Louis Berger

BURNS & McDONNELL

Final
Remedial Investigation Report
WWI Incinerator, NW Camp Funston (CFI)
Operable Unit 007
Fort Riley, Kansas

U.S. Army Corps of Engineers
Kansas City District

Project No. 63525
September 9, 2016

Final
Remedial Investigation Report
WWI Incinerator, NW Camp Funston (CFI)
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prepared for

U.S. Army Corps of Engineers
Kansas City District

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September 9, 2016

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
%	percent
°F	degrees Fahrenheit
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
2,3,7,8 TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
Arrowhead	Arrowhead Contracting, Inc.
atm-m^3/mol	atmospheres-cubic meter per mole
ATSDR	Agency for Toxic Substances and Disease Registry
BCF	Bioconcentration Factors
bgs	below ground surface
BMcD	Burns & McDonnell Engineering Company, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CENWK	United States Army Corps of Engineers - Kansas City District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFI	Camp Funston Incinerator
CHWWTP	Custer Hill Waste Water Treatment Plant
cm/sec	centimeters per second
cm^2	square centimeters
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CSM	Conceptual Site Model
CTI	CTI & Associates, Inc.
DA	United States Department of the Army
DO	Dissolved Oxygen
DQCR	Daily Quality Control Report
DRO	Diesel Range Organics
Eh	oxidation-reduction potential
ERAGS	Ecological Risk Assessment Guidance for Superfund
FR	Federal Register
FS	Feasibility Study
ft	Feet
ft/day	feet per day
ft/ft	feet per foot
gpm	gallons per minute

LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
GRO	Gasoline Range Organics
HHRA	Human Health Risk Assessment
HI	Hazard Index
HRI	Hampshire Research Institute, Inc.
HTW	Hazardous and Toxic Waste
i	Hydraulic Gradient
ICP	Inductively Coupled Plasma
IDW	Investigative-Derived Waste
in/yr	inches per year
INRMP	Integrated Natural Resources Management Plan
IPaC	Information, Planning, and Conservation System
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
IUR	Inhalation Unit Risk
IW-IDW	*Installation-Wide Investigative-Derived Waste Management Plan for Environmental Investigations at Fort Riley, Kansas*
J	Estimated Value
K	Hydraulic Conductivity
K_d	Ratio of a contaminant concentration in a solid to the contaminant concentration in the surrounding aqueous solution.
KDHE	Kansas Department of Health and Environment
kg	Kilograms
K_{oc}	The K_d coefficient normalized to the concentration of organic carbon in the solid phase.
K_{ow}	Ratio between a chemical concentration in octanol to that in water at steady state condition.
KSWQS	Kansas Surface Water Quality Standard
L/day	liters per day
L/hr	liters per hour
L/kg	liters per kilogram
LBG	The Louis Berger Group, Inc.
LCS	Laboratory Control Sample
LOAEL	Lowest Observed Adverse Effect Level
m^3/kg	cubic meters per kilogram
MAAF	Marshall Army Airfield
MCL	Maximum Contaminant Level

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
MeHg	Methyl Mercury
MFs	Modifying Factors
mg/cm^2	milligrams per square centimeter
mg/day	milligrams per day
mg/kg	milligrams per kilogram
mg/kg/day	milligrams of chemical per kilogram body weight per day
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mph	miles per hour
MSL	mean sea level
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NCI	National Cancer Institute
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
n_e	Effective Porosity
NOAEL	No Observed Adverse Effect Level
NRWQS	National Recommended Water Quality Standard
NW	Northwest
NWI	National Wetlands Inventory
ORNL	Oak Ridge National Laboratory
ORP	Oxidation-Reduction Potential
OU 007	Operable Unit 007
PAH	Polycyclic Aromatic Hydrocarbon
PEF	Particulate Emission Factor
pg/g	picograms per gram
pg/L	picograms per liter
pH	hydrogen ion activity
Phase I Tech Memo	*Technical Memorandum: Phase I Data Evaluation for Field Sampling Activities at the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas*
Phase II Tech Memo	*Technical Memorandum: Phase II Data Evaluation for Field Sampling Activities at the WWI Incinerator, Northwest NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas*
PPRTV	Provisional Peer-Reviewed Toxicity Values
PWE	Fort Riley Directorate of Public Works – Environmental Division
Q/C	inverse of the mean concentration at the center of a source

LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
QCSR	Quality Control Summary Report
R	qualified as rejected
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
RML	Removal Management Level
RPMP	Real Property Master Plan
RSK	Risk-Based Standard for Kansas
RSL	Regional Screening Level
SAP-IW	*Installation-Wide Sampling and Analysis Plan (Including Uniform Federal Policy [UFP]-Quality Assurance Project Plan) for the Fort Riley CERCLA Process Support at Fort Riley, Kansas*
SARA	Superfund Amendments and Reauthorization Act
SIM	Selected Ion Monitoring
SLERA	Screening Level Ecological Risk Assessment
sMCL	Secondary Maximum Contaminant Level
SOP	Standard Operating Procedures
SS-IDW	*Site-Specific Installation-Wide Investigative-Derived Waste Management Plan for RI/FS Environmental Investigations for the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas*
SS-SAP	*Remedial Investigation/Feasibility Study Site-Specific Sampling and Analysis Plan (Including Site-Specific UFP-Quality Assurance Project Plan) for the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas*
SU	Standard Unit
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TEC	Toxicity Equivalent Concentration
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence
TPH	Total Petroleum Hydrocarbon
UCL	Upper Confidence Limit

LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
UFP	Unified Federal Policy
UFs	Uncertainty Factors
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USDA-NRCS	United States Department of Agriculture – Natural Resources Conservation Service
USDoC	United States Department of Commerce
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
V	Linear Groundwater Velocity
VF	Volatilization Factor
WHO	World Health Organization
Work Plan	*Remedial Investigation/Feasibility Study Work Plan for the World War I (WWI) Incinerator, Northwest (NW) Camp Funston (CFI) – Operable Unit 007 (OU 007) at Fort Riley, Kansas*
WWC-5	KDHE Water Well Record Form
WWI	World War I
XRF	X-Ray Fluorescence

* * * * *

1.0 INTRODUCTION

The Fort Riley Directorate of Public Works – Environmental Division (PWE) under the Installation Restoration Program (IRP) at Fort Riley, Kansas is conducting a Remedial Investigation (RI) at the World War I (WWI) Incinerator, Northwest (NW) Camp Funston (CFI) – Operable Unit 007 (OU 007). The RI at the CFI Site is being conducted by The Louis Berger Group, Inc. (LBG) and Burns & McDonnell Engineering Company, Inc. (BMcD) under the United States Army Corps of Engineers (USACE) – Kansas City District's (CENWK's) Contract Number W912DQ-08-D-0017, Task Order Number 0027. Work at the CFI Site is being conducted to meet the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

1.1 Purpose of the Remedial Investigation

The objectives of the CFI Site RI and risk assessments (Human Health Risk Assessment [HHRA] and Screening Level Ecological Risk Assessment [SLERA]) are:

- Quantify the nature and extent of on-site contaminants related to the operation of the CFI Site;
- Characterize the physical and chemical nature of contamination at the CFI Site, including fate and transport mechanisms;
- Determine potential ecological and human health risk posed by contamination at the CFI Site; and
- Obtain information necessary to evaluate remedial alternatives, as needed, for the Feasibility Study (FS).

The RI is being performed in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and will follow the United States Environmental Protection Agency (USEPA) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988), and the *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Parts A, E, and F)* (USEPA, 1989, 2004, and 2009a), as well as other applicable regulations and requirements.

This RI Report has been prepared to:

- Summarize field investigation and data gathering activities completed as part of the RI;
- Present the nature and extent of contamination determined to be present;

- Summarize the potential fate and transport of contaminants determined to be present;
- Describe the conceptual site model (CSM);
- Present the calculations and potential risk associated with the CFI Site as determined in the HHRA and SLERA; and
- Convey conclusions and recommendations for on-going efforts.

1.2 Site Background

1.2.1 Site Location and Description

Fort Riley is located in north-central Kansas (see Figure 1-1). The Post was established in 1853 and has been owned and operated by the United States Department of the Army (DA) since that time. The Reservation is over 100,000 acres in size and includes portions of Riley, Clay, and Geary Counties. The developed areas of Fort Riley are divided into six cantonment areas (see Figure 1-1): Historic Main Post, Camp Forsyth, Camp Funston, Camp Whitside, Marshall Army Airfield (MAAF), and Custer Hill.

The CFI Site is located in the western portion of the Camp Funston cantonment area within Riley County and occupies approximately two acres. The CFI Site sits approximately 300 feet (ft) southeast of the Huebner Road/Williston Point Road roundabout, directly southeast of the Union Pacific Railroad (UPRR) grade, and directly southwest of Threemile Creek (see Figure 1-2). The upland terrace portion of the CFI Site is immediately adjacent to the UPRR grade. The floodplain slope and Kansas River floodplain portions of the CFI Site are located approximately 60 ft and 110 ft southeast of the UPRR grade, respectfully (see Figure 1-3). The boundary line for OU 007 is illustrated on Figure 1-4, which shows the spatial relationship to CFI Site monitoring wells and major features of the general area.

1.2.2 Site Use

1.2.2.1 Historic and Current

Fort Riley was established in 1853 and has been owned and operated by the DA since that time. The Camp Funston cantonment area, where the CFI Site is located, was constructed during the summer of 1917 as part of the WWI war effort and has been occupied and in service continuously since.

There is currently no information available on the date the CFI was constructed or how long incinerator operations were ongoing. The CFI Site was operational during WWI; however, it is believed that the CFI operations ceased within a year after the end of WWI. Camp Funston maintained its own garbage collection, disposal system, and incinerators for the disposal of the waste stream. The Camp Funston waste stream consisted of garbage, similar to that of a small municipality of its time, and dead animals. The waste stream during peak operation was approximately 18,000 pounds per day. The CFI was operated by the burning of wood; however, it is not known whether or not combustible fuels were used as accelerant to support the CFI operations. The CFI byproducts (ash/cinder) were dumped and/or pushed over the edge of the upland terrace onto the floodplain slope. During the 2010 field investigation activities, both the brick and mortar incinerator foundation and the concrete incinerator pad were demolished.

Currently, land use at Camp Funston is related to the operations of an active Army installation. Camp Funston is used to support active military training, housing, and military operations which are expected to continue into the next century. According to the Fort Riley Real Property Master Plan (RPMP) the land use for the area where the CFI Site located is currently classified as open space (Black & Veatch, 2007). Future land use at the CFI Site is likely to remain the same. The area in the immediate vicinity of the CFI Site is currently unused wood/brush-covered land.

1.2.2.2 Future Land Use and Plans

Based on the Fort Riley RPMP (Black & Veatch, 2007), land use is not projected to change significantly in the future.

1.2.3 Previous Environmental Investigations

Several environmental investigations have been conducted at the CFI Site. Copies of previous environmental investigation reports at the CFI Site are provided in Appendix A. Previous environmental investigations include:

- A field investigation was conducted in early 2001 by Arrowhead Contracting, Inc. ([Arrowhead], 2001). This investigation was performed to determine whether shallow soils at and adjacent to the foundation of the CFI were impacted by heavy metals contamination. Shallow soil samples were screened in the field using field portable x-ray fluorescence (XRF) equipment. Confirmation samples were also sent to an off-site laboratory for analysis.
    - XRF data indicated heavy metals contamination on the upland terrace and floodplain slope adjacent to the former incinerator and
    - Concentrations of arsenic and lead that exceeded screening levels were present in surface soils at the site.

- In December 2006, the USACE-CENWK performed additional soil sampling, to follow up the 2001 field investigation, at the CFI Site (USACE-CENWK, 2007). The objectives of this investigation were to verify the results from the XRF investigation conducted in 2001 and to determine the distribution of metals arising from the previous use of the incinerator. One hundred surface and shallow subsurface soil samples were collected in the area around the incinerator foundation, on the floodplain slope, and at the toe of the floodplain slope. Soil samples were submitted for analysis of eight Resource Conservation and Recovery Act (RCRA) metals. Toxicity characteristic leaching procedure (TCLP) was run on selected samples. Appendix A contains a complete copy of the USACE-CENWK report. The results of this investigation included:

  - The sampling demonstrated that the results of the 2001 XRF investigation were generally representative of the CFI Site;
  - Concentrations of arsenic, lead, and mercury in the soil that exceeded screening levels indicated that the effects of past incinerator use were limited to the west and south of the CFI Site; and
  - None of the samples analyzed for TCLP had detections above their respective TCLP limit.

In 2010, CTI & Associates, Inc. (CTI) performed additional soil sampling at the CFI Site. CTI also performed demolition, removal, and off-site disposal of the incinerator foundation and contaminated upland surface soil as special waste (CTI, 2010). Appendix A contains a complete copy of the CTI report. The activities performed by CTI included:

  - Site preparation activities, including the installation of a low-water crossing on Threemile Creek, and the clearing, grubbing, and disposal of vegetation;
  - Removal of clean soils from the rail spur to improve access to the investigation area;
  - Excavation of eight test trenches to delineate extent of ash. Collection of ash samples for off-site analysis. Trenches were then backfilled;
  - Demolition, removal, and off-site disposal of the incinerator foundation and contaminated upland surface soils as special waste; and
  - Confirmation soil sampling of the upland area and incinerator foundation to confirm soil removal met the Kansas Department of Health and Environment (KDHE) Risk-Based Standards for Kansas (RSK) criteria for residential land use.

Historical analytical results from samples collected during the 2001, 2006, and 2010 field activities are discussed further in Section 4.0 of this RI Report.

1.3 RI Report Organization

This report has been organized per the recommended format presented in the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988). Sections included in this RI Report include:

- Section 1.0 Introduction – Includes the objectives of the RI, site background, and a summary of previous investigations.
- Section 2.0 Remedial Investigation Activities – Includes a summary of the activities that were completed as part of the RI.
- Section 3.0 Site Setting – Presents site location and description, physical setting, water use, climatology, demography, and ecology of the study area.
- Section 4.0 Nature and Extent of Contamination – Presents the analytical results, screens the results against appropriate screening levels, and discusses the extent of impacts.
- Section 5.0 Fate and Transport – Discusses the environmental fate and transport of the chemicals of potential concern (COPCs), and presents the CSM.
- Section 6.0 Human Health Risk Assessment – Presents the parameters and equations used in the HHRA and the results of those calculations.
- Section 7.0 Screening Level Ecological Risk Assessment – Presents the parameters and equations used in the SLERA and the results of those calculations.
- Section 8.0 Summary and Conclusions – Summarizes the RI and presents the final conclusions.
- Section 9.0 References, Tables, Figures, and Appendices – Provide the supporting information for the RI Report.

* * * * *

2.0 RI ACTIVITIES

2.1 Introduction

Field Activities at the CFI Site were conducted in three phases. Phase I of the RI was conducted in accordance with the *Remedial Investigation/Feasibility Study Work Plan for the World War I (WWI) Incinerator, Northwest (NW) Camp Funston (CFI) – Operable Unit 007 (OU 007) at Fort Riley, Kansas* (LBG-BMcD, 2013a) (Work Plan) (see Appendix B). Phase II of the RI was conducted in accordance with the Work Plan and the Work Plan modifications stipulated in the *Technical Memorandum: Phase I Data Evaluation for Field Sampling Activities at the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas* (LBG-BMcD, 2014a) (Phase I Tech Memo) (see Appendix C). Phase III of the RI was conducted in accordance with the Work Plan and the Work Plan modifications stipulated in the *Technical Memorandum: Phase II Data Evaluation for Field Sampling Activities at the WWI Incinerator, Northwest NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas* (LBG-BMcD, 2015a) (Phase II Tech Memo) (see Appendix D). Phase I, Phase II, and Phase III field activities were conducted in accordance with the appropriate standard operating procedure (SOP) as presented in the *Installation-Wide Sampling and Analysis Plan (Including Uniform Federal Policy [UFP]-Quality Assurance Project Plan) for the Fort Riley CERCLA Process Support at Fort Riley, Kansas* (LBG-BMcD, 2011) (SAP-IW) (see Appendix E) and the *Remedial Investigation/Feasibility Study Site-Specific Sampling and Analysis Plan (Including Site-Specific UFP-Quality Assurance Project Plan) for the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas* (LBG-BMcD, 2013b) (SS-SAP) (provided in the Work Plan as Appendix D).

Phase I field activities conducted to support the RI at the CFI Site included:

- Site preparation;
- Collection of background surface and subsurface soils from an off-site location analogous to the CFI Site;
- Collection of surface and subsurface soils from the upland terrace area, the floodplain slope, and the Kansas River floodplain at the CFI Site;
- Collection of surface soils from the drainage swale;
- Collection of stream sediments from Threemile Creek at a location approximately midpoint of, up gradient of, and down gradient of the CFI Site;

- Collection of surface waters from Threemile Creek at a location approximately midpoint of, up gradient of, and down gradient of the CFI Site; and
- Collection of groundwater at and down gradient of the CFI Site.

Table 2-1 presents a summary of field activities performed during Phase I of the RI. A summary of Phase I samples collected during the RI is presented in Table 2-2.

Samples collected during the Phase I field activities were analyzed for the following parameters per the prescribed procedures in the Work Plan:

Analytical Group	Analytical Method	Matrix Sampled
Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and Total Petroleum Hydrocarbon (TPH) - Gasoline Range Organics (GRO)	SW-846 8260B	Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater
Semi-Volatile Organic Compounds (SVOCs) (Phenols and Polycyclic Aromatic Hydrocarbons [PAHs])	SW-846 8270C	Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater
Target Analyte List (TAL) Metals (23 elements)	SW-846 6010B and 7470A/7471A	Background Soil, Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater
Methyl Mercury (MeHg)	SW-846 1630	Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater
SVOCs (PAHs)	SW-846 8270 Selected Ion Monitoring (SIM)	Background Soil
TPH - Diesel Range Organics (DRO)	SW-846 8015M	Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater
Dioxins/Furans	SW-846 8290A	Surface and Subsurface Soil, Stream Sediment, Surface Water, and Groundwater

Following the completion of the Phase I field sampling activities, analytical data collected were compiled, analyzed, and validated in accordance with the procedures detailed in the SAP-IW and SS-SAP. After the analytical data were compiled, analyzed, and validated, chemical detections were compared to the matrix-appropriate screening levels presented in the regulatory agency-approved Work Plan. The most conservative (residential) screening levels were used in this data evaluation. The Phase I data evaluation results were presented in the Phase I Tech Memo. Based on the results of the Phase I data, several modifications and adjustments to the Work Plan were recommended in the Phase I Tech Memo.

Phase II field activities conducted to support the RI at the CFI Site included:

- Collection of additional up gradient stream sediments;
- Collection of surface soils from the drainage swale;
- Collection of surface and subsurface soils from the upland terrace area, the floodplain slope, and the Kansas River floodplain at the CFI Site; and
- Collection of groundwater at and down gradient of the CFI Site.

Table 2-1 presents a summary of field activities performed during Phase II of the RI. A summary of Phase II samples collected during the RI is presented in Table 2-2.

Samples collected during Phase II, were selectively analyzed for the following parameters per the prescribed procedures in the regulatory agency-approved Work Plan, and/or Phase I Tech Memo:

Analytical Group	Analytical Method	Matrix Sampled
TAL Metals (23 elements)	SW-846 6020 and 7470A/7471A	Surface and Subsurface Soil, Stream Sediment, and Groundwater
SVOCs (PAHs)	SW-846 8270C SIM	Surface and Subsurface Soil and Groundwater
Dioxins/Furans	SW-846 8290A	Surface and Subsurface Soil and Groundwater

Phase III field activities conducted to support the RI at the CFI Site included:

- Installation and development of four monitoring wells;
- Aquifer testing to characterize the aquifer;
- Quarterly collection of surface water samples from Threemile Creek at a location approximately midpoint of, up gradient of, and down gradient of the CFI Site; and
- Quarterly collection of groundwater samples from monitoring wells.

Table 2-1 presents a summary of field activities performed during Phase III of the RI. A summary of Phase III samples collected during the RI is presented in Table 2-2.

Samples collected during Phase III field activities were analyzed per the prescribed procedures the Work Plan, Phase I Tech Memo, and/or Phase II Tech Memo:

Analytical Group	Analytical Method	Matrix Sampled
TAL Metals (23 elements)	SW-846 6020 and 7470A/7471A	Surface Water and Groundwater
SVOCs (PAHs)	SW-846 8270C SIM	Surface Water and Groundwater
Dioxins/Furans	SW-846 8290A	Surface Water and Groundwater
TOC	SW-846 9060	Groundwater (1st quarterly event only)
Alkalinity	SM 2320B	Groundwater (1st quarterly event only)
Anions (Chloride, Nitrate, Nitrite, and Sulfate)	EPA 300.0	Groundwater (1st quarterly event only)
Sulfide	EPA 9034	Groundwater (1st quarterly event only)

Field activities for Phase I, II, and III were documented in Daily Quality Control Reports (DQCRs), field logbooks, hazardous and toxic waste (HTW) drilling logs, and groundwater sampling forms. Copies of the DQCRs are included in Appendix F. Copies of the field logbooks are included in Appendix G of this RI Report. Appendix H includes the HTW Drilling Logs for the newly installed monitoring wells, the accompanying monitoring well construction and development forms, the KDHE Water Well Record Forms (WWC-5), and the direct-push HTW drilling logs. Data and calculations for the *in-situ* slug testing are included in Appendix I and groundwater sampling forms are included in Appendix J. Survey data for the sampling locations and reference points are included in Appendix K.

2.2 Phase I RI Field Activities

Phase I of the field investigation occurred between December 16, 2013 and January 16, 2014 and included pre-investigation work and background, surface soil, subsurface soil, stream sediment, surface water, and groundwater sampling. Results of the Phase I investigation were used to plan the Phase II field activities.

2.2.1 Pre-Investigation Activities

Prior to the initiation of sampling activities, excess brush and timber along sampling transects on the Kansas River floodplain were cleared. Brush and timber clearing activities were performed on December 16, 2013 through December 18, 2013.

2.2.2 Background Soil Sampling and Analysis

A background soil study was performed, in which 24 samples were collected from 12 hand auger borings (BG01 through BG12) from an off-site location with analogous soil type and depositional environments. Background Soil Samples BG01 through BG04 were collected from the upland terrace depositional environment of the background area; Background Soil Samples BG05 through BG08 were collected from the floodplain slope depositional environment of the background area; and Background Soil Samples BG09 through BG12 were collected from the Kansas River floodplain depositional environment of the background area. These background soil samples were collected from ground surface to 0.5 ft below ground surface (bgs) and 3 ft to 4 ft bgs intervals and were analyzed for TAL metals (23 elements) and SVOCs (PAHs). Background soil sampling locations are illustrated on Figure 2-1.

2.2.3 Drainage Swale Surface Soil Sampling and Analysis

Five surface soil samples (SS01 through SS05) were collected from the drainage swale located adjacent to the floodplain slope on the Kansas River floodplain from ground surface to 0.5 ft bgs. Drainage swale surface soil samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Figure 2-2 shows the location of the drainage swale surface soil samples.

2.2.4 Stream Sediment Sampling and Analysis

Three stream sediment samples (SD01 through SD03) were collected from Threemile Creek during the Phase I field activities. Stream sediment samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Stream sediment sample locations are depicted on Figure 2-3.

2.2.5 Surface Water Sampling and Analysis

Three surface water samples (SW01 through SW03) were collected from Threemile Creek during the Phase I field activities. Surface water samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Surface water sample locations are depicted on Figure 2-3.

2.2.6 Direct-Push Soil Sampling and Analysis

Seven direct-push borings (DP01 through DP07) were advanced at the site and 29 soil samples were collected (see Figure 2-4). As illustrated on Figure 2-4, Direct-Push Boring DP01 was collected on the upland terrace; Direct-Push Borings DP-02 through DP-05 were collected from the floodplain slope; and Direct-Push Borings DP-06 and DP-07 were collected from the Kansas River floodplain. Five samples were collected from Direct-Push Boring DP01 and four samples were collected from Direct-Push Borings DP02 through DP07. Direct-push soil samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. These soil samples were collected at depths ranging from ground surface to approximately 32 ft bgs. Upon completion of sampling, the borings were abandoned following the procedures outlined in the IW-SAP and SS-SAP. HTW boring logs for the direct-push subsurface soil sample locations are included in Appendix H.

2.2.7 Direct-Push Groundwater Sampling and Analysis

Five direct-push borings (DP08 through DP12) were advanced at the site and a single groundwater sample was collected from each boring during the Phase I field activities (see Figure 2-5). As illustrated on Figure 2-5, Direct-Push Boring DP08 was collected on the upland terrace; Direct-Push Boring DP-09 was collected from the floodplain slope; and Direct-Push Borings DP-10 through DP-12 were collected from the Kansas River floodplain. Direct-push groundwater samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Groundwater samples from the upland terrace groundwater samples were collected from an interval of 34 ft to 38 ft bgs. Floodplain slope and Kansas River floodplain samples were collected from an interval of 22 ft to 26 ft bgs. Boreholes were abandoned upon completion of this phase of field work per the procedures in the IW-SAP and the SS-SAP.

2.3 Phase I Data Evaluation

Upon completion of the Phase I field activities the analytical data were evaluated. During the Phase I data evaluation the analytical data were compared to screening levels per the regulatory agency-approved Work Plan to determine chemical exceedances in the media sampled. Exceedances in each media were also illustrated on site figures for visualization of the horizontal and vertical extent of contamination. Based on the evaluation of the Phase I data, following USEPA and KDHE review and approval, the following modifications were made to the Phase II field sampling approach in the Phase I Tech Memo (see Appendix C):

- BTEX, TPH-GRO, TPH-DRO, MeHg, and SVOCs (phenols) were deleted from the analytical suites for all media as there were no exceedances in any of the Phase I samples.
- The collection of additional up-gradient surface water samples was removed due to the absence of metals exceedances.

- The collection of additional up-gradient stream sediment samples was added to Phase II activities to determine if metals detections in the Phase I stream sediment samples are naturally occurring or were from operations at the site.
- The collection of additional surface soil samples from the drainage swale to delineate the horizontal extent of a thallium detection.
- The collection of additional surface soil and shallow subsurface soil samples from the upland terrace area to provide definition of impacts in the surface soils and shallow subsurface soils near the former incinerator structures where historical remedial activities occurred.
- Modification of soil sampling depth intervals for when ash/cinder deposits were not identified in subsurface material to conform to the protocol used during the Phase I sampling.
- Adjustment of the location of the original proposed Phase II direct-push soil and groundwater boring locations to be closer to the area where incinerator ash/cinder deposits were identified during Phase I field activities.

2.4 Phase II RI Field Activities

The Phase II investigation was conducted between November 17, 2014 and November 25, 2014. Field activities included: a SLERA survey; additional drainage swale surface soil sampling and analysis; stream sediment comparison study; upland terrace soil sampling and analysis; and direct-push soil and groundwater sampling and analysis.

2.4.1 Screening Level Ecological Risk Assessment Survey

An SLERA survey was conducted at the CFI Site on November 18, 2011 per the procedures set forth in the Work Plan. The findings of the SLERA survey are presented in Section 7.0 of this RI Report.

2.4.2 Additional Drainage Swale Surface Soil Sampling and Analysis

Three additional surface soil samples (SS06 through SS08) were collected from the drainage swale adjacent to Surface Soil Sample SS05 (which was collected during Phase I of the RI). The samples were collected from ground surface to 0.5 ft bgs to delineate the horizontal extent of thallium previously detected in SS05. Surface soil samples from the drainage swale were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Figure 2-2 shows the location of the additional drainage swale surface soil samples.

2.4.3 Stream Sediment Comparison Study

Eight additional stream sediment samples (SD04 through SD11) were collected upstream from Threemile Creek to determine if metals detections in the Phase I stream sediment samples are naturally occurring or are from site impacts. The additional stream sediment samples were analyzed for TAL metals (23 elements) only. Figure 2-3 shows the location of these samples.

2.4.4 Upland Terrace Soil Sampling and Analysis

Seven direct-push borings (UT01 through UT07) were advanced at the site on the upland terrace and 14 soil samples were collected to provide better areal coverage of the surface soils and shallow subsurface soils near the former incinerator structures where historical remedial activities occurred. Upland terrace sample locations are shown on Figure 2-4. These soil samples were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Upland terrace soil samples were collected from ground surface to 0.5 ft bgs and 3 ft to 4 ft bgs. Upon completion of sampling, the borings were abandoned following the procedures outlined in the IW-SAP and SS-SAP. HTW boring logs for the direct-push subsurface soil sample locations are included in Appendix H.

2.4.5 Direct-Push Soil Sampling and Analysis

Twelve direct-push borings (DP13 through DP24) were advanced at the site and 48 soil samples were collected (see Figure 2-4). These direct-push soil samples were collected to provide additional areal coverage of the upland terrace, floodplain slope, and Kansas River floodplain. Direct-push soil samples were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. These soil samples were collected at depths ranging from ground surface to approximately 32 ft bgs. Upon completion of sampling, the borings were abandoned following the procedures outlined in the IW-SAP and SS-SAP. HTW boring logs for the direct-push subsurface soil sample locations are included in Appendix H.

2.4.6 Direct-Push Groundwater Sampling and Analysis

Thirteen direct-push borings (DP25 through DP37) were advanced at the site and a single groundwater sample was collected from each boring during the Phase II field activities (see Figure 2-5). As illustrated on Figure 2-5, Direct-Push Boring DP25 was collected on the upland terrace; Direct-Push Boring DP-28 was collected from the floodplain slope; and Direct-Push Borings DP-26, DP-27, and DP-29 through DP-37 were collected from the Kansas River floodplain. These direct-push soil samples were collected to provide additional areal coverage of the upland terrace and Kansas River floodplain. Direct-push groundwater samples were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Groundwater samples from the upland terrace groundwater samples were collected from an interval of 34 ft to 38 ft bgs. Floodplain slope and Kansas River floodplain samples were collected from an interval of 22 ft to 26 ft bgs. Upon completion of sampling, the borings were abandoned following the procedures outlined in the IW-SAP and SS-SAP.

2.5 Phase II Data Evaluation

Upon completion of the Phase II field activities the analytical data were evaluated. During the Phase II data evaluation, Phase I and Phase II analytical data were compared to screening levels per the regulatory agency-approved Work Plan to determine chemical exceedances in the media sampled. Exceedances in each media were also illustrated on site figures to refine the visualization of the horizontal and vertical extent of contamination. Based on the evaluation of the Phase II data, following USEPA and KDHE review and approval, the Phase II Tech Memo presented the rationales for the installation of monitoring wells, proposed locations of monitoring wells, and analytical requirements for quarterly sampling of monitoring wells and surface water (see Appendix D).

2.6 Phase III RI Field Activities

Phase III of the field investigation was conducted between April 13, 2015 and February 12, 2016. Field activities included: monitoring well installation and development; *in-situ* hydraulic conductivity testing; quarterly monitoring well groundwater sampling and analysis; and quarterly surface water sampling and analysis.

