04	0.02	0.14	0.09	0.10	0.06
	Lead	0.004	0.003	--	--	--	--
Townsend's Big Eared Bat	Mercury	0.00002	NA	0.00004	NA	0.00002	NA
	Selenium	0.002	0.002	--	--	--	--
	Vanadium	0.001	0.001	0.003	0.002	0.002	0.001
	Zinc	0.02	0.02	0.02	0.02	0.001	0.001
	Cadmium	0.05	0.01	0.18	0.03	0.12	0.02
	Chromium	0.02	0.002	--	--	--	--
	Fluoride	0.09	0.05	0.25	0.15	0.16	0.10
Townsend's Big Eared Bat	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	0.003	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.01	0.005	0.02	0.01	0.01	0.01
	Zinc	0.02	0.02	0.03	0.03	0.01	0.01

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 5		Parcel 5	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.07	0.02	0.06	0.01
	Chromium	0.02	0.02	--	--	--	--
	Fluoride	0.20	0.05	0.69	0.17	0.49	0.12
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	0.0003	NA	0.0001	NA
	Selenium	0.005	0.004	--	--	--	--
	Vanadium	0.02	0.01	0.05	0.04	0.03	0.02
Red-Tailed Hawk	Zinc	0.02	0.02	0.03	0.02	0.01	0.004
	Cadmium	0.005	0.001	0.03	0.01	0.02	0.005
	Chromium	0.01	0.01	--	--	--	--
	Fluoride	0.20	0.05	0.71	0.17	0.51	0.12
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.00001	NA
	Selenium	0.001	0.001	--	--	--	--
Bald Eagle	Vanadium	0.00	0.003	0.01	0.01	0.01	0.01
	Zinc	0.03	0.03	0.03	0.03	0.001	0.001
	Cadmium	0.004	0.001	0.02	0.005	0.02	0.004
	Chromium	0.004	0.004	--	--	--	--
	Fluoride	0.15	0.04	0.55	0.13	0.40	0.10
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	0.00001	NA	0.000005	NA
Horned Lark	Selenium	0.001	0.001	--	--	--	--
	Vanadium	0.003	0.002	0.01	0.01	0.01	0.004
	Zinc	0.03	0.02	0.03	0.02	0.001	0.001
	Cadmium	0.02	0.01	0.10	0.02	0.08	0.02
	Chromium	0.03	0.03	--	--	--	--
	Fluoride	0.20	0.05	0.73	0.18	0.53	0.13
	Lead	0.10	0.01	--	--	--	--
Horned Lark	Mercury	0.001	NA	0.001	NA	0.001	NA
	Selenium	0.01	0.01	--	--	--	--
	Vanadium	0.03	0.02	0.09	0.06	0.06	0.04
	Zinc	0.03	0.02	0.04	0.03	0.01	0.01

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 -- Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 5	Parcel 5
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.22	0.16
	Chromium	PW	0.0001	--	--
	Fluoride	Plant	0.47	1.20	0.72
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.04	0.02
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	0.27	0.17
		Plant	0.02	0.06	0.04
		Plant	0.22	0.24	0.01
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.10	0.05
	Chromium	PW	0.0001	--	--
	Fluoride	Plant	0.28	0.64	0.37
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.04	0.02
	Selenium	PW	0.16	--	--
	Vanadium	Plant	0.001	--	--
		PW	0.10	0.27	0.17
		Plant	0.02	0.06	0.04
		Plant	0.07	0.08	0.01

TABLE 3-25a
 NORTHERN PARCEL 6 SAMPLE DATA SUMMARY AND EVALUATION AGAINST ECOLOGICAL AND RESIDENTIAL COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Residential Human Health Comparative Value (CV)^a					3.4	10.7	7.7	294	772	424	2.5	890	2.3	0.97	39.3	0.64	5.3	1.66	58.6	2366
Ecological Comparative Value (CV)^b					-	28.4	1.1	39.9	302	34.9	-	-	0.023	-	0.8	-	-	-	27.4	112
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL6-SSC001	PARCEL6-SSC001 (0-2)	10/27/08	0 - 2	Soil	1.5 UB	4.9 B	47	82 B	5400 D,J-	31	9.1 ± 2.2	260 B	0.11	4.07 ± 0.76	1.9 T	0.57 T,B	17 B	6.1 ± 1.1	130 B	310 B
PARCEL6-SSC002	PARCEL6-SSC002 (0-2)	10/30/08	0 - 2	Soil	1.4 UB	4.9 B	46	85 B	5200 D,J-	33	7.6 ± 1.8	280 B	0.14	5.17 ± 0.95	1.8 T	0.59 T,B	17 B	8.1 ± 1.5	130 B	320 B
PARCEL6-SSC003	PARCEL6-SSC003 (0-2)	10/27/08	0 - 2	Soil	1.3 UB	6.7 B	42	78 B	4400 D,J-	31	7.5 ± 1.8	270 B	0.14	4.94 ± 0.92	1.8 T	0.55 T,B	15 B	6.8 ± 1.2	120 B	450 B
PARCEL6-SSC004	PARCEL6-SSC004 (0-2)	10/29/08	0 - 2	Soil	1.1 UB	4.4 B	37	69 B	4100 D,J-	31	7.3 ± 1.8	290 B	0.12	4.93 ± 0.91	1.6 T	0.52 T,B	13 B	6.2 ± 1.2 J-	110 B	270 B
PARCEL6-SSC005	PARCEL6-SSC005 (0-2)	10/30/08	0 - 2	Soil	1.5 UB	4.9 J,B	51 J	93 J,B	4900 D,J-	31	9.9 ± 2.4	310 J,B	0.12	5.24 ± 0.99	1.9 T,J	0.68 T,B	18 B	7.6 ± 1.4	140 J,B	330 J,B
PARCEL6-SSC006	PARCEL6-SSC006 (0-2)	10/30/08	0 - 2	Soil	1.7 J-,UB	5.4 J-,B	57 J	110 J-,B	5600 D,J-	41 J-	9.5 ± 2.3	300 J,B	0.14 J+	7 ± 1.3 J-	2 J-	0.74 T,B	21 B	8.2 ± 1.5 J-	160 J,B	370 J,B
PARCEL6-SSC006 Dup	PARCEL6-SSC206 (0-2)	10/30/08	0 - 2	Soil	1.6 UB	5.5 J,B	54 J	100 J,B	4400 D,J-	35	9.9 ± 2.4	300 J,B	0.13 J+	6.1 ± 1.1	1.9 T,J	0.72 T,B	20 B	6.9 ± 1.3	160 J,B	350 J,B
PARCEL6-SSC007	PARCEL6-SSC007 (0-2)	10/30/08	0 - 2	Soil	1.3 UB	4.5 B	42	72 B	4600 D,J-	30	6.9 ± 1.7	270 B	0.18	5.4 ± 1.0	1.6 T	0.53 T,B	15 B	5.8 ± 1.1	110 B	270 B
PARCEL6-SSC008	PARCEL6-SSC008 (0-2)	10/30/08	0 - 2	Soil	1.1 UB	5 B	40	80 B	3000 D,J-	27	7.2 ± 1.7	300 B	0.17	2.8 ± 0.55	1.6 T	0.55 T,B	15 B	6.5 ± 1.2	120 B	270 B
Mean Concentration					1.36	5.1	45.1	83.0	4575	31.5	8.2	285	0.139	4.9	1.77	0.59	16.3	6.83	127.5	323
95% UCL on Mean Concentration					NC	5.6	49.1	90.8	5087	33.6	9.0	297	0.156	5.6	1.87	0.64	17.9	7.39	138.7	363
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Residential Human Health Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	1.6	NA	NA	1.35	NA	NA	NA	1.77	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL6-SSC001	PARCEL6-SSC001 (2-6)	10/27/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.03 ± 0.75	NA	NA	1.86 ± 0.37	NA	NA	NA	2.03 ± 0.47	NA	NA
PARCEL6-SSC002	PARCEL6-SSC002 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.02 ± 0.74	NA	NA	1.3 ± 0.28	NA	NA	NA	2.43 ± 0.53	NA	NA
PARCEL6-SSC003	PARCEL6-SSC003 (2-6)	10/27/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.75 ± 0.68	NA	NA	1.89 ± 0.36	NA	NA	NA	2.84 ± 0.6	NA	NA
PARCEL6-SSC004	PARCEL6-SSC004 (2-6)	10/29/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.46 ± 0.61	NA	NA	1.37 ± 0.27	NA	NA	NA	2.16 ± 0.47	NA	NA
PARCEL6-SSC005	PARCEL6-SSC005 (2-6)	10/29/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.21 ± 0.54	NA	NA	2.12 ± 0.42	NA	NA	NA	1.99 ± 0.44	NA	NA
PARCEL6-SSC006	PARCEL6-SSC006 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.04 ± 0.52	NA	NA	0.77 ± 0.19	NA	NA	NA	1.92 ± 0.45	NA	NA
PARCEL6-SSC006 Dup	PARCEL6-SSC206 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.79 ± 0.44	NA	NA	1.48 ± 0.29	NA	NA	NA	1.97 ± 0.45	NA	NA
PARCEL6-SSC007	PARCEL6-SSC007 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.45 ± 0.60	NA	NA	1.44 ± 0.29	NA	NA	NA	2.27 ± 0.49	NA	NA
PARCEL6-SSC008	PARCEL6-SSC008 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.62 ± 0.65	NA	NA	1.07 ± 0.22	NA	NA	NA	2.12 ± 0.48	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.56	NA	NA	1.52	NA	NA	NA	2.22	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	2.81	NA	NA	1.78	NA	NA	NA	2.42	NA	NA

^a Residential human health CVs established as the 95% UCL on mean background concentration + residential soil screening level (SSL). Human health SSLs are presented in Table 3-2

^b Ecological CVs established as the 95% UCL on mean background concentration + ecological SSL, if available. Ecological SSLs are presented in Table 3-2

- Constituent not considered to be a COPC.