2.6.1 Monitoring Well Installation and Development

Four monitoring wells (CFIMW15-01 through CFIMW15-04) were installed and developed during the Phase III investigation per the procedures presented in the Work Plan and Phase II Tech Memo. Each monitoring well was screened within the Kansas River alluvial aquifer. Soil borings were continuously logged from the ground surface to the approximate total depth for logging purposes. The monitoring wells were installed and developed in accordance with the SOPs provided in the IW-SAP and SS-SAP. Monitoring well construction details can be found on Table 2-3. Monitoring well logs, construction diagrams, development forms, and KDHE WWC-5 forms are included in Appendix H. The locations of the monitoring wells are shown on Figure 2-6.

2.6.2 Aquifer Testing

In-situ hydraulic conductivity tests (slug tests) were conducted at each of the four monitoring wells on May 5, 2015 prior to beginning the first quarterly groundwater sampling event. Calculations for the slug tests are included in Appendix I. Results of the slug tests are discussed in Section 3.1.5.2 of this RI Report.

2.6.3 Quarterly Monitoring Well and Surface Water Sampling and Analysis

Quarterly groundwater/surface water sampling events were conducted in May, August, and November of 2015 and February of 2016. Four monitoring wells (CFIMW15-01 through CFIMW15-04) were sampled during each event (see Figure 2-6). Groundwater level measurements were collected prior to each groundwater sampling event. The monitoring wells were sampled for TAL metals, SVOCs (PAHs), dioxins/furans, and water quality parameters (temperature, hydrogen ion activity [pH], specific conductivity, dissolved oxygen [DO], and oxidation-reduction potential [ORP]) per the protocol presented in the SS-SAP and the IW-SAP. Additional water quality parameters collected during the first quarterly sampling event included alkalinity, anions (chloride, nitrate, nitrite, and sulfate), sulfide, and TOC. Complete analytical sets were collected from the monitoring wells for each of the sampling events. Quarterly groundwater sample forms are included in Appendix J.

During each quarterly sampling event, surface water samples were collected from Threemile Creek at a location approximately midpoint of, up gradient of, and down gradient of the CFI Site (see Figure 2-3). Surface waters were sampled for TAL metals, SVOCs (PAHs), dioxins/furans, and water quality parameters (temperature, pH, and specific conductivity).

2.7 Surveying

Following the completion of Phase I, Phase II, and monitoring well installation field activities, sample locations and/or monitoring wells were surveyed by a Kansas-licensed surveyor. Sample locations were surveyed horizontally to the nearest 0.1 foot and tied into the Universal Transverse Mercator (UTM). The ground surface elevation of each sample location was measured to the nearest 0.1 foot relative to mean sea level (MSL) and reported using North American Vertical Datum of 1988 (NAVD 88). For monitoring wells, the reference notch on the well riser and the survey monument was surveyed to the nearest 0.01 foot relative to MSL and reported using NAVD 88. Survey data for the sampling locations are presented on Table 2-2 and included in Appendix K.

A topographic survey of the upland terrace, floodplain slope, and Kansas River floodplain encompassing most of the area investigated during the RI was conducted on February 8, 2016 by a Kansas licensed surveyor. During surveying the horizontal and vertical control at the site were set using North American Datum of 1983 (NAD 83) and NAVD 88. The topographic survey was performed to better correlate sample locations with site topography. A copy of the figure generated by the topographic survey is included in Appendix K.

2.8 IDW Management

Investigative-derived waste (IDW) generated during RI field activities was characterized and disposed of in accordance with local, state, and federal regulations as outlined in the *Installation-Wide Investigative-Derived Waste Management Plan for Environmental Investigations at Fort Riley, Kansas* (BMcD, 2003) (IW-IDW) and the *Site-Specific Installation-Wide Investigative-Derived Waste Management Plan for RI/FS Environmental Investigations for the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas* (LBG-BMcD, 2013c) (SS-IDW). IDW characterization samples were collected from soil and water waste streams generated during Phase I and Phase II field activities on November 25, 2014. Phase III IDW characterization samples were collected on April 16, 2015 following the completion of monitoring well development. IDW characterization sample data are presented in Tables 2-4 and 2-5. Soil and water waste streams from Phase I, Phase II, and Phase III (excluding monitoring well purge water from the second, third, and fourth quarter groundwater sampling events) were disposed of on July 16, 2015. Six drums of soil IDW were emptied and thinly spread on site and ten water IDW drums were transported to the Custer Hill Waste Water Treatment Plant (CHWWTP) and deposed of at the designated disposal point. Monitoring well purge water from the second, third, and fourth quarter groundwater sampling events was characterized using the analytical results of each monitoring well from each groundwater sampling event (see Tables 2-6 and 2-7). Monitoring well purge water from the second, third, and fourth quarter groundwater sampling events was transported to and disposed of at Sanitary Sewer Manhole 173 on April 28, 2016.

2.9 Data Validation

Analytical data were validated as specified per the protocol presented in the SS-SAP and the IW-SAP. Quality Control Summary Reports (QCSRs) were produced and submitted to the Fort Riley, USACE, USEPA, and KDHE after each sampling event. QCSRs were generated for the following data sets:

- Phase I (Background Soil Sampling, Surface Soil Sampling, Stream Sediment Sampling, Surface Water Sampling, and Direct-Push Soil and Groundwater Sampling) – *Quality Control Summary Reports, Phase 1 WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas and Fort Riley Camp Funston Incinerator Background PAH Samples*, March 2014 (LBG-BMcD, 2014b).
- Phase II (Stream Sediment Sampling, Surface Soil Sampling, Upland Terrace Soil Sampling, and Direct-Push Soil and Groundwater Sampling) – *Quality Control Summary Report, Phase 2 WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas*, January 2015 (LBG-BMcD, 2015b).

- Phase III (Stream Sediment and Groundwater Sampling, Quarter 1) – *Quality Control Summary Report, Baseline/First Quarter Event, WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas,* June 2015 (LBG-BMcD, 2015c).
- Phase III (Stream Sediment and Groundwater Sampling, Quarter 2) – *Quality Control Summary Report, Second Quarter Event, WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas,* October 2015 (LBG-BMcD, 2015d).
- Phase III (Stream Sediment and Groundwater Sampling, Quarter 3) – *Quality Control Summary Report, Third Quarter Event, WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas,* January 2016 (LBG-BMcD, 2016a).
- Phase III (Stream Sediment and Groundwater Sampling, Quarter 4) – *Quality Control Summary Report, Fourth Quarter Event, WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas,* April 2016 (LBG-BMcD, 2016b).

Copies of the above mentioned QCSRs can be found in Appendix L of this RI Report.

* * * * *

3.0 SITE SETTING

3.1 Physical Setting

3.1.1 Surface Features

3.1.1.1 Regional Surface Features

The topography of Fort Riley and the surrounding area consists of a low plain that has been eroded by streams and rivers. The area is designated as the Osage Plains section of the Central Lowlands physiographic province (Schoewe, 1949). Sedimentary bedrock strata dip gently to the west-northwest. East-facing escarpments of more resistant rock units are separated by gentle, westward-sloping plains. The resulting topography can be divided into upland areas with bluffs along alluvial valleys, and lowland areas which consist of alluvial plains and associated terraces. The upland areas are dissected by numerous intermittent and perennial streams. The lowlands areas occur along the banks of the major rivers in the area including; the Republican, Smoky Hill, and Kansas Rivers (Jewett, 1941).

3.1.1.2 Site-Specific Surface Features

The CFI Site is located at the transition of the terrace into the Kansas River alluvial valley and includes three distinct areas; the upland terrace area, the floodplain slope, and the Kansas River floodplain. The upland terrace area is relatively flat and drains southeast toward Threemile Creek. The floodplain slope is relatively steep with an approximate 3 to 1 slope. The floodplain slope is approximately 16 ft high and extends approximately 50 ft laterally between the upland terrace area and the Kansas River floodplain (CTI, 2010). The floodplain slope also drains southeast toward Threemile Creek. The Kansas River floodplain is relatively flat and drains southeast toward Threemile Creek. Site-specific surface features are illustrated on Figure 1-3.

3.1.2 Climatology

The average temperature for the area (measured at Station 144972, located in Manhattan, Kansas, approximately 10 miles east-northeast of the CFI Site) is 55 degrees Fahrenheit (ºF). Temperature extremes range from a record low of -31 ºF (January 1947) to a record high of 116 ºF (August 1936). Annual precipitation from 1900 through 2010 ranged from a minimum of 15.42 inches to a maximum of 60.38 inches, with an average of approximately 33 inches per year (in/yr). The maximum 24-hour rain event during the same period was reported at 6.28 inches. Average annual snowfall is approximately 18 inches with a maximum annual snowfall during the reporting period of 49.5 inches in 1960. The maximum 24-hour snowfall event during this same time period was reported as 18 inches (High Plains

Regional Climate Center, 2016). Pan evaporation, measured by the USACE at Tuttle Creek Lake north of Manhattan, averaged 47.13 in/yr between 1980 and 1997, with extremes of 37.39 in/yr and 58.66 in/yr.

Prevailing wind directions are variable. Winds are predominantly from the south and southwest during March through December, and winds are predominately from the north during the months of January and February. Wind speeds generally range from seven to ten miles per hour (mph). Wind speeds of up to 110 mph have been recorded at MAAF (personal communication, First Weather Group, Detachment 8, Fort Riley MAAF, 1998).

3.1.3 Geology and Soils

3.1.3.1 Regional Geology and Soils

The geology of Fort Riley and the surrounding area consists of Pennsylvanian and Permian Age sedimentary rock overlain by eolian and fluvial deposits of Pleistocene and Recent Age (Jewett, 1941). The Nemaha Anticline is the prominent structural feature in the area, and Fort Riley is situated on the western limb of this fold within the Salina Basin (Merriam, 1963). Bedrock dips gently (approximately 30 ft per mile) to the west-northwest and consists of alternating beds of limestone and shale of the Permian Chase and Council Grove Groups. The Barnestone Formation of the Chase Group (composed of the Fort Riley Limestone, Oketo Shale, and Florence Limestone Members) is the uppermost bedrock in the upland areas. This sequence of interbedded limestones and shales continues to depths of several hundred ft. The bedrock surface has been eroded by the major rivers and streams. The major streams tend to flow to the east and south. The rivers are broad, shallow, and slow-moving.

In the major river valleys, alluvial sand, silt, and gravel deposits reach a thickness of approximately 100 ft near the rivers and decrease in thickness toward the margins of the Kansas River floodplain. Alluvium and loess cover portions of the upland areas, including terraces underlain by Buck Creek terrace deposits (Fader, 1974). These terrace deposits include both alluvium and loess. Eudora and Kenesaw soils are developed throughout Fort Riley (Jantz et al., 1975). Eudora silt loams are well drained, have moderate permeability, and normally form in coarse, silty alluvium on high flood plains or low terraces. Kenesaw silt loams are well drained, have moderate permeability, and form in loess on deep gently sloping and sloping soils on uplands (United States Department of Agriculture - Natural Resources Conservation Service [USDA-NRCS], in cooperation with the Kansas Agriculture Experiment Station, 2005).

3.1.3.2 Site-Specific Geology and Soils

Three cross sections for the CFI Site have been constructed using geologic logs produced during the RI field activities. Figure 3-1 indicates where the three cross sections cut the site. Cross Section A-Aˈ cuts approximately east-west (parallel) through the floodplain slope (see Figure 3-2). Cross Section B-Bˈ cuts approximately northwest-southeast from the upland terrace, through the floodplain slope and Kansas River floodplain (see Figure 3-3). Figure 3-3 shows the topography slopes to the northwest and to the southeast. Cross Section C-Cˈ cuts approximately northeast-southwest from the upland terrace, through the floodplain slope and Kansas River floodplain (see Figure 3-4).

The geology of the CFI Site consists of alluvial sediments overlying Permian-age sedimentary rock composed of alternating sequences of shale and limestone. Information obtained from soil borings at the CFI Site indicated that the soils sampled were primarily alluvial sediments. The soil borings exhibited the upward-fining sequence typical of alluvial sediments, with coarse-grained sands at depth, grading upward into medium- to fine-grained sands, then fine-grained silts and clays near the surface (see Figures 3-3, and 3-4). Most of the materials encountered appeared to be natural deposits, with the exception of the some fill and rubble material present on the upland terrace and the anthropogenic ash/cinder deposits discussed in Section 3.1.3.3.

The soils in the Kansas River floodplain and in those borings advanced in the upland terrace were found to be generally similar in nature. Eudora soils are present in the alluvial valley to the south and east of the UPRR grade. Kenesaw soils are present on the Buck Creek terrace deposits north of the UPRR grade. These soils are also well drained and moderately permeable. Kenesaw soils, which are well drained and moderately permeable, are the predominant soil type present at the CFI Site (USDA-NRCS, in cooperation with the Kansas Agriculture Experiment Station, 2005).

3.1.3.3 Incinerator Waste Material (Ash/Cinder)

Incinerator operation waste material consisting of ash/cinder was identified on the floodplain slope. With some ash/cinder material also located on the upland terrace and Kansas River floodplain. Waste material (ash/cinder) on the upland terrace was identified in three borings (DP01, DP13, and DP14) in surficial soils from ground surface to approximately 1 ft bgs near the hinge point of the floodplain slope. Ash/cinder material was identified in all eight borings (DP02, DP03, DP04, DP05, DP15, DP16, DP17, and DP18) sampled on the floodplain slope (see Figure 3-2). The anthropogenic ash/cinder deposits ranged in thicknesses from approximately 1 ft to approximately 9.5 ft. Ash/cinder material was only identified in one boring (DP22) on the Kansas River floodplain that was immediately adjacent to the toe of the floodplain slope. Ash/cinder material at this location was approximately 3 ft thick and was covered by approximately 3 ft of clayey soil. The approximate extent of ash/cinder material is illustrated on Figure 3-5.

3.1.4 Surface Water Hydrology

3.1.4.1 Regional Surface Water Drainage

Fort Riley is located along the Kansas River, and is surrounded by other large bodies of water associated with the Kansas River system. The river system in the area includes Milford Lake (a reservoir on the Republican River) to the west, the Republican River (downstream of Milford Lake to the southwest), and the Smoky Hill River to the south. The Republican and Smoky Hill Rivers merge to form the Kansas River approximately six miles west of the CFI Site. There are numerous other intermittent and perennial creeks/streams that dissect Fort Riley, eventually feeding into the large rivers identified above (Jewett, 1941).

3.1.4.2 Site-Specific Surface Water Drainage

Threemile Creek is located adjacent (northeast) of the former incinerator. During average flow, the width ranges from approximately 6 ft to 30 ft wide along the portion of Threemile Creek that is adjacent to the investigation area, with the depths ranging from less than 1 ft to approximately 3 ft deep. Water within Threemile Creek flows south southeast toward the Kansas River (see Figure 2-3). Stormwater runoff drains from the upland terrace portion of the CFI Site southeast down the floodplain slope onto the Kansas River floodplain and east northeast into a drainage swale. The drainage swale runs parallel to the floodplain slope and extends approximately 600 ft to the east where it comes to an abrupt stop when the Kansas River floodplain becomes hummocky and irregular and becomes difficult to discern any indication of an integrated surface drainage toward Threemile Creek (see Figure 2-2). Based on visual observations of the surface water drainage at the CFI Site, it appears that there is very little, if any, hydrologic connection between the former incinerator operations area and Threemile Creek.

3.1.5 Hydrogeology

3.1.5.1 Regional Hydrogeology

Fort Riley lies within the Nonglaciated Central Region Groundwater Province (Heath, 1984). This region is hydrogeologically complex and is generally characterized by both consolidated rock aquifers having low yields and alluvial aquifers having moderate to high yields along the major rivers. In Geary and Riley Counties, both types of aquifers are present. Consolidated Permian limestone and shale aquifers produce small quantities of groundwater in the uplands areas. These aquifers are developed within fractures and cavities in the Permian Chase and Council Grove Groups (Buchanan and Buddemeier, 1993). In the river valleys, aquifers are developed within the unconsolidated alluvial sediments deposited by the rivers and major streams. These alluvial aquifers are unconfined and water wells completed within the Kansas River floodplain deposits can have high yields in the hundreds of gallons per minute (gpm). Elevated alluvial terrace deposits, which are located along the margins and above the modern floodplain, also act as low-yield aquifers. These deposits usually have lower transmissivities than the deposits of the modern alluvial floodplain because the saturated thickness of sediments is much less, and consequently, not a reliable supply of water. However, the terrace aquifers do provide recharge to the Kansas River alluvial aquifer and can act as conduits for contaminants. Alluvial, terrace, and bedrock aquifers are present at Fort Riley.

Three hydrogeologic environments are present at Fort Riley: the river valley consisting of alluvial sediments including clay, silt, and sand, and gravel; the upland terrace areas consisting of a thin, unconsolidated sedimentary regolith over bedrock; and the transition zones along the river valley margins where colluvial deposits from the upland terraces overlie and intermingle with alluvial river deposits. The unconsolidated materials are underlain by bedrock, which, consists of alternating beds of limestone and shale (Jewett, 1941 and Fader, 1974).

The regional groundwater flow within the alluvium generally flows in the down gradient direction of the Kansas River. In the area of Fort Riley, the Kansas River, as shown by comparison of river stage to groundwater levels in the aquifer, can act as either a gaining or a losing stream dependent upon season, precipitation, and water release from Milford Lake. When behaving as a gaining stream, the water level in the river is lower than the water level in the aquifer, and groundwater flow provides recharge to the river. As a losing stream, the water level is higher in the river than the surrounding alluvial aquifer, and flow from the river provides recharge to the aquifer.

3.1.5.2 Site-Specific Hydrogeology

Much of the information available on the site-specific hydrogeology comes from the network of monitoring wells installed at the CFI Site during the RI. Information on the construction details for these monitoring wells is presented in Table 2-3.

The CFI Site is located at the transition zone between the alluvial aquifer of the Kansas River valley and the upland terrace area. The alluvial aquifer of the Kansas River underlies the CFI Site. The Kansas River alluvial aquifer is an unconfined aquifer. Piezometric measurements for May, August, and November, 2015 and February 2016 are summarized on Table 3-1. Piezometric surfaces for the CFI Site are shown on Figures 3-6 through 3-9 for the four quarterly groundwater sampling events. As shown on the figures, the groundwater gradient within this aquifer is to the south southeast toward where Threemile Creek and the Kansas River converge. The water elevation of Threemile Creek at SW01 and SW02 was surveyed on January 25, 2015, during the winter, at 1038.57 ft above MSL and 1038.68 ft above MSL, respectively (see Table 2-2); however, the piezometric surface of the aquifer, during the winter, ranged from 1033.36 ft above MSL to 1033.32 ft above MSL (see Table 3-1) indicating Threemile Creek is a losing stream. Based on the measured piezometric surfaces during quarterly groundwater sampling activities at the CFI Site, it appears that there is very little, if any, hydrogeologic connection between the former incinerator operations area and Threemile Creek.

In-situ hydraulic conductivity testing (slug testing) was performed at each of the newly installed monitoring wells. Each monitoring well was slug tested twice. Data from the slug tests were uploaded into AQTESOLV, a hydrogeologic software program, to calculate the hydraulic conductivity (K) of the aquifer using both the Bouwer-Rice (Bouwer-Rice, 1976) and Springer-Gelhar (Springer-Gelhar, 1991) solution methods. The results of the slug tests are summarized in Table 3-2. The K values ranged from 2.18×10^{-02} centimeters per second (cm/sec) or 61.88 feet per day (ft/day) (CFIMW15-04, Bouwer-Rice, Test 2) to 3.34×10^{-03} cm/sec or 9.46 ft/day (CFIMW15-02, Springer-Gelhar, Test 1). The overall average K value for the CFI Site was calculated to be 9.45×10^{-03} cm/sec or 26.79 ft/day. Appendix I contains the raw data and calculations for the slug tests.

The estimated hydraulic gradient (i) was determined from the piezometric surface maps generated from each groundwater sampling event (Figures 3-6 through 3-9) to be 0.0084 feet/foot (ft/ft), 0.0095 ft/ft, 0.0095 ft/ft, and 0.0082 ft/ft, respectively. The average i across the CFI Site during the RI was 0.0089 ft/ft. The estimated average linear groundwater velocity (V) for the CFI Site was calculated to be 0.95 ft/day using the following equation:

$$V = Ki/n_e$$

Where:

V = Linear Groundwater Velocity
K = Hydraulic Conductivity (9.45×10^{-03} cm/sec or 26.79 ft/day, calculated average [see Table 3-2])
i = Hydraulic Gradient (0.0089 ft/ft, calculated average see above)
n_e = Effective Porosity (25%, assumed value)

3.1.6 Demography

According to the Fort Riley 1st Infantry Division webpage, the current assigned-served manpower/population is approximately 32,000 people. This population is broken down to approximately 1,100 active duty officers, 9,200 active duty enlisted, 12,400 family members, 5,962 retirees, and 3,300 civilian work force (1st Infantry Division, 2016).

There is currently no one who lives or works at the CFI Site. The lands surrounding the CFI Site consist of undeveloped lands and the UPRR. In addition to the other cantonment areas of Fort Riley (all of which are within six miles of the CFI Site), the following towns are within ten miles of the CFI Site: Junction City and Grandview Plaza (adjacent to the south) and Ogden (approximately six miles to the northeast). The approximate populations of the surrounding major towns are: Junction City (23,353), Grandview Plaza (1,560), and Ogden (2,087) (United States Department of Commerce [USDoC], 2010).

3.1.7 Land Use

Land use at Camp Funston, Fort Riley is related to the operations of an active Army installation. Camp Funston is used to support active military training, housing, and military operations which are expected to continue into the next century. According to the Fort Riley RPMP the land use for the area where the CFI Site located is currently classified as open space (Black & Veatch, 2007). Future land use at the CFI Site is likely to remain the same.

The area in the immediate vicinity of the CFI Site is currently unused wood/brush-covered land. Building 1460 located approximately a half mile east of the CFI Site is used for the repair, maintenance, and storage of vehicles and heavy equipment. There is an active fire station approximately a half mile northeast of the CFI Site on Huebner Road. There is active military housing (barracks) northwest of the CFI Site on Huebner Road. The Camp Funston Wastewater Treatment Plant is located approximately a quarter mile south of the CFI Site. The former Southwest Funston Landfill lies approximately a half mile south of the CFI Site. The UPRR tracks, which run immediately northwest of the CFI Site, support moderately heavy rail traffic, with several freight trains both east and westbound each day.

3.1.8 Groundwater Use

Fort Riley and the communities of Junction City and Ogden rely on groundwater drawn from alluvial sediments for municipal drinking water supplies. The Fort Riley water supply wells are in the alluvial valley, approximately eight miles up-gradient of the CFI Site near Camp Forsyth. The nearest water supply wells are approximately three miles east of the CFI Site, on the southern portion of the Kansas

River floodplain. There are no water supply wells located on the Kansas River floodplain between the CFI Site and the Kansas River.

3.1.9 Ecology

Fort Riley lies within a transitional zone between deciduous forests of Eastern Kansas and the grass prairies of the Great Plains. The area supports a wide variety of wildlife, adapted to a variety of habitat types. Habitats at Fort Riley consist of a mosaic of upland and riparian woodland, cropland, tall grass prairie, pasture/hayfield, re-vegetated grassland, and lawn based upon previous work performed. The Kansas River provides additional wildlife habitat.

The Fort Riley PWE Conservation Branch has identified 37 listed and rare species that have been identified or could potentially exist in the Fort Riley area. Table 3-3 provides a list of these species. Many of the species have recently been documented at Fort Riley. According to the U.S. Fish and Wildlife Service and Kansas Department of Wildlife, Parks, and Tourism, a total of 12 state or federal-protected (threatened or endangered) species are known or likely to occur within Geary or Riley County (Table 3-3). An additional 24 species are listed by the Kansas Department of Wildlife, Parks, and Tourism as species in need of conservation. However, no potential protected species habitats were observed during the November 18, 2014 site visit.

According to the National Wetland Inventory (NWI) maps, no ponds or wetlands are located within the boundary of the CFI Site. One perennial stream, Threemile Creek, is adjacent to the CFI Site. Threemile Creek flows southeastward from the hills to the north of the CFI Site to the Kansas River, located approximately one mile southeast of the CFI Site.

The vegetation communities at the CFI Site consisted mostly of mature floodplain forest with a riparian corridor along Threemile Creek and open grassy areas along Huebner Road/Williston Point Road and the UPRR railroad tracks. The plant and animal species composition of the CFI site is composed of common species that are tolerant of human disturbances. The following sections identify species that were observed during the November 18, 2014 site visit.

3.1.9.1 Vegetation

Woody vegetation at the CFI Site is present within the Kansas River floodplain forest southeast of the UPRR railroad tracks and narrow riparian zone along the Threemile Creek channel. The common woody species found within the forested areas of the site include American sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), elm (*Ulmus* spp.), bur oak (*Quercus macrocarpa*), and eastern cottonwood (*Populus deltoides*) with coralberry (*Symphoricarpos orbiculatus*), rough-leaved dogwood (*Cornus drummondii*), amur honeysuckle (*Lonicera maackii*), green brier (*Smilax bona-nox*), riverbank grape (*Vitis riparia*), and poison ivy (*Toxicodendron radicans*) in the understory. A berm is present along the south side of the railroad tracks. Grasses and forbs such as Johnsongrass (*Sorghum halepense*), bristlegrass (*Setaria* spp.), Canada goldenrod (*Solidago canadensis*), common mullein (*Verbascum thapsus*), and giant ragweed (*Ambrosia trifida*) are present along the top of the berm and flat, open areas along Huebner Road/Williston Point Road and the UPRR railroad tracks.

3.1.9.2 Terrestrial Wildlife

The lands surrounding the CFI Site consist of undeveloped wooded and grassy lands. Species observed at and in the vicinity of the site included American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Parus atricapillus*), and downy woodpecker (*Picoides pubescens*). Squirrel (*Sciurus* spp.) nests were present in the trees of the Kansas River floodplain forest in the vicinity of the CFI Site. Beaver (*Castor canadensis*) cuttings on the trunks of trees were present along Threemile Creek. Opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), and white-tailed deer (*Odocoileus virginianus*) tracks were present along the streams and within the Kansas River floodplain forest.

3.1.9.3 Aquatic Biota

The aquatic species observed within Threemile Creek during the November 18, 2014 site visit include creek chub (*Semotilus atromaculatus*), central stoneroller (*Campostoma anomalum*), and orangethroat darter (*Etheostoma spectabile*). No aquatic plants, aquatic invertebrates, and benthic vertebrates were observed in Threemile Creek during the site visit; however, aquatic plants, aquatic invertebrates, and benthic vertebrates are likely present and would likely be observed during the spring and summer months.

* * * * *

4.0 NATURE AND EXTENT OF CONTAMINATION

4.1 Introduction

Within this section of the RI Report, the nature and extent of impacts at the CFI Site are discussed on a media-specific basis (soil, stream sediment, surface water, and groundwater). Soil results are discussed as surface soil (0 to 2 ft bgs) and subsurface soil (>2 ft bgs). These depths have been used to be consistent with the current risk assessment guidance as used in the HHRA portion of this report (see Sections 6.0). For the purposes of the nature and extent of contamination discussion, all soil results except background soil will be discussed jointly, respective to their depth. Historic information is discussed where available.

Analytical results were compared to screening levels per the procedures set forth in the regulatory agency-approved Work Plan (LBG-BMcD, 2013a). Table 4-1 summarizes the human health screening levels used and the source of the screening levels for the analytes detected for each medium. Ecological screening levels used and their sources are presented in Section 7.0. The following conventions were used to evaluate the analytical data collected during the RI:

Surface and Subsurface Soil

- USEPA Regional Screening Levels (RSLs) using a target hazard quotient (THQ) of 1.0 for residential soil were used as the soil screening level for chemicals which have USEPA RSL screening values (USEPA, 2016a).
- KDHE Residential Scenario RSKs for soil were used as the soil screening level for chemicals which do not have USEPA RSL screening values (KDHE, 2015a).

Surface and subsurface soil samples were screened against the KDHE RSK for total chromium as total chromium was the analyte that was analyzed for during the RI.

Stream Sediment

- USEPA RSLs using a THQ of 1.0 for residential soil were used as the stream sediment screening level for chemicals which have USEPA RSL screening values (USEPA, 2016a).
- KDHE Residential Scenario RSKs for soil were used as the stream sediment screening level for chemicals which do not have USEPA RSL screening values (KDHE, 2015a).

Stream sediment samples were screened against the KDHE RSK for total chromium as total chromium was the analyte that was analyzed for during the RI.

Surface Water

- Kansas Surface Water Quality Standards (KSWQS) (public health domestic water supply) were used as the surface water screening level for chemicals which have KSWQS (public health domestic water supply) screening values (KDHE, 2015b).
- USEPA National Recommended Water Quality Criteria (NRWQS), Human Health Criteria Table (human health for the consumption of water plus organism) were used as the surface water screening level for chemicals which do not have KSWQS (public health domestic water supply) screening values (USEPA, 2015a).

Groundwater

- USEPA Maximum Contaminant Levels (MCLs) were used as the groundwater screening level for chemicals which have USEPA MCLs (USEPA, 2009b).
- USEPA RSLs using a THQ of 1.0 for tapwater were used as the groundwater screening levels for chemicals which do not have USEPA MCLs.
- KDHE Residential Scenario RSKs for groundwater were used as the groundwater screening level for chemicals which do not have USEPA MCLs or USEPA RSL screening standards.

Copies of applicable screening standard documents that are used in the RI Report are provided in Appendix M.

To compare the analytical results of the individual dioxins/furans congener to the media-specific screening level for 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), the total 2,3,7,8-TCDD equivalent or toxicity equivalence (TEQ) for each sample analyzed was calculated. The calculated total 2,3,7,8-TCDD equivalent or TEQ of each sample was then compared to the media-specific screening level for 2,3,7,8-TCDD to determine if there were any exceedances of dioxins/furans. The total 2,3,7,8-TCDD equivalent or TEQ value for each sample analyzed for dioxins/furans was calculated using the following equation:

$$TEF_i \times C_i = TEC_i$$

$$\Sigma(TEC_i) = TEQ$$

Where:

TEF_i = Toxicity Equivalence Factor of an individual dioxins/furans congener.
C_i = Concentration of an individual dioxins/furans congener. Individual dioxins/furans congeners that were not detected were assigned a C_i value of zero.
TEC_i = Toxicity Equivalent Concentration of an individual dioxins/furans congener.
TEQ = Toxicity Equivalence

Toxicity values for individual dioxins/furans congeners were developed based upon the toxicity values for 2,3,7,8-TCDD. Toxicity equivalence factors (TEFs) have been developed to reflect the variability in toxicity between the different dioxins/furans congeners. The World Health Organization (WHO) consensus TEFs (Van den Berg et al., 2006) were used for all total 2,3,7,8-TCDD or TEQ calculations (see Table 4-2). Because dioxins/furans exert health effects on the same target organs and through similar metabolic pathways, this method is appropriate. Although there are 75 different dioxin congeners and 135 different furan congeners, TEFs are only available for those congeners considered most likely to be of toxic concern (i.e., those congeners substituted in the lateral 2, 3, 7, and 8 positions). Therefore, no TEFs are available for “total dioxins/furans values”.

4.2 Background Soil

During Phase I field activities, background soil samples (surface and subsurface) were collected from an off-site location that contained the same depositional environments. The analogous soil types were used to evaluate natural and anthropogenic distribution and occurrences of COPCs at the CFI Site. Four surface soil and four subsurface soil samples were collected from each of the three depositional environments (upland terrace, floodplain slope, and Kansas River floodplain). Background soil sample locations are shown on Figure 2-1. Background soil samples were analyzed for TAL metals (23 elements) and SVOCs (PAHs). Background soil detections are discussed below and summarized in Table 4-3 and illustrated on Figures 4-1A and 4-1B.

4.2.1 SVOCs (PAHs)

PAHs detected in background soil samples included acenaphthene, acenapthylene, anthracene, benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenantherene, and pyrene.

4.2.2 TAL Metals (23 Elements)

Nineteen of the 23 TAL metals (aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc) were detected in background soil samples.

4.2.3 Background Soil Evaluation

Background soil concentrations (background levels) for the CFI Site were determined by calculating the 95% UTL for each chemical detected. The UTL represents a value that 95% of the population will fall below with 95% confidence. Usually, the UTL will tend to be higher than the highest value in the background data set that was used to calculate the UTL. UTLs for each chemical detected were calculated using the statistics program 95 ProUCL version 5.1 (USEPA, 2016b). Prior to running the background data through 95 ProUCL version 5.1 to determine the UTL, the surface and subsurface soil data sets were analyzed for statistical outliers using 95 ProUCL's outlier test function. The outlier output tables for each data set are provided in Appendix N and summarized on Table 4-4A. Statistical outliers at a 5 percent (%) significance level were removed from the data set, and the data was then compiled through 95 ProUCL version 5.1. The UTL output tables for each data set are provided in Appendix N. A summary of the calculated background UTLs and the selected background concentration for each chemical detected in background soils (surface and subsurface) are presented on Table 4-4B. Note, the most conservative calculated UTL was selected as the background concentration for each chemical. Only chemicals which have at least one detection were evaluated during the background soil evaluation.

The only chemicals that had exceedances of screening levels in surface or subsurface soil samples during the RI that were also analyzed for background include: arsenic, iron, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene.

The background levels for each of these chemicals, as shown on Table 4-4B, and their corresponding depth intervals is presented below:

<u>**Surface Soil (0 to 0.5 ft bgs)**</u>

- **Arsenic – 17 milligrams per kilogram (mg/kg) (95% UTL with 95% coverage for nonparametric data distribution) (screening level – 0.68 mg/kg)**
- Iron – 16,201 mg/kg (95% UTL with 95% Coverage for normal data distribution) (screening level – 55,000 mg/kg)
- Thallium – Not detected in background surface soil samples.

- Benzo(a)anthracene – 0.038 mg/kg (95% Bootstrap UTL with 95% coverage for lognormal distribution) (screening level – 0.16 mg/kg)
- **Benzo(a)pyrene – 0.034 mg/kg (95% UTL with 95% coverage for nonparametric distribution) (screening level – 0.016 mg/kg)**
- Benzo(b)fluoranthene – 0.085 mg/kg (95% UTL with 95% coverage for nonparametric distribution) (screening level – 0.16 mg/kg)
- Dibenzo(a,h)fluroanthene – 0.0072 mg/kg (95% Bootstrap UTL with 95% coverage for lognormal distribution) (screening level – 0.016)

As shown above, in bold, arsenic and benzo(a)pyrene were the only chemicals in surface soil which had background levels greater than their screening levels.

Subsurface Soil (3 to 4 ft bgs)

- **Arsenic – 9.144 mg/kg (95% UTL with 95% Coverage for normal data distribution) (screening level – 0.68 mg/kg)**
- Iron – 26,885 mg/kg (95% UTL with 95% Coverage for normal data distribution) (screening level – 55,000 mg/kg)
- Thallium – Not detected in background subsurface soil samples.
- Benzo(a)anthracene – 0.00179 mg/kg (95% UTL with 95% Coverage for normal data distribution) (screening level – 0.16 mg/kg)
- Benzo(a)pyrene – 0.0021 mg/kg (95% UTL with 95% Coverage for normal data distribution) (screening level – 0.016 mg/kg)
- Benzo(b)fluoranthene – 0.004 mg/kg (95% Bootstrap UTL with 95% coverage for lognormal distribution) (screening level – 0.16 mg/kg)
- Dibenzo(a,h)fluroanthene – Background level not calculated, the only detection was identified as a outlier and removed from data set.

As shown above, in bold, arsenic is the only chemical in subsurface soil that had a background level greater than its screening levels.

4.2.4 Summary

Twenty-four soil samples were collected from twelve off-site background locations from three different depositional environments. Each of the background soil samples were analyzed for TAL metals (23 elements) and SVOCs (PAHs). Background concentrations (background levels) were determined for the chemicals that were detected in surface and subsurface soil in the background area. Background concentration for each chemical detected at each sample interval are presented on Table 4-4B. Arsenic and benzo(a)pyrene were the only chemicals in surface soil which had background levels (17 mg/kg and 0.034 mg/kg) greater than their screening levels (0.68 mg/kg and 0.016 mg/kg). Arsenic is the only chemical in subsurface soil that had a background level (9.144 mg/kg) greater than its screening levels (0.68 mg/kg).

4.3 Surface Soil (0-2 ft bgs)

Surface soil samples were collected during Phase I and II of the RI field activities as part of the site-wide delineation of contamination in surface soil. During Phase I field activities, 14 surface soil samples were collected from 12 locations located across the CFI Site. Phase I surface soil sample locations are shown on Figures 2-2 and 2-4. Surface soil samples collected during Phase I of the RI field activities were analyzed for BTEX, TPH-GRO, TPH-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans.

During Phase II of the RI field activities, 23 surface soil samples were collected from 22 locations located across the CFI Site. Phase II surface soil sample locations are shown on Figure 2-2 and 2-4. Surface soil samples collected during the Phase II of the RI field activities were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Detections of surface soil are discussed below and summarized in Tables 4-5 and 4-6 and depicted on Figures 4-2 through 4-5.

4.3.1 BTEX

BTEX compounds were not detected in any of the surface soil samples collected during Phase I. BTEX was not analyzed during the Phase II investigation.

4.3.2 TPH-GRO

TPH-GRO was detected in four of the 14 surface soil samples collected during Phase I. TPH-GRO detections were well below the screening level of 220 mg/kg. TPH-GRO detection concentrations ranged from 2 estimated value (J) mg/kg to 11 mg/kg (see Table 4-5). TPH-GRO was not analyzed during the Phase II investigation.

4.3.3 TPH-DRO

TPH-DRO was detected in all 14 of the surface soil samples collected during Phase I. TPH-DRO detections were well below the screening level of 2,000 mg/kg. TPH-DRO concentrations ranged from 3.6 J mg/kg to 290 J mg/kg (see Table 4-5). TPH-DRO was not analyzed during the Phase II investigation.

4.3.4 SVOCs (Phenols and PAH)

SVOCs were detected in all 37 surface soil samples collected during Phase I and Phase II RI activities (14 Phase I and 23 Phase II). The SVOCs detected in surface soil samples included: acenaphthene; acenapthylene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; dibenzofuran; dimethyl phthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenantherene; and pyrene. Of these, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Benzo(a)anthracene exceeded its screening level of 0.16 mg/kg in one sample (DP15/SB01/0-0.5 ft) at a concentration of 0.21 mg/kg. Benzo(a)pyrene exceeded its screening level of 0.016 mg/kg in 15 samples at concentrations ranging from 0.019 J mg/kg (UT06/SB01/0-0.5 ft) to 0.14 mg/kg (DP15/SB01/0-0.5 ft), with seven samples exceeding the surface soil background level of 0.034 mg/kg. Benzo(a)fluoranthene exceeded its screening level of 0.16 mg/kg in one sample (DP15/SB01/0-0.5 ft) at a concentrations of 0.16 mg/kg. Dibenzo(a,h)anthracene exceeded its screening level of 0.016 mg/kg in two samples (DP15/SB01/0-0.5 ft and DP17/SB01/0-0.5 ft) at concentrations of 0.032 J mg/kg and 0.019 J mg/kg, respectively. SVOC exceedances are shown by depositional environment on Figure 4-3 (Upland Terrace), Figure 4-4 (Floodplain Slope), and Figure 4-5 (Kansas River Floodplain) and summarized on Table 4-5.

4.3.5 TAL Metals (23 Elements)

All 23 TAL metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc) were detected in Phase I and Phase II surface soil samples. Of these, arsenic, iron, and thallium were detected above their screening levels. Arsenic exceeded its screening level of 0.68 mg/kg in all 37 samples collected at concentrations ranging from 3.4 mg/kg (SS07/SS01/0-0.5 ft) to 35 mg/kg (DP03/SB01/0-0.5 ft). Seven of the 37 arsenic exceedances also exceeded the surface soil background level of 17 mg/kg. Iron exceeded its screening level of 55,000 mg/kg in two samples (DP02/SB01/0-0.5 ft and DP04/SB02/1-3 ft) at concentrations of 56,000 mg/kg and 76,000 mg/kg, respectively. Thallium exceeded its screening level of 0.78 mg/kg in four samples (DP02/SB01/0-0.5 ft, DP03/SB01/0-0.5 ft, DP04/SB01/1-3 ft, and SS05/SS01/0-0.5 ft) at concentrations of 1.8 J mg/kg, 1.6 J mg/kg, 2.0 J mg/kg, and 1.5 J mg/kg, respectively. Metals exceedances are shown by depositional environment on Figure 4-3 (Upland Terrace), Figure 4-4 (Floodplain Slope), and Figure 4-5 (Kansas River Floodplain) and summarized on Table 4-5.

4.3.6 MeHg

MeHg was detected in all 14 of the surface soil samples collected during Phase I activities. MeHg detections were well below the screening level of 7.8 mg/kg. MeHg concentrations ranged from 0.000028 J mg/kg to 0.000265 mg/kg (see Table 4-5). MeHg was not analyzed during the Phase II investigation.

4.3.7 Dioxins/Furans

Dioxins/furans congeners were detected in all 37 surface soil samples collected during Phase I and Phase II RI activities (14 Phase I and 23 Phase II). Of which, only three samples (DP02/SB01/0-0.5 ft, DP13/SB01/0-0.5 ft, and UT01/SB01/0-0.5 ft) had a total 2,3,7,8-TCDD equivalent above the screening level of 4.8 picograms per gram (pg/g). The total 2,3,7,8-TCDD equivalent for these three samples were 14.9180 pg/g, 5.9354 pg/g, and 7.3780 pg/g, respectively. Dioxins/furans exceedances are shown by depositional environment on Figure 4-3 (Upland Terrace), Figure 4-4 (Floodplain Slope), and Figure 4-5 (Kansas River Floodplain) and summarized on Table 4-6.

4.3.8 Historical Data

Three previous field investigations have been performed at the CFI Site in 2001, 2006, and 2010. Copies of these field investigation reports are provided in Appendix A. Historical soil data collected from the previous investigations are presented on Tables 4-7, 4-8, and 4-9.

4.3.8.1 2001 Arrowhead XRF Field Investigation

Fifty-eight surface soil samples were collected at the CFI Site during the XRF field investigation in 2001 and analyzed for barium, copper, lead, tin, and zinc using a field portable XRF (Arrowhead, 2001) (see Table 4-7). Fifteen of the 58 samples were sent to an off-site confirmation laboratory and analyzed for antimony, arsenic, copper, mercury, lead, and zinc (see Table 4-8). Arsenic exceeded its screening level of 0.68 mg/kg in all 15 confirmation samples analyzed at concentrations ranging from 2.9 mg/kg to 23.3 mg/kg; however, seven of these exceedances were removed during the October 2010 soil remediation activities on the upland terrace. One of the seven remaining exceedances also exceeded the surface soil background level of 17 mg/kg. Lead exceeded its screening level of 400 mg/kg in two of the 58 samples analyzed using the field portable XRF at concentrations of 515 mg/kg and 544 mg/kg. Only one of the laboratory confirmation samples had a lead detection above its screening level at a concentration of 488 mg/kg; however, this lead exceedance was removed during the October 2010 soil remediation activities on the upland terrace. As these sample locations were not surveyed their exact location cannot be determined; and therefore, are not included on figures in this RI Report. Refer to the figures in the 2001XRF Field Investigation Report located in Appendix A for sample locations.

4.3.8.2 2006 USACE-CENWK Field Investigation

One hundred surface soil samples were collected at the CFI Site in 2006 to verify the results of the 2001 XRF field investigation (see Table 4-8) (see Appendix A). Each of the 100 samples collected were submitted to an off-site laboratory and analyzed for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Additionally, 12 samples were submitted for analysis of TCLP eight RCRA metals (see Table 4-9). Arsenic exceeded its screening level of 0.68 mg/kg in all 100 samples at concentrations ranging from 2.5 mg/kg to 47.4 mg/kg; however, 22 exceedances were removed during the October 2010 soil remediation activities. Ten of the existing 78 samples also exceeded the background level for arsenic of 17 mg/kg. Lead exceeded its screening level of 400 mg/kg in five of the 100 samples at concentrations of 400 mg/kg, 439 mg/kg, 509 mg/kg, 844 mg/kg, and 1,300 mg/kg; however, the lead exceedance of 1,300 mg/kg was removed during the October 2010 soil remediation activities on the upland terrace. Mercury exceeded its screening level of 11 mg/kg in one sample at a concentration of 16.5 mg/kg. There were no exceedances of barium, cadmium, chromium, selenium, or silver. None of the samples analyzed for TCLP had detections above their respective TCLP limit. As these sample locations were not surveyed, their exact location cannot be determined; and therefore, are not included on figures in this RI Report. Refer to the figures in the 2006 Sampling Report located in Appendix A for sample locations.

4.3.8.3 2010 CTI Field Investigation and Soil Remediation

Four discrete grab samples were collected from four trenches that were excavated along the floodplain slope at the CFI Site (see Table 4-8) (see Appendix A). Each of these samples were submitted to an off-site laboratory and analyzed for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Arsenic exceeded its screening level of 0.68 mg/kg in all four samples with concentrations ranging from 3.7 mg/kg to 5.2 mg/kg. None of the discrete grab samples had arsenic exceedances above the surface soil background level of 17 mg/kg. Arsenic exceeded the surface soil background level of 17 mg/kg in five of the composite samples.

The former incinerator concrete slab, suspected incinerator burn area, and their associated footings were removed and transported off site and disposed of as special waste in October 2010. The upland terrace area that was previously investigated in 2001 and 2006 was then excavated approximately 6 to 12 inches bgs to remove soil and debris. Six composite confirmation surface soil samples (CFI-Q1 through CFI-Q5 and CFI-PAD-C) were collected from five sampling quadrants and from within the area of the former incinerator concrete slab. These six samples were submitted to an off-site laboratory and analyzed for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Arsenic exceeded its screening level of 0.68 mg/kg in all six samples at concentrations ranging from 3.2 mg/kg to 5.0 mg/kg. None of the confirmation samples exceeded the surface soil background level for arsenic. There were no exceedances of barium, cadmium, chromium, mercury, selenium, or silver. As these sample locations were not surveyed, their exact location cannot be determined; and therefore, are not included on figures in this RI Report. Refer to the figures in the 2010 Field Investigation and Soil Remediation Report located in Appendix A for sample locations.

Because soil removal activities were performed on the upland terrace area of the CFI Site, the surface soil data from the 0 to 0.5 ft interval will not be used the HHRA and SLERA as this soil was removed. Any of the surface soil data from the 0 to 0.5 ft interval not within the upland terrace area will be used in the HHRA and SLERA. Furthermore, analytical data from composite sample locations will be used on a case-by-case basis and their usability will be discussed in the risk assessments (HHRA and SLERA).

4.3.9 Distribution of Surface Soil Exceedances

4.3.9.1 Upland Terrace

Eleven surface soil samples were collected from ten borings on the upland terrace during Phase I and Phase II RI activities (see Figure 4-3). Chemicals in surface soil on the upland terrace which exceeded their respective screening levels include: arsenic, benzo(a)pyrene, and dioxins/furans. Arsenic was detected above its screening level in all eleven surface soil samples collected on the upland terrace. Arsenic exceedances ranged from 3.7 mg/kg to 14 mg/kg. None of the surface soil samples collected on the upland terrace were above the surface soil background level for arsenic of 17 mg/kg. Benzo(a)pyrene was detected above the screening level in nine of the surface soil samples collected on the upland terrace. Benzo(a)pyrene exceedances ranged from 0.019 J mg/kg to 0.075 mg/kg. Four samples (DP14/SB01/0-0.5 ft, UT/01/SB01/0-0.5 ft, UT/03/SB01/0-0.5 ft, and UT/04/SB01/0-0.5 ft) were above the surface soil background level for benzo(a)pyrene of 0.0034 mg/kg. There were two samples (DP13/SB01/0-0.5 ft, and UT01/SB01/0-0.5 ft) that had a total 2,3,7,8-TCDD equivalent above the screening level. The sample from DP13/SB01/0-0.5 ft was comprised of soil/ash material. Upland terrace surface soil exceedances are shown on Figure 4-3 and summarized on Tables 4-5 and 4-6. Additionally, there were 46 arsenic exceedances on the upland terrace during pre-RI sampling activities, of which, two exceeded the surface soil background level for arsenic of 17 mg/kg (see Table 4-8).

4.3.9.2 Floodplain Slope

Ten surface soil samples were collected from eight borings on the floodplain slope during Phase I and Phase II RI activities (see Figure 4-4). Chemicals in surface soil on the floodplain slope which exceeded their respective screening levels include: arsenic, iron, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and dioxins/furans. Arsenic was detected above its screening level in all ten surface soil samples collected on the floodplain slope. Arsenic exceedances ranged from 4.2 J mg/kg to 35 mg/kg. Seven of the ten samples were above the surface soil background level for arsenic of 17 mg/kg. Iron was detected above its screening level in two samples from the floodplain slope (DP02/SB01/0-0.5 ft and DP04/SB01/0-0.5 ft) at concentrations of 56,000 mg/kg and 76,000 mg/kg, respectively. Thallium was detected above its screening level in three samples from the floodplain slope (DP02/SB01/0-0.5 ft, DP02/SB01/0-0.5 ft, and DP04/SB01/0-0.5 ft) at concentrations of 1.8 J mg/kg, 1.6 J mg/kg, and 2.0 J mg/kg, respectively. Benzo(a)pyrene was detected above the screening level in five of the surface soil samples collected on the floodplain slope. Benzo(a)pyrene exceedances ranged from 0.028 mg/kg to 0.14 mg/kg. Three samples (DP15/SB01/0-0.5 ft, DP16/SB01/0-0.5 ft, and DP17/SB01/0-0.5 ft) were above the surface soil background level for benzo(a)pyrene of 0.034 mg/kg. Only one sample (DP15/SB01/0-0.5 ft) had exceedances of benzo(a)anthracene and benzo(b)fluroanthene above their respective screening levels. There were two samples (DP15/SB01/0-0.5 ft, and DP17/SB01/0-0.5 ft) that had dibenzo(a,h)anthracene exceedances above the screening level. One sample (DP02/SB01/0-0.5 ft) had a total 2,3,7,8-TCDD equivalent above the screening level. With the exception of DP05/SB01/0-0.5 ft, all surface soil samples collected on the floodplain slope were comprised of soil/ash or ash material. Floodplain slope surface soil exceedances are shown on Figure 4-4 and summarized on Tables 4-5 and 4-6. Additionally, there were 23 arsenic exceedances on the floodplain slope during pre-RI sampling activities, of which, eight exceeded the surface soil background level for arsenic of 17 mg/kg. There were two exceedances of lead and one exceedance of mercury on the floodplain slope during pre-RI sampling activities (see Table 4-8).

4.3.9.3 Kansas River Floodplain

Eight surface soil samples were collected on the Kansas River floodplain immediately downslope of the incinerator operations and eight surface soil samples were collected on the Kansas River floodplain in the drainage swale during Phase I and Phase II RI activities (see Figures 4-2 and 4-5). Chemicals in surface soil on the Kansas River floodplain which exceeded their respective screening levels include: arsenic, thallium, and benzo(a)pyrene. Arsenic was detected above its screening level in all 16 surface soil samples collected on the Kansas River floodplain. Arsenic exceedances ranged from 3.4 mg/kg to 6.5 mg/kg. All samples were below the surface soil background level for arsenic of 17 mg/kg. Benzo(a)pyrene was detected above the screening level in one surface soil sample (DP22/SB01/0-0.5 ft) collected on the Kansas River floodplain at concentration of 0.022 J mg/kg, which is below the surface soil background level of 0.034 mg/kg. Thallium was detected above its screening level in one sample (SS05) on the Kansas River floodplain in the drainage swale at concentration of 1.5 J mg/kg. All surface soil samples collected on the Kansas River floodplain were comprised of soil material. Kansas River floodplain exceedances are shown on Figures 4-2 and 4-5 and summarized on Tables 4-5 and 4-6. Additionally, there were 21 arsenic exceedances on the Kansas River floodplain during pre-RI sampling activities, of which, one exceeded the surface soil background level for arsenic of 17 mg/kg. There were two exceedances of lead on the Kansas River floodplain during pre-RI sampling activities (see Table 4-8).

4.3.10 Summary

Thirty-seven surface soil samples were collected during the RI field activities at the CFI Site from the three depositional environments. Fourteen surface soil samples were analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans during Phase I field activities. Twenty-three surface soil samples were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans during Phase II field activities. There were no exceedances of BTEX, TPH-GRO, TPH-DRO, or MeHg in the surface soil samples. The analytes detected above their respective screening levels in surface soil during the RI were arsenic, iron, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene. Additionally, dioxins/furans had a total 2,3,7,8-TCDD equivalent above the screening level in three samples. Arsenic, lead, and mercury were detected above their respective screening levels in historical surface soil samples.

Arsenic exceedances were ubiquitous throughout the surface soil collected from the three depositional environments; however, the highest concentrations were present in samples containing soil/ash and ash material on the upland terrace and floodplain slope. Iron exceedances were only present in surface soils on the floodplain slope in samples containing soil/ash and ash material. Thallium exceedances were present on the floodplain slope and the Kansas River floodplain drainage swale. Thallium exceedances on the floodplain slope were present in samples containing soil/ash and ash material. Exceedances of benzo(a)pyrene were present in all three depositional environments; however, there was only one sample on the Kansas River floodplain that exceeded its screening level. Benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene exceedances occurred only on the floodplain slope.

Dioxins/furans exceedances were present in samples on the upland terrace and floodplain slope. Pre-RI exceedances of lead and mercury were only present on the floodplain slope.

4.4 Subsurface Soil (>2 ft bgs)

Subsurface soil samples were collected during Phase I and Phase II of the RI field activities as part of the site-wide delineation of contamination in subsurface soil. During Phase I field activities, 20 subsurface soil samples were collected from seven locations located across the CFI Site. Phase I subsurface soil sample locations are shown on Figure 2-4. Subsurface soil samples collected during Phase I of the RI field activities were analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans.

During Phase II of the RI field activities, 42 subsurface soil samples were collected from 19 locations located across the CFI Site. Phase II subsurface soil sample locations are shown on Figure 2-4. Subsurface soil samples collected during the Phase II of the RI field activities were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Detections of subsurface soil are discussed below and summarized in Tables 4-10 and 4-11 and depicted on Figures 4-6 through 4-8.

4.4.1 BTEX

BTEX compounds were not detected in any of the subsurface soil samples collected during Phase I activities. BTEX was not analyzed during the Phase II investigation.

4.4.2 TPH-GRO

TPH-GRO was detected in two of the 20 Phase I subsurface soil samples (DP02/SB02/3-6’ and DP03/SB02/3-5’) collected at concentrations of 7.2 mg/kg, and 11 J mg/kg, respectively (see Table 4-10). The TPH-GRO detections were well below the screening level of 220 mg/kg. TPH-GRO was not analyzed during the Phase II investigation.

4.4.3 TPH-DRO

TPH-DRO was detected in 19 of the 20 subsurface soil samples collected during Phase I activities. TPH-DRO detection concentrations ranged from 0.84 J mg/kg to 290 J mg/kg (see Table 4-10), well below the screening level of 2,000 mg/kg. TPH-DRO was not analyzed during the Phase II investigation.

4.4.4 SVOCs (Phenols and PAHs)

SVOCs were detected in 15 of the 20 subsurface soil samples collected during the Phase I investigation and 32 of the 42 subsurface soil samples collected during the Phase II investigation. The SVOCs detected in subsurface soil samples included: acenaphthene; acenapthylene, anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; dibenzofuran; dimenthyl phthalate; fluoranthene, fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenantherene; and pyrene. Of these, only benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Benzo(a)anthracene exceeded its screening level of 0.16 mg/kg in one sample (DP18/SB02/3-4 ft) at a concentration of 0.16 mg/kg. Benzo(a)pyrene exceeded its screening level of 0.016 mg/kg in six samples (DP15/SB02/3-4 ft, DP18/SB02/3-4 ft, DP22/SB02/3-4 ft, UT03/SB02/3-4 ft, UT06/SB02/3-4 ft, and UT07/SB02/3-4 ft) at concentrations of 0.086 mg/kg, 0.12 mg/kg, 0.059 mg/kg, 0.025 J mg/kg, 0.019 J mg/kg, and 0.046 mg/kg, respectively. Dibenzo(a,h)anthracene exceeded its screening level of 0.016 mg/kg in two samples (DP18/SB02/3-4 ft and UT06/SB02/3-4 ft) at concentrations of 0.022 J mg/kg and 0.021 J mg/kg, respectively. SVOC exceedances are shown by depositional environment on Figure 4-6 (Upland Terrace), Figure 4-7 (Floodplain Slope), and Figure 4-8 (Kansas River Floodplain) and summarized on Table 4-10.

4.4.5 TAL Metals (23 Elements)

All 23 TAL metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc) were detected in Phase I and Phase II subsurface soil samples. Of these, only arsenic, iron, and thallium were detected above their respective screening levels. Arsenic exceeded its screening level of 0.68 mg/kg in all 62 samples collected at concentrations ranging from 1.5 mg/kg (DP18/SB02/3-4 ft) to 41 mg/kg (DP22/SB02/3-4 ft). Additionally, 5 of the 62 arsenic exceedances were above the subsurface soil background level of 9.144 mg/kg. Iron exceeded its screening level of 55,000 mg/kg in three samples (DP02/SB02/3-6 ft, DP15/SB04/3-4 ft, and DP22/SB02/3-4 ft) at concentrations of 55,000 mg/kg, 100,000 mg/kg, and 85,000 mg/kg, respectively. Thallium exceeded its screening level of 0.78 mg/kg in two samples (DP02/SB02/3-6 ft and DP03/SB02/3-5 ft) at concentrations of 1.6 J mg/kg and 1.4 J mg/kg, respectively. Metals exceedances are shown by depositional environment on Figure 4-6 (Upland Terrace), Figure 4-7 (Floodplain Slope), and Figure 4-8 (Kansas River Floodplain) and summarized on Table 4-10.

4.4.6 MeHg

MeHg was detected in all 14 of the subsurface soil samples collected during Phase I activities. MeHg detections ranged from 0.000011 J mg/kg to 0.000126 mg/kg (see Table 4-10), well below the screening level of 7.8 mg/kg. MeHg was not analyzed during the Phase II investigation.

4.4.7 Dioxins/Furans

Dioxins/furans congeners were detected in all 62 subsurface soil samples collected during Phase I and Phase II RI activities (20 Phase I and 42 Phase II). Of which, only two samples (DP02/SB02/3-6' and DP22/SB02/3-4') had a total 2,3,7,8-TCDD equivalent above the screening level of 4.8 pg/g. The total 2,3,7,8-TCDD equivalent for these two samples was 13.3537 pg/g and 8.1965 pg/g, respectively. Dioxins/furans exceedances are shown by depositional environment on Figure 4-6 (Upland Terrace), Figure 4-7 (Floodplain Slope), and Figure 4-8 (Kansas River Floodplain) and summarized on Table 4-11.

4.4.8 Historical Data

Ten discrete grab samples and six composite samples were collected from six trenches that were excavated along the floodplain slope at the CFI Site (see Table 4-8) (see Appendix A). Each of these samples were submitted to an off-site laboratory and analyzed for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Additionally, five of the discrete grab samples and all six of composite samples were also submitted for analysis of TCLP eight RCRA metals (see Table 4-9). Arsenic exceeded its screening level of 0.68 mg/kg in all ten discrete grab samples and all six composite samples with concentrations ranging from 3.3 mg/kg to 86.9 mg/kg. Four of the discrete grab samples and all six composite samples had arsenic exceedances above the surface soil background level of 9.144 mg/kg. None of the samples analyzed for TCLP had detections above their respective TCLP limit. As these sample locations were not surveyed, their exact locations cannot be determined; and therefore, are not included on figures in this RI Report. Refer to the figures in the 2010 Field Investigation and Soil Remediation Report located in Appendix A for sample locations.

4.4.9 Distribution of Subsurface Soil Exceedances

4.4.9.1 Upland Terrace

Sixteen subsurface soil samples were collected from ten borings on the upland terrace during Phase I and Phase II RI activities (see Figure 4-6). Chemicals in subsurface soil on the upland terrace which exceeded their respective screening levels include: arsenic, benzo(a)pyrene, and dibenzo(a,h)anthracene. Arsenic was detected above its screening level in all 16 subsurface soil samples collected on the upland terrace. Arsenic exceedances ranged from 3.0 mg/kg to 5.8 mg/kg. None of the upland terrace samples were above the subsurface soil background level for arsenic of 9.144 mg/kg. Benzo(a)pyrene was detected above the screening level in three of the subsurface soil samples collected on the upland terrace (UT03/SB02/3-4 ft, UT06/SB02/3-4 ft, and UT07/SB02/3-4 ft). Only one sample (UT06/SB02/3-4 ft) had an exceedance of dibenzo(a,h)anthracene above the screening level. The subsurface soil samples from the upland terrace were comprised of soil material. Upland terrace subsurface soil exceedances are shown on Figure 4-6 and summarized on Tables 4-10 and 4-11. No subsurface soils were collected on the upland terrace during pre-RI sampling activities.