Mean concentration exceeds both human health and ecological CVs.

Mean concentration exceeds the human health CV.

Mean concentration exceeds the ecological CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-25b
 NORTHERN PARCEL 6 SAMPLE DATA SUMMARY AND EVALUATION AGAINST WORKER COMPARATIVE VALUES
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 1)

Analyte					Antimony	Arsenic	Cadmium	Chromium	Total Fluoride	Lead	Lead-210	Manganese	Mercury	Radium-226	Selenium	Thallium	Uranium	Uranium-238	Vanadium	Zinc
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	pCi/g	mg/kg	mg/kg
0 - 2" Soil Background (95% UCL on Mean)					0.28	10.4	0.72	13.9	302	23.9	2.0	710	0.023	0.95	0.30	0.13	0.66	0.88	19.6	66.5
Commercial/Industrial Worker Comparative Value (CV)^a					454	12.1	860	1000000	68396	824	3.0	24248	340	0.98	5675	77.3	682	2.3	7969	340533
Construction Worker Comparative Value (CV)^a					105	24.9	82.0	550743	33346	824	9.5	77,812	464	1.9	2,754	375	251	21.5	3523	165,285
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL6-SSC001	PARCEL6-SSC001 (0-2)	10/27/08	0 - 2	Soil	1.5 UB	4.9 B	47	82 B	5400 D,J-	31	9.1 ± 2.2	260 B	0.11	4.07 ± 0.76	1.9 T	0.57 T,B	17 B	6.1 ± 1.1	130 B	310 B
PARCEL6-SSC002	PARCEL6-SSC002 (0-2)	10/30/08	0 - 2	Soil	1.4 UB	4.9 B	46	85 B	5200 D,J-	33	7.6 ± 1.8	280 B	0.14	5.17 ± 0.95	1.8 T	0.59 T,B	17 B	8.1 ± 1.5	130 B	320 B
PARCEL6-SSC003	PARCEL6-SSC003 (0-2)	10/27/08	0 - 2	Soil	1.3 UB	6.7 B	42	78 B	4400 D,J-	31	7.5 ± 1.8	270 B	0.14	4.94 ± 0.92	1.8 T	0.55 T,B	15 B	6.8 ± 1.2	120 B	450 B
PARCEL6-SSC004	PARCEL6-SSC004 (0-2)	10/29/08	0 - 2	Soil	1.1 UB	4.4 B	37	69 B	4100 D,J-	31	7.3 ± 1.8	290 B	0.12	4.93 ± 0.91	1.6 T	0.52 T,B	13 B	6.2 ± 1.2 J-	110 B	270 B
PARCEL6-SSC005	PARCEL6-SSC005 (0-2)	10/30/08	0 - 2	Soil	1.5 UB	4.9 J,B	51 J	93 J,B	4900 D,J-	31	9.9 ± 2.4	310 J,B	0.12	5.24 ± 0.99	1.9 T,J	0.68 T,B	18 B	7.6 ± 1.4	140 J,B	330 J,B
PARCEL6-SSC006	PARCEL6-SSC006 (0-2)	10/30/08	0 - 2	Soil	1.7 J-UB	5.4 J-,B	57 J	110 J-,B	5600 D,J-	41 J-	9.5 ± 2.3	300 J,B	0.14 J+	7 ± 1.3 J-	2 J-	0.74 T,B	21 B	8.2 ± 1.5 J-	160 J,B	370 J,B
PARCEL6-SSC006 Dup	PARCEL6-SSC206 (0-2)	10/30/08	0 - 2	Soil	1.6 UB	5.5 J,B	54 J	100 J,B	4400 D,J-	35	9.9 ± 2.4	300 J,B	0.13 J+	6.1 ± 1.1	1.9 T,J	0.72 T,B	20 B	6.9 ± 1.3	160 J,B	350 J,B
PARCEL6-SSC007	PARCEL6-SSC007 (0-2)	10/30/08	0 - 2	Soil	1.3 UB	4.5 B	42	72 B	4600 D,J-	30	6.9 ± 1.7	270 B	0.18	5.4 ± 1.0	1.6 T	0.53 T,B	15 B	5.8 ± 1.1	110 B	270 B
PARCEL6-SSC008	PARCEL6-SSC008 (0-2)	10/30/08	0 - 2	Soil	1.1 UB	5 B	40	80 B	3000 D,J-	27	7.2 ± 1.7	300 B	0.17	2.8 ± 0.55	1.6 T	0.55 T,B	15 B	6.5 ± 1.2	120 B	270 B
Mean Concentration					1.36	5.1	45.1	83.0	4575	31.5	8.2	285	0.139	4.9	1.77	0.59	16.3	6.83	127.5	323
95% UCL on Mean Concentration					NC	5.6	49.1	90.8	5087	33.6	9.0	297	0.156	5.6	1.87	0.64	17.9	7.39	138.7	363
2 - 6" Soil Background (95% UCL on Mean)					NA	NA	NA	NA	NA	NA	1.2	NA	NA	1.34	NA	NA	NA	1.00	NA	NA
Commercial/Industrial Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	2.1	NA	NA	1.36	NA	NA	NA	2.4	NA	NA
Construction Worker Comparative Value (CV)^a					NA	NA	NA	NA	NA	NA	8.6	NA	NA	2.3	NA	NA	NA	21.6	NA	NA
Location Identification	Field Sample Identification	Date Collected	Depth (in)	Matrix																
PARCEL6-SSC001	PARCEL6-SSC001 (2-6)	10/27/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.03 ± 0.75	NA	NA	1.86 ± 0.37	NA	NA	NA	2.03 ± 0.47	NA	NA
PARCEL6-SSC002	PARCEL6-SSC002 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	3.02 ± 0.74	NA	NA	1.3 ± 0.28	NA	NA	NA	2.43 ± 0.53	NA	NA
PARCEL6-SSC003	PARCEL6-SSC003 (2-6)	10/27/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.75 ± 0.68	NA	NA	1.89 ± 0.36	NA	NA	NA	2.84 ± 0.6	NA	NA
PARCEL6-SSC004	PARCEL6-SSC004 (2-6)	10/29/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.46 ± 0.61	NA	NA	1.37 ± 0.27	NA	NA	NA	2.16 ± 0.47	NA	NA
PARCEL6-SSC005	PARCEL6-SSC005 (2-6)	10/29/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.21 ± 0.54	NA	NA	2.12 ± 0.42	NA	NA	NA	1.99 ± 0.44	NA	NA
PARCEL6-SSC006	PARCEL6-SSC006 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.04 ± 0.52	NA	NA	0.77 ± 0.19	NA	NA	NA	1.92 ± 0.45	NA	NA
PARCEL6-SSC006 Dup	PARCEL6-SSC206 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	1.79 ± 0.44	NA	NA	1.48 ± 0.29	NA	NA	NA	1.97 ± 0.45	NA	NA
PARCEL6-SSC007	PARCEL6-SSC007 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.45 ± 0.60	NA	NA	1.44 ± 0.29	NA	NA	NA	2.27 ± 0.49	NA	NA
PARCEL6-SSC008	PARCEL6-SSC008 (2-6)	10/30/08	2 - 6	Soil	NA	NA	NA	NA	NA	NA	2.62 ± 0.65	NA	NA	1.07 ± 0.22	NA	NA	NA	2.12 ± 0.48	NA	NA
Mean Concentration					NA	NA	NA	NA	NA	NA	2.56	NA	NA	1.52	NA	NA	NA	2.22	NA	NA
95% UCL on Mean Concentration					NA	NA	NA	NA	NA	NA	2.81	NA	NA	1.78	NA	NA	NA	2.42	NA	NA

^a Worker CVs established as the 95% UCL on mean background concentration + worker soil screening level (SSL). Worker SSLs are presented in Table 3-2

- Constituent not considered to be a COPC.

Mean concentration exceeds both the commercial/industrial worker and construction worker CVs.

Mean concentration exceeds the commercial/industrial worker CV.

Mean concentration exceeds the construction worker CV.

Bold Bolded result indicates positively identified compound.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

NA Not analyzed.

NC Detection frequency too low to calculate a 95% UCL on the mean using ProUCL software.

B Analyte detected in an associated blank.

J Data are estimated due to associated quality control data.

J- Data are estimated, potentially biased low due to associated quality control data.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

UB Analyte considered not detected based on associated blank data.

TABLE 3-26

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 6
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 1 of 3)

Exposure Pathways	Exposure Scenario														
	Resident (a)							Outdoor Commercial/Industrial Worker							
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*	
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc		
Lifetime Cancer Risk															
COCs															
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	BScr	BScr	BScr	BScr	BScr	BScr	-	NA	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	3.E-08	4.E-10	3.E-08	5.E-09	7.E-11	5.E-09	-	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>5.E-04</u>	<u>1.E-04</u>	<u>3.E-04</u>	<u>7.E-05</u>	<u>2.E-05</u>	<u>4.E-05</u>	As	<u>1.E-04</u>	<u>3.E-05</u>	<u>7.E-05</u>	<u>2.E-05</u>	<u>7.E-06</u>	<u>1.E-05</u>	As	
<i>Total COPC Lifetime Cancer Risk</i>	<i>5.E-04</i>	<i>1.E-04</i>	<i>3.E-04</i>	<i>7.E-05</i>	<i>2.E-05</i>	<i>4.E-05</i>	As	<i>1.E-04</i>	<i>3.E-05</i>	<i>7.E-05</i>	<i>2.E-05</i>	<i>7.E-06</i>	<i>1.E-05</i>	As	
ROCs															
External Exposure to Gamma Radiation	3.E-04	9.E-05	2.E-04	5.E-05	1.E-05	3.E-05	Ra-226, U-238	1.E-04	5.E-05	9.E-05	3.E-05	1.E-05	2.E-05	Ra-226, U-238	
Incidental Soil Ingestion	4.E-05	8.E-06	3.E-05	3.E-06	7.E-07	3.E-06	Pb-210, Ra-226	2.E-05	4.E-06	1.E-05	2.E-06	4.E-07	2.E-06	Pb-210, Ra-226	
Ingestion of Homegrown Produce	2.E-05	5.E-06	1.E-05	5.E-06	1.E-06	3.E-06	Pb-210	NA	NA	NA	NA	NA	NA	-	
Fugitive Dust Inhalation	1.E-08	2.E-09	1.E-08	2.E-09	3.E-10	1.E-09	-	9.E-08	2.E-08	7.E-08	2.E-08	4.E-09	2.E-08	-	
<u>Ingestion of Groundwater</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	-	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	-	
<i>Total ROPC Lifetime Cancer Risk</i>	<i>3.E-04</i>	<i>1.E-04</i>	<i>2.E-04</i>	<i>6.E-05</i>	<i>2.E-05</i>	<i>4.E-05</i>	<i>Ra-226, Pb-210</i>	<i>2.E-04</i>	<i>5.E-05</i>	<i>1.E-04</i>	<i>3.E-05</i>	<i>1.E-05</i>	<i>2.E-05</i>	<i>Ra-226, Pb-210</i>	
Total Lifetime Cancer Risk	8.E-04	2.E-04	6.E-04	1.E-04	4.E-05	8.E-05	As, Ra-226	3.E-04	8.E-05	2.E-04	6.E-05	2.E-05	4.E-05	Ra-226, As	
Chronic and Subchronic Non-Cancer Hazard Quotient															
COCs															
Incidental Soil Ingestion	2.3	0.1	2.2	0.7	0.04	0.7	F, Cd	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	0.07	0.001	0.07	0.006	0.00009	0.006	-	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	7.0	0.1	6.9	0.9	0.02	0.8	Cd	NA	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	0.002	0.00004	0.002	0.001	0.00003	0.001	-	BScr	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>5.6</u>	<u>2.0</u>	<u>3.7</u>	<u>2.8</u>	<u>0.9</u>	<u>1.9</u>	As, F	<u>0.8</u>	<u>0.3</u>	<u>0.5</u>	<u>0.6</u>	<u>0.2</u>	<u>0.4</u>	As	
Total Non-Cancer Hazard Quotient	15.1	2.2	12.9	4.4	0.99	3.4	Cd, As	0.8	0.3	0.5	0.6	0.2	0.4	As	

Notes:

- a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.
- Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.
- NA = Not an applicable exposure route for the receptor of concern.
- * The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-26

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 6
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 2 of 3)

Exposure Pathways	Exposure Scenario													
	Indoor Commercial/Industrial Worker							Construction Worker						
	RME			CTE			Risk Drivers*	RME			CTE			Risk Drivers*
	Total	Bkgd	Inc	Total	Bkgd	Inc		Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk														
<u>COCs</u>														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>1.E-04</u>	<u>3.E-05</u>	<u>8.E-05</u>	<u>2.E-05</u>	<u>8.E-06</u>	<u>1.E-05</u>	As	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>1.E-04</i>	<i>3.E-05</i>	<i>8.E-05</i>	<i>2.E-05</i>	<i>8.E-06</i>	<i>1.E-05</i>	As	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
<u>ROCs</u>														
External Exposure to Gamma Radiation	6.E-05	2.E-05	4.E-05	1.E-05	4.E-06	9.E-06	Ra-226	3.E-06	1.E-06	2.E-06	4.E-07	1.E-07	3.E-07	Ra-226
Incidental Soil Ingestion	9.E-06	2.E-06	7.E-06	2.E-06	4.E-07	2.E-06	Pb-210, Ra-226	2.E-07	3.E-08	1.E-07	2.E-08	4.E-09	2.E-08	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	2.E-07	4.E-08	2.E-07	3.E-08	5.E-09	3.E-08	-
<u>Ingestion of Groundwater</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	<u>BScr</u>	-	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>7.E-05</i>	<i>2.E-05</i>	<i>5.E-05</i>	<i>2.E-05</i>	<i>4.E-06</i>	<i>1.E-05</i>	<i>Ra-226, Pb-210</i>	<i>4.E-06</i>	<i>1.E-06</i>	<i>2.E-06</i>	<i>5.E-07</i>	<i>1.E-07</i>	<i>3.E-07</i>	<i>Ra-226</i>
Total Lifetime Cancer Risk	2.E-04	6.E-05	1.E-04	4.E-05	1.E-05	3.E-05	As, Ra-226	4.E-06	1.E-06	2.E-06	5.E-07	1.E-07	3.E-07	Ra-226
Chronic and Subchronic Non-Cancer Hazard Quotient														
<u>COCs</u>														
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	NA	NA	NA	NA	NA	NA	-	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>0.9</u>	<u>0.3</u>	<u>0.6</u>	<u>0.6</u>	<u>0.2</u>	<u>0.4</u>	As	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
Total Non-Cancer Hazard Quotient	0.9	0.3	0.6	0.6	0.2	0.4	As	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

- a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.
- Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.
- NA = Not an applicable exposure route for the receptor of concern.
- * The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

TABLE 3-26

SUMMARY OF POTENTIAL HUMAN HEALTH RISKS TO FUTURE RECEPTORS IN NORTHERN PROPERTIES PARCEL 6
 SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
 FMC Corporation, Pocatello, Idaho
 (Page 3 of 3)

Exposure Pathways	Exposure Scenario						Risk Drivers*
	Utility Worker						
	RME			CTE			
	Total	Bkgd	Inc	Total	Bkgd	Inc	
Lifetime Cancer Risk							
<u>COCs</u>							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	NA	BScr	BScr	NA	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
<i>Total COPC Lifetime Cancer Risk</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	<i>BScr</i>	-
<u>ROCs</u>							
External Exposure to Gamma Radiation	2.E-07	8.E-08	2.E-07	4.E-08	1.E-08	3.E-08	-
Incidental Soil Ingestion	1.E-08	2.E-09	1.E-08	2.E-09	4.E-10	2.E-09	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	2.E-08	3.E-09	1.E-08	3.E-09	5.E-10	3.E-09	-
<u>Ingestion of Groundwater</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
<i>Total ROPC Lifetime Cancer Risk</i>	<i>3.E-07</i>	<i>9.E-08</i>	<i>2.E-07</i>	<i>5.E-08</i>	<i>1.E-08</i>	<i>3.E-08</i>	-
Total Lifetime Cancer Risk	3.E-07	9.E-08	2.E-07	5.E-08	1.E-08	3.E-08	-
Chronic and Subchronic Non-Cancer Hazard Quotient							
<u>COCs</u>							
Incidental Soil Ingestion	BScr	BScr	BScr	BScr	BScr	BScr	-
Dermal Absorption	BScr	BScr	BScr	BScr	BScr	BScr	-
Ingestion of Homegrown Produce	NA	NA	NA	NA	NA	NA	-
Fugitive Dust Inhalation	BScr	BScr	BScr	BScr	BScr	BScr	-
<u>Ingestion of Groundwater</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	-
Total Non-Cancer Hazard Quotient	BScr	BScr	BScr	BScr	BScr	BScr	-

Notes:

- a) Residential cancer risks representative of an age-integrated child/adult receptor. Residential non-cancer risks based on a child receptor.
- Bscr = COC/ROC concentrations within this parcel are below screening levels for the receptor of concern.
- NA = Not an applicable exposure route for the receptor of concern.
- * The two COCs/ROCs most significantly exceeding an incremental cancer risk of 1E-06 or incremental hazard index of 0.1 for each exposure pathway are identified.