4.4.9.2 Floodplain Slope

Twenty-two subsurface soil samples were collected from eight borings on the floodplain slope during Phase I and Phase II RI activities (see Figure 4-7). Chemicals in surface soil on the floodplain slope which exceeded their respective screening levels include: arsenic, iron, thallium, benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, and dioxins/furans. Arsenic was detected above its screening level in all 22 subsurface soil samples collected on the floodplain slope. Arsenic exceedances ranged from 1.5 mg/kg to 37 mg/kg. Four samples were above the subsurface soil background level for arsenic of 9.144 mg/kg. Iron was detected above its screening level in two samples from the floodplain slope (DP02/SB02/3-6 ft and DP15/SB02/3-4 ft) at concentrations of 55,000 mg/kg and 100,000 mg/kg, respectively. Thallium was detected above its screening level in one sample from the floodplain slope (DP02/SB02/3-6 ft) at a concentration of 1.6 J mg/kg. Benzo(a)pyrene was detected above the screening level in two subsurface soil samples collected on the floodplain slope (DP15/SB02/3-4 ft and DP18/SB02/3-4 ft) at concentrations of 0.086 mg/kg and 0.12 mg/kg. Sample (DP18/SB02/3-4 ft) had exceedances of benzo(a)anthracene and dibenzo(a,h)anthracene above their respective screening levels. One sample (DP02/SB02/3-6 ft) had a total 2,3,7,8-TCDD equivalent above the screening level. Subsurface soil samples collected on the floodplain slope were comprised of ash or soil material. Floodplain slope subsurface soil exceedances are shown on Figure 4-7 and summarized on Tables 4-10 and 4-11. Additionally, there were 17 arsenic exceedances on the floodplain slope during pre-RI sampling activities, of which, ten exceeded the subsurface soil background level for arsenic of 9.144 mg/kg (see Table 4-8).

4.4.9.3 Kansas River Floodplain

Twenty-four subsurface soil samples were collected from eight borings on the Kansas River floodplain immediately downslope of the incinerator operations during Phase I and Phase II RI activities (see Figure 4-8). Chemicals in surface soil on the Kansas River floodplain which exceeded their respective screening levels include: arsenic, iron, benzo(a)anthracene, and dioxins/furans. Arsenic was detected above its screening level in all 24 subsurface soil samples collected on the Kansas River floodplain. Arsenic exceedances ranged from 2.7 mg/kg to 41 mg/kg. Two samples were above the subsurface soil background level for arsenic of 9.144 mg/kg. Iron was detected above its screening level in one sample from the Kansas River floodplain (DP22/SB02/3-4 ft) at a concentration of 85,000 mg/kg.

Benzo(a)anthracene was detected above the screening level in one subsurface soil sample (DP22/SB02/3-4 ft) collected on the Kansas River floodplain at concentration of 0.059 mg/kg. One sample (DP22/SB02/3-4 ft) had a total 2,3,7,8-TCDD equivalent above the screening level. All subsurface soil samples collected on the Kansas River floodplain were comprised of soil material with the exception of one sample that was comprised of ash material (DP-22/SB02/3-4 ft). Kansas River floodplain exceedances are shown on Figure 4-8 and summarized on Tables 4-10 and 4-11. No subsurface soils were collected on the Kansas River floodplain during pre-RI sampling activities.

4.4.10 Summary

Sixty-two subsurface soil samples were collected during the RI field activities at the CFI Site. Twenty subsurface soil samples were analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans during Phase I field activities. Forty-two subsurface soil samples were analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans during Phase II field activities. There were no exceedances of BTEX, TPH-GRO, TPH-DRO, or MeHg in the subsurface soil samples. Analytes detected above their respective screening levels in subsurface soil during the RI were arsenic, iron, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene. Additionally, dioxins/furans had a total 2,3,7,8-TCDD equivalent above the screening level in two of the samples. Arsenic exceeded its screening level in all eleven historical subsurface soil samples analyzed. Ten of the 17 historical subsurface soil samples also exceeded the subsurface soil background level for arsenic of 9.144 mg/kg.

Arsenic exceedances were ubiquitous throughout the subsurface soil samples collected from three depositional environments; however, the highest concentrations were present in samples containing ash material on the floodplain slope and Kansas River floodplain. Iron exceedances were present in subsurface soils on the floodplain slope and Kansas River floodplain containing ash material. Thallium exceedances were only present on the floodplain slope in one sample containing ash material. Exceedances of benzo(a)pyrene were present on the upland terrace and floodplain slope. Benzo(a)anthracene exceedances were present in subsurface soils on the floodplain slope and Kansas River floodplain in samples containing ash material. Dibenzo(a,h)anthracene exceedances occurred on both the upland terrace and floodplain slope. Dioxins/furans exceedances were present subsurface soils on the floodplain slope and Kansas River floodplain in samples containing ash material.

4.5 Stream Sediment

Three stream sediment samples were collected from Threemile Creek as part of the Phase I field activities. One sample (SD03) was collected up gradient of the site, one sample (SD02) was collected midpoint of the site, and one sample (SD01) was collected down gradient of the site. Phase I stream sediment sample locations are illustrated on Figure 2-3. Stream sediment samples collected during Phase I of the RI field activities were analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Detections of stream sediment are discussed below and summarized in Tables 4-12 and 4-13 and depicted on Figure 4-9.

4.5.1 BTEX

BTEX compounds were not detected in any of the stream sediment samples collected during Phase I activities.

4.5.2 TPH-GRO

TPH-GRO was not detected in any of the stream sediment samples collected during Phase I activities.

4.5.3 TPH-DRO

TPH-DRO was detected in all three stream sediment samples collected during Phase I. TPH-DRO detections were well below the screening level of 2,000 mg/kg. TPH-DRO detection concentrations ranged from 2.3 J mg/kg to 5.4 mg/kg (see Table 4-12).

4.5.4 SVOCs (Phenols and PAHs)

No SVOC compounds were detected in any of the stream sediment samples collected during Phase I activities.

4.5.5 TAL Metals (23 Elements)

Nineteen of the 23 TAL metals (aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc) were detected in the Phase I stream sediment samples. Of these, only arsenic was detected above its respective screening level of 0.68 mg/kg in all three samples (SD01 through SD03) at concentrations of 2.7 J mg/kg, 2.2 J mg/kg, and 7.3 mg/kg, respectively. The highest exceedance (SD03) was located up gradient of the site (see Table 4-12 and Figure 4-9).

4.5.6 MeHg

MeHg was detected in all three of the stream sediment samples collected. MeHg detections were well below the screening level of 7.8 mg/kg. MeHg detection concentrations ranged from 0.000014 J mg/kg to 0.000038 mg/kg (see Table 4-12).

4.5.7 Dioxins/Furans

Dioxins/furans congeners were detected in all three stream sediment samples collected during Phase I RI activities. None of the samples had a total 2,3,7,8-TCDD equivalent above the screening level of 4.8 pg/g (see Table 4-13).

4.5.8 Historical Data

Stream sediment samples were not collected during any previous investigations at the CFI Site.

4.5.9 Up-Gradient Stream Sediment Comparison Study

During the Phase II RI field activities, eight additional up-gradient stream sediment samples (SD04 through SD11) were collected as part of an up-gradient stream sediment comparison study (see Figure 2-3). The up-gradient stream sediment comparison study was performed to determine if the Phase I arsenic detections are naturally occurring or are from site impacts. Stream sediment samples collected as part of the up-gradient stream sediment comparison study were analyzed for TAL metals (23 elements) only.

All 23 TAL metals (aluminum, arsenic, antimony, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc) were detected in the up-gradient stream sediment comparison samples (see Table 4-14 and Figure 4-9).

Up-gradient stream sediment concentrations (up-gradient levels) were determined by calculating the 95% UTL using the statistics program 95 ProUCL version 5.1 (USEPA, 2016b). Prior to running the up-gradient stream sediment data through 95 ProUCL version 5.1 to determine the UTL, the data set was analyzed for statistical outliers using 95 ProUCL's outlier test function. The outlier output tables are provided in Appendix O and summarized on Table 4-15A. Statistical outliers at a 5% significance level were removed from the data set, and the data was then compiled through 95 ProUCL version 5.1. The UTL output tables are provided in Appendix O. A summary of the calculated background UTLs and the selected up-gradient stream sediment concentration for each chemical detected are presented on Table 4-15B. Note, the most conservative calculated UTL was selected as the up-gradient stream sediment concentration for each chemical. Only chemicals which have at least one detection were evaluated.

The only chemicals that had exceedances of screening levels in stream sediment samples during the RI that were also analyzed in up-gradient stream sediment samples was arsenic. As indicated on Table 4-15B, the up-gradient level for arsenic was determined to be 7.244 mg/kg (using the 95% UTL w/ 95% Coverage for Normal Distribution), which is above the screening level of 0.68 mg/kg. All but one arsenic exceedance (SD03) from site stream sediment samples were below the up-gradient level of 7.244 mg/kg. However, Stream Sediment Sample SD03 is located up gradient of the CFI Site (see Figure 4-9); therefore, this exceedance is not likely caused by impacts from incinerator operations.

4.5.10 Summary

Three sediment samples were collected during Phase I of the RI and analyzed for BTEX, TPH-GRO, TPH-DRO, SVOCs (phenols and PAHs), TAL metals (23 elements), MeHg, and dioxins/furans. Arsenic was the only analyte that exceeded its screening level. During Phase II of the RI, eight additional up-gradient stream sediment samples were collected and analyzed for TAL metals (23 elements) as part of an up-gradient stream sediment comparison study to determine if the arsenic detections from Phase I are naturally occurring or are from site impacts. As stated above, the up-gradient stream sediment concentration for arsenic was determined to be 7.244 mg/kg. All but one arsenic exceedance (SD03) from site stream sediment samples were below the up-gradient level. SD03 is located up gradient of the CFI site; therefore, this exceedance is not likely caused by impacts from incinerator operations.

4.6 Surface Water

Surface water samples were collected during the Phase I and Phase III RI field activities. Three surface water samples were collected during the Phase I field activities and three samples were collected during each quarterly sampling event as part of Phase III field activities. Phase III samples were collected at the same locations as the Phase I surface water samples. Surface water sample locations are shown on Figure 2-3. Phase I surface water samples were analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans. During Phase III surface water samples were collected quarterly and analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Detections are discussed below and summarized in Tables 4-16 and 4-17 and illustrated on Figure 4-10.

4.6.1 BTEX

BTEX compounds were not detected in any of the surface water samples collected during Phase I activities. BTEX was not analyzed during the Phase III field activities.

4.6.2 TPH-GRO

TPH-GRO was not detected in any of the surface water samples collected during Phase I activities. TPH-GRO was not analyzed during the Phase III field activities.

4.6.3 TPH-DRO

TPH-DRO was detected in one of the three surface water samples (SW02/SW01) collected during Phase I field activities at a concentration of 72 J micrograms per liter (µg/L) (see Table 4-16). There is no surface water screening level available for TPH-DRO. TPH-DRO was not analyzed during the Phase III field activities.

4.6.4 SVOCs (Phenols and PAHs)

SVOCs were only detected at one surface water sample point (SW03) during the five surface water sampling events conducted during Phase I and Phase III of the RI. The SVOCs detected in Surface Water Sample SW03/SW03 were benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and pyrene. Of these, benzo(a)pyrene, benzo(b)fluoranthene, and chrysene were detected above their respective screening levels of 0.0028 µg/L at concentrations of 0.0046 J µg/L, 0.0088 J µg/L, and 0.012 J µg/L, respectively (see Table 4-16 and Figure 4-10).

4.6.5 TAL Metals (23 Elements)

Thirteen TAL metals (aluminum, arsenic, barium, calcium, copper, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc) were detected in Phase I and Phase III surface water samples. No detections of metals exceeded their respective screening levels for surface water during the five sampling events (see Table 4-16 and Figure 4-10).

4.6.6 MeHg

MeHg was detected in all three Phase I surface water samples collected. MeHg detections ranged from 0.000041 J µg/L to 0.000094 J µg/L (see Table 4-16). There is no surface water screening level available for MeHg. MeHg was not analyzed during the Phase III field activities.

4.6.7 Dioxins/Furans

Dioxins/furans congeners were detected in ten of the 15 surface water samples (SW01/SW02, SW01/SW03, SW01/SW05, SW02/SW01, SW02/SW02, SW02/SW03, SW02/SW04, SW02/SW05, SW03/SW02, and SW03/SW03) collected during Phase I and Phase II RI activities. Of these, nine surface water samples (SW01/SW02, SW01/SW03, SW01/SW05, SW02/SW01, SW02/SW02, SW02/SW03, SW02/SW04, SW02/SW05, and SW03/SW03) had total 2,3,7,8-TCDD equivalents above the screening level of 0.013 picograms per liter (pg/L) with concentrations ranging from 0.0142 pg/L (SW03/SW03) to 3.196 pg/L (SW01/SW05) (see Table 4-17 and Figure 4-10).

4.6.8 Historical Data

Surface water samples were not collected during any previous investigations at the CFI Site.

4.6.9 Summary

Surface water samples were collected during Phase I and Phase III RI activities. During Phase I, three surface water samples were collected from Threemile Creek and analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans. During Phase III, the three surface water samples were collected quarterly from Threemile Creek and analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. There were no exceedances of BTEX, TPH-GRO, TPH-DRO, TAL metals or MeHg in the surface water samples. Analytes detected above their respective screening levels included benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and dioxins/furans.

4.7 Groundwater

4.7.1 Direct-Push Groundwater Sampling

Direct-push groundwater samples were collected during Phase I and II of the RI as part of the site-wide delineation of contamination in groundwater. For Phase I, five direct-push groundwater samples were collected from five direct-push locations (DP08 through DP12) and analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans (see Figure 2-5). For Phase II, 13 direct-push groundwater samples were collected from 13 direct-push locations (DP25 through DP37) and analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans (see Figure 2-5). Direct-push groundwater detections are discussed below and summarized in Tables 4-18 and 4-19 illustrated on Figure 4-11.

4.7.1.1 BTEX

Benzene was not detected in any of the direct-push groundwater samples collected during Phase I. Benzene was not analyzed during the Phase II field activities.

Toluene was detected in all five Phase I direct-push groundwater samples (DP-08 through DP-12). Toluene detection concentrations ranged from 0.22 J µg/L to 0.52 J µg/L (see Table 4-18), below the screening level of 1,000 µg/L. Toluene was not analyzed during the Phase II field activities.

Ethylbenzene was detected in four of the five Phase I direct-push groundwater samples (DP-08 through DP-11). Ethylbenzene detection concentrations ranged from 0.19 J µg/L to 0.39 J µg/L (see Table 4-18) below the screening level of 700 µg/L. Ethylbenzene was not analyzed during the Phase II field activities.

Xylenes were not detected in any of the direct-push groundwater samples collected during Phase I activities. Xylenes were not analyzed during the Phase II field activities.

4.7.1.2 TPH-GRO

TPH-GRO was not detected in any of the direct-push groundwater samples collected during Phase I (see Table 4-18). TPH-GRO was not analyzed during the Phase II field activities.

4.7.1.3 TPH-DRO

TPH-DRO was not detected in any of the direct-push groundwater samples collected during Phase I (see Table 4-18). TPH-DRO was not analyzed during the Phase II field activities.

4.7.1.4 SVOC (Phenols and PAHs)

SVOCs detected in direct-push groundwater samples included the PAH compounds acenapthylene, fluoranthene, naphthalene, phenantherene, and pyrene. Acenapthylene was detected in two direct-push groundwater samples (DP26 and DP27); fluoranthene was detected in one direct-push groundwater sample (DP37); naphthalene was detected in two direct-push groundwater samples (DP26 and DP27); phenantherene was detected in one direct-push groundwater sample (DP27); and pyrene was detected in three direct-push groundwater samples (DP32, DP35, and DP37). None of the SVOC detections in direct-push groundwater samples were above their respective screening levels (see Table 4-18).

4.7.1.5 TAL Metals (23 Elements)

TAL metals (aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, and zinc) were detected in direct-push groundwater samples. Of these, cobalt and manganese were detected above their screening levels. Cobalt exceeded its screening level of 6 µg/L in three samples, DP09, DP27, and DP34, at concentrations of 18 µg/L, 11 µg/L, and 9.4 µg/L, respectively. Manganese exceeded its screening level of 430 µg/L in two samples, DP12 and DP37, at concentrations of 490 µg/L and 750 µg/L, respectively (see Table 4-18 and Figure 4-11).

4.7.1.6 MeHg

MeHg was detected in four of the five Phase I direct-push groundwater samples (DP-08 through DP-11). MeHg detections were below the screening level of 2 µg/L. MeHg detections ranged from 0.000079 J µg/L to 0.00153 µg/L (see Table 4-18). MeHg was not analyzed during the Phase II field activities.

4.7.1.7 Dioxins/Furans

Dioxins/furans congeners were detected in 11 of the 18 Phase I and Phase II direct-push groundwater samples (DP08, DP09, DP-11, DP-26, DP-27, DP-28, DP-30, DP-32, DP-33, DP-34, and DP-36). None of the direct-push groundwater samples had a total 2,3,7,8-TCDD equivalent above the screening level of 30 pg/L (see Table 4-19).

4.7.2 Monitoring Well Groundwater Sampling

Four quarterly groundwater sampling events were conducted in May, August, and November of 2015 and February of 2016. Four monitoring wells (CFIMW15-01 through CFIMW-15-04) were sampled during each sampling event for TAL metals (23 elements), SVOCs (PAHs), dioxins furans, and water quality parameters (temperature, pH, specific conductivity, DO, and ORP). Additional water quality parameters including alkalinity, anions (chloride, nitrate, nitrite, and sulfate), sulfide, and TOC were collected during the first quarterly sampling event. Analytical detections for the groundwater samples are presented in Tables 4-20 and 4-21 and summarized below illustrated on Figure 4-12.

4.7.2.1 SVOCs (PAHs)

The only SVOC (PAH) detected in groundwater samples collected from monitoring wells was naphthalene. Naphthalene was detected once in Monitoring Wells CFIMW15-01 and CFIMW15-04 (first quarterly event) at concentrations of 0.019 J µg/L and 0.0077 J µg/L, respectively. Neither detection of naphthalene was above the screening level of 0.17 µg/L (see Table 4-20).

4.7.2.2 TAL Metals (23 Elements)

Eighteen TAL metals (aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, and zinc) were detected in groundwater samples collected from monitoring wells. None of the metals detections were above their respective screening levels (see Table 4-20).

4.7.2.3 Dioxins/Furans

Dioxins/furans congeners were detected in twelve of the 16 groundwater samples collected from the monitoring wells during the four quarterly groundwater sampling events (CFIMW15-01/GW01,

CFIMW15-01/GW02, CFIMW15-01/GW03, CFIMW15-02/GW01, CFIMW15-02/GW03, CFIMW15-03/GW01, CFIMW15-03/GW02, CFIMW15-03/GW03, CFIMW15-04/GW01, CFIMW15-04/GW02, CFIMW15-04/GW03, and CFIMW15-04/GW04). None of the groundwater samples from the monitoring wells had a total 2,3,7,8-TCDD equivalent above the screening level of 30 pg/L (see Table 4-21).

4.7.2.4 Groundwater Quality Parameters

Field measured groundwater quality parameters (temperature, pH, specific conductivity, DO, and ORP) were collected during each quarterly groundwater sampling event. Laboratory measured groundwater quality parameters including: alkalinity; anions (chloride, nitrate, nitrite, and sulfate); sulfide; and TOC were collected during the first quarterly sampling event. The groundwater quality parameters are summarized on Table 4-22.

Chloride was detected in all four monitoring wells, but did not exceed its screening level (Secondary Maximum Contaminant Level [sMCL]) of 250 milligrams per liter (mg/L) in any sample (see Table 4-22). Nitrate as nitrogen was detected in all four of the monitoring wells, but did not exceed its screening level of 10 mg/L in any sample (see Table 4-22). Sulfate was detected in all four of the monitoring wells. There is no screening level for sulfate. Sulfide was detected in one of the four monitoring wells (CFIMW15-04), but did not exceed its screening level (sMCL) of 250 mg/L (see Table 4-22). TOC was detected in three of the four of the monitoring wells (CFIMW15-02 through CFIMW15-04). There is no screening level for TOC.

4.7.2.5 Historical Data

Groundwater samples were not collected during any previous investigations at the CFI Site.

4.7.2.6 Summary

Groundwater samples were collected during three separate phases of the RI activities. Groundwater samples were collected during Phase I and Phase II RI field activities from direct-push borings and from monitoring wells during Phase III RI field activities. During Phase I, five direct-push groundwater samples were collected from the CFI Site and analyzed for BTEX, TPH-GRO, TPG-DRO, TAL metals (23 elements), MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Only cobalt and manganese were detected at levels that exceeded their respective screening levels. During Phase II of the RI field activities, 13 direct-push groundwater samples were collected from the CFI Site and analyzed for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Cobalt and manganese were detected above their respective screening levels. During Phase III of the RI field activities, four monitoring wells were sampled during four quarterly sampling events for TAL metals (23 elements), SVOCs (PAHs), and dioxins/furans. Laboratory measured groundwater quality parameters including: alkalinity; anions (chloride, nitrate, nitrite, and sulfate); sulfide; and TOC were collected during the first quarterly sampling event. There were no exceedances of TAL metals (23 elements), SVOCs (PAHs), dioxins/furans, or groundwater quality parameters in groundwater samples collected from monitoring wells.

4.8 Summary of Nature and Extent of Contamination

Detections above applicable screening levels for samples collected during the RI field activities have been summarized on Table 4-23 by media. Nature and extent of contamination at the CFI Site can be summarized by the following statements:

- BTEX – There were no exceedances of BTEX compounds in any of the media sampled during the RI.
- TPH-DRO – There were no exceedances of TPH-GRO in any of the media sampled during the RI.
- TPH-GRO – There were no exceedances of TPH-DRO in any of the media sampled during the RI.
- SVOCs (phenols and PAHs)
  - Surface Soil – PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Exceedances of benzo(a)pyrene were present in all three depositional environments. Exceedances of benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were present on the floodplain slope.
  - Subsurface Soil – PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Exceedances of benzo(a)pyrene were present on the upland terrace and floodplain slope. Benzo(a)anthracene exceedances were present on the floodplain slope and Kansas River floodplain in samples containing ash material. Dibenzo(a,h)anthracene exceedances occurred on both the upland terrace and floodplain slope.
  - Stream Sediment – There were no exceedances of SVOCs in the stream sediment sampled during the RI.
  - Surface Water – PAHs, benzo(a)pyrene, benzo(k)fluoranthene, and chrysene were detected above their respective screening levels. These exceedances were detected at one surface water sample point during five surface water sampling events.
  - Groundwater – There were no SVOC exceedances in groundwater samples collected from direct-push borings during Phase I or Phase II. Additionally, there were no SVOC exceedances in groundwater samples collected from the monitoring wells during the four quarterly sampling events.

- Metals

  - Surface Soil – Arsenic, iron, and thallium were the metals detected above their respective screening levels during the RI. Arsenic, lead and mercury also exceeded screening levels in Pre-RI surface soil samples. Arsenic exceedances were ubiquitous throughout the investigation area with the highest detections present in samples containing soil/ash or ash material on the upland terrace and the floodplain slope. Iron exceedances were present in samples collected on the floodplain slope containing soil/ash or ash material. Thallium exceedances located on the floodplain slope were in samples containing soil/ash or ash material. One exceedance of thallium was present in the drainage swale on the Kansas River floodplain. Historical lead and mercury detections at the CFI Site were located on the floodplain slope.
  - Subsurface Soil – Arsenic, iron, and thallium were the metals detected above their respective screening levels during the RI. Arsenic also exceeded its screening levels in historical subsurface soil samples. Arsenic exceedances were ubiquitous throughout the investigation area with the highest detections present on in samples containing ash material on the floodplain slope and Kansas River floodplain. Iron exceedances were present in samples collected on the floodplain slope and Kansas River floodplain containing ash material. Thallium exceedances were present in samples collected on the floodplain slope containing ash material.
  - Stream Sediment – Arsenic was the only metal that was detected in excess of its screening level. Arsenic exceedances were ubiquitous in stream sediment throughout the Threemile Creek stream bed.
  - Surface Water – There were no exceedances of metals in surface water samples collected from Threemile Creek during the RI.
  - Groundwater – Cobalt and manganese were the metals detected above their respective screening levels. Two of the three cobalt exceedances were located in direct-push groundwater samples collected on the toe of the floodplain slope, with the other cobalt exceedance being located down gradient on the Kansas River Floodplain. Manganese exceedances were located in the two furthest down gradient direct-push groundwater samples. There were no metals exceedances in groundwater samples collected from the monitoring wells during the four quarterly sampling events.

- MeHg – There were no exceedances of MeHg in any of the media sampled during the RI.

- Dioxins/Furans

  - Surface Soil – There were three samples with an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level. Dioxins/furans exceedances were located on the upland terrace (one sample) and the floodplain slope (two samples). There were no dioxins/furans exceedances on the Kansas River floodplain.
  - Subsurface Soil – There were two samples with an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level. Dioxins/furans exceedances were located on the floodplain slope (one sample) and the Kansas River floodplain (one sample). There were no dioxins/furans exceedances on the upland terrace. Dioxins/furans exceedances were present only in samples containing ash material

- Stream Sediment – There were no exceedances of dioxins/furans in stream sediment samples from Threemile Creek.
- Surface Water – All three surface water sample locations had an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level during Phase I and Phase III RI activities.
- Groundwater – There were no dioxins/furans exceedances in groundwater samples collected from direct-push borings during Phase I or Phase II. Additionally, there were no dioxins/furans exceedances in groundwater samples collected from the monitoring wells during the four sampling events.

* * * * *

5.0 FATE AND TRANSPORT

This section provides a detailed discussion of contaminant fate and transport at the CFI Site and will include a discussion of contaminant sources at the site, chemical and physical properties of constituents, migration pathways, fate and transport, and persistence of site constituents.

As discussed in Section 4.2.3, background levels for surface and subsurface soil were calculated for only chemicals which had detections in both background surface/subsurface soils by using 95 ProUCL version 5.1. Arsenic and benzo(a)pyrene were the only chemicals in surface soil with a background levels higher than their respective screening levels. For subsurface soil arsenic was the only chemical with a background level higher than its screening level. The up-gradient levels for stream sediment were also calculated for all chemicals which had detections by using 95 ProUCL version 5.1 (see Section 4.5.9). Arsenic was the only chemical in stream sediment with an up-gradient level higher than its screening level.

The fate and transport of chemicals exceeding screening levels, background levels, and up-gradient levels, where appropriate, for soil, stream sediment, surface water, and groundwater are discussed in the following sections.

5.1 Contaminant Sources

Releases of constituents of potential interest from the CFI Site have occurred principally as a result of the historical operational practices of the former incinerator which include direct disposal of ash/cinder material and particulate deposition from incinerator emissions. The data collected during the RI and historical investigations indicates that the soils on the upland terrace and floodplain slope are impacted by metals, SVOCs (PAHs), and dioxins/furans. Soils on the Kansas River floodplain adjacent to the toe of the floodplain slope are also impacted by metals, SVOCs (PAHs), and dioxins/furans. These soil impacts are likely due to incinerator operations; however, historic and current railroad operations may also be a contributing factor. Additionally, surface water at Threemile Creek appears to also be impacted by metals, SVOCs (PAHs), and dioxins/furans. Surface water impacts do not appear to be related to operations and could be associated with upstream activities, railroad operations, and/or automobile traffic along Huebner road.

5.2 Chemical and Physical Characteristics of Constituents

Table 5-1 lists the physical and chemical characteristics of the organic constituents (SVOCs and dioxins/furans) detected above background and/or screening levels at CFI Site. Table 5-2 lists physical and chemical characteristics of the inorganic constituents (metals) detected above background levels, up-gradient levels, and/or screening levels at the CFI Site.

The physical and chemical properties of the constituents present at the site strongly influence their fate and transport processes. These properties dictate environmental partitioning and chemical mobility. Some of these properties also affect the chemical behavior of the compounds and their susceptibilities to degradation induced by physical and biological agents. Because there are many complex factors that control the partitioning of a constituent in the environment, the measured concentrations at the source areas can only represent site conditions at a discrete point in time. In addition, while the above historical release sources were identified, they may not have resulted in significant impact; thus, an understanding of the general fate and transport characteristics of the constituents present at the site is important when predicting future exposures, linking sources with currently impacted media, and identifying potentially complete pathways to site media.

Contaminant behavior in the environment is an important determinant of exposure pathways and concentrations. Contaminant behavior is a function of physical and chemical properties specific to the contaminant and characteristics of the matrix in which it exists. Important physical and chemical properties include solubility in water, vapor pressure, and specific gravity.

Solubility

Water solubility refers to the maximum concentration of a chemical that dissolves in a given amount of pure water. The solubility of a contaminant is important to understanding its ability to migrate in the environment. Highly water-soluble chemicals are less strongly adsorbed to soil and can be readily leached to groundwater. Additionally, highly water-soluble chemicals tend to volatilize less from water and to be more biodegradable.

Vapor Pressure

Vapor pressure is a measure of the volatility of a chemical in pure state and is an important determinant of the rate of volatilization from contaminated soils and waters. In general, chemicals with low vapor pressures and high affinity for soils or water are less apt to vaporize. Henry's law constants incorporate molecular weight, solubility, and vapor pressure to indicate the degree of volatility of a chemical in solution as follows:

Extent of Volatility	**Henry's Law Constant Ranges (atmospheres-cubic meter per mole [atm-m^3/mol])**
Nonvolatile	$<3x10^{-7}$
Low Volatility	$3x10^{-7}$ to $1x10^{-5}$
Moderate Volatility	$1x10^{-5}$ to $1x10^{-3}$
High Volatility	$>1x10^{-3}$

Site-specific factors also significantly influence the behavior of chemicals released to the environment. These factors include climatic conditions, hydrogeologic characteristics, and soil characteristics.

The following discussion provides basic information on how metals can exist in the environment and the general behavior properties of these compounds. Specific metal compounds that may be present and the physical and chemical characteristics of those metal compounds are discussed in Section 5.4.2.

Metal mobility is directly affected by the extent of fixation, adsorption, exclusion, complex formation, and by reaction kinetics. These processes are in turn influenced by a media's physical and chemical properties. Since metals may exist in more than one oxidation or chemical state, each metal will also exhibit differing mobility characteristics. The inductively coupled plasma (ICP) emission spectrometers used to analyze project samples measure the total metal concentration and do not distinguish between metal speciation or oxidation state. Thus, the exact nature of the metal in the media of concern has not been distinguished and its mobility and bioavailability properties cannot be assumed.

The mobility of metals is dependent on the chemical state of the metal present in the sampled media. The particular species present depends on the oxidation-reduction potential (Eh) and pH of the soil. Eh measures the electron activity. pH is expressed as the negative log of hydrogen ion activity in moles per liter. The fixation of metals in soils also depends on the Eh and pH of the soil.