**TABLE 3-27
ECOLOGICAL HAZARD QUOTIENT SUMMARY FOR PARCEL 6
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)**

(A) Mammalian Hazard Quotient Summary

MAMMALIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 6		Parcel 6	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Deer Mouse	Cadmium	0.05	0.01	0.37	0.06	0.32	0.05
	Chromium	0.02	0.002	0.15	0.01	0.12	0.01
	Fluoride	0.08	0.05	0.58	0.35	0.50	0.30
	Lead	0.04	0.03	--	--	--	--
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.08	0.07	0.07	0.06
	Vanadium	0.01	0.004	0.05	0.03	0.04	0.03
	Zinc	0.03	0.03	0.05	0.05	0.02	0.02
Pygmy Rabbit	Cadmium	0.04	0.01	0.37	0.06	0.33	0.05
	Chromium	0.02	0.001	0.12	0.01	0.10	0.01
	Fluoride	0.09	0.05	0.55	0.33	0.46	0.28
	Lead	0.03	0.02	--	--	--	--
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.06	0.05	0.05	0.05
	Vanadium	0.01	0.004	0.04	0.03	0.04	0.02
	Zinc	0.02	0.02	0.04	0.04	0.02	0.02
Mule Deer	Cadmium	0.004	0.001	0.04	0.01	0.03	0.01
	Chromium	0.002	0.0001	0.01	0.001	0.01	0.001
	Fluoride	0.01	0.01	0.06	0.03	0.05	0.03
	Lead	0.004	0.002	--	--	--	--
	Mercury	0.0001	NA	0.001	NA	0.001	NA
	Selenium	0.001	0.001	0.01	0.01	0.005	0.005
	Vanadium	0.001	0.0004	0.004	0.003	0.004	0.002
	Zinc	0.005	0.004	0.01	0.01	0.002	0.002
Coyote	Cadmium	0.007	0.001	0.10	0.02	0.10	0.02
	Chromium	0.004	0.0003	0.03	0.002	0.02	0.002
	Fluoride	0.04	0.02	0.51	0.30	0.47	0.28
	Lead	0.004	0.003	--	--	--	--
	Mercury	0.00002	NA	0.0001	NA	0.0001	NA
	Selenium	0.002	0.002	0.01	0.01	0.01	0.01
	Vanadium	0.001	0.001	0.01	0.004	0.01	0.004
	Zinc	0.02	0.02	0.03	0.02	0.003	0.003
Townsend's Big Eared Bat	Cadmium	0.05	0.01	0.34	0.05	0.29	0.05
	Chromium	0.02	0.002	0.15	0.01	0.13	0.01
	Fluoride	0.09	0.05	0.61	0.36	0.52	0.31
	Lead	0.05	0.04	--	--	--	--
	Mercury	0.001	NA	0.01	NA	0.01	NA
	Selenium	0.01	0.01	0.07	0.07	0.06	0.06
	Vanadium	0.01	0.005	0.06	0.03	0.05	0.03
	Zinc	0.02	0.02	0.04	0.04	0.02	0.02

Notes:

Hazard Quotients above 1 are shaded.
 IHQ = Incremental Hazard Quotient
 NOAEL IHQ = No Observed Adverse Effects Level Incremental Hazard Quotient
 LOAEL IHQ = Lowest Observed Adverse Effects Level Incremental Hazard Quotient
 NA - No TRV available
 '-' Not evaluated. Soil concentration below the CV as defined in SRI Field Modifications 13 & 14.
 Plant TRV Basis - Toxicity based on plant concentration
 PW TRV Basis - Toxicity based on pore water concentration

(B) Avian Hazard Quotient Summary

AVIAN Measurement Endpoint Species		Total Hazard Quotients				Incremental Hazard Quotients	
		BKGD		Parcel 6		Parcel 6	
		NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL IHQ	LOAEL IHQ
Sage Grouse	Cadmium	0.01	0.002	0.17	0.04	0.16	0.04
	Chromium	0.02	0.02	0.14	0.14	0.12	0.12
	Fluoride	0.20	0.05	2.05	0.50	1.85	0.45
	Lead	0.08	0.01	--	--	--	--
	Mercury	0.0001	NA	0.001	NA	0.001	NA
	Selenium	0.005	0.004	0.03	0.02	0.02	0.02
	Vanadium	0.02	0.01	0.14	0.10	0.12	0.08
	Zinc	0.02	0.02	0.04	0.03	0.02	0.02
Red-Tailed Hawk	Cadmium	0.005	0.001	0.07	0.02	0.06	0.01
	Chromium	0.01	0.01	0.04	0.03	0.03	0.03
	Fluoride	0.20	0.05	2.54	0.62	2.34	0.57
	Lead	0.02	0.002	--	--	--	--
	Mercury	0.00001	NA	0.0001	NA	0.00005	NA
	Selenium	0.001	0.001	0.01	0.01	0.01	0.005
	Vanadium	0.004	0.003	0.03	0.02	0.03	0.02
	Zinc	0.03	0.03	0.04	0.03	0.005	0.004
Bald Eagle	Cadmium	0.004	0.001	0.05	0.01	0.05	0.01
	Chromium	0.004	0.004	0.03	0.03	0.02	0.02
	Fluoride	0.15	0.04	1.96	0.48	1.80	0.44
	Lead	0.01	0.001	--	--	--	--
	Mercury	0.00001	NA	0.00004	NA	0.00004	NA
	Selenium	0.001	0.001	0.01	0.004	0.004	0.003
	Vanadium	0.003	0.002	0.02	0.02	0.02	0.01
	Zinc	0.03	0.02	0.03	0.02	0.004	0.003
Horned Lark	Cadmium	0.02	0.01	0.21	0.05	0.19	0.04
	Chromium	0.03	0.03	0.20	0.19	0.17	0.16
	Fluoride	0.20	0.05	2.35	0.57	2.15	0.52
	Lead	0.10	0.01	--	--	--	--
	Mercury	0.001	NA	0.005	NA	0.004	NA
	Selenium	0.01	0.01	0.06	0.04	0.05	0.04
	Vanadium	0.03	0.02	0.22	0.16	0.19	0.13
	Zinc	0.03	0.02	0.05	0.04	0.03	0.02

(C) Plant Hazard Quotient Summary

Measurement Endpoint Species	COPC	TRV Basis	BKGD	Parcel 6	Parcel 6
			HQ	HQ	IHQ
Sagebrush (unwashed)	Cadmium	Plant	0.06	0.34	0.28
	Chromium	PW	0.0001	0.00	0.0004
	Fluoride	Plant	0.47	1.92	1.44
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.16	0.14
	Selenium	PW	0.16	0.99	0.83
		Plant	0.001	0.01	0.01
	Vanadium	PW	0.10	0.69	0.60
		Plant	0.02	0.15	0.13
		Zinc	Plant	0.22	0.25
Thickspike Wheatgrass (unwashed)	Cadmium	Plant	0.05	0.13	0.08
	Chromium	PW	0.0001	0.00	0.0004
	Fluoride	Plant	0.28	1.10	0.82
	Lead	PW	0.01	--	--
	Mercury	PW	0.02	0.16	0.14
	Selenium	PW	0.16	0.99	0.83
		Plant	0.001	0.01	0.01
	Vanadium	PW	0.10	0.69	0.60
		Plant	0.02	0.15	0.13
		Zinc	Plant	0.07	0.09

TABLE 3-28
SUMMARY OF SRI ADDENDUM SAMPLING LOCATIONS AND EPA IN SITU RESULTS
SUPPLEMENTAL REMEDIAL INVESTIGATION - ADDENDUM
FMC Corporation, Pocatello, Idaho
(Page 1 of 1)