Sorption

Sorption (adsorption/absorption) is defined as the accumulation of an element on the surface of soil particles with a decrease in the concentration of the dissolved element in water. Clay surfaces possess negative charges. The soil mineral negative surface charge is responsible for attracting and accumulating cationic species of elements. Humus is also responsible for the accumulation of cationic species of elements or compounds on soil surfaces. Humus is the relatively stable fraction of soil organic matter, which remains in soil after the chemicals comprising plant and animal residues have decomposed. The sorption of compounds to sediments, suspended soils, and soils limits the fraction available for other fate and transport processes.

The organic content of the soil influences the degree to which compounds will be adsorbed by soil particles. Many organic compounds will be more extensively adsorbed by soil particles if the soil contains greater amounts of organic material. Since the vadose zone typically exhibits higher organic content in soils than the saturated zone, movement of compounds through the vadose zone will generally be much slower. The sorptive characteristics of a compound are expressed as partition coefficients, which are defined as the relative concentrations of a given chemical in two phases or matrices. The partition coefficients used to define the sorptive characteristics of compounds include K_{ow}, K_d, and K_{oc}. K_{ow} is generally defined as the ratio between a chemical concentration in octanol to that in water at steady state condition; K_d is the ratio of a contaminant concentration in a solid to the contaminant concentration in the surrounding aqueous solution; and K_{oc} is the K_d coefficient normalized to the concentration of organic carbon in the solid phase.

In general, the higher the K_{oc} value, the higher the tendency for a compound to sorb to organic soil matter. The sorptive tendency of a compound is dependent upon the soil adsorption coefficient (K_{oc}) as follows:

Sorptive Tendency	**K_{oc} (liters per kilogram [L/kg])**
Very weakly sorbed	< 10
Weakly sorbed	10 – 100
Moderately sorbed	100 – 1,000
Moderately to strongly sorbed	1,000 – 10,000
Strongly sorbed	10,000 – 100,000
Very strongly sorbed	> 100,000

Biodegradation

The persistence of a constituent in a particular environmental medium is a measure of the length of time that it remains in that medium. Biodegradation is a biological process whereby chemical compounds degrade to other products. Many variables affect the rate at which biodegradation occurs, including temperature, pH, moisture and oxygen content, presence of microorganisms, presence of food and nutrients, and chemical properties and concentrations. Compounds with lower molecular weights tend to have a higher biodegradation rate. The biological breakdown of a chemical compound could result in a product or products that are more toxic than the original compound.

The longer a compound remains in a medium, the more persistent it is. The term half-life is often used when discussing persistence. Half-life is the time required for half the amount of a substance to degrade by natural processes. Using the half-life value, the persistence of a compound in an environmental medium can be predicted. It takes between four and five half-lives to reduce the original concentration by 95%. The persistence of a compound may also be affected by adsorption. For example, the soil-or-sediment binding capacity of a chemical may act as a catalyst for chemical degradation, or it may protect the chemical from biodegradation. Bioaccumulation may increase a chemical's persistence by protecting the chemical from processes of environmental degradation.

5.3 Migration Pathways

A chemical migration pathway is a route by which a chemical travels following a release or spill from a source. This section highlights sources and migration pathways relevant for the CFI Site. The fate and transport of constituents at a site are determined by their physical, chemical, and biological interactions with the environment. The mobility and persistence of the constituents at a site are two key characteristics in determining their probable behavior. Mobility is the potential for a constituent to migrate in environmental media, and persistence is a measure of how long a constituent will remain in the environment in its current form. The primary fate and transport mechanisms that control the mobility and persistence of the constituents are aqueous solubility, sorption, volatility, and degradation.

The potential chemical migration pathways from the source area along with the receiving media are summarized below.

Release Source Analysis for Current Site Conditions

Chemical Sources	Release Mechanisms	Receiving Media
Surface Soil and Surficial Ash/Cinder Deposits	Leaching and Runoff	Surface and Subsurface Soil, Surface Water, Stream Sediment, and Groundwater
Subsurface Soil and Ash/Cinder Deposits	Leaching	Groundwater

A migration pathway is complete if a chemical present in a source is detected in multiple media at concentrations that illustrate a trend (i.e., increasing or decreasing). If a trend does not exist or illustrate that a specific chemical process is taking place (i.e., degradation, dilution, etc.), then a separate source area or another reason for the presence of a chemical (i.e., laboratory cross contamination, anomaly, etc.) may be indicated.

A primary objective of assessing the potential fate and transport of surface soils at the CFI Site is to determine if constituents detected in surface soil, surficial ash/cinder deposits, or ash/cinder deposits have the potential of impacting the underlying groundwater zones or down gradient receptors via surface runoff, infiltration, or air dispersion of dust.

Another potential migration pathway for the site-related constituents is potential release of site-related soil constituents to air via mechanical disturbance or wind. The release of site-related soil constituents to air via mechanical disturbance or wind is not considered a migration pathway of concern because of the heavy vegetative cover at the CFI Site. Therefore, this potential pathway is considered to be of lesser significance.

5.3.1 Surface Soil and Surficial Ash/Cinder Deposits to Surface Water and/or Stream Sediment

For the surface soil and surficial ash/cinder deposits to surface water and/or stream sediment migration pathway, an analysis of the data was conducted to determine if chemicals present in surface soil and surficial ash/cinder deposits also are present in surface waters and/or sediments in Threemile Creek. The COPCs identified in the surface soil and surficial ash/cinder deposits included SVOCs (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene), metals (arsenic, iron, lead, mercury, and thallium), and dioxins/furans. The COPCs in surface water are SVOCs (PAHs) (benzo(a)pyrene, benzo(k)fluoranthene, and chrysene) and dioxins/furans. Benzo(a)pyrene and dioxins/furans are common to both media; however, based on visual observations of the surface water drainage at the CFI Site in Section 3.1.4.2, it appears that there is very little, if any, hydrologic connection between the former incinerator operations area and Threemile Creek. Therefore, the impact on surface water in Threemille Creek from surface soil and surficial ash/cinder deposits at the CFI site is considered to be minimal.

Arsenic was the only COPC in stream sediment, with only the up gradient-most sample exceeding the up-gradient stream sediment level for arsenic. Upon comparison of the COPCs detected in surface soil and surficial ash/cinder deposits and stream sediment, arsenic was common to both surface soil and surficial ash/cinder deposits and stream sediment. Based on the measured piezometric surfaces during quarterly groundwater sampling activities at the CFI Site it appears groundwater is flowing toward the Kansas River and not Threemile Creek and there is very little, if any, hydrogeologic connection between the former incinerator operations area and Threemile Creek (see Figures 3-6 through 3-9). Therefore, the impact on stream sediment from surface soil and surficial ash/cinder deposits at the CFI Site is also considered minimal.

5.3.2 Surface Soil and Surficial Ash/Cinder Deposits to Subsurface Soil

Surface soil and surficial ash/cinder deposits overlying subsurface soil occur primarily on the upland terrace. To determine the surface soil and surficial ash/cinder deposits to subsurface soil migration pathway, an analysis of the data was conducted to determine if chemicals present in surface soil and surficial ash/cinder deposits on the upland terrace are also present in subsurface soil on the upland terrace because of leaching. The COPCs identified in the surface soil and surficial ash/cinder deposits included SVOCs (PAHs) (benzo(a)pyrene and dibenzo(a,h)anthracene), arsenic, and dioxins/furans (see Figure 4-3). The COPCs identified in subsurface soils on the upland terrace were SVOCs (PAHs) (benzo(a)pyrene and dibenzo(a,h)anthracene) and arsenic (see Figure 4-6). Upon comparison of the COPCs detected in surface soil and surficial ash/cinder deposits and subsurface soil, PAHs, benzo(a)pyrene and dibenzo(a,h)anthracene, and arsenic are common to both media with concentrations attenuating with depth. Based on the above comparison, the impact on subsurface soil from surface soil and surficial ash/cinder deposits is considered to be minimal.

Surface soils overlying subsurface soil occur primarily on Kansas River floodplain except at the toe of the slope where a thin layer of ash/cinder deposits separate surface and subsurface soil. To determine the surface soil to subsurface soil migration pathway, an analysis of the data was conducted to determine if chemicals present in surface soil on the Kansas River floodplain are also present in subsurface soil on the Kansas River floodplain because of leaching. The COPCs identified in the surface soil on the Kansas River floodplain included benzo(a)pyrene and arsenic (see Figure 4-5). Arsenic was the only COPCs identified in subsurface soils, excluding the ash layer. Upon comparison of the COPCs detected in surface soil and subsurface soil, arsenic was common to both media. Based on the above comparison, the impact on subsurface soil on the Kansas River floodplain from surface soil can be considered to be minimal.

5.3.3 Ash/Cinder Deposits to Subsurface Soil

Ash/cinder deposits overlying subsurface soil occur primarily on the floodplain slope and the Kansas River floodplain near the toe of the floodplain slope. To determine the ash/cinder deposits to subsurface soil migration pathway, an analysis of the data was conducted to determine if chemicals present in ash/cinder deposits on the floodplain slope and Kansas River floodplain are also present in subsurface soil because of leaching. The COPCs identified in the ash/cinder deposits included SVOCs (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene), metals (arsenic, iron, and thallium), and dioxins/furans (see Figure 4-4 and 4-5). Arsenic was the only COPC identified in subsurface soil beneath the ash/cinder deposits on the floodplain slope and Kansas River floodplain. Upon comparison of the COPCs detected in ash/cinder deposits and subsurface soil only arsenic was common to both. Arsenic concentrations observed in subsurface soil beneath the ash/cinder deposits were significantly lower compared to the concentrations in ash/cinder deposits and were similar to the subsurface soil background level. Based on the above comparisons, the impact on subsurface soils on the floodplain slope and Kansas River floodplain from ash/cinder deposits can be considered to be minimal.

5.3.4 Subsurface Soil and Ash/Cinder Deposits to Groundwater

In order to determine the subsurface soil and ash/cinder deposits to groundwater migration pathway, an analysis of the data was conducted to determine if chemicals present in subsurface soil are also present in groundwater. The primary chemicals identified in the subsurface soil and ash/cinder deposits included SVOCs (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene), metals (arsenic, iron, and thallium), and dioxins/furans. The COPCs identified in groundwater (direct-push samples only) were metals (cobalt and manganese). There was no overlap of COPCs in samples collected in the subsurface soil and/or ash/cinder deposits and groundwater. Based on the above comparison, the impact on groundwater from subsurface soil is considered to be negligible.

5.4 Fate and Transport of Site Constituents

The fate and transport for each of the constituents exceeding background levels and/or screening levels in soil, up-gradient levels in stream sediment, screening levels in surface water, and screening levels in groundwater at the CFI Site are discussed in the following sections.

5.4.1 Organic Constituents

5.4.1.1 SVOCs

Four SVOCs (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene) were detected above their respective screening values in surface and subsurface soils. Benzo(a)pyrene was also detected above its surface soil background level. The surface soil background levels for benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were below their respective screening levels. The subsurface background levels for each of the four SVOCs (PAHs) listed were below their respective screening levels. Additionally, benzo(a)pyrene, benzo(k)fluoranthene, and chrysene were detected above their respective screening values in surface water.

5.4.1.1.1 Benzo(a)anthracene

Benzo(a)anthracene exceeded the screening level in surface and subsurface soils. Benzo(a)anthracene has a low volatility and low water solubility. It is expected to be very strongly adsorbed to soil and sediment as shown by its high K_{oc} and K_{ow} values (Agency for Toxic Substances and Disease Registry [ATSDR], 1995a and Hampshire Research Institute, Inc. [HRI], 1995). Benzo(a)anthracene will biodegrade in soil and water, but at very slow rates (Howard, 1991). It will likely remain in the soil at the CFI Site and not leach into the groundwater.

5.4.1.1.2 Benzo(a)pyrene

Benzo(a)pyrene exceeded the background level and screening level in surface soils and the screening level for subsurface soil and surface water. Benzo(a)pyrene has a low volatility and low water solubility. It is expected to be very strongly adsorbed to soil and sediment as shown by high K_{oc} and K_{ow} values (ATSDR, 1995a and HRI, 1995). Benzo(a)pyrene will biodegrade in soil and water, but at very slow rates (Howard, 1991). It will likely remain in the soil at the CFI Site and not leach into the groundwater.

5.4.1.1.3 Benzo(b)fluoranthene

Benzo(b)fluoranthene exceeded the screening level in surface soil in only one sample. Benzo(b)fluoranthene is moderately volatile as shown by its vapor pressure and Henry's Law constant. It has a low water solubility and is expected to be very strongly adsorbed to soil and sediment as shown by high K_{oc} and K_{ow} values (ATSDR, 1995a and HRI, 1995). Benzo(a)fluoranthene will biodegrade in soil and water, but at very slow rates (Howard, 1991). It will likely remain in the soil at the CFI Site and not leach into the groundwater.

5.4.1.1.4 Benzo(k)fluoranthene

Benzo(k)fluoranthene exceeded the screening level for surface water. Benzo(k)fluoranthene has a low volatility and low water solubility. It is expected to be very strongly adsorbed to soil and sediment as shown by high K_{oc} and K_{ow} values (ATSDR, 1995a and HRI, 1995). Benzo(k)fluoranthene will biodegrade in soil and water, but at very slow rates (Howard, 1991). It will likely remain in the soil at the CFI Site and not leach into the groundwater.

5.4.1.1.5 Chrysene

Chrysene exceeded the screening level for surface water. Chrysene is moderately volatile as shown by its vapor pressure and Henry's Law constant. It has a low water solubility and is expected to be very strongly adsorbed to soil and sediment as shown by high K_{oc} and K_{ow} values (ATSDR, 1995a and HRI, 1995). Chrysene will biodegrade in soil and water, but at very slow rates (Howard, 1991). It will likely remain in the soil at the CFI Site and not leach into the groundwater.

5.4.1.1.6 Dibenzo(a,h)anthracene

Dibenzo(a,h)anthracene exceeded the screening level for surface and subsurface soils. Dibenzo(a,h)anthracene is unlikely to volatilize and has a low water solubility. It is expected to be very strongly adsorbed to soil and sediment as shown by high K_{oc} and K_{ow} values (ATSDR, 1995a and HRI, 1995). Dibenzo(a,h)anthracene will biodegrade in soil, but at very slow rates (Howard, 1991). It will likely remain in the soil at the Site and not leach into the groundwater.

5.4.1.2 Dioxins/Furans

Dioxins/furans congeners were detected consistently in all media sampled at the CFI Site; however, the total 2,3,7,8-TCDD equivalent concentrations exceeded screening levels in surface and subsurface soils and surface water. Dioxins/furans are expected to be extremely stable compounds under normal environmental conditions and to be strongly adsorbed to soils, sediments, and particulate matter. Erosion and aquatic transport of sediment is expected to be the main transport mechanism for dioxins/furans. The potential for significant leaching and volatilization are minimal. Dioxins/furans are expected to be strongly adsorbed to soils, sediments, and particulate matter. They will likely remain in the soil at the CFI Site and not leach into the groundwater. The half-life in surface water for 2,3,7,8-TCDD is greater than one year, and the half-life in surface soil in one to three years. Therefore, 2,3,7,8-TCDD ultimately tends to accumulate in the sediment. 2,3,7,8-TCDD is expected to bioaccumulate significantly due to its long half-life (ATSDR, 1995b and 1999a). Photodegradation appears to be the only mechanism of degradation for dioxins/furans. Dioxins/furans have long half-lives and are considered essentially non-biodegradable in the environment, and like other persistent compounds, are expected to be resistant to attack by microorganisms and other types of biotransformation processes (ATSDR, 1995b and 1999a).

5.4.2 Inorganic Constituents

Five metals (arsenic, cobalt, iron, lead, manganese, and thallium) were detected above screening levels in one or more of the various media evaluated during the RI field activities. Lead and mercury were also detected above their screening levels in historical surface soil samples. Of these metals, only arsenic had a background level for surface and subsurface soil above the screening level. Additionally, arsenic was the only metal that had an up-gradient level for stream sediment above the screening level.

Predicting the migration of metals in the environment is complex because metals can exist in a variety of forms. For instance, metals may exist as charged particles, such as ions in solution, or in an uncharged or neutral state. Metals may also interact with both inorganic and organic species to form a variety of different compounds of variable solubilities. Multiple oxidation states of some metals further complicate their behavior. The concentration of metals in the soil, at any given time, is governed by a number of interrelated processes, including inorganic and organic complexation, oxidation-reduction reactions, precipitation/dissolution reactions, and adsorption/desorption reactions. The kinetic component that is critical to predict the behavior of metals in soils cannot be assessed easily (USEPA, 1992a). Analytical procedures used to determine metal concentrations in soil do not give an indication as to the chemical form of the metal. Thus, only general fate and transport information for metals is discussed below.

5.4.2.1 Arsenic

Arsenic was detected consistently in all media sampled at the CFI Site. Surface and subsurface soils had detections above background levels and/or screening levels. Additionally, Stream Sediment Sample SD03, located up gradient of the CFI Site, had an arsenic detection above its up-gradient level of 7.244 mg/kg. Because of its multiple oxidation states and its tendency to form soluble complexes, the geochemistry of arsenic is both intricate and not well characterized. The solubility of arsenic varies widely according to the oxidation state. In natural environments, four oxidation states are possible for arsenic: 3^-, 0, 3^+, and 5^+. The adsorption of arsenic onto clays, iron oxides, and humic material are important fate processes. Co-precipitation or sorption of arsenic with hydrous oxides of iron is probably the most important removal process. The rate and extent of adsorption decreases with increasing salinity and increasing pH. Arsenic is relatively immobile in soils due to its binding to soil particles, but may be leached under the appropriate conditions. It binds to clay, iron oxides, and aluminum hydroxides (ATSDR, 2007a).

5.4.2.2 Cobalt

Cobalt was detected in all media sampled except surface water at the CFI Site; however, only three direct-push groundwater samples (DP09, DP27, and DP34) had exceedances of screening levels. Most of the cobalt in natural waters exists in the precipitated or adsorbed state in the 2^+ or 3^+ oxidation states. The predominant precipitated forms involve the carbonate and hydroxide species. Increased solubility may occur under acidic and anoxic conditions and in the presence of excess chloride ions or organic and inorganic chelating agents. In soils, cobalt is retained by metal oxides, crystalline minerals, and organic matter in soils. Bioaccumulation can be significant in some aquatic species (ATSDR, 2004).

5.4.2.3 Iron

Iron was detected consistently in all media sampled at the CFI Site. Iron exceeded its screening level in surface and subsurface soils. The essential nutrient iron exists in two oxidation states, ferrous iron (Fe^{2+}) and ferric iron (Fe^{3+}). Iron can form hydroxides and oxides. Iron oxides act as inorganic bonding agents for adjacent particles. Fe^{3+} can form a water-insoluble complex with fulvic acid and can form insoluble iron-sulfate. Iron solubility increases at pH values less than 5.0 Standard Units (SUs).

5.4.2.4 Lead

Lead was detected in surface and subsurface soils, stream sediment, and groundwater at the CFI site; however, the only exceedance was in surface soil (historical data). Lead is transferred continuously between air, water, and soil. Sorption to sediments is the dominant fate process of lead in natural waters. Precipitation with hydroxides, carbonate, sulfate, and sulfide results in decreased dissolved lead concentrations. Lead undergoes specific adsorption at mineral interfaces, precipitation of sparingly soluble solids, and formation of relatively stable organic-metal complexes/chelates with organic matter. Complexation of lead with organic matter increases its adsorptive affinity for clays and other mineral surfaces. Lead is strongly retained by most soil. At pH values above 6 SUs, lead is either adsorbed on clay surfaces or forms lead carbonate. Elemental lead cannot be broken down, but lead compounds can be transformed to other products (ATSDR, 2007b and USEPA, 1992a).

5.4.2.5 Manganese

Manganese was detected consistently in all media sampled at the CFI Site; however, only direct-push groundwater samples had detections above its screening level. Manganese exists in six oxidation states: 1^+, 2^+, 3^+, 4^+, 6^+, and 7^+. For pH values ranging from 4 to 7 SU, Mn^{2+} dominates; above a pH value of 8 SU, the higher oxidation states dominate. The principle anion associated with manganese is CO_3^{2-}. $MnCO_3$ is relatively insoluble. In oxidizing environments, manganese solubility is controlled by oxidation of Mn^{2+} and Mn^{3+} and Mn^{4+}. In reducing environments, manganese solubility is controlled by the poorly soluble manganese sulfide. Manganese is often transported in water by adsorbing to suspended particulates (ATSDR, 2012).

5.4.2.6 Mercury

Mercury was detected consistently in all media sampled at the CFI Site; however, only surface soil (historical data) had a detection above its screening level. Mercury has two oxidation states: 1^+ and 2^+. The transport and partitioning of mercury in surface waters and soils is influenced by the particular form of the compound. Some microorganisms in the water or soil can change inorganic forms of mercury to organic forms. Volatile forms (dimethylmercury and metallic mercury) are expected to evaporate to the atmosphere. The more dominant process involves the solid forms which partition to particulates in the soil or water, and in the water are transported downward to sediments. In sediment, other processes, such as precipitation as mercury sulfide and methylation by bacteria can occur. Inorganic mercury, once adsorbed, is not readily desorbed, therefore, sediments and soils act as repositories, and leaching is relatively insignificant. Resuspension of sediments by turbulence or the activity of benthic organisms can release the mercury-containing compounds directly into the water column. Surface run off is an important mechanism for moving mercury from soil to water. Adsorption of mercury in soil decreases under alkaline conditions and/or high chloride concentrations (ATSDR, 1999b; Callahan, 1979).

5.4.2.7 Thallium

Thallium was detected in surface and subsurface soil, and stream sediment at the CFI Site. Thallium exceeded its screening level in surface and subsurface soils. Thallium typically exists in the environment combined with other elements such as oxygen, sulfur, and the halogens. These compounds are generally quite soluble in water. Thallium is typically found as the monovalent ion (Tl^{+}), but may be trivalent (Tl^{3+}) in very oxidizing environments. In surface water, thallium often precipitates as a sulfide (Tl_2S). Thallium tends to adsorb to soils and sediments and it may bioconcentrate in biota. Thallium is very persistent in that it does not break down (ATSDR, 2013).

5.5 Persistence of Constituents

The persistence of a constituent in a particular environmental medium is a measure of the length of time that it remains in that medium. Processes of constituent removal include degradation, transformation, and transport to another medium. The longer a compound remains in a medium, the more persistent it is in that medium. The term half-life is often used when discussing persistence. Half-life is the time required for half the amount of a substance to degrade by natural processes. Using the half-life value, the persistence of a compound in an environmental medium can be predicted. It takes between four and five half-lives to reduce the original concentration by 95%. The persistence of a compound may also be affected by adsorption. For example, the soil-or-sediment binding capacity of a chemical may act as a catalyst for chemical degradation or it may protect the chemical from biodegradation. Bioaccumulation may increase a chemical's persistence by protecting the chemical from processes of environmental degradation (Bohn et al., 1985).

5.5.1 Organic Constituents

5.5.1.1 SVOCs (PAHs)

The SVOCs (PAHs) detected are considered to be persistent in the environment. The half-lives of PAHs are highly variable and range from a few days to a few years under aerobic conditions. In general, the persistence of these compounds increases with increasing molecular weight. Photodegradation is another important fate process for PAHs, but is significant only if PAHs are directly exposed to sunlight. PAHs adsorb strongly to soils and are expected to persist in soils until they are degraded (ATSDR, 1995a). PAHs bind onto dissolved organic macromolecules or organic matter. These macromolecules are not mobile in most soil-water systems (Dragun, 1988).

5.5.1.2 Dioxins/Furans

Dioxins and furans are considered to be persistent in the environment. Dioxins/furans are expected to be strongly adsorbed to soils, sediments, and particulate matter. They are expected to bioaccumulate significantly due to their long half-lives. Dioxins/furans have very long half-lives and are considered essentially non-biodegradable in the environment, and, like other persistent compounds, are expected to be resistant to attack by microorganisms and other types of biotransformation processes (ATSDR, 1995b and 1999a).

5.5.2 Inorganic Constituents

Because metals are not actually degraded, persistence is addressed in terms of the removal or transport of the metals from one medium to another. In general, migration through leaching is expected for metals forming soluble organic or ionic complexes. Insoluble metal compounds and adsorbed metals tend to persist in soils. The metals in soil may be either ionic or adsorbed to the solid phase or may be in a nonionic, precipitated form. A variety of factors determine whether or not these metals will be mobilized in the future. For instance, the adsorbed species may be removed by ion-exchange reactions, and the solid phases may be dissolved during the infiltration of rainwater. The metals will likely remain in the soil unless changes occur in the physical and chemical characteristics of the phases. These characteristics include pH, the presence of competing ions for exchange sites, and the presence of complexing/chelating agents which solubilize some metals. Changes in the redox conditions of the soil will directly affect the metal species with multiple oxidation states and may indirectly affect the others.

Since the stream sediments in Threemile Creek are relatively shallow, the metals in the sediments would tend to act similarly to the way they react in soil. However, the metals solubility is of much more importance in sediments, due to the continual exposure to an aqueous environment. This aqueous environment encourages metals to be continuously attempting to reach a state of equilibrium. When the concentrations of certain metals drop below the equilibrium solubility, the metal ion begins to dissolve as it replenishes the dissolved concentration, which results in the ability of metal ions to buffer their concentrations (Dragun, 1988). In this manner, sediments can act as a contaminant reservoir or source of contamination.

Contaminated sediments do not always remain at the bottom of the aquatic environment, as anything that disrupts the water, resuspends some of the sediments. The size of a sediment grain and amount of organic carbon in the sediment play important roles in determining the persistence and bioavailability of the contaminants. Metals tend to bioaccumulate in benthic organisms, which are then eaten by other aquatic organisms resulting in biomagnification of the metal (USEPA, 1992a).

In groundwater and surface water, several processes interact to influence metal ion transport. Some of these processes include complexation reactions in water, redox-related processes, and reactions that result in metal ion removal from water, such as adsorption and precipitation. Although metal ion reactivity depends on the particular mineral assemblage and the composition of the groundwater, they are typically strongly adsorbed by the surfaces of minerals in a porous medium or in rock fractures. Aqueous complex formation can have a significant effect on metal adsorption tendency. When complexed with a strongly-binding ligand, a metal may be transported down gradient at velocities magnitudes higher than would be expected in the absence of ligands. Changes in speciation, and therefore reactivity, can result from encountering varying chemical concentrations and contaminants along a groundwater flow pathway (Davis, 1993). The dissolved concentration of certain chemicals greatly affects the metals concentrations in solution. The metals can react with other ions in solution and form complexes which affect the equilibrium concentration. Minerals generally dissolve if soil conditions are conducive to the formation of a new mineral having a solubility that is lower than that of the original mineral. After dissolution in water, certain inorganic chemicals may initiate the dissolution of some soil or sediment minerals (Dragun, 1988).

Many metals may exist in more than one oxidation state, and the mobilities of the various oxidation states may differ by orders of magnitude (Davis, 1993).

5.6 Summary

The available data indicates that little, if any, leaching of contaminants at the CFI Site is occurring. Five metals (arsenic, cobalt, iron, lead, manganese, and thallium) were detected above screening levels in one or more of the various media evaluated during the RI field activities. Lead and mercury were also detected above their respective screening level in historical surface soil samples. Four SVOCs (PAHs), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above screening levels in surface and subsurface soils. Three SVOCs (PAHs), benzo(a)pyrene, benzo(k)fluoranthene, and chrysene were detected above screening levels in surface water. Dioxins/furans were detected above screening levels in surface and subsurface soils and surface water.

Metals are by far the most widespread of the contaminants at the CFI Site. SVOCs (PAHs) and dioxins/furans were detected above screening levels, but to a much lesser extent. Although there were chemical exceedances in surface water and stream sediment, surface run-off to surface water and stream sediment is not likely at the CFI Site. Based on visual observations of the surface water drainage and measured piezometric surfaces during quarterly groundwater sampling activities, it appears that there is very little, if any, hydrologic or hydrogeologic connection between the location of the former incinerator operations area and Threemile Creek.

COPCs detected above their respective screening levels at the CFI Site were detected primarily in surface and subsurface soils. Arsenic exceedances were ubiquitous throughout the surface and subsurface soil samples collected from three depositional environments; however, the highest concentrations were present in samples containing ash/soil or ash material. All but one thallium exceedance, and all iron exceedances were in samples containing ash/soil or ash material. Additionally, a majority of the PAH and dioxins/furans exceedances were in samples containing ash/soil or ash material. Excluding arsenic, there were no exceedances of COPCs in subsurface soil below ash/cinder deposits on the floodplain slope or the Kansas River floodplain, with arsenic exceedances being similar to background level. On the upland terrace there were three exceedances of PAHs in subsurface soils, indicating that minor leaching from surface soils and ash/cinder deposits may potentially be occurring, or occurred in the past at the CFI Site; therefore, leaching is a possible contaminant transport mechanism at the CFI Site. Although several contaminant groups were detected in the soils, very little migration of these contaminants to groundwater appears to be occurring. The constituents appear to be remaining in the ash/cinder deposits and areas where soil and ash/cinder deposits are well mixed.

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6.0 HUMAN HEALTH RISK ASSESSMENT

6.1 Introduction

6.1.1 Purpose

The purpose of this HHRA is to determine potential risks that might be experienced by human receptors coming into contact with COPCs associated with the site. This evaluation was completed in accordance with procedures outlined in the USEPA's *RAGS Volume I: Human Health Evaluation Manual (Parts A, E, and F)* (USEPA, 1989, 2004, and 2009a); other USEPA supplemental guidance documents; the KDHE *RSK Manual – 5th Version* (KDHE, 2015a); and other documents referenced throughout the text.

6.1.2 HHRA Organization

This HHRA consists of the following sections:

- 6.1 Introduction – The first section states the purpose and scope of the HHRA and explains the organization.
- 6.2 Identification of COPCs – In this section, analytical data representing current site conditions are reviewed, the chemicals detected are summarized, and COPCs are identified.
- 6.3 Toxicity Assessment – This section presents information on the sources used to acquire toxicity values. It includes a brief discussion of the nature and form of the toxicity values.
- 6.4 Exposure Assessment – This section presents a summary of information on the exposure setting, potentially exposed populations, and exposure pathways. It includes information on chemical intake estimation and chemical concentration calculations.
- 6.5 Risk Characterization – The risk characterization section is a summary of the possible nature and magnitude of health risk associated with the site. Risks are characterized by combining calculated chemical intake with chemical toxicity information, as presented in a series of tables.
- 6.6 Uncertainty and Variability – This section presents a discussion of the uncertainty and variability inherent in the risk assessment process.
- 6.7 Summary and Conclusions – This section summarizes the HHRA and presents conclusions.

6.2 Identification of COPCs

COPCs include those chemicals detected at the site that have the potential to impact human health. The following sections detail the procedure undertaken to select the COPCs evaluated in this HHRA. Section

6.2.1 identifies the media of potential concern, and Section 6.2.2 describes the identification of the COPCs.

6.2.1 Media of Potential Concern

To estimate risks from chemical contaminants present at the CFI site, it is necessary to establish potential media of concern. Sampling and analysis activities resulted in the detection of site-related constituents in surface (0-2 ft bgs) and subsurface soils, stream sediment, surface water, and groundwater. Because chemicals in surface soil can be directly contacted by receptors (ingestion, dermal contact, and inhalation of dust), exposure to surface soil could present potential human health concerns. Direct contact with subsurface soil (ingestion, dermal contact, and inhalation of dust) could occur as the result of construction activities. Additionally, volatile constituents in surface and subsurface soil could migrate to the surface and impact outdoor air. Because chemicals in stream sediment can be directly contacted by receptors, exposure to stream sediment could present potential human health concerns. Direct contact with surface water is possible; therefore, exposure to surface water could present potential human health concerns. Although unlikely to occur, there are currently no restrictions in place to prevent future use of groundwater at the site as a potable water source. In addition, due to areas of the site with shallow groundwater, it could be contacted during construction activities. Given the potential for exposure, surface soil, subsurface soil, stream sediment, surface water, and groundwater were retained as media of potential concern.

Please note, the results of groundwater samples collected from monitoring wells did not show chemical concentrations above screening levels for any constituents. Although data from direct-push samples showed exceedances of metals, the data were determined to be unsuitable for decision-making purposes due to high turbidity levels. Based on the lack of constituents above screening levels, groundwater was not identified as a medium of concern and thus was not evaluated in the risk assessment.

6.2.2 Identification of COPCs

The first step in quantifying potential risks to human health is to identify COPCs. COPCs include those site-related chemicals that have the potential to impact human health. COPCs were identified separately for each of the data sets compiled for this HHRA – surface soil, subsurface soil, comprehensive soil, stream sediment, surface water, and groundwater. The surface soil data set includes those samples that were collected during the RI activities at the upland terrace, floodplain slope, and Kansas River floodplain within the 0-2 ft bgs interval, while the subsurface soil data set includes all soil samples that were collected during the RI activities at the Kansas River floodplain from a depth of less than 12 ft. The comprehensive soil data set includes all soil samples that were collected during the RI activities at the upland terrace, floodplain slope, and Kansas River floodplain from the unsaturated zone (a maximum depth of 32 ft), and is used in the estimation of vapor migration from soil to outdoor air. It should be noted that historical composite samples were not used in the HHRA, as composite samples already represent an average concentration and they are inappropriate for use in calculating upper confidence limits (UCLs). The stream sediment data set includes all stream sediment samples collected on-site during the RI activities. Up-gradient stream sediment samples are not included in this HHRA and further were not included in 95% UCLs that were developed to evaluate site-related exposures. Although, the up-gradient stream sediment samples were used for comparison with stream sediment samples collected approximately midpoint of, up gradient of, and down gradient of the CFI Site to establish that arsenic contamination is not site-specific. It should be noted that stream sediment samples were collected as wet sediment. The surface water data set includes all surface water samples collected during the RI activities. The groundwater data set includes all groundwater samples collected from the Kansas River alluvial aquifer during the four quarterly groundwater sampling events in 2015-2016 (May, August, and November 2015 and February, 2016). The monitoring wells are located within the same water bearing unit. The sample locations included in each HHRA data set are summarized on Table 6-1. Summary tables of human health screening statistics for each soil data set evaluated for this HHRA are provided on Tables 6-2 through 6-10. Additionally, summary tables of human health screening statistics for stream sediment, surface water, direct-push groundwater, and monitoring well groundwater are provided on Tables 6-11 through 6-14, respectively.

For this HHRA, chemicals that were positively detected in at least one sample from a given data set were initially considered COPCs. The COPC list was then reduced through a comparison to human health-based screening levels. Analytes with at least one positive detection and whose concentration was higher than the human health based screening level were retained as COPCs for their given media. PAHs were also retained given that at least one PAH passed the criteria above provided that at least one concentration, for an individual analyte, was detected in the media of concern. Chemicals retained as COPCs after a comparison to human health-based screening levels are shown on Table 6-15. Essential nutrients were not assesses in this HHRA.

Please note, the results of groundwater samples collected from site monitoring wells did not show chemical concentrations above screening levels for any constituents as discussed in Section 4.7.2. Although data from direct-push samples showed exceedances of metals, the data were determined to be unsuitable for decision-making purposes due to high turbidity levels. Based on the lack of constituents above screening levels, groundwater was not identified as a medium of concern and thus was not evaluated in the risk assessment.

6.3 Toxicity Assessment

The toxicity of COPCs is evaluated for both carcinogenic potential and noncarcinogenic adverse health effects. Data regarding health effects are then used by various agencies to derive numerical toxicity values. The USEPA gathers toxicological information from a variety of sources including experimental animal studies, epidemiological investigations, and clinical human studies. Well-conducted epidemiological studies that show a positive correlation between an agent and a disease represent the most convincing evidence about human risk. At present, human data adequate to serve as the sole basis for the development of toxicity values are available for only a few chemicals. In most cases where there are insufficient direct human data, USEPA uses toxicity information developed from experiments conducted on non-human mammals such as rats, mice, dogs, or rabbits.

Toxicity values were compiled following the USEPA's *Memorandum Human Health Toxicity Values in Superfund Risk Assessments* (USEPA, 2003a). The primary source of toxicological information for this report was the USEPA-sponsored *Integrated Risk Information System* (IRIS) (USEPA, 2016c). If toxicity values were not found in IRIS, the USEPA National Center for Environmental Assessment's list of Provisional Peer-Reviewed Toxicity Values (PPRTV) was consulted for provisional information. If neither of these sources provided toxicity values, other state or federal agencies were consulted.

The following subsections detail information regarding both noncancer and cancer toxicity values.

6.3.1 Noncancer Toxicity Values

The Reference Dose (RfD) and Reference Concentration (RfC) are the toxicity values used in assessing noncancer health effects from oral and inhalation exposures, respectively. For noncancer health effects, the level of exposure below which no adverse health effects develop is termed the threshold level or threshold dose. RfDs and RfCs represent exposure levels that are below the threshold. Each is an estimate of daily exposure to the general human population (including sensitive subpopulations) that is unlikely to pose an appreciable likelihood of adverse effects during a given term of exposure.

RfDs and/or RfCs are derived from experimental no observed adverse effect levels (NOAELs) or lowest observed adverse effect levels (LOAELs) by application of uncertainty factors (UFs) or modifying factors (MFs). UFs of 10 are used to protect sensitive subpopulations, to account for interspecies variability, and to account for data being obtained from subchronic rather than chronic studies. A UF of 10 is also used when the toxicity value is derived from a LOAEL rather than a NOAEL. MFs, usually a value of 10 or less, are applied for uncertainties not addressed by the listed UFs.

RfD values are expressed as milligrams of chemical per kilogram body weight per day (mg/kg/day), and RfC values are expressed as a chemical concentration in air in milligrams per cubic meter (mg/m^3).

Table 6-16 summarizes available RfDs and reference sources. By convention, RfD values, as with all toxicity values and risk assessment calculations, are expressed in scientific notation. For example, the oral RfD for benzene, 0.004 mg/kg/day, is expressed as 4 x 10-3 mg/kg/day or 4E-03 mg/kg/day, as shown in the table.

No dermal toxicity values are currently available, necessitating the adaptation and use of oral toxicity values. Dermal toxicity, other than relatively short-term effects at the point of contact, generally occurs as a result of chemical absorption. However, oral values are typically developed from laboratory animal studies and reflect an administered (in feed or water), rather than an absorbed (through the gastrointestinal tract) dose. The degree of gastrointestinal absorption varies between chemicals with some being readily absorbed and some being poorly absorbed. To reflect this, default gastrointestinal absorption efficiency factors are applied to the oral values if laboratory studies indicate less than 50% gastrointestinal absorption (USEPA, 2004). Table 6-17 provides the gastrointestinal absorption efficiency factors, an indication of whether an absorption adjustment is needed, and the RfD to be used for dermal exposure.

6.3.2 Cancer Toxicity Values

The toxicity values used in assessing cancer risk are slope factors and/or inhalation unit risks. A slope factor represents the 95% UCL on the probability that a carcinogen will cause cancer at a dose of one mg/kg/day over a lifetime. Unlike most noncancer health effects, genotoxic carcinogenesis is not generally believed to conform to the concept of a threshold dose. Mechanistic data indicate that in some instances even the smallest dose of a carcinogen can lead to a clinical state of disease. For this reason, it is not possible to determine a no response dose, but rather it is necessary to relate a specific dose to the statistical probability of a carcinogenic response.

An inhalation unit risk is defined as the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 microgram per cubic meter ($\mu g/m^3$) in air. Inhalation unit risk toxicity values are expressed in units of $(\mu g/m^3)^{-1}$.

For carcinogenic effects, a cancer weight-of-evidence descriptor is used to describe a substance’s potential to cause cancer in humans and the conditions under which the carcinogenic effects may be expressed. This judgment is independent of consideration of the agent's carcinogenic potency. Under the USEPA's 1986 guidelines for carcinogen risk assessment, the weight-of-evidence was described by categories "A through E" – Group A for known human carcinogens through Group E for agents with evidence of noncarcinogenicity. Under the USEPA's 2005 guidelines for carcinogen risk assessment, a narrative approach, rather than categories, is used to characterize carcinogenicity. Five standard weight-of-evidence descriptors (Carcinogenic to Humans, Likely to be Carcinogenic to Humans, Suggestive Evidence of Carcinogenic Potential, Inadequate Information to Assess Carcinogenic Potential, and Not Likely to be Carcinogenic to Humans) are used as part of the narrative.

Table 6-18 summarizes the available slope factors, reference sources, and weight of evidence classifications for the carcinogenic COPCs. Please note that some weight of evidence classifications in IRIS have not yet been updated to the 2005 descriptors. The weight of evidence classifications shown on Table 6-18 reflect the data provided in the primary reference source, and may reflect either the 1986 or 2005 guidelines depending on the date at which the primary reference source was most recently updated.

As with RfDs, slope factors are not available for dermal exposure. For dermal exposure, current guidance recommends that oral slope factors be adjusted to reflect gastrointestinal absorption efficiency only when the absorption efficiency is less than 50% (USEPA, 2004). Slope factors for dermal exposure are provided on Table 6-16 along with the gastrointestinal absorption efficiencies and an indication of the need for an absorption adjustment.

6.3.3 Health Effects of Lead

Lead represents a special situation with regard to both its cancer and noncancer toxicities. Populations especially sensitive to lead include children and pregnant women. The toxic effects of lead involve several organ systems including the nervous, vascular, and renal systems with the critical, or most sensitive effects involving the nervous system. In children, lead exposure has been shown to decrease intelligence scores, slow growth, and cause hearing problems. Exposure of a pregnant woman to lead may cause premature birth, lower birth weight, and decreased mental ability in the infant. In adults, lead exposure may decrease reaction time and possibly memory. It has been shown to increase blood pressure in middle-aged men, but it is uncertain if it has the same effect in women. Exposure to high levels of lead can cause brain and kidney damage in children and adults. Lead is also classified as a carcinogen, based on experimental studies in animals (ATSDR, 2007b).

Lead is categorized as B2, a probable human carcinogen, but also produces neuropathic effects that do not appear to have a threshold. Therefore, any exposure to lead may have an associated risk. The pharmacokinetics of lead are, however, quite complex and depend on a number of factors, including age, gender, and nutritional status. In general, lead is poorly absorbed into the bloodstream, although absorption rates are significantly higher in children. Human toxicity has been historically evaluated in terms of blood lead levels rather than exposure levels. Risk from lead is addressed in Section 6.5.3.11 – Risk from Exposure to Lead.

6.4 Exposure Assessment

In the exposure assessment, potentially exposed populations and potential pathways of exposure are identified. The assessment considers the current and theoretical future land use in order to identify pathways and potentially exposed populations. Only completed exposure pathways (i.e., human receptors in contact with impacted media) may pose a human health risk. Section 6.4.1 presents a brief description of the exposure setting, Section 6.4.2 identifies human populations likely to have contact with chemicals detected at the CFI Site, Section 6.4.3 identifies potentially completed exposure pathways, and Section 6.4.4 presents a discussion of the process for estimating chemical intake.

6.4.1 Characterization of the Exposure Setting

The first step in evaluating exposure is to characterize a site with respect to its physical features, current and future land uses, and observed and predicted human activities so that potentially exposed populations at and near the site can be identified. The CFI Site is located at the transition of the terrace into the Kansas River alluvial valley and includes three distinct areas; the upland terrace area, the floodplain slope, and the Kansas River floodplain. The upland terrace area is relatively flat and drains southeast toward Threemile Creek. The floodplain slope is relatively steep with an approximate 3 to 1 slope. The floodplain slope is approximately 16 ft high and extends approximately 50 ft laterally between the upland terrace area and the Kansas River floodplain (CTI, 2010). The floodplain slope also drains southeast toward Threemile Creek. The Kansas River floodplain is relatively flat and drains southeast toward Threemile Creek.

6.4.1.1 Current and Future Land Use

Land use at Camp Funston at Fort Riley is related to the operations of an active Army installation. Camp Funston is used to support active military training, housing, and military operations which are expected to continue into the next century. According to the Fort Riley RPMP, the land use for the area where the CFI Site is located is currently classified as open space (Black & Veatch, 2007). Fort Riley currently has no plans to expand military or nonmilitary operations into the CFI Site; therefore, future land use is likely to remain the same.

The area in the immediate vicinity of the CFI Site is currently unused wood/brush-covered land. Building 1460 located approximately a half mile east of the CFI Site is used for the repair, maintenance, and storage of vehicles and heavy equipment. There is an active fire station approximately a half mile northeast of the CFI Site on Huebner Road. There is active military housing (barracks) northwest of the CFI Site on Huebner Road. The Camp Funston Wastewater Treatment Plant is located approximately a quarter mile south of the CFI Site, in the Kansas River floodplain. The former Southwest Funston Landfill lies approximately a half mile south of the CFI Site. The UPRR tracks (located on the upland terrace), which run immediately northwest of the CFI Site, support moderately heavy rail traffic with several freight trains running both east and westbound each day. The upland terrace portion of the CFI Site is immediately adjacent to the UPRR grade. The floodplain slope and Kansas River floodplain portions of the CFI Site are located approximately 60 ft and 110 ft southeast of the UPRR grade, respectfully (see Figure 1-3).

6.4.1.2 Current and Future Water Use

Fort Riley and the communities of Junction City and Ogden rely on groundwater drawn from alluvial sediments for municipal drinking water supplies. The Fort Riley water supply wells are in the alluvial valley, approximately eight miles up-gradient of the CFI Site near Camp Forsyth. The nearest water supply wells are located approximately three miles east of the CFI Site, on the southern portion of the Kansas River floodplain. There are no water supply wells located on the Kansas River floodplain between the CFI Site and the Kansas River. Although it is not used as a water source, Threemile Creek is located adjacent (northeast) of the CFI Site and flows into the Kansas River, approximately one mile east of the site.

6.4.2 Potentially Exposed Populations

Potential receptors are defined as the human populations that may be exposed to chemicals in an exposure medium through one or more exposure routes. This is described as a complete exposure pathway and must have the following essential components: site-related chemical release to environment; transport to an exposure point; the presence of a receptor at the exposure point; and an exposure route. The following is a discussion of human receptors for which potentially complete exposure pathways may exist currently or in the future, in the absence of remediation.

Potentially exposed human populations include those persons whose locations and activities create an opportunity for contact with impacted media. Site conditions and land and water uses influence human activities and patterns of behavior and are considered in identifying potential receptors. It should be noted that not every receptor is likely to be present or contact all exposure media. The following is a discussion of the receptors expected to be present in each of the three depositional environments of the CFI Site.

Upland Terrace

There are currently no Fort Riley personnel stationed at the upland terrace portion of the CFI Site. Additionally, due to the small area of land available for development and the presence of the UPRR tracks adjacent to the CFI Site, it is not expected that future construction/redevelopment work would occur. Thus, constructing a residence in this area would be difficult and unlikely due to the configuration of the land and the need for any residence to be constructed immediately against the railroad. However, the presence of the UPRR tracks is expected to necessitate a current and future rail worker presence, who may perform routine maintenance tasks, and/or repair activities. Also, because the CFI Site is classified as an open area, it is expected that current and future visitors (child, youth, and adult) may be present.

Floodplain Slope

There are also currently no Fort Riley personnel stationed at the floodplain slope portion of the CFI Site. Because of the severity of the slope (approximately 45 degrees), it is not anticipated that future construction/redevelopment work would occur. It is possible, however, that personnel could be present at the floodplain slope in the future to perform maintenance and/or landscaping activities if the floodplain portion of the CFI Site was redeveloped. Also, because the CFI Site is classified as an open area, it is expected that current and future visitors (child, youth, and adult) may be present.

Kansas River Floodplain

As noted in both the upland terrace and floodplain slope portions of the CFI Site, there are currently no Fort Riley personnel stationed at the Kansas River floodplain portion of the CFI Site. Although there are no current plans for redevelopment, the relatively topography of the Kansas River floodplain portion could allow for future redevelopment, especially considering the close proximity of the Camp Funston Wastewater Treatment Plant. Any future redevelopment of the CFI Site would likely result in construction and maintenance and/or landscaping activities. Additionally, future redevelopment of the CFI Site could result in the construction of military housing (barracks), as is present northwest of the CFI Site on Huebner Road. Also, because the CFI Site is classified as an open area, it is expected that current and future visitors (child, youth, and adult) may be present.

The following is a list of human receptors that are evaluated quantitatively for the CFI Site:

<u>Upland Terrace</u>

- Current/Future Upland Terrace Rail Worker (this is a person who may participate in rail repair, landscaping, replacement of rail ties, and other tasks related to working on or around the railroad)
- Current/Future Child Visitor
- Current/Future Youth Visitor
- Current/Future Adult Visitor

<u>Floodplain Slope</u>

- Future Floodplain Slope Worker
- Current/Future Child Visitor
- Current/Future Youth Visitor
- Current/Future Adult Visitor

<u>Kansas River Floodplain</u>

- Future Kansas River Floodplain Worker
- Future Kansas River Floodplain Construction Worker
- Current/Future Child Visitor
- Current/Future Youth Visitor
- Current/Future Adult Visitor
- Future Kansas River Floodplain Child Resident
- Future Kansas River Floodplain Adult Resident

All human receptors are assumed to be potentially exposed to the following media: surface and/or subsurface soil, particulates in outdoor air, outdoor vapors, stream sediment, and surface water. Please note that the visitor populations are assumed to move across the three depositional environments and are therefore considered on a site-wide basis. The site-wide visitor scenario is effectively the same as a trespasser scenario.

6.4.3 Potential Exposure Pathways

Health risks may occur only when there is contact with a chemical by a receptor population. Exposed populations must then either ingest, inhale, or dermally contact COPCs to complete an exposure pathway and possibly experience a health risk. Figure 6-1 displays a graphical representation of the human health

CSM. The following is a discussion of the likelihood of completed pathways for each receptor population.

6.4.3.1 Current/Future Upland Terrace Rail Worker Scenario

The current/future upland terrace rail worker population was assumed to consist of workers engaged in regular maintenance and/or repair activities associated with the UPRR tracks. Since most common maintenance and/or repair activities would not include subsurface excavation, it was assumed that current/future upland terrace rail workers would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of soil and chemical absorption through dermal contact. Maintenance and/or repair activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water in Threemile Creek is possible if maintenance and/or repair activities are required on the railroad bridge located adjacent to the CFI Site. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the current/future upland terrace rail worker are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.2 Future Floodplain Slope Worker Scenario

The future floodplain slope worker population was assumed to consist of workers engaged in regular maintenance activities associated with the floodplain slope if it is redeveloped (i.e. landscaping, brush removal, etc.). Since most common maintenance activities would not include subsurface excavation, it was assumed that future floodplain slope workers would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of soil and chemical absorption through dermal contact. Maintenance activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water in Threemile Creek is possible if maintenance activities are required at the floodplain slope. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the future floodplain slope worker are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.3 Future Kansas River Floodplain Worker Scenario

The future Kansas River floodplain worker population was assumed to consist of workers engaged in regular maintenance activities associated with the Kansas River floodplain if it is redeveloped (i.e. landscaping, brush removal, etc.). Since most common maintenance activities would not include subsurface excavation, it was assumed that future Kansas River floodplain workers would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of surface soil and chemical absorption through dermal contact. Maintenance activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water in Threemile Creek is possible if maintenance activities are required at the Kansas River floodplain. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the future Kansas River floodplain worker are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.4 Future Kansas River Floodplain Construction Worker Scenario

Future Kansas River floodplain construction workers could be present if redevelopment and/or digging activities are required at the site, and could directly contact contaminated surface and subsurface soil, to a general depth of construction of 12 ft. The depth of 12 ft bgs was used as a reasonable depth for construction, as it accounts for construction of an 8 ft below grade basement and underlying utility structures. Direct contact with surface and subsurface soil could lead to incidental ingestion of surface and/or subsurface soil and chemical absorption through dermal contact. Digging activities could disturb surface and subsurface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface and subsurface soil was considered a potentially completed pathway. Given the presence of

SVOCs and dioxins/furans in surface and subsurface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if redevelopment and/or digging activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the future Kansas River floodplain construction worker are:

- Incidental ingestion of surface and subsurface soil,
- Absorption through dermal contact with surface and subsurface soil,
- Inhalation of fugitive dust from surface and subsurface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.5 Current/Future Site-Wide Child Visitor Scenario

The current/future site-wide child visitor population was assumed to consist of children from ages 0 to 6, accompanying their parents to the site during recreational activities such as mushroom gathering, hiking, etc. Since most common recreational activities would not include subsurface excavation, it was assumed that current/future site-wide child visitors would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of surface soil and chemical absorption through dermal contact. Recreational activities could disturb soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if recreational activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the current/future site-wide child visitor are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.6 Current/Future Site-Wide Youth Visitor Scenario

The current/future site-wide youth visitor population was assumed to consist of youths from ages 9 to 15 visiting the site for recreational activities such as mushroom gathering, hiking, etc. Since most common recreational activities would not include subsurface excavation, it was assumed that current/future site-wide youth visitors would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of soil and chemical absorption through dermal contact. Recreational activities could disturb soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if recreational activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the current/future site-wide youth visitor are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.7 Current/Future Site-Wide Adult Visitor Scenario

The current/future site-wide adult visitor population was assumed to consist of adults visiting the site for recreational activities such as mushroom gathering, hiking, etc. Since most common recreational activities would not include subsurface excavation, it was assumed that current/future site-wide adult visitors would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of surface soil and chemical absorption through dermal contact. Recreational activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if recreational activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the current/future site-wide adult visitor are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,

- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.8 Future Kansas River Floodplain Child Resident Scenario

Although Kansas River floodplain site use is not anticipated to change in the future, there are currently no restrictions in place preventing future residential land use. Therefore, a child resident could be present in the future on the Kansas River floodplain. Since most common residential activities would not include subsurface excavation, it was assumed that future Kansas River floodplain child residents would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of surface soil and chemical absorption through dermal contact. Residential activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if residential recreational activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the future Kansas River floodplain child resident are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,

- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.3.9 Future Kansas River Floodplain Adult Resident Scenario

Although Kansas River floodplain site use is not anticipated to change in the future, there are currently no restrictions in place preventing future residential land use. Therefore, an adult resident could be present in the future on the Kansas River floodplain. Since most common residential activities would not include subsurface excavation, it was assumed that future Kansas River floodplain adult residents would not directly contact subsurface media. Direct contact with surface soil could lead to incidental ingestion of surface soil and chemical absorption through dermal contact. Residential activities could disturb surface soils and generate fugitive dusts that could be inhaled. Therefore, direct contact with surface soil was considered a potentially completed pathway. Given the presence of SVOCs and dioxins/furans in surface soil, inhalation of chemical vapors in outdoor air was considered a potentially completed pathway.

Contact with contaminated stream sediment and surface water is possible if residential recreational activities are conducted in Threemile Creek. Contact with stream sediment and surface water could lead to ingestion and chemical absorption through dermal contact. Therefore, contact with stream sediment and surface water were considered potentially completed pathways.

In summary, the potentially completed exposure pathways for the future Kansas River floodplain adult resident are:

- Incidental ingestion of surface soil,
- Absorption through dermal contact with surface soil,
- Inhalation of fugitive dust from surface soil,
- Inhalation of outdoor vapors from soil,
- Incidental ingestion of stream sediment,
- Absorption through dermal contact with stream sediment,
- Incidental ingestion of surface water, and
- Absorption through dermal contact with surface water.

6.4.4 Estimation of Intake

Intake rates for COPCs were quantified using the ingestion and dermal contact equations taken from RAGS and supplementary documents. Equations for inhalation exposures were obtained from USEPA's *RAGS Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment) Final* (USEPA, 2009a). The equations and variable values used to calculate chemical intake are presented on Tables 6-19 to 6-26. The calculated intakes and concentrations are later used in conjunction with toxicity values to characterize risk, as discussed in Section 6.5, Risk Characterization.

6.4.4.1 Exposure Variables

Where available, recommended exposure variable values from guidance documents were used; otherwise, best professional judgment about current and hypothetical future exposure settings was employed in estimating values for the exposure scenarios. The recommended values and estimated values were specifically chosen to result in a reasonable maximum exposure (RME) estimate. An RME conservatively represents the highest exposure that can be reasonably expected to occur at the site.

Current/Future Upland Terrace Rail, Future Floodplain Slope, and Future Kansas River Floodplain Worker Exposure Variables

Site workers were assumed to weigh 80 kilograms (kg) (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating dermal contact with soil, stream sediment, and surface water 3,527 square centimeters (cm^2) was used as the total area of exposed skin based upon the adult mean values for head, hands, and forearms (USEPA, 2014). The soil-to-skin adherence factor was assumed to be 0.12 milligrams per square centimeter (mg/cm^2) (USEPA, 2014) for soil. A sediment-to-skin adherence factor was assumed to be 0.20 mg/cm^2 (USEPA, 2011) for stream sediment. This value is based on an adult clamming scenario.

An ingestion rate of 100 milligrams per day (mg/day) (USEPA, 2014) was used to estimate intake of both contaminated soil and stream sediment. The variable of fraction from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.568 liters per day (L/day) (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate represents an upper percentile of 0.071 liters per hour (L/hr) of adult water ingestion while swimming, multiplied by an eight-hour working day. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for a worker. Therefore, the surface water ingestion rate is conservative in nature.

The standard 250 workdays per year for 25 years was used for exposure frequency and duration for soil, respectively (USEPA, 2014). An exposure frequency of 52 days per year was used for stream sediment and surface water, based on one day a week spent in Threemile Creek. The exposure time for inhalation of fugitive dust and chemical vapors was set at eight hours based on a standard working day.

Future Kansas River Floodplain Construction Worker Exposure Variables

Construction workers were assumed to weigh 80 kg (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating dermal contact with soil, stream sediment, and surface water, 3,527 cm^2 was used as the total area of exposed skin based upon the adult mean values for hands, and forearms (USEPA, 2014). The soil-to-skin adherence factor was assumed to be 0.3 mg/cm^2 (USEPA, 2002) for soil. A sediment-to-skin adherence factor was assumed to be 0.20 mg/cm^2 (USEPA, 2011) for stream sediment.

A higher level of soil contact can reasonably be expected to occur during construction activities; consequently, a higher soil ingestion rate than the normal adult default value was assumed for construction workers. An ingestion rate of 330 mg/day (USEPA, 2002) was used to estimate intake of both contaminated soil and stream sediment. The variable of fraction from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.568 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate represents an upper percentile of 0.071 L/hr of adult water ingestion while swimming, multiplied by an eight-hour working day. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for a worker. Therefore, the surface water ingestion rate is conservative in nature.

Because of the size of the site, future construction work was assumed to occur for 8 hours per day for 6 months (120 working days out of a 180-day time period). An exposure frequency of 26 days per year was used for stream sediment and surface water, based on one day a week spent in Threemile Creek during the six months of assumed construction.

Current/Future Site-Wide Child Visitor Exposure Variables

Child visitors were assumed to weigh 15 kg, the recommended default body weight for children from infancy to six years of age (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating dermal contact with soil, stream sediment, and surface water 2,373 cm^2 was used as the total area of exposed skin based upon the mean values for head, hands, forearms, lower legs, and feet (USEPA, 2014). For exposure to soil, the recommended default soil-to-skin adherence factor of 0.2 mg/cm^2 for children 0-6 years old was assumed (USEPA, 2014). A sediment-to-skin adherence factor was assumed to be 3.6 mg/cm^2, based upon the mean solid adherence to skin values for hands, arms, legs, and feet of children playing in stream sediment (USEPA, 2011).

The recommended default soil ingestion rate of 200 mg/day (USEPA, 2014) was used to estimate intake through incidental ingestion of both soil and stream sediment. The variable of fraction from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.54 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate represents an upper percentile of 0.12 L/hr of child water ingestion while swimming, multiplied by a 4.5 hour exposure time for children under the age of 15 years swimming in freshwater. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for a child visitor. Therefore, the surface water ingestion rate is conservative in nature.

It was conservatively assumed that current/future site-wide child visitors spend one day per week for twelve months, or 52 days per year on the site. Current/future site-wide child visitors were assumed to be present on the site for a total of 4.8 hours per event based on the assumption that they would be accompanied by an adult. Based on the identified age range, the exposure duration was assumed to be six years.

Current/Future Site-Wide Youth Visitor Exposure Variables

Youth visitors were assumed to weigh 44.3 kg (average body weight for youths 9-15 years old) (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating dermal contact with soil, stream sediment, and surface water 5,437 cm^2 was used as the total area of exposed skin based upon the mean values for head, hands, forearms, lower legs, and feet (USEPA, 2011). The soil-to-skin adherence factor was assumed to be 0.2 mg/cm^2 (USEPA, 2014) for soil. A sediment-to-skin adherence factor was assumed to be 4.0 mg/cm^2, based upon the mean solid adherence to skin values for hands, forearms, lower legs, and feet of children playing in stream sediment (USEPA, 2011).

An ingestion rate of 100 mg/day (USEPA, 2002) was used to estimate intake of both contaminated soil and stream sediment. The variable of fraction from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.24 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate represents an upper percentile of 0.12 L/hr of child water ingestion while swimming, multiplied by a two hour exposure time. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for a youth visitor. Therefore, the surface water ingestion rate is conservative in nature.

It was conservatively assumed that current/future youth visitors spend one day per week for twelve months, or 52 days per year on the site. Current/future youth visitors were assumed to be present on the site for a total of 2 hours per event based on the mean amount of time spent outdoors for the ages of 9 to 15 (USEPA, 2011). Based on the identified age range, the exposure duration was assumed to be six years.