EPA Location #	EPA Description	FMC Comment	FMC Sample ID	Soil Sample Type	SRI Addendum Laboratory Results		EPA In-situ Results ¹		SRI Addendum Laboratory Results		EPA In-situ Results ²	
					Ra-226	Ra-226	Bi-214 ⁴		U-238	U-238	Pa-234m ⁵	
					pCi/g 0-2 inch	pCi/g 2-6 inch	pCi/g	± 2 SD	pCi/g 0-2 inch	pCi/g 2-6 inch	pCi/g	± 2 SD
1	slag asphalt road south of Rainbow Road background area	no FMC pt for comparison	--	--	--	--	21.9	1.8	--	--	16.4	3.8
2	flagged and sampled location in Rainbow Road background area		RRE1BCK1-SSD	discrete	0.28 ± 0.1	0.47 ± 0.13	1.3	0.2	⁶ 0.8 ± 0.22	0.9 ± 0.31	<4.0	--
3	2nd location Rainbow Road background area		RRE2BCK2-SSD	discrete	0.67 ± 0.15	0.82 ± 0.18	1.0	0.2	⁶ 0.78 ± 0.23	0.72 ± 0.22	<4.0	--
4	Parcel 4, flag 4NP7-3		PARCEL4-SSC007 ²	composite	3.81 ± 0.71	1.32 ± 0.27	4.0	0.2	3.54 ± 0.72	1.46 ± 0.36	4.1	2.2
5	Parcel 4, flag 4NP7-17		PARCEL4-SSC007 ²	composite	3.81 ± 0.71	1.32 ± 0.27	3.0	0.1	3.54 ± 0.72	1.46 ± 0.36	4.5	1.1
6	Parcel 6, flag 6NP3-6		PARCEL6-SSC003 ²	composite	4.94 ± 0.92	1.89 ± 0.36	4.5	2.6	⁶ 6.8 ± 1.2	2.84 ± 0.6	<4.0	--
7	Parcel 6, south end of parcel	near flag 6NP6-1	PARCEL6-SSC006 ^{2,3}	composite	7 ± 1.3 J-	8.2 ± 1.5 J-	6.2	0.5	0.77 ± 0.19	1.92 ± 0.45	7.7	1.5
8	Parcel 6, flag 6NP4-5		PARCEL6-SSC004 ²	composite	4.93 ± 0.91	1.37 ± 0.27	2.2	0.2	⁶ 6.2 ± 1.2 J-	2.16 ± 0.47	<4.0	--
9	Parcel 1, flag 1NP2-8		PARCEL1-SSC002 ²	composite	1.47 ± 0.32	1.52 ± 0.32	4.0	0.2	2.69 ± 0.55	1.23 ± 0.31	4.7	2.0
10	Parcel 1, flag 1NP4-1		PARCEL1-SSC004 ³	composite	1.6 ± 0.32	1.34 ± 0.29	1.5	0.1	⁶ 2.14 ± 0.47	1.25 ± 0.32	<4.0	--
11	Parcel 2, flag 2NP1-5		PARCEL2-SSC001 ²	composite	6.7 ± 1.2	1.49 ± 0.31	7.3	0.5	8.8 ± 1.6	4.96 ± 0.96	8.2	1.8
12	Parcel 2, flag 2NP2-12		PARCEL2-SSC002 ²	composite	4.94 ± 0.92	1.86 ± 0.38	8.3	0.7	6.3 ± 1.2	2.78 ± 0.6	9.7	0.7
13	slag asphalt lot adjacent to Parcel 1	no FMC pt for comparison	--	--	--	--	25.6	2.0	--	--	26.7	2.4
14	Parcel 3, north of Simplot, west of employee parking lot	near flag 3NP6-9	PARCEL3-SSC006 ^{2,3}	composite	14 ± 2.5	2.3 ± 0.47	9.6	0.8	14.5 ± 2.5	4.36 ± 0.83	10.0	3.3
15	Parcel 3, north of Simplot, adjacent to I-86 on-ramp	near flag 3NP8-17	PARCEL3-SSC008 ^{2,3}	composite	7.3 ± 1.3 J-	3.47 ± 0.65	6.7	0.5	14.3 ± 2.5	4.59 ± 0.9	9.6	3.3
16	China Peak trailhead background area		BLRK1BCK5-SSD	discrete	0.62 ± 0.17	0.6 ± 0.15	1.1	0.2	⁶ 0.72 ± 0.26	0.97 ± 0.27	<4.0	--
17	Barton and Wildlife Roads background area		REDHBCK8-SSD	discrete	0.80 ± 0.18	0.37 ± 0.12	1.0	0.2	⁶ 0.76 ± 0.22	0.82 ± 0.24	<4.0	--
18	Pocatello Creek Road background area		PCRBCK3-SSD	discrete	0.84 ± 0.2	<0.2	0.8	0.2	⁶ 0.92 ± 0.27	0.72 ± 0.22	<4.0	--

Notes:

¹ Depth interval unknown

³ FMC samples are a composite of 20 discrete soil sample locations

³ FMC selected the FMC sample point closest to the EPA location for comparison

⁴ From Table 3, Dry Concentrations From Corrected In-Situ Results, *Demonstration of High Resolution In-Situ Gamma-Ray Spectrometry at the Northern FMC-Owned Properties, Eastern Michaud Flats, Pocatello, Idaho*

⁵ From Table 5, Dry Concentrations of Bi-214 and Pa-234m above MDC, *Demonstration of High Resolution In-Situ Gamma-Ray Spectrometry at the Northern FMC-Owned Properties, Eastern Michaud Flats, Pocatello, Idaho*

⁶ Data are not reported in Table 5, Dry Concentrations of Bi-214 and Pa-234m above MDC

pCi/g - picocuries per gram

Ra-226 - radium-226

Bi-214 - bismuth-214 (surrogate for Ra-226)

U-238 - uranium-238

Pa-234 - protactinium-234 (surrogate for U-238)

Section 4

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 INTRODUCTION

This section summarizes the investigation findings for the 2008 field work, as outlined in the field modifications that guided these activities, and recommends a path forward in the SRI/SFS process for the: 1) Southern and Western Undeveloped Areas and 2) Parcels 1 through 6 of the Northern Properties of the FMC Plant OU.

Below, Section 4.2 sets forth the 2008 SRI Addendum general conclusions followed by site-specific findings/conclusions for the individual areas/parcels that have been discussed throughout this report. The discussion for each area/parcel is organized as follows: Nature and Extent of Contamination, Risk to Human Health and the Environment, and Information to Support the SFS.

Finally, Section 4.3 presents the recommendations based on the investigation findings.

4.2 CONCLUSIONS

4.2.1 General Conclusions

The results discussed in Section 3 corroborate one primary and two supporting general 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, to a lesser extent, stack emissions from past FMC and past/current Simplot manufacturing operations. Only radionuclides were sampled at both 0-to-2 inch bgs and 2-to-6 inch bgs sampling intervals. In every instance, the concentrations of the target radionuclides detected in soil samples collected from the 2-to-6 inch bgs interval were less than the concentrations of COCs detected in the shallower 0-to-2 inch bgs sampling interval. The metals and fluoride concentrations would be expected to follow the same trend had they been analyzed for the 2 to 6 inch bgs interval. In soil samples collected from deeper intervals, such as in Parcel 3, subsurface samples collected from 0-to-10 feet bgs interval were well below the screening CVs and comparable to background concentrations.

The second conclusion, which supports the first finding, is that parcels located directly in the prevailing downwind direction from 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). Figure 4-1 depicts the SUA, WUA, Parcels 1 through 6 of the Northern Properties, and Simplot's location relative to the FMC plant site and has an inset wind-rose diagram.

Finally, 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 and specifically the former dry ore handling operations at both FMC and Simplot, 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). Specifics for these findings are further discussed on an area/parcel-specific basis in the following subsections.

4.2.2 Southern Undeveloped Area

Nature and Extent of Contamination. SRI Addendum findings for the SUA indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. Other than slag that is present on dirt roads in a limited portion the SUA, which are comparable and included in RU 23 Roadways, the only potential impact from EMF site operations has been from historical deposition of FMC plant stack and fugitive emissions, along with deposition of historic and current stack and fugitive emissions from the Simplot plant. These impacts have been characterized by the surface composite soil samples collected across the area. No constituents exceeded the site worker CVs; however, cadmium, total fluoride, mercury, and vanadium exceeded their respective ecological CVs as discussed in Section 3.3.3. These constituents were further evaluated in the Supplemental ERA as discussed below.

Risk to Human Health and the Environment. Risks to potential future worker receptors in the SUA are below a level of health concern, as documented by the fact that all of the soil COPC/ROPC concentrations were found to be below their corresponding worker CVs in the initial screening evaluation. In addition, groundwater within the SUA is unlikely to be impacted as it lies hydraulically upgradient at a sufficient distance from identified and potential sources of groundwater impacts on both the FMC Plant Site and Simplot Plant OU.

A Supplemental ERA was performed using conservative assumptions to evaluate risks to current and potential future plant, mammalian and avian ecological receptors from exposure to COCs that exceeded ecological CVs in the initial screening evaluation: cadmium, fluoride, mercury and vanadium. The Supplemental ERA report, which details the methods, assumptions and findings of the assessment, is included as Appendix E. In summary, the quantitative evaluation of ecological risks in the SUA determined that incremental HQs for all of the COCs are less than 1 for each of the ecological receptors.

Information to Support the SFS. The risks posed to human health and environment in the SUA have been sufficiently bound and provide adequate support to conclude that the SUA does not require evaluation of remedial alternatives in the SFS.

4.2.3 Western Undeveloped Area

Nature and Extent of Contamination. SRI Addendum findings for the WUA indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. Other than slag for road construction in the WUA, which are comparable and included in RU 23 Roadways, the only potential impact from EMF site operations would have been from historical deposition of FMC plant stack and fugitive

emissions, along with historical and current deposition of stack and fugitive emissions from the Simplot plant. However, these impacts appear to be limited since the WUA is located in the prevailing upwind direction from both the FMC and Simplot plant sites. These impacts have been characterized by the surface composite soil samples collected across the area. No constituents exceeded the site worker CVs; cadmium and fluoride were the only constituents to exceed the ecological CVs as discussed in Section 3.4.3. These constituents were further evaluated in the Supplemental ERA as discussed below.