Current/Future Site-Wide Adult Visitor Exposure Variables

Adult visitors were assumed to weigh 80 kg (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating dermal contact with soil 6,032 cm^2 was used as the total area of exposed skin based upon the adult mean values for head, hands, forearms, and lower legs (USEPA, 2014). For stream sediment and surface water, 12,680 cm^2 was used as the total area of exposed skin based upon the mean values for head, hands, forearms, lower legs, and feet (USEPA, 2011). The soil-to-skin adherence factor was assumed to be 0.07 mg/cm^2 (USEPA, 2014) for soil. A sediment-to-skin adherence factor was assumed to be 0.26 mg/cm^2, based upon the mean solid adherence to skin values for hands, arms, legs, and feet of adults clamming (USEPA, 2011).

An ingestion rate of 100 mg/day (USEPA, 2014) was used to estimate intake of both contaminated soil and stream sediment. The variable of fraction from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.341 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate represents an upper percentile of 0.071 L/hr of adult water ingestion while swimming, multiplied by a 4.8 hour exposure time. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for an adult visitor. Therefore, the surface water ingestion rate is conservative in nature.

It was conservatively assumed that current/future adult visitors spend one day per week for twelve months, or 52 days per year on the site. Current/future adult visitors were assumed to be present on the site for a total of 4.8 hours per event based on the mean amount of time spent outdoors for the ages of 18 to 70 (USEPA, 2011). The exposure duration for adults represents 20 years as an adult.

Future Kansas River Floodplain Resident Exposure Variables

The combined child-adult resident population scenario, spanning a 26-year period and including six years as a child and 20 years as an adult, was used to assess exposure to carcinogenic compounds. The focus is on individuals who may live in the same residence for a high-end period of time (e.g., 26 years). The childhood period is specifically included so as to incorporate the relatively higher exposures of children into the lifetime average daily dose (USEPA, 1996). Exposure to noncarcinogens was assessed separately for adults and children in order to not underestimate possible hazards to children. Again, this is because children may have a higher chemical intake in relation to body weight than adults.

Future child residents were assumed to weigh 15 kg, the recommended default body weight for children from infancy to six years of age (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating intake through dermal absorption from soil, stream sediment, and surface water, 2,373 cm^2 was used as the area of exposed skin, based upon the mean values for head, hands, forearms, lower legs, and feet (USEPA, 2014). For exposure to soil, the recommended default soil-to-skin adherence factor of 0.2 mg/cm^2 for children 0-6 years old was assumed (USEPA, 2004). A sediment-to-skin adherence factor was assumed to be 3.6 mg/cm^2, based upon the mean solid adherence to skin values for head, hands, arms, legs, and feet of children playing in stream sediment (USEPA, 2011).

The recommended default soil ingestion rate of 200 mg/day (USEPA, 2014) was used to estimate intake through incidental ingestion of both soil and stream sediment. The variable of fraction ingested from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of 0.54 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate conservatively represents an upper percentile of 0.12 L/hr of child water ingestion while swimming, multiplied by a 4.5 hour exposure time for children under the age of 15 years swimming in freshwater. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for a child resident. Therefore, the surface water ingestion rate is conservative in nature. For the exposure frequency, it was conservatively assumed that children would visit Threemile Creek 72 times per year (2-3 times per week from April to September).

Future adult residents were assumed to weigh 80 kg (USEPA, 2014). Use of mean weight requires use of mean skin surface area. In evaluating intake through dermal absorption from soil, 6,032 cm^2 was used as the area of exposed skin, based upon the mean values for head, hands, forearms, and lower legs (USEPA, 2014). For stream sediment and surface water, 12,680 cm^2 was used as the skin surface area, based on the mean values for head, hands, forearms, lower legs, and feet (USEPA, 2011). For exposure to soil, the recommended default soil-to-skin adherence factor of 0.07 mg/cm^2 for adults was assumed (USEPA, 2014). A sediment-to-skin adherence factor was assumed to be 0.26 mg/cm^2, based upon the mean solid adherence to skin values for hands, arms, legs, and feet of adults clamming (USEPA, 2011).

The recommended default soil ingestion rate of 100 mg/day (USEPA, 2014) was used to estimate intake through incidental ingestion of both soil and sediment. The variable of fraction ingested from a contaminated source was conservatively assumed to be 1.0 (100%). A surface water ingestion rate of

0.249 L/day (USEPA, 2011) was used to estimate intake through ingestion of surface water. This surface water ingestion rate conservatively represents an upper percentile of 0.071 L/hr of adult water ingestion while swimming, multiplied by a 3.5 hour exposure time for adults swimming in freshwater. It should be noted that surface water ingestion rates are not available for wading, as this is the most likely exposure scenario for an adult resident. Therefore, the surface water ingestion rate is conservative in nature. For the exposure frequency, it was conservatively assumed that adults would visit Threemile Creek 72 times per year (2-3 times per week from April to September).

It was assumed that adults and children spend 350 days per year at home (USEPA, 2014). In accordance with procedures defined in RAGS, and adult exposure duration of 20 years and a childhood exposure duration of six years were assumed for separate noncancer risk calculations. An exposure duration of 26 years was used for combined cancer risk calculations. The cumulative 26-year exposure duration used for the cancer risk calculations assumes that a person resides at the site for a total of 26 years, six as a child and 20 as an adult.

6.4.4.2 Chemical Variables

6.4.4.2.1 Data Selection

Analytical laboratory data were evaluated for use in the quantitative risk assessment in accordance with the data evaluation procedures outlined in RAGS (USEPA, 1989) and USEPA's *Guidance on Data Useability in Risk Assessment* (USEPA, 1992b). As stated in RAGS and USEPA, 1992b, data qualified as rejected (R) were not used in this HHRA; a data point may have been rejected due to excessive exceedance of analytical holding times, high temperature or other inappropriate sample preservation, laboratory control sample (LCS) or surrogate (organic only) recovery failure, and calibration failures, among other factors. All analytical data for the COPCs were considered valid and were considered in the risk assessment. For duplicate sample results, the most appropriate data point for use in the risk assessment was identified using the following guidelines:

- If both analytical results were nondetect, then the lowest nondetect result was carried forward in the risk assessment.
- If both analytical results were detections, then the highest detected concentration was carried forward in the risk assessment.
- If the data group contained both detect and nondetect results, then the detect result was carried forward and used.

6.4.4.2.2 Exposure Concentrations

Current USEPA risk assessment guidance specifies that the RME for a receptor population be calculated using the 95% UCL of the arithmetic mean of chemical concentrations. 95% UCLs were calculated for the soil, stream sediment, and surface water data sets.

UCLs were calculated using USEPA's ProUCL software Version 5.1 (USEPA, 2016c). Nondetect chemical concentrations were entered into ProUCL, which uses a statistical analysis to incorporate those nondetects into the output. The program's statistical output for each compound in each data set is provided in Appendix P. It should be noted that some of the UCL calculations may result in 95% UCLs that are higher than the maximum detected concentration. In these instances, the maximum detected concentration was used (USEPA, 1992b). Tables 6-27 to 6-37 summarize the selection of exposure concentrations for soil, stream sediment, and surface water.

6.4.4.2.3 Dermal Absorption

Recommended absorption factors for dermal absorption of COPCs from soil were obtained from the most recent USEPA guidance (USEPA, 2004). An absorption factor of 0.13 was used for PAHs, based on benzo(a)pyrene. An absorption factor of 0.03 was used for 2,3,7,8-TCDD equivalent. Current guidance does not provide a default dermal absorption factor for inorganics; therefore, a dermal absorption value of zero was used for inorganic COPCs, with the exception of arsenic (0.03).

When evaluating dermal absorption of chemicals from surface water, chemical-specific absorbed doses were calculated using the equations on Tables 6-38 to 6-40 (USEPA, 2004).

6.4.4.2.4 Particulate Emission Factor

Daily wind dispersion can result in the generation of fugitive dust, which produces a potential chemical exposure for receptors. To evaluate exposure through inhalation of dust, a default particulate emission factor (PEF) value of 1.316E+09 cubic meters per kilogram (m^3/kg) (USEPA, 2002) was used.

6.4.4.2.5 Vapor Modeling and Estimated Concentrations

Modeling is commonly used to estimate chemical vapor concentrations in air, especially for future scenarios. There are a variety of vapor models available for use, requiring differing degrees of site-specific information. Vapor transport modeling from soil to outdoor air was conducted for all exposure scenarios.

Outdoor vapor concentrations from soil were estimated by applying chemical-specific volatilization factors (VFs) to the measured chemical concentrations in soil. VFs represent media transfer factors that account for the three steps of the vapor migration process. The equation for calculating the VF from soil to outdoor air was obtained from the EPA guidance on soil screening levels (USEPA, 2002) and combines an estimate of the chemical flux from soil with a simulation of contaminant dispersion in ambient air. The estimate of chemical flux from soil is based on a commonly used partitioning equation, and the simulation of contaminant dispersion in ambient air is represented by the inverse of the mean concentration at the center of a source (Q/C) term.

The chemical flux component of the equation reflects both soil characteristics and chemical-specific physical properties. Default data were used for the soil properties. The Q/C term reflects the results of air dispersion modeling conducted by USEPA using varying contaminant source sizes and meteorological conditions. The equations and variables for calculating the soil to outdoor air VFs are presented on Tables 6-41 to 6-49.

The calculated VF values were then combined with the measured concentrations in soil to estimate chemical concentrations in outdoor air. Tables 6-50 to 6-58 summarize the predicted concentrations in outdoor air from soil and show the concentration used in the risk assessment. The chemical concentrations used to model soil volatilization to outdoor air are presented on Tables 6-28 to 6-31.

6.5 Risk Characterization

To quantify the potential risk posed by exposure to chemicals through identified pathways, the intake of each chemical is combined mathematically with the appropriate toxicity value to estimate the likelihood of health risks. For noncancer risk or hazard, the intake is compared to the RfD or RfC. If the intake or the estimated chemical concentration in air does not exceed the reference value, no adverse effects would be expected. For cancer risk, the intake is multiplied by the slope factor or inhalation unit risk (IUR). The result is a theoretical statistical probability of a cancer effect.

The following two sections define the general risk characterization process for evaluating noncancer and cancer risks. Risk characterization for each potentially exposed population then follows.

6.5.1 Noncancer Risk

To characterize the risk of noncancer effects, toxicity values for COPCs are used in conjunction with intake estimates or estimated chemical concentrations in air developed from exposure scenarios to quantitatively estimate the potential for adverse health effects associated with a site. Chemical-specific intakes or chemical concentrations in air are compared to the RfD or RfC for the chemical. The comparison of intake or chemical concentration in air to RfDs or RfCs is expressed mathematically as a hazard quotient (HQ), which is the intake or chemical concentration in air divided by the reference value:

$$\text{HQ} = \text{Intake (mg/kg/day)/RfD (mg/kg/day) or Concentration in Air (mg/m}^3\text{)/RfC (mg/m}^3\text{)}$$

HQs for chemicals within the evaluated pathway are summed to give the pathway Hazard Index (HI). If multiple pathways are evaluated, pathway HIs are then summed for a total exposure HI. If the total HI is one or less, the site poses essentially no likelihood of causing adverse noncancer health effects within the described scenario. An HQ of 3 is generally considered a reasonable risk level for removal management levels (RMLs) for non-carcinogenic chemicals based on USEPA’s discussion of uncertainty (spanning perhaps an order of magnitude) in the RfDs and RfCs (USEPA, 2016c).

6.5.2 Cancer Risk

Cancer risk is expressed as a probability of a cancer effect as a result of a period of exposure to a given chemical at a site. This represents risk that is solely attributable to exposure from the site and in excess of the general background risk. The estimated intake or chemical concentration in air for each carcinogen is multiplied by the corresponding slope factor or IUR to calculate risk. The expression is:

$$\text{Risk=Intake (mg/kg/day) x Slope Factor (mg/kg/day)}^{-1} \text{ or Concentration in Air (mg/m}^3\text{) x IUR (mg/m}^3\text{)}^{-1}$$

For simultaneous exposure to several carcinogens, the calculated risks are summed within each pathway and then for all pathways to yield total cancer risk posed by a site. This risk is considered the “excess individual lifetime cancer risk,” the site-attributable risk in excess of that which would otherwise occur. Based on National Cancer Institute (NCI) statistics (NCI, 2015), background risk may be considered 0.41 (4.1×10^{-1} or 4.1E-01 in scientific notation), since approximately one in three people in the United States will develop some form of cancer during a lifetime.

Given the current assumption that any exposure to a carcinogen poses some risk, zero risk is not achievable in a practical sense. To be protective of human health, USEPA believes that exposure to site-related carcinogens should be limited so as to result in an individual, upper-bound, excess lifetime cancer risk level of one in 10,000 or less (Federal Register [FR], 1990). Ranges of risk have been developed for use as remediation goals. The risk range of one in 10,000 to one in a million is a commonly accepted remediation goal. In other words, an excess lifetime cancer risk greater than one in 10,000 would generally be considered unacceptably high (would require remedial action), while risks within the risk management range are not necessarily considered protective, but require site-specific risk management decisions to be made. Risks of one in a million or less are generally considered insignificant (do not require remedial action).

6.5.3 Risk Characterization

The following sections detail the results of both the noncancer and cancer risk calculations for each potentially exposed population.

6.5.3.1 Current/Future Upland Terrace Rail Worker Scenario

Table 6-59 shows intake, reference values, and HIs for the current/future upland terrace rail worker population. These HIs are presented below.

- Incidental ingestion of surface soil 4E-02
- Dermal contact with surface soil 5E-03
- Inhalation of fugitive dust 9E-05
- Inhalation of outdoor vapors 1E-04
- Incidental ingestion of stream sediment 4E-03
- Dermal contact with stream sediment 9E-04
- Incidental ingestion of surface water 1E-03
- Dermal contact with surface water 2E-02

The total HI for all pathways combined was 7E-02. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-60 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the current/future upland terrace rail worker population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 5E-06
- Dermal contact with surface soil 7E-07
- Inhalation of fugitive dust 3E-09
- Inhalation of outdoor vapors 9E-09
- Incidental ingestion of stream sediment 7E-07
- Dermal contact with stream sediment 1E-07
- Incidental ingestion of surface water 5E-08
- Dermal contact with surface water 4E-06

The total potential excess cancer risk for all pathways combined was 1E-05. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.2 Future Floodplain Slope Worker Scenario

Table 6-61 shows intake, reference values, and HIs for the future floodplain slope worker population. These HIs are presented below.

- Incidental ingestion of surface soil 3E-01
- Dermal contact with surface soil 1E-02
- Inhalation of fugitive dust 2E-04
- Inhalation of outdoor vapors 9E-04
- Incidental ingestion of stream sediment 4E-03
- Dermal contact with stream sediment 9E-04
- Incidental ingestion of surface water 2E-03
- Dermal contact with surface water 9E-02

The total HI for all pathways combined was 4E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-62 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the future floodplain slope worker population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 1E-05
- Dermal contact with surface soil 1E-06
- Inhalation of fugitive dust 6E-09
- Inhalation of outdoor vapors 5E-08
- Incidental ingestion of stream sediment 7E-07
- Dermal contact with stream sediment 1E-07
- Incidental ingestion of surface water 5E-08
- Dermal contact with surface water 4E-06

The total potential excess cancer risk for all pathways combined was 2E-05. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.3 Future Kansas River Floodplain Worker Scenario

Table 6-63 shows intake, reference values, and HIs for the future Kansas River floodplain worker population. These HIs are presented below.

- Incidental ingestion of surface soil 9E-02
- Dermal contact with surface soil 3E-03
- Inhalation of fugitive dust 6E-05
- Inhalation of outdoor vapors 2E-04
- Incidental ingestion of stream sediment 4E-03
- Dermal contact with stream sediment 9E-04
- Incidental ingestion of surface water 2E-03
- Dermal contact with surface water 9E-02

The total HI for all pathways combined was 2E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-64 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the future Kansas River floodplain worker population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 4E-06
- Dermal contact with surface soil 5E-07
- Inhalation of fugitive dust 2E-09
- Inhalation of outdoor vapors 1E-08
- Incidental ingestion of stream sediment 7E-07
- Dermal contact with stream sediment 1E-07
- Incidental ingestion of surface water 5E-08
- Dermal contact with surface water 4E-06

The total potential excess cancer risk for all pathways combined was 9E-06. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.4 Future Kansas River Floodplain Construction Worker Scenario

Table 6-65 shows intake, reference values, and HIs for the future Kansas River floodplain construction worker population. These HIs are presented below.

- Incidental ingestion of surface soil 3E-01
- Dermal contact with surface soil 8E-03
- Inhalation of fugitive dust 7E-05
- Inhalation of outdoor vapors 1E-03
- Incidental ingestion of stream sediment 2E-02
- Dermal contact with stream sediment 1E-03
- Incidental ingestion of surface water 1E-03
- Dermal contact with surface water 1E-01

The total HI for all pathways combined was 4E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-66 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the future Kansas River floodplain construction worker population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 2E-07
- Dermal contact with surface soil 2E-08
- Inhalation of fugitive dust 4E-11
- Inhalation of outdoor vapors 1E-09
- Incidental ingestion of stream sediment 5E-08
- Dermal contact with stream sediment 3E-09
- Incidental ingestion of surface water 1E-09
- Dermal contact with surface water 8E-08

The total potential excess cancer risk for all pathways combined was 4E-07. This is below the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.5 Current/Future Site-Wide Child Visitor Scenario

Table 6-67 shows intake, reference values, and HIs for the current/future site-wide child visitor population. These HIs are presented below.

- Incidental ingestion of surface soil 3E-01
- Dermal contact with surface soil 6E-03
- Inhalation of fugitive dust 1E-05

- Inhalation of outdoor vapors 1E-04
- Incidental ingestion of stream sediment 5E-02
- Dermal contact with stream sediment 6E-02
- Incidental ingestion of surface water 6E-03
- Dermal contact with surface water 1E-01

The total HI for all pathways combined was 5E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-68 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the current/future site-wide child visitor population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 3E-06
- Dermal contact with surface soil 2E-07
- Inhalation of fugitive dust 1E-10
- Inhalation of outdoor vapors 1E-09
- Incidental ingestion of stream sediment 2E-06
- Dermal contact with stream sediment 2E-06
- Incidental ingestion of surface water 6E-08
- Dermal contact with surface water 1E-06

The total potential excess cancer risk for all pathways combined was 9E-06. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.6 Current/Future Site-Wide Youth Visitor Scenario

Table 6-69 shows intake, reference values, and HIs for the current/future site-wide youth visitor population. These HIs are presented below.

- Incidental ingestion of surface soil 5E-02
- Dermal contact with surface soil 5E-03
- Inhalation of fugitive dust 6E-06
- Inhalation of outdoor vapors 5E-05
- Incidental ingestion of stream sediment 8E-03
- Dermal contact with stream sediment 5E-02

- Incidental ingestion of surface water 1E-03
- Dermal contact with surface water 1E-01

The total HI for all pathways combined was 2E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-70 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the current/future site-wide youth visitor population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 6E-07
- Dermal contact with surface soil 2E-07
- Inhalation of fugitive dust 4E-11
- Inhalation of outdoor vapors 6E-10
- Incidental ingestion of stream sediment 3E-07
- Dermal contact with stream sediment 2E-06
- Incidental ingestion of surface water 1E-08
- Dermal contact with surface water 1E-06

The total potential excess cancer risk for all pathways combined was 4E-06. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.7 Current/Future Site-Wide Adult Visitor Scenario

Table 6-71 shows intake, reference values, and HIs for the current/future site-wide adult visitor population. These HIs are presented below.

- Incidental ingestion of surface soil 3E-02
- Dermal contact with surface soil 1E-03
- Inhalation of fugitive dust 1E-05
- Inhalation of outdoor vapors 6E-05
- Incidental ingestion of stream sediment 4E-03
- Dermal contact with stream sediment 4E-03
- Incidental ingestion of surface water 9E-04
- Dermal contact with surface water 1E-01

The total HI for all pathways combined was 1E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

Table 6-72 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the current/future site-wide adult visitor population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 1E-06
- Dermal contact with surface soil 1E-07
- Inhalation of fugitive dust 3E-10
- Inhalation of outdoor vapors 3E-09
- Incidental ingestion of stream sediment 6E-07
- Dermal contact with stream sediment 6E-07
- Incidental ingestion of surface water 3E-08
- Dermal contact with surface water 4E-06

The total potential excess cancer risk for all pathways combined was 6E-06. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.8 Future Kansas River Floodplain Child Resident Scenario

Table 6-73 shows intake, reference values, and HIs for the future Kansas River floodplain child resident population. These HIs are presented below.

- Incidental ingestion of surface soil 1E+00
- Dermal contact with surface soil 3E-02
- Inhalation of fugitive dust 3E-04
- Inhalation of outdoor vapors 1E-03
- Incidental ingestion of stream sediment 6E-03
- Dermal contact with stream sediment 5E-03
- Incidental ingestion of surface water 9E-04
- Dermal contact with surface water 5E-02

The total HI for all pathways combined was 2E+00. This is greater than the USEPA level of concern for noncancer risk, which is a HI greater than one.

6.5.3.9 Future Kansas River Floodplain Adult Resident Scenario

Table 6-74 shows intake, reference values, and HIs for the future Kansas River floodplain adult resident population. These HIs are presented below.

- Incidental ingestion of surface soil 1E-01
- Dermal contact with surface soil 4E-03
- Inhalation of fugitive dust 3E-04
- Inhalation of outdoor vapors 1E-03
- Incidental ingestion of stream sediment 6E-03
- Dermal contact with stream sediment 5E-03
- Incidental ingestion of surface water 9E-04
- Dermal contact with surface water 5E-02

The total HI for all pathways combined was 2E-01. This is below the USEPA level of concern for noncancer risk, which is a HI greater than one.

6.5.3.10 Future Kansas River Floodplain Age-Adjusted Resident Scenario

Table 6-75 presents intake, slope factors/IURs, and the excess lifetime cancer risk associated with chemical exposure for the future Kansas River floodplain age-adjusted resident population. These pathway cancer risks are presented below.

- Incidental ingestion of surface soil 2E-05
- Dermal contact with surface soil 2E-06
- Inhalation of fugitive dust 9E-09
- Inhalation of outdoor vapors 1E-07
- Incidental ingestion of stream sediment 2E-05
- Dermal contact with stream sediment 1E-06
- Incidental ingestion of surface water 2E-07
- Dermal contact with surface water 8E-06

The total potential excess cancer risk for all pathways combined was 4E-05. This is within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range.

6.5.3.11 Risk from Exposure to Lead

USEPA has provided guidance on soil lead levels for residential land use (USEPA, 1994). This guidance recommends a screening level of 400 mg/kg for lead in residential soil, and 800 mg/kg for lead in industrial soil. A screening level that is protective of residents can reasonably be expected to be protective of commercial/industrial populations. Please note that, due to changes in recommendations from the Centers for Disease Control regarding blood-lead levels in children, the allowable lead levels in soil are expected to decrease in the future.

At the CFI Site, the highest detected concentration of lead in soil was 844 mg/kg (Sample CFI06-27, 0-0.5 ft), which is above both the residential and industrial screening levels. The following list presents the arithmetic average concentrations for lead in each area of the CFI Site, where lead was a COPC.

- Site-wide surface soil 78 mg/kg
- Floodplain slope surface soil 190 mg/kg
- Kansas River floodplain surface soil 50 mg/kg
- Kansas River floodplain subsurface soil 42 mg/kg
- Site-wide comprehensive soil 61 mg/kg
- Floodplain slope comprehensive soil 111 mg/kg
- Kansas River floodplain comprehensive soil 39 mg/kg

No exposure point concentrations of lead exceeded the residential screening level of 400 mg/kg.

6.6 Uncertainty and Variability

Preparation of a risk evaluation requires making a number of assumptions. These assumptions serve to introduce degrees of uncertainty and variability. Uncertainty arises from imperfect knowledge of the true value for a particular input, such as the current mean concentration of chemicals in soil. Variability is due to naturally occurring ranges in the values for inputs, such as employment duration or length of residency. Risk evaluations are also conservative in nature, typically resulting in an overestimation of potential risk rather than an underestimation. The following sections discuss some of the more important of these uncertainties.

6.6.1 Uncertainty Associated with Chemical Identification

At any site, it is possible that there are more individual chemical substances present than identified in the sampling and analysis effort. The selection of media to be sampled, number of samples, and analyses requested are determined by a review of the history of the site, information on current conditions, and an evaluation as to which chemicals could potentially be present. The analyses selected during the site investigation were identified based on knowledge of historical site practices. The use of such knowledge provides confidence that the related constituents present at the site have been identified. Available information was used in determining the location of historical sampling locations for inclusion in applicable data sets. Since these historical sampling locations were not surveyed, the exact location cannot be determined. However, the historical sampling locations relative to each of the three areas of the CFI Site (upland terrace, floodplain slope, and Kansas River floodplain) were determined based on a description in historical text and available figures.

The application of quality control throughout the sampling, analysis, and data validation phases reduced uncertainty in the results. Therefore, the chemical identification phase of the risk assessment does not appear to have introduced significant uncertainty.

6.6.2 Uncertainty from Toxicity Assessment

For some chemical substances there is little or no toxicity information available and for many chemicals, what is available is typically from animal studies. The relative strength of the available toxicological information generates some uncertainty in the evaluation of possible adverse health effects and the exposure level at which they may occur. To provide for a margin of error, USEPA applies conservative adjustments to the toxicity values.

For noncarcinogenic substances, RfD and RfC values are typically established only after uncertainty and/or modifying factors are applied. These factors may result in an RfD/RfC that is as little as a thousandth or less of the "safe" dose level determined through animal studies.

For carcinogens, the slope factor represents the 95% UCL of an extrapolated low dose response curve. The actual carcinogenic potency of a substance at low doses is almost certainly less. Additionally, many substances identified as carcinogens in high dose laboratory testing may not be carcinogenic at low doses and/or may not be carcinogenic to humans. Similarly, the carcinogenicity of some compounds may not follow a linear dose-response curve.

To quantify risk from chemicals that do not have toxicity numbers posted in IRIS, provisional numbers are used when available. These provisional numbers receive both internal and independent external peer review before the assessment is released. PPRTV assessments differ from IRIS assessments in that PPRTV assessments are not also subjected to the review of other agencies outside of the USEPA. Uncertainty is generated by the use of provisional numbers. However, this uncertainty is less than that generated by ignoring or qualitatively assessing risks. For chemicals with no provisional numbers, risk could not be quantified. In those cases, the risk from exposure to those chemicals is likely underestimated.

Numerical toxicity values for dermal exposures have not been developed by USEPA. To quantitatively assess risk from dermal exposure, USEPA guidance recommends adjusting oral RfDs and slope factors, usually presented as administered instead of absorbed doses, by chemical-specific gastrointestinal absorption factors to account for the differing dose calculation. Because of potential differences in patterns of distribution, metabolism, and excretion between the oral and dermal routes of exposure, use of adjusted oral toxicity values may over- or under-estimate risk, depending on the chemical.

The TEF approach used for both dioxins and PAHs operates under certain assumptions which attach varying degrees of uncertainty. These assumptions include:

- Individual compounds all act through the same biologic pathway
- Individual effects are dose-additive
- Dose-response curves are similarly shaped
- Individual compounds are similarly distributed throughout the body

TEFs are assumed to be equivalent for all effects, all exposure scenarios and all species, although this may not be the reality. Dose-additivity may not be applicable to all exposure scenarios, particularly those involving low doses. Interactions with other chemicals that may induce antagonistic effects are not considered and those may be species-specific. In terms of HHRAs, estimates of relative potency from animal studies are assumed to be predictive of toxicity in humans, although there are species-specific differences. Nevertheless, *In vivo* mixture studies have shown that TEF values predicted mixture toxicity within a factor of two or less. A probabilistic approach may provide an advantage in the determination of TEF because it will better describe the level of uncertainty present in a TEF value.

The use of TEF values to assess abiotic matrices such as soil, stream sediment, and water is problematic because TEF values are primarily calculated from oral intake studies.

It should also be noted that cancer risks from exposure to 2,3,7,8-TCDD equivalent are based on the California EPA values, as the USEPA has not yet completed its cancer assessment of dioxins.

6.6.3 Uncertainty from Exposure Assessment

When evaluating exposure, probable scenarios are developed to estimate conditions and duration of human contact with COPCs. Scenarios are based on observations or assumptions about the current or potential activities of human populations that could result in direct exposure. To prevent underestimation of risk, scenarios incorporate exposure levels, frequencies, and durations at or near the top end of the range of probable values. This is sometimes termed a reasonable maximum exposure, one that may be unlikely or at the high end of a range of exposures, but still possible.

Default values, such as ingestion rates, are used in the exposure calculations to quantify intakes. Although they are based on USEPA-validated data, there is uncertainty in the applicability of such values to any particular exposed population or individual. To compensate for this uncertainty, the default values are typically set to the upper end (usually the 90th or 95th percentile) of the normal range.

Uncertainty also arises from the treatment of nondetected concentrations in the risk assessment. The actual concentration of the contaminant could be anywhere between zero and the reporting limit. This may result in either an over- or underestimation of risk.

Models were used for exposure to chemicals through vapor inhalation for outdoor scenarios. Models are simplified representations of reality, which cannot effectively account for variations in subsurface conditions or the attenuation processes that will lead to a reduction in source concentrations over time. In addition, there may be errors in the vapor exposure pathway for PAHs and dioxins/furans, which strongly sorb to soil particles, thereby reducing their potential for volatility. This can be true in soils at depths up to 100 ft bgs.

All of these factors add uncertainty in the estimates of potential risk. However, due to the inherently conservative nature of risk assessments, the uncertainty is generally that risk has been overestimated, not underestimated.

6.7 Summary and Conclusions

The potential for human health risk from exposure to COPCs at the CFI Site was evaluated for soil, stream sediment, and surface water. Detected constituents in each medium that exceeded the screening process were retained as COPCs. Media evaluated in the HHRA were surface soil, subsurface soil, stream sediment, and surface water.

Land use at Camp Funston is related to the operations of an active Army installation. Camp Funston is used to support active military training, housing, and military operations which are expected to continue into the next century. According to the Fort Riley RPMP, the land use for the area where the CFI Site is located is currently classified as open space (Black & Veatch, 2007). Information regarding current and potential future land and water use was used to develop the exposure scenarios evaluated. Based on the current and potential future uses of the CFI Site, current/future upland terrace rail worker, future floodplain slope worker, future Kansas River floodplain worker, future Kansas River floodplain construction worker, current/future site-wide child visitor, current/future site-wide youth visitor, current/future site-wide adult visitor, future Kansas River floodplain child resident, and future Kansas River floodplain adult resident scenarios were evaluated.

All current/future site workers were assumed to be potentially exposed to COPCs in appropriate surface soil data sets through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain construction workers were assumed to be potentially exposed to COPCs in surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide child visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide youth visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide adult visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain child residents were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain adult residents were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact.