Risk to Human Health and the Environment. Risks to potential future worker receptors in the WUA are below a level of health concern, as documented by the fact that all of the soil COPC/ROPC concentrations were found to be below their corresponding worker CVs in the initial screening evaluation. In addition, groundwater within the WUA is unlikely to be impacted as it lies hydraulically upgradient at a sufficient distance from identified and potential sources of groundwater impacts on both the FMC Plant Site and Simplot Plant OU.

A Supplemental ERA was performed using conservative assumptions to evaluate risks to current and potential future plant, mammalian and avian ecological receptors from exposure to COCs that exceeded ecological CVs in the initial screening evaluation: cadmium and fluoride. The Supplemental ERA report, which details the methods, assumptions and findings of the assessment, is included as Appendix E. In summary, the quantitative evaluation of ecological risks in the WUA determined that incremental HQs for all of the COCs are less than 1 for each of the ecological receptors.

Information to Support the SFS. The risks posed to human health and environment in the WUA have been sufficiently bound and provide adequate support to conclude that the WUA does not require evaluation of remedial alternatives.

4.2.4 Northern Properties - Parcel 1 (Western Sampling Parcel)

Nature and Extent of Contamination. SRI Addendum findings for Parcel 1 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This entire sampling parcel is located within the external boundary of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. This sampling parcel has been disturbed by historical agricultural and road construction activities. Other than slag used in road construction which are comparable and included in RU 23 Roadways, there are no records or knowledge that any FMC plant materials, or wastes, were ever stored or placed within this parcel.

Parcel 1 is adjacent to the former plant operation and it is likely that this sampling parcel has primarily been impacted by deposition of historical FMC stack and fugitive dust emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant. Several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3.5.3. These constituents were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated. The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, none of the receptors (residential or worker) evaluated in the Supplemental HHRA were found to be associated with RME cumulative lifetime cancer risks in excess of EPA's acceptable risk range. However, residential RME non-cancer HQs associated with the incidental soil ingestion, homegrown fruit and vegetable ingestion and groundwater ingestion pathways were found to exceed 1. Cumulative non-cancer HQs to all worker receptors were determined to be below 1.

The Supplemental ERA determined that none of the COCs exceed an incremental HQ of 1 for any of the plant, mammalian or avian receptors evaluated.

Information to Support the SFS. The risks posed to human health and environment in Parcel 1 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. The process to evaluate remedial alternatives will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.2.5 Northern Properties - Parcel 2 (Central Sampling Parcel)

Nature and Extent of Contamination. SRI Addendum findings for Parcel 2 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This entire sampling parcel is located within the external boundary of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. However, this sampling parcel has been disturbed by historical agricultural, aviation (former Pocatello airport), motor sports (former Drag City "drag strip" and road construction activities. Other than slag used in road construction which are comparable and included in RU 23 Roadways, there are no records or knowledge that any FMC plant materials, or wastes, were ever stored or placed within this parcel.

Based upon the SRI Addendum data, this sampling parcel appears to have been primarily impacted by deposition of historical FMC stack and fugitive dust emissions, along with historical and current stack and fugitive emissions from the Simplot plant. Figure 4-1 depicts the location of the FMC and Simplot manufacturing operations in relationship to this parcel as well as the predominant wind directions. Several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3.6.3. These constituents were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential

and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated. The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, RME cumulative lifetime cancer risks to residential receptors were found to exceed EPA's acceptable risk range, with the external exposure to gamma radiation pathway contributing to the majority (over 80%) of the total risk. In addition, residential RME non-cancer HQs via incidental soil ingestion, homegrown fruit and vegetable ingestion and groundwater ingestion were found to exceed 1.

RME cumulative lifetime cancer risks were found to be within EPA's acceptable risk range and non-cancer HQs were estimated to be below 1 for all worker receptors.

The Supplemental ERA determined that the incremental NOAEL HQ for fluoride marginally exceeded 1 for all of the avian receptors evaluated (horned lark, bald eagle, sage grouse and red-tailed hawk). However, the fluoride incremental LOAEL HQ for each of these receptors was found to be well below 1. The plant IHQ marginally exceeded 1 for fluoride in unwashed sagebrush.

Incremental NOAEL and LOAEL HQs for all COCs other than fluoride were found to be below 1 for all mammalian and avian receptors. There were no plant incremental HQs greater than 1 other than a marginal exceedance for fluoride.

Information to Support the SFS. The risks posed to human health and environment in Parcel 2 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. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.2.6 Northern Properties - Parcel 3 (Eastern Sampling Parcel)

Nature and Extent of Contamination. SRI Addendum findings for Parcel 3 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This entire sampling parcel is located outside the external boundary of the Fort Hall Reservation. This sampling parcel is separated from sampling parcel 2 immediately to the west and it is part of the Power County Development Authority (PCDA) development agreement. This parcel was not used as part of the FMC phosphorus manufacturing operations, but has been disturbed by historical agricultural, aviation (former Pocatello airport) and road construction (Highway 30 and I-86) activities. Other than slag used on a short segment of access road which is comparable and included in RU 23 Roadways, there are no records or knowledge that any FMC plant materials, or wastes, were ever stored or placed within this parcel.

Based on the area wind-rose diagram in Figure 4-1, Parcel 3 is downwind of the former EMF ore handling areas and the field data indicate that this sampling parcel has been most impacted by deposition of historical stack and fugitive emissions from the FMC plant, along with historical and current stack and fugitive dust emissions from the Simplot plant. Concentrations of several constituents in Parcel 3 surface soils exceeded their respective CVs for ecological, residential and future worker receptors as, detailed in Section 3.7.3. However, none of the constituent concentrations in 0-10 ft bgs subsurface soil samples collected from this most heavily impacted parcel exceeded worker CVs, indicating that subsurface migration of surface impacts is not an issue of concern for the Northern Properties. The constituents that exceeded CVs were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated. The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, RME cumulative lifetime cancer risks to residential receptors were found to exceed EPA's acceptable risk range, with the groundwater ingestion (60%) and external exposure to gamma radiation (34%) pathways contributing to the majority of the total risk. In addition, residential RME non-cancer HQs via incidental soil ingestion, homegrown fruit and vegetable ingestion and groundwater ingestion were found to exceed 1.

RME cumulative lifetime cancer risks to both future outdoor and indoor commercial/industrial workers were also found to exceed EPA's acceptable risk range, with the groundwater ingestion and external exposure to gamma radiation pathways again contributing to the majority of the total risk. However, cumulative incremental cancer risks under a CTE scenario, which likely characterizes upperbound worker exposures more accurately for the external gamma pathway, were found to be within EPA's acceptable risk range. Also, neither the RME nor the CTE gamma risk estimates consider shielding for outdoor workers, which would be provided by the vehicles and ground-cover (e.g., parking lots) almost certain to be present should commercial/industrial development occur. Similarly, the EPA default 60% shielding from office buildings assumed for indoor workers is likely low-biased. Pressurized ion chamber (PIC) function test measurements made during the 2007 SRI field activities in the parking lot upon which the FMC Office Trailers are located in Parcel 3 verify that typical asphalt paving in the Pocatello area (2" hot rolled asphalt over 4" compacted natural aggregate base) provides a high degree of gamma radiation shielding. In fact, the PIC measurements were equivalent to background levels, indicating that the presence of asphalt paving is protective of both outdoor and indoor workers under the RME risk scenario.

RME non-cancer HQs to outdoor and indoor commercial/industrial workers via the groundwater ingestion pathway were also found to exceed 1. However, the cumulative HQs from soil-related exposure pathways, in contrast, were below 1 for both receptors. Finally, RME non-cancer HQs to construction workers were estimated to be greater than 1 for cadmium via the fugitive dust

inhalation pathway. However, conservatism in the sub-chronic factor used to characterize the inhalation toxicity of cadmium likely overstates risks associated with this pathway. Moreover, potential impacts associated with this pathway can be easily mitigated by implementation of a fugitive dust control program as part of any future construction project within Parcel 3.

The Supplemental ERA determined that the incremental NOAEL HQ for fluoride exceeded 1 for all avian receptors evaluated (horned lark, bald eagle, sage grouse and red-tailed hawk). However, the fluoride incremental LOAEL HQ was less than 1 for all of these receptors other than the red-tailed hawk which only slightly exceeded 1 (1.02). No mammalian fluoride IHQs exceeded 1. The plant IHQ marginally exceeded 1 for fluoride in unwashed sagebrush.

Incremental NOAEL and LOAEL HQs for COCs other than fluoride were found to be below 1 for all mammalian and avian receptors. There were no plant incremental HQs of concern other than for fluoride.

Information to Support the SFS. The risks posed to human health and environment in Parcel 3 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 worker receptors. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.2.7 Northern Properties - Parcel 4 (Northwestern Sampling Parcel)

Nature and Extent of Contamination. SRI Addendum findings for Parcel 4 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This parcel is entirely outside the external boundary of the Fort Hall Reservation and is part of the PCDA development agreement. There is no record or knowledge that any FMC plant materials or wastes were ever stored or placed within this parcel.

Based on the area wind-rose diagram in Figure 4-1, Parcel 4 is downwind of the former plant operation and the field data indicate that this sampling parcel has been impacted by deposition of historical FMC fugitive and stack emissions, along with historical and current stack and fugitive dust emissions from the Simplot plant. Several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3.8.3. These constituents were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated. The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, none of the receptors (residential or worker) evaluated in the Supplemental HHRA were found to be associated with RME cumulative lifetime cancer risks in excess of EPA's

acceptable risk range. However, residential RME non-cancer HQs associated with exposure via the incidental soil ingestion, homegrown fruit and vegetable ingestion and groundwater ingestion pathways were found to exceed 1. Cumulative non-cancer HQs to all worker receptors were determined to be below 1.

The Supplemental ERA determined that the incremental NOAEL HQ for fluoride slightly exceeded 1 for two of the avian receptors evaluated (horned lark and red-tailed hawk). However, the fluoride incremental LOAEL HQ for each of these receptors was found to be well below 1. No mammalian fluoride incremental HQs exceed 1. The plant IHQ of unwashed sagebrush slightly exceeded 1 for fluoride.

Incremental NOAEL and LOAEL HQs for COCs other than fluoride were found to be below 1 for mammalian and avian receptors. Likewise, no COC plant IHQs exceeded 1 other than for fluoride.

Information to Support the SFS. The risks posed to human health and environment in Parcel 4 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. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.2.8 Northern Properties Parcel 5 – Gravel Pit Sampling Parcel

Nature and Extent of Contamination. SRI Addendum findings for Parcel 5 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This sampling parcel is entirely outside the external boundary of Fort Hall Reservation and is part of the PCDA development agreement. It should be noted that there is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel, either historically during plant operation or during the plant demolition.

Based upon the SRI Addendum data, this sampling parcel appears to have been impacted by deposition of FMC and Simplot stack and fugitive dust emissions. Several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3. However, this parcel is not as impacted as the surrounding Parcel 4 and Parcel 6. This may be the result of the samples being collected from reworked bermed topsoil material surrounding the gravel pits, or due to the fact that samples were collected from 0-to-6 inches bgs, rather than 0-to-2 inches bgs as was done in the other parcels to be more representative of the ultimate surficial soils when the berm is used to cover the reclaimed gravel pit. As shown in the parcel-specific data tables presented in Section 3, the majority of contaminants are located in the upper two inches of soil, as would be expected from deposition of stack and fugitive emissions. Concentrations in the 2-to-6 inch bgs sample interval collected from the Northern Properties are lower than in the shallower soil sample interval. Following screening of the 0-to-6 inch sample results, several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3.9.3. These constituents were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated. The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, none of the receptors (residential or worker) evaluated in the Supplemental HHRA were found to be associated with RME cumulative lifetime cancer risks in excess of EPA's acceptable risk range. However, the residential RME non-cancer HQ associated with exposure via the groundwater ingestion pathway was found to exceed 1. In addition, the cumulative residential RME non-cancer HQ for all soil-related exposure pathways was found to be marginally above 1. Cumulative non-cancer HQs to all worker receptors were determined to be below 1.

The Supplemental ERA determined that none of the COCs exceed an incremental HQ of one for any of the receptors evaluated.

Information to Support the SFS. The risks posed to human health and environment in the Parcel 5 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. The process to evaluate remedial alternatives will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.2.9 Northern Properties - Parcel 6 (Batiste Spring Sampling Parcel)

Nature and Extent of Contamination. SRI Addendum findings for Parcel 6 indicate that sufficient information has been collected to evaluate the nature of contamination associated with surficial impacts in this area. This sampling parcel is entirely outside the external boundary of the Fort Hall Reservation and was not used as part of the FMC phosphorus manufacturing operations. There is no record or knowledge that any plant materials or wastes were ever stored or placed within this parcel.

Based on the area wind-rose diagram in Figure 4-1 and the SRI Addendum data, Parcel 6 appears to have been impacted by deposition of historical stack and fugitive emissions from the FMC plant, along with historical and current stack and fugitive dust emissions from the Simplot plant. Several constituents exceeded their respective CVs for ecological, residential and future worker receptors as detailed in Section 3.10.3. These constituents were further evaluated in the Supplemental HHRA and ERA as discussed below.

Risk to Human Health and the Environment. A Supplemental HHRA and ERA was performed using conservative assumptions to evaluate risks to potential future human (residential and worker) receptors, and current and potential future ecological receptors from exposure to COCs/ROCs in surface soil that were found to exceed CVs in the initial screening evaluation. In addition, risks to potential future human receptors from exposure to groundwater were evaluated.

The Supplemental HHRA and ERA reports, which detail the methods, assumptions and findings of the assessments, are included as Appendices D and E.

In summary, RME cumulative lifetime cancer risks to residential receptors were found to exceed EPA's acceptable risk range, with the groundwater ingestion (60%) and external exposure to gamma radiation (34%) pathways contributing to the majority of the total risk. In addition, residential RME non-cancer HQs via incidental soil ingestion, homegrown fruit and vegetable ingestion and groundwater ingestion were found to exceed 1.

RME cumulative lifetime cancer risks were found to be within EPA's acceptable risk range and non-cancer HQs were estimated to be below 1 for all worker receptors.

The Supplemental ERA determined that the incremental NOAEL HQ for fluoride marginally exceeded 1 for all of the avian receptors. However, the fluoride incremental LOAEL HQ for each of these receptors was found to be well below 1. No mammalian fluoride IHQs exceed 1. The plant IHQ of unwashed sagebrush slightly exceeded 1 for fluoride.

Incremental NOAEL and LOAEL HQs for COCs other than fluoride were found to be below 1 for mammalian and avian receptors. Likewise, no COC plant IHQs exceeded 1 other than for fluoride.

Information to Support the SFS. The risks posed to human health and environment in Parcel 6 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. The process to evaluate remedial alternatives, to be described in the SFS work plan, will be consistent with EPA guidance and the SRI/SFS consent order Statement of Work.

4.3 RECOMMENDATIONS

The information presented in the conclusion section indicates that the human health and ecological risks associated with impacted shallow soils in the SUA, WUA and Northern Properties are sufficiently understood to allow the CERCLA process to proceed to the SFS. The inclusion of this information in the *Final SRI Report*, along with the groundwater component described in the *GWCCR*, indicates that the nature and extent of contamination associated with fill and impacted soils at the FMC Plant OU have been largely bound, and the risks posed to human health and the environment are sufficiently understood to allow the CERCLA process to proceed to the SFS.

With respect to ecological receptors, the findings of the Supplemental ERA Addendum are similar to the findings of the BERA, namely that fluoride is the only COC which marginally exceeds NOAEL and, in one case, a LOAEL incremental HQs, 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 Parcels 2, 3, 4, and 6 will be carried forward into the SFS primarily due to the NOAEL HQs which are marginally above one.

Discussed below are the recommendations for further evaluation of the FMC Undeveloped Areas and Northern Properties in the SFS process. The following discussion groups the Undeveloped Areas and Northern Property parcels by the degree to which they pose potential impacts to human health, based on the findings of the Supplemental HHRA Addendum. Issues regarding the significance of the HHRA findings for each grouping of areas/parcels, which will be further evaluated in the SFS to inform risk management decisions, are also identified.

Areas/Parcels that Do Not Pose Human Health Risks Above a Level of Concern. For several areas/parcels, the Supplemental HHRA Addendum did not identify any risks above a level of health concern to human receptors. These areas/parcels consist of the following:

- Southern Undeveloped Area
- Western Undeveloped Area

These areas do not require evaluation of remedial alternatives in the SFS.

Areas/Parcels that Pose Risks to Hypothetical Future Residential Receptors In Excess of EPA's Acceptable Cumulative Lifetime Cancer Risk Range and/or a Non-Cancer Hazard Quotient of 1. The Supplemental HHRA Addendum found that several areas/parcels pose RME cumulative lifetime cancer risks and/or non-cancer HQs above a level of potential concern to hypothetical future residential receptors. However RME risks to the future worker receptors evaluated are within EPA's acceptable risk range.

These areas/parcels, along with the pathways of primary concern for hypothetical future residential receptors, are listed below:

- Parcel 1
 - HQ from soil ingestion exceeds 1,
 - HQ from consumption of homegrown produce exceeds 1, and
 - HQ from groundwater ingestion exceeds 1.
- Parcel 2
 - HQ from soil ingestion exceeds 1,
 - HQ from consumption of homegrown produce exceeds 1, and
 - HQ from groundwater ingestion exceeds 1.
- Parcel 4
 - HQ from soil ingestion exceeds 1,
 - HQ from consumption of homegrown produce exceeds 1, and
 - HQ from groundwater ingestion exceeds 1.
- Parcel 5

- HQ from groundwater ingestion exceeds 1.
- Parcel 6
 - Cancer risk from groundwater ingestion exceeds 3E-04,
 - HQ from soil ingestion exceeds 1,
 - HQ from consumption of homegrown produce exceeds 1, and
 - HQ from groundwater ingestion exceeds 1.