Table 6-76 summarizes the noncancer HIs and excess lifetime cancer risk values calculated for each of the potentially exposed populations evaluated in the HHRA. The HI for the future Kansas River floodplain child resident population (2E+00) exceeded the USEPA level of concern for noncancer risk, which is a HI greater than one. No other potentially exposed populations had HIs greater than one. The excess lifetime cancer risk values for the current/future upland terrace rail worker, future floodplain slope worker, future Kansas River floodplain worker, current/future site-wide child visitor, current/future site-wide youth visitor, current/future site-wide adult visitor, and future Kansas River floodplain age-adjusted resident were within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range. A 1E-06 cancer risk and/or HI of 1 is considered the point of departure by the USEPA.

Based on the noncancer and cancer risk levels calculated for the CFI Site, appropriate remedial alternatives and risk management options should be developed and evaluated in the FS.

* * * * *

7.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

7.1 Introduction

This SLERA for the CFI Site was conducted according to the USACE and USEPA guidance for ecological risk assessments (USACE, 1996; USEPA 1992c, 1997a, and 1998) and other USEPA supplemental guidance documents referenced throughout the text. The SLERA includes the first two steps in the Ecological Risk Assessment Guidance for Superfund (ERAGS) process and is meant as a rapid determination if a site poses no or negligible ecological risk and to identify which contaminants and exposure pathways require further evaluation. The object was to evaluate the preliminary chemicals of potential ecological concern (COPECs) and receptors in a manner that is unlikely to results in screening out chemicals or receptors prematurely. An ecological risk does not exist unless:

- The chemical, or stressor, has the inherent ability to cause one or more adverse effects, and
- It co-occurs with or contacts an ecological receptor for a sufficient time and intensity to elicit the identified adverse effect (USEPA, 1992c).

In order to assess the potential risk to ecological receptors the following steps are necessary:

- Identify the stressors;
- Determine the potential of the stressor to cause adverse effects;
- Determine the level at which the stressor is present in the environment; and
- Determine the availability of the stressor to ecological receptors.

This SLERA is organized into the following sections:

- 7.1 Introduction – The first section states the purpose and scope of the SLERA and explains the organization.
- 7.2 Ecological Site Characterization – This section provides a description of the ecology at the CFI Site. Threatened, endangered, and rare species in the area are identified, and ecological conditions that influence the presence or absence of ecological receptors are detailed.
- 7.3 Ecological Evaluation Process – This section describes the method for this quantitative screening and the process of refining the list of COPECs. The primary exposure pathways are identified.

- 7.4 Screening Level Problem Formulation – This section establishes the goals, scope and focus for the SLERA.
- 7.5 Potential Ecological Receptors – This section describes general probable ecological receptors used for the CFI Site and appropriate species for the screening evaluation are selected.
- 7.6 Exposure Pathways – This section identifies the primary exposure pathways of interest.
- 7.7 Bioaccumulation in Food – The potential for COPECs to be transferred through the environmental food chain to plant and wildlife receptors is evaluated in this section.
- 7.8 Risk Characterization – This section evaluates the likelihood of potential risk to ecological receptors.
- 7.9 Exposure Values – Factors affecting wildlife are discussed in the section.
- 7.10 Hazard Quotient Analysis – This section presents the calculated HQs for plant and wildlife receptors.
- 7.11 Predicted Future Conditions and Potential Risk – This section discusses the likelihood of future potential risk.
- 7.12 Uncertainties – This section of the evaluation explains the uncertainties inherent in the process.
- 7.13 Summary – This section provides a summary of the screening level ecological evaluation.

7.2 Ecological Site Characterization

The ecological site characterization is a description of the local ecology and environmental conditions of the potentially impacted areas at the CFI Site. A background search of references, including the April 30, 2010, Fort Riley, Kansas, *Integrated Natural Resources Management Plan* (INRMP); *Vegetation of the Fort Riley Military Reservation, Kansas* (Freeman and Delisle, 2004); *Vegetation Survey and Mapping of the Fort Riley Military Reservation, Kansas* (Delisle et al., 2012); topographical maps; NWI maps; and various other sources was conducted to provide preliminary information on the CFI Site's ecological communities. A field investigation was conducted on November 18, 2014 to confirm the preliminary information obtained in developing the ecological characterization. Data recorded during the field investigation included observed species, a description of the area ecology and habitat types present, and evidence of stress or any abnormal conditions observed among local flora and fauna.

Ecological line of evidence, such as absence of typically present species, dead or dying vegetation, or unusually high numbers of a less dominant species, are important to data interpretation and risk analysis and were evaluated at the CFI Site. The potential presence of sensitive receptors in the area, including threatened or endangered species, wetlands, streams, etc., were identified by reconnaissance conducted by biologists familiar with regional flora and fauna. Additionally, the United States Fish and Wildlife Service, Information, Planning, and Conservation System (IPaC) and the Kansas Department of Wildlife, Parks, and Tourism's lists of threatened and endangered species were also reviewed. According to the United States Fish and Wildlife Service and Kansas Department of Wildlife, Parks, and Tourism, 12 state or federal-protected species are known or likely to occur within Geary or Riley County (see Table 3-3 and Section 3.1.9). An additional 24 species are listed by the Kansas Department of Wildlife, Parks, and Tourism as species in need of conservation.

An ecological survey was conducted on November 18, 2014 at the CFI Site. No areas devoid of vegetation were observed at or in the vicinity of the CFI Site. Similarly, no areas consisting of stressed, dead, or dying vegetation, or patches of unusually high densities of a less dominant species were observed at or in the vicinity of the CFI Site. Although minimal wildlife was observed during the site visit, a list of the plants and wildlife observed at the CFI Site is provided in Section 3.1.9.

The CFI Site is located in Riley County, Kansas, along the county's southern edge with Geary County, Kansas. The CFI Site is also located along the eastern edge of Fort Riley. The CFI Site is approximately two acres in size and was historically used to incinerate garbage (see Section 3.0). Threemile Creek, a perennial stream, is the only aquatic feature present near the CFI Site. The vegetation communities at and in the vicinity of the CFI Site consisted mostly of mature floodplain forest with a riparian corridor along Threemile Creek and open grassy areas along Huebner Road/Williston Point Road and the UPRR railroad tracks. The plant and animal species composition of the CFI Site is composed of common species that are tolerant of human disturbances. No potential protected species habitat was observed during the November 18, 2014 site visit.

7.2.1 Vegetation

Woody vegetation at the CFI Site is present within the Kansas River floodplain forest southeast of the railroad tracks and narrow riparian zone along the Threemile Creek channel. The common woody species found within the forested areas of the site include American sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), elm (*Ulmus* spp.), bur oak (*Quercus macrocarpa*), and eastern cottonwood (*Populus deltoides*) with coralberry (*Symphoricarpos orbiculatus*), rough-leaved dogwood (*Cornus drummondii*), amur honeysuckle (*Lonicera maackii*), green brier (*Smilax bona-nox*), riverbank grape (*Vitis riparia*), and poison ivy (*Toxicodendron radicans*) in the understory. A berm is present along the south side of the railroad tracks. Grasses and forbs such as Johnsongrass (*Sorghum halepense*), bristlegrass (*Setaria* spp.), Canada goldenrod (*Solidago canadensis*), common mullein (*Verbascum thapsus*), and giant ragweed (*Ambrosia trifida*) are present along the top of the berm and the flat, open areas along Huebner Road/Williston Point Road and the UPRR tracks.

7.2.2 Terrestrial Wildlife

The lands surrounding the CFI Site consist of undeveloped wooded and grassy lands. Species observed at and in the vicinity of the site included American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Parus atricapillus*), and downy woodpecker (*Picoides pubescens*). Squirrel (*Sciurus* spp.) nests were present in the trees of the Kansas River floodplain forest in the vicinity of the CFI Site. Beaver (*Castor canadensis*) cuttings on the trunks of trees were present along Threemile Creek. Opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), and white-tailed deer (*Odocoileus virginianus*) tracks were present along the streams and within the Kansas River floodplain forest. Additional species that were not observed but likely occur at the site include eastern cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), voles (*Microtus* spp.), shrews, and field mice.

7.2.3 Aquatic Biota

Threemile Creek, which flows near the CFI Site, is the only aquatic feature within the CFI Site. The aquatic species observed within Threemile Creek include creek chub (*Semotilus atromaculatus*), central stoneroller (*Campostoma anomalum*), and orangethroat darter (*Etheostoma spectabile*). No aquatic plants, aquatic invertebrates, or benthic invertebrates were observed in Threemile Creek during the November 18, 2014 site visit; however, aquatic plans, aquatic invertebrates, and benthic invertebrates are likely present and would likely be observed during the spring and summer months.

7.3 Ecological Evaluation Process

The following sections summarize the screening method used for this ecological evaluation. In the evaluation process, COPECs; potentially exposed populations of wildlife, plants, and aquatic organisms; and potential pathways of exposure are identified. This assessment considers physical site features and surrounding land uses to determine the likelihood for exposure. Only completed exposure pathways (i.e., wildlife, plants, and aquatic organism receptors that come in contact with COPECs through contaminated media such as soils, stream sediments, and surface water) may actually pose an ecological risk.

7.3.1 Chemicals of Potential Ecological Concern

Ecological receptors, including plants and animals, are exposed to a variety of elements and chemicals throughout their lives. Additionally, the needs of an individual receptor may change seasonally as a reflection of its various life functions, such as during egg production or other reproductive activities, hibernation, or migration. While many substances are essential for the health, survival, and wellbeing of the individual receptor, other naturally-occurring and man-made substances may have no effect on the receptor, be beneficial, or have an adverse effect on the ability of the receptor to sustain itself. Chemicals that may elicit adverse effects to ecological receptors, are bioaccumulative, or have detection limits above the ecological screening level for that chemical are considered COPECs and are retained for further evaluation. COPECs were determined to be bioaccumulative if they were listed by the USEPA as a persistent, bioaccumulative, and toxic chemical (USEPA, 1998).

COPECs include those site-related chemicals that have the potential to impact ecological receptors. The first step in determining a COPEC was to review the analytical data collected for soil, stream sediments, and surface water samples and determine the potential exposure pathways for various species of wildlife, plant, and aquatic organism. In soils, surface water, and stream sediments, organic compounds and metals were considered to be COPECs if they are bioaccumulative or were detected, exceeded ecological screening levels, or had no available screening level (see Tables 7-1 through 7-6).

For this SLERA, the COPECs were identified primarily through a comparison to ecological-based screening levels. The primary source of screening levels was the USEPA Region 5 Ecological Screening Levels for water, stream sediment, and soil. Constituents with detections greater than screening levels were retained. Detections of constituents without screening levels were also retained. Constituents that were classified as non-detects were not retained. Bioaccumulative compounds were also retained even if they did not exceed screening levels. Constituents that were retained as COPECs were evaluated and compared to toxicological benchmarks.

7.3.1.1 Surface Soils (0-3 ft bgs)

Surface soil samples were collected at the CFI Site in January and November 2014. A total of 43 surface soil samples were collected between 0 and 0.5 ft bgs (see Table 7-2). Phase I surface soil samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Phase II surface soil samples were analyzed for SVOC (PAHs), TAL metals (23 elements) and dioxins/furans. A total of 113 historic surface soil samples were collected at the CFI Site in 2001, 2006, and 2010 (see Table 7-3). All historic surface soil samples were analyzed for metals. A total of 37 chemicals were detected in surface soils above applicable USEPA ecological screening levels for soils and retained as COPECs for the SLERA (see Table 7-3 and bulleted listed below). Except for aluminum, and manganese, the maximum metals concentrations detected in surface soils at the CFI Site were greater than the maximum metals concentrations detected in background surface soil samples. The maximum concentration detected for aluminum were the same between the CFI Site and background concentrations and the maximum manganese concentrations detected in background soils were greater the maximum concentrations detected in surface soils at the CFI Site. Please note that screening levels were calculated for the individual dioxins/furans congeners by applying the ecological TEFs to the screening levels for 2,3,7,8-TCDD as outlined in USEPA's July 2008 *Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (see Table 7-2).

- 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)
- 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)
- 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)
- 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)
- 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)
- 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)
- 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)
- 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)
- 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)
- 2,3,7,8-Tetrachlorodibenzofuran (TCDF)
- 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
- TPH-DRO
- Naphthalene
- Aluminum
- Antimony
- Arsenic

- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Zinc

One chemical was detected in surface soil samples and retained as COPECs and evaluated due to a lack of a chemical-specific ecological screening level.

- Dibenzofuran

The following constituents were detected in surface soil samples, did not exceed USEPA ecological screening levels for soils, but were retained as COPEC s and evaluated because they are bioaccumulative and could potentially result in a greater exposure risk to higher trophic level organisms in the environment.

- Acenaphthene
- Acenaphthylene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene

- Dibenzo(a,h)anthracene
- Fluoranthene
- Fluorene
- 2-Methylnaphthalene
- Phenanthrene
- Pyrene
- Methyl Mercury

7.3.1.2 Subsurface Soils (>3 ft bgs)

Subsurface soil samples were collected at the site in January and November 2014. A total of 68 subsurface soil samples were collected (see Table 7-4). Phase I subsurface soil samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Phase II subsurface soil samples were analyzed for SVOC (PAHs), TAL metals (23 elements) and dioxins/furans. A total of 36 chemicals were detected in subsurface soils above applicable USEPA ecological screening levels for soils and retained as COPECs for this SLERA (see Table 7-4 and bulleted list below). Please note that screening levels were calculated for the individual dioxins/furans congeners by applying the ecological TEFs to the screening levels for 2,3,7,8-TCDD as outlined in USEPA's July 2008 *Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (see Table 7-4).

- 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)
- 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)
- 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)
- 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)
- 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)
- 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)
- 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)

- 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)
- 2,3,7,8-Tetrachlorodibenzofuran (TCDF)
- 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
- TPH-DRO
- Naphthalene
- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Zinc

One SVOC was detected in subsurface soil samples, retained as a COPEC, and evaluated due to a lack of an applicable ecological screening level and/or is considered to be bioaccumulative.

- Dibenzofuran

The following constituents were detected in subsurface soil samples, did not exceed USEPA ecological screening levels for soils, but were retained as COPECs and evaluated because they are bioaccumulative and could potentially result in a greater exposure risk to higher trophic level organisms in the environment.

- Acenaphthene
- Acenaphthylene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene
- Dibenzo(a,h)anthracene
- Fluoranthene
- Fluorene
- 2-Methylnaphthalene
- Phenanthrene
- Pyrene
- Methyl Mercury

7.3.1.3 Stream Sediment

A total of four stream sediment samples were collected in January 2014. Stream sediment samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. A total of 7 chemicals were detected in stream sediments above applicable USEPA ecological screening levels for stream sediment and retained as COPECs for the SLERA (see Table 7-5 and bulleted list below). Please note that screening levels were calculated for the individual dioxins/furans congeners by applying the ecological TEFs to the screening levels for 2,3,7,8-TCDD as outlined in USEPA's July 2008 *Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (see Table 7-5).

- 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)
- 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)
- Barium
- Cadmium
- Manganese
- Methyl Mercury

An additional metal was detected in stream sediment samples, retained as a COPEC, and evaluated due to a lack of an applicable ecological screening level.

- Vanadium

The following constituents were detected in stream sediment samples, did not exceed USEPA ecological screening levels for stream sediments, but were retained as COPEC s and evaluated because they are bioaccumulative and could potentially result in a greater exposure risk to higher trophic level organisms in the environment.

- Arsenic
- Beryllium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Zinc

7.3.1.4 Surface Water

A total of 20 surface water samples were collected in 2014, 2015, and 2016. Phase I surface water samples were analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Phase III surface water samples were analyzed for SVOC (PAHs), TAL metals (23 elements) and dioxins/furans. A total of 17 chemicals were detected in surface water above applicable USEPA ecological screening levels for surface water and retained as COPECs for the SLERA (see Table 7-6 and bulleted list below). Please note that screening levels were calculated for the individual dioxin/furan congeners by applying the ecological TEFs to the screening levels for 2,3,7,8-TCDD as outlined in USEPA's July 2008 *Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (see Table 7-6).

- 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)
- 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)
- 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)
- 1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)

- 1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)
- 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)
- 1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)
- 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)
- 2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)
- 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)
- 2,3,7,8-Tetrachlorodibenzofuran (TCDF)
- Copper
- Mercury

Two SVOCs were detected in surface water samples, retained as a COPEC, and evaluated due to a lack of an applicable ecological screening level.

- Benzo(k)fluoranthene
- Chrysene

The following six constituents were detected in surface water samples, did not exceed USEPA ecological screening levels for surface water, but were retained as COPECs and evaluated because they are bioaccumulative and could potentially result in a greater exposure risk to higher trophic level organisms in the environment.

- Benzo(a)pyrene
- Pyrene
- Arsenic
- Methyl Mercury
- Nickel
- Zinc

7.3.1.5 Groundwater

The water table at the CFI Site occurs at a depth of 30 ft to 32 ft bgs within the upland terrace and 13 to 17 ft bgs within the Kansas River floodplain. Based on the depth to groundwater at the CFI Site, it was determined that there is not a completed pathway between groundwater and potential ecological receptors that may occur at the CFI Site.

7.4 Screening Level Problem Formulation

The preliminary problem formulation process is conducted to guide the SLERA process. Problem formulation establishes the goals, scope, and focus of the SLERA. The purpose of conducting this SLERA is to determine if the COPEC concentrations in soils, stream sediment, and surface water at the CFI Site and within Threemile Creek are adversely affecting terrestrial and aquatic receptor populations that occur in the vicinity of the CFI Site and come in direct contact with soil, stream sediment, surface water, or consume soil invertebrates, benthic and aquatic invertebrates, terrestrial and aquatic plants, and small mammals from the site.

7.4.1 Selection of Assessment Endpoints

Assessment and measurement endpoints were selected to evaluate receptors for which complete exposure pathways exist (Ecological CSM, Figure 7-1; Table 7-7). The fate, transport, and toxicological properties of the COPECs, including the potential for COPECs to bioaccumulate, were also considered during the selection process. Assessment endpoints are site-specific, depend on the habitats present, and focus the SLERA on what could most likely be adversely affected by the COPECs at the site. The primary assessment endpoint for this SLERA is the continued survival, growth, and reproduction of selected receptor species at and in the vicinity of the CFI Site. The measurement endpoints selected are measurable biological responses of the selected receptor species' exposure to the COPECs that can be used to make inferences about the assessment endpoint, which typically cannot be directly measured.

7.4.2 Selected Ecological Receptors

An ecological CSM was developed based on the overall setting and specific site characteristics of CFI Site and Threemile Creek observed during the November 18, 2014 site visit (see Figure 7-1).

The ecological receptors that were evaluated quantitatively for the CFI Site included soil invertebrates (earthworms), terrestrial plants, terrestrial insectivores (short-tailed shrew), terrestrial herbivores (white-footed mouse, cottontail rabbit, and white-tailed deer), terrestrial omnivores (meadow vole and American robin), and terrestrial carnivores (red fox and red-tailed hawk). Based on the results of the site visit, it was assumed that soil invertebrates, terrestrial plants, and burrowing mammals (short-tailed shrew, white-footed mouse, cottontail rabbit, meadow vole, and red fox) could come in direct contact with the surface soils at the CFI Site. It was also assumed that some terrestrial plants such as trees and some grass species are capable of growing deep roots and could come into direct contact with subsurface soils if the soil conditions are right. However, soil invertebrates and burrowing mammals, which typically don't burrow below 3 feet bgs, would not come in direct contact with subsurface soils (soils > 3 feet bgs).

The ecological receptors that were evaluated quantitatively for Threemile Creek at the CFI Site included benthic invertebrates, aquatic invertebrates, aquatic plants, fish, and the raccoon. Although no benthic invertebrates, aquatic invertebrates, or aquatic plants were observed within the Threemile Creek during the November 18, 2014, site visit, it was assumed that these species are likely present during warmer seasons. It was also assumed that the raccoon, which was selected to represent piscivore and benthic invertivores that may occur in the vicinity of the CFI Site, consumed only fish and benthic invertebrates that were present within Threemile Creek. It was also assumed the raccoon did not come into direct contact with surface soils or subsurface soils at the CFI Site.

7.4.3 Measurement Endpoints

Measurement endpoints for soil invertebrates (earthworms) and terrestrial plants were determined by comparing COPEC concentrations in surface soils at the CFI Site with reported soil screening values for earthworms and terrestrial plants. Measurement endpoints for fish, aquatic plants, and benthic and aquatic invertebrates were determined by comparing COPEC concentrations in stream sediment and surface water from Threemile Creek adjacent to the CFI Site with reported stream sediment and surface water screening values for fish, aquatic plants, and benthic and aquatic invertebrates. Measurement endpoints for terrestrial mammal and avian receptor species were determined by modeled dietary intakes using COPEC concentrations in CFI Site soils, stream sediment, and surface water and comparing those results with NOAEL- and LOAEL-based ingestion screening values for each specific receptor species.

7.4.4 Screening Level Exposure Assessment

The screening level exposure assessment estimates exposure point concentrations for chemicals to which ecological receptors may be exposed. For this SLERA, the exposure point concentrations were the maximum detected concentrations in surface soil, subsurface soil (vegetation species only), stream sediment, and surface water. For bioaccumulative chemicals in these media, the maximum detected concentrations were used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors. Various aspects of the receptor species' diets and life histories are provided in Tables 7-8 through 7-10.

7.4.5 Screening Level Effects Assessment

The effects assessment establishes chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. One set of screening values was developed for each selected assessment endpoint.

7.4.6 Media-Specific Screening Values

Based on the ecological CSM, direct exposure to surface soil, subsurface soil (vegetation species only), stream sediment, and surface water are potentially complete pathways for selected ecological receptors. Screening values were established for surface soil, stream sediment, and surface water. Medium-specific screening values for taxonomic groupings (soil, benthic, and aquatic invertebrates and terrestrial and aquatic plants) were used to evaluate the measurement and assessment endpoints assessed in this SLERA.

7.5 Potential Ecological Receptors

For this ecological evaluation, potential ecological receptors (terrestrial and aquatic wildlife, terrestrial and aquatic plants, and soil and benthic organisms) were selected based on species observed while conducting the field investigation, habitats available at the CFI Site, and best professional judgment of what species are likely present in the area.

7.5.1 Vegetation

As stated in Section 3.1.9, the CFI Site consists of open grassy areas and floodplain forest. Woody vegetation was present along Threemile Creek. The plant species observed at the CFI Site during the November 18, 2014 site visit are common plant species to open fields, riparian habitats, and floodplain forests in northeastern Kansas and consistent with the species and communities presented in the Fort Riley INRMP, *Vegetation of the Fort Riley Military Reservation, Kansas* (Freeman and Delisile, 2004), and *Vegetation Survey and Mapping of the Fort Riley Military Reservation, Kansas* (Delisle et al., 2012). Some of the species at the CFI Site likely have extensive root systems that contact surface and subsurface soils; therefore, it was assumed that the plant species at the CFI Site are likely to be exposed to COPECs in both surface soils (soils between 0 and 3 ft bgs) and subsurface soils (soils greater than 3 ft bgs).

7.5.2 Terrestrial Species

American robin, American crow, black-capped chickadee, and downy woodpecker were observed during the November 18, 2014 site visit. Additionally, the tracks of opossum, red fox, and white-tailed deer were also observed at the CFI Site. Additional species that were not observed but likely occur at the CFI Site include eastern cottontail rabbit, striped skunk, voles, shrews, and field mice. These species are likely to be exposed to surface soils (soils between 0 and 3 ft bgs), surface water contaminants, soil invertebrates, or vegetation that may have accumulated contaminants from soils at CFI Site. Similarly, the raccoon, a terrestrial mammal species, could potentially be exposed to contaminants in surface water, stream sediments, fish, and benthic invertebrates that may have accumulated contaminants. It was assumed that none of the animals come into contact with subsurface soils (soils greater than 3 ft bgs) while feeding or burrowing through the soil.

The short-tailed shrew, white-footed mouse, meadow vole (close relative and surrogate for the prairie vole), eastern cottontail rabbit, red fox, white-tailed deer, American robin, and red-tailed hawk were selected as the representative terrestrial wildlife species that occur or are likely to occur at the CFI Site. Various aspects of these species' life histories and relative sensitivity to contaminants have been estimated, measured, and quantified in previous USEPA documents and were used to evaluate potential risk. The chosen species represent several different sizes of animals (see Table 7-8) and feeding guilds (see Table 7-9). These species represent insectivorous (short-tailed shrew), herbivorous (white-footed mouse, eastern cottontail rabbit, and white-tailed deer), omnivorous (meadow vole, and American robin), and carnivorous (red fox and red-tailed hawk) animals that were observed at or are likely to occur at the CFI Site (Note, body mass listed in the tables is expressed as wet weight). Some of these species or evidence for some of these species were observed at the CFI Site and have toxicological benchmarks for many of the COPECs listed in Section 7.3.1.

Various aspects of the receptor species' diets are provided in Table 7-9. The diet of the omnivorous meadow vole was assumed to be composed of 50% soil invertebrates (earthworms) and 50% vegetation. The diet of the American robin was assumed to be composed of 80% soil invertebrates (earthworms) and 20% vegetation. The diet of the raccoon was assumed to be composed of equal parts of benthic invertebrates and fish. The insectivorous short-tailed shrew's diet was assumed to be composed of 100% soil invertebrates (earthworms). The herbivorous white-footed mouse, eastern cottontail rabbit, and white-tailed deer were assumed to be 100% vegetation from the CFI Site.

Based on available food, their means of travel, and their relatively large size, it is likely that the red fox, raccoon, white-tailed deer, and red-tailed hawk spend only a fraction of their time in the vicinity of the CFI Site. These animals have large home ranges and the CFI Site constitutes only a fraction of these animals' reported total home ranges (see Table 7-10). However, this SLERA assumes that the potential for risk is determined by the amount of time that the species is present in the vicinity of a COPEC. Since the red fox, raccoon, white-tailed deer, and red-tailed hawk are likely to spend equal amounts of time in the different regions of their home range, it was assumed that the amount of contaminant that these animals are exposed to is dependent on what fraction that the CFI Site makes up in their home range. It was also assumed that the red fox, raccoon, white-tailed deer, and red-tailed hawk consumed prey or vegetation that occur within their respective home ranges, which include both the CFI Site and areas outside of the CFI Site.

7.5.3 Aquatic Species

Three common fish species were observed within Threemile Creek adjacent to the CFI Site. No aquatic plants, aquatic invertebrates, or benthic invertebrates were observed in Threemile Creek during the November 18, 2014 site visit; however, it is assumed that aquatic vegetation, aquatic invertebrates, and benthic invertebrates would be present during the spring and summer seasons.

Fish, aquatic plants, and aquatic and benthic invertebrates were assumed to inhabit Threemile Creek adjacent to the CFI Site throughout the year and are likely to be exposed to contaminants within the surface water and stream sediments. As stated previously, the raccoon, which consumes surface water, stream sediment, benthic invertebrates, and fish is also likely to be exposed to contaminants associated with Threemile Creek adjacent to the CFI Site.

For the purposes of this evaluation, aquatic and benthic invertebrates, fish, and aquatic plants were selected as the representative aquatic species that likely occur at the CFI Site. Various aspects of these species' life histories and relative sensitivity to contaminants have been estimated, measured, and quantified in previous USEPA documents and were used to evaluate potential risk. This SLERA assumes that the potential for risk is determined by the amount of time that the species is present in the vicinity of a COPEC.

7.6 Exposure Pathways

Surface soils, subsurface soils, surface water, and stream sediment may provide a contact point for ecological receptors. Surface soils, subsurface soils, and surface water were evaluated as potential exposure media for terrestrial receptors. Surface water and stream sediments were evaluated as potential exposure media for aquatic species. Groundwater was not analyzed in this ecological evaluation because it was assumed that, due to the depth, the wildlife and plants at the CFI Site would not come in contact with the groundwater. Figure 7-1 displays a graphical representation of the ecological CSM.

The primary completed exposure pathways (i.e., pathways for those contaminants that can reach ecological receptors) for the contaminated media and the potentially exposed ecological receptors include direct and accidental ingestion of contaminants through feeding. Soil invertebrates, burrowing animals, insectivorous animals, and herbivores may be exposed to contaminants in the surface soils due to ingesting soils, whether intentionally or accidentally; however, it was assumed that none of the terrestrial wildlife species came in contact with subsurface soils (soils greater than 3 ft bgs) while feeding or burrowing through the soil. It was assumed that the plant species at the CFI Site are likely to be exposed to contaminants in both surface soils (soils between 0 and 3 ft bgs) and subsurface soils (soils greater than 3 ft bgs). Plants and soil invertebrates may also accumulate soil contaminants and subsequently be consumed by insectivorous, herbivorous, and omnivorous species. Predatory animals may consume smaller animals that have consumed contaminated soils or plants and other smaller animals that have accumulated contaminants.

Aquatic species (aquatic plants, fish, and aquatic and benthic invertebrates) may be exposed to contaminants in the surface water and stream sediments by ingesting contaminants in the water and stream sediment, whether intentionally or accidentally. These contaminates may affect higher trophic levels in the food-chain when consumed by predators, such as the raccoon. Lastly, surface water may also be a potential source of exposure. Potential CFI Site contaminants may be ingested by animals while drinking water from Threemile Creek. Similarly, fish and benthic invertebrates, may accumulate contaminants in surface water and stream sediments and subsequently be consumed by the raccoon.

Exposure pathways for many species may not be completed for a particular medium due to life history characteristics or available habitat. The following discussion provides a description of the types of ecological receptors potentially exposed to each medium along with wildlife species-specific characteristics that are used later in the COPEC screening process.

7.6.1 Soils

Soil organisms, including microorganisms and earthworms, may be directly exposed to impacted soil and ash/cinder deposits. Plants may be exposed by the uptake through root systems. Acute and chronic toxicity effects to plants and soil organisms can be evaluated directly or indirectly through a qualitative assessment. Ecological evidence such as areas devoid of vegetation, notable overpopulation of a particular species, and/or accumulation of detritus, are symptoms of toxicity to plants and/or soil organisms.

Potential risk to wildlife ecological receptors from contaminants in soil and ash/cinder deposits was assessed using analytical data for samples collected from surface soil. The CFI Site, which consists of previously disturbed grassy areas and riparian and floodplain forest habitats, contains cover, grazing, and browsing opportunities for small and larger animal species. Plant species at the CFI Site are likely to be exposed to contaminants in surface soils, subsurface soils, and ash/cinder deposits. Terrestrial wildlife receptor species could be exposed to soils as they graze, browse, and burrow in the surface soils of the CFI Site. Thus, the soil exposure pathway for wildlife species was assumed to be limited to the maximum detected chemicals in surface soils within the CFI Site, which occur in ash/cinder deposits.

The maximum detected concentration for each COPEC in soil was used in this evaluation. This is the most conservative approach because it assumes that the highest concentration for each COPEC