The finding that these parcels exceed levels of concern for residential receptors is consistent with the conclusion of the Baseline HHRA. Indeed, following completion of the RI/FS, FMC recorded restrictive covenants with Power County that prohibit residential development of Northern Property Parcels 1 through 5 (FMC did not own Parcel 6 at the time the covenants were recorded).

These parcels will be forwarded to the SFS for consideration of remedial alternatives. In the SFS, current and potential future institutional controls will be included as one of the core elements that are common to the remedial alternatives assembled and screened for the FMC Plant OU.

Areas/Parcels that Pose Risks to Residential and Worker Receptors In Excess of EPA's Acceptable Cumulative Lifetime Cancer Risk Range and/or a Non-Cancer Hazard Quotient of 1. One parcel was determined to pose cancer and non-cancer risks above levels of potential concern to hypothetical future residential and worker receptors.

This parcel, along with the pathways of primary concern for hypothetical future residential and worker receptors, is listed below:

- Parcel 3

Resident

- Cancer risk from external exposure to gamma radiation exceeds 3E-04,
- Cancer risk from groundwater ingestion exceeds 3E-04,
- HQ from soil ingestion exceeds 1,
- HQ from consumption of homegrown produce exceeds 1, and
- HQ from groundwater ingestion exceeds 1.

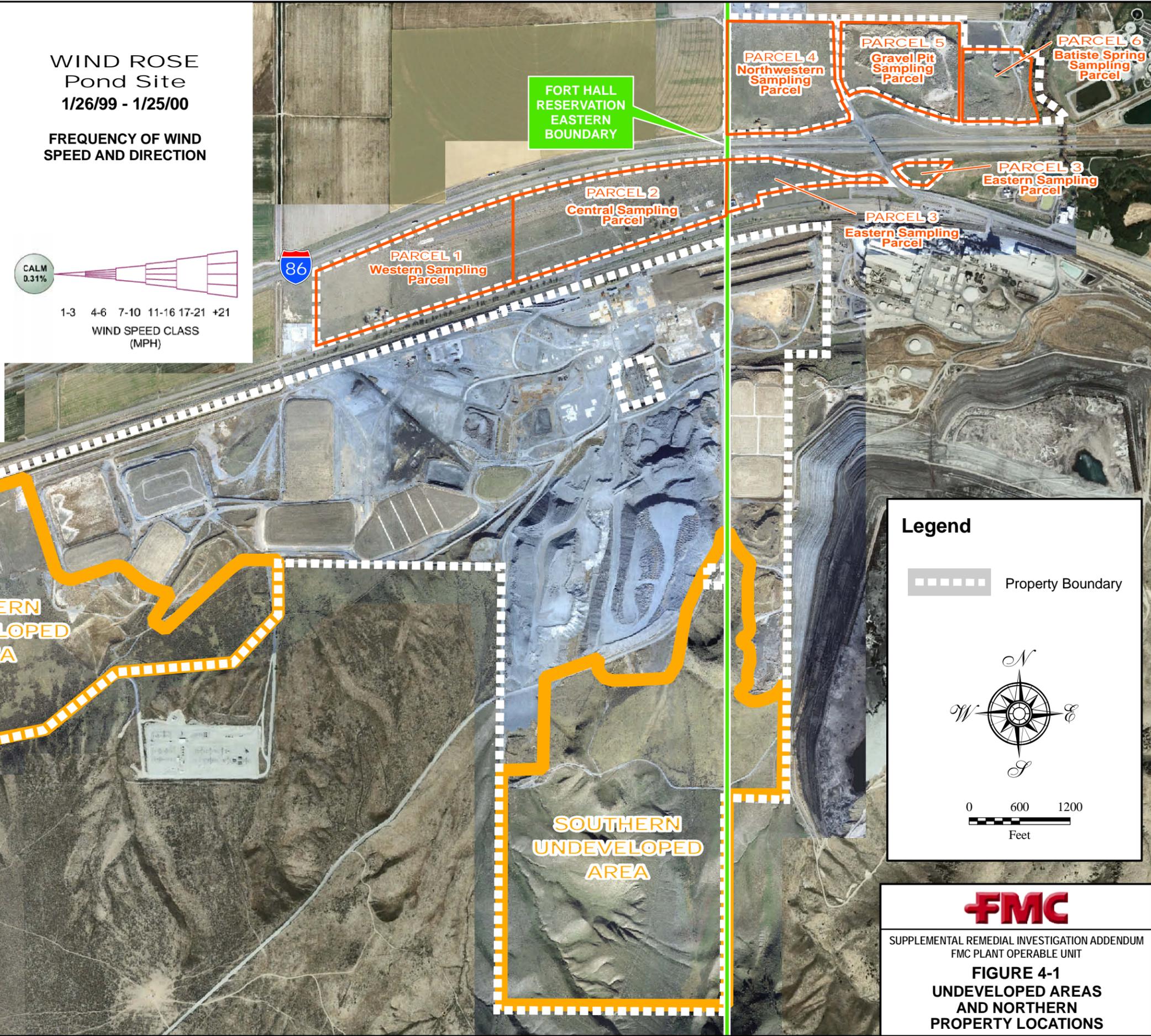
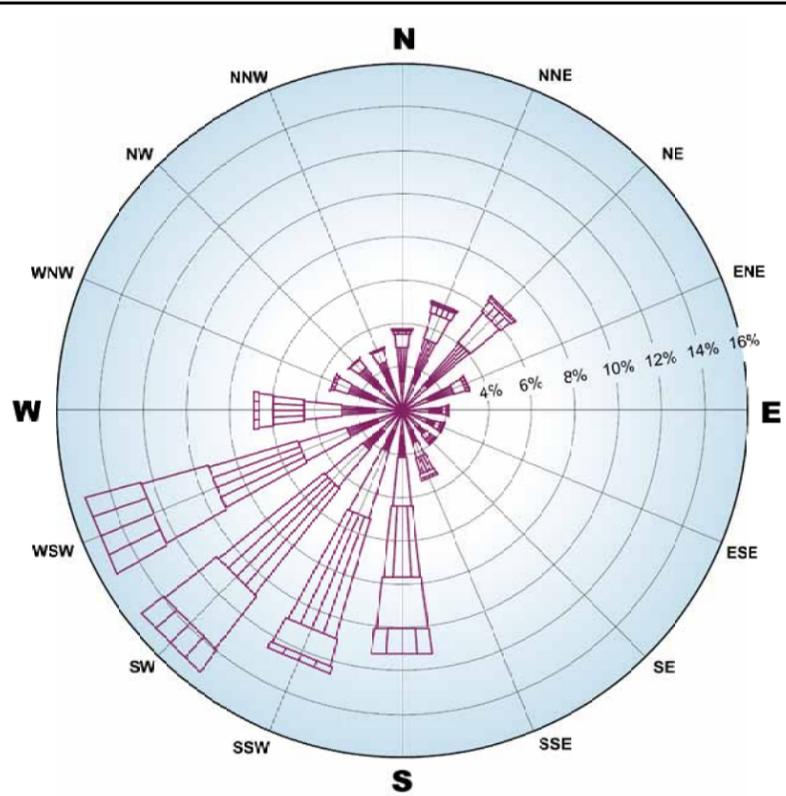
Worker

- HQ from groundwater ingestion exceeds 1 (outdoor and indoor commercial/industrial workers), and
- HQ from fugitive dust inhalation exceeds 1 (construction worker).

The finding that this parcel exceeds levels of potential concern for residential receptors is consistent with the conclusion of the Baseline HHRA. Indeed, following completion of the RI/FS, FMC recorded restrictive covenants with Power County that prohibit residential development of Northern Property Parcel 3.

Worker risks were not evaluated for the Northern Properties in the Baseline HHRA. The Supplemental HHRA found that RME cumulative lifetime cancer risks to outdoor and indoor commercial/industrial workers exceed EPA's acceptable range for the combination of external gamma exposure and groundwater ingestion. The RME non-cancer HQ to outdoor and indoor commercial/industrial workers exceeds 1 for groundwater ingestion, and the RME HQ to construction workers exceeds 1 for fugitive dust inhalation in this most heavily impacted Northern Property parcel.

This parcel will be forwarded to the SFS for consideration of remedial alternatives. In the SFS, current and potential future institutional controls will be included as one of the core elements that are common to the remedial alternatives assembled and screened for the FMC Plant OU.



Legend

Property Boundary

0 600 1200
Feet

FMC

SUPPLEMENTAL REMEDIAL INVESTIGATION ADDENDUM
FMC PLANT OPERABLE UNIT

FIGURE 4-1
UNDEVELOPED AREAS AND NORTHERN PROPERTY LOCATIONS

FILE Fig 4-01_ Undeveloped Areas and Northern Property Locations_609.mxd 6/22/09



Section 5

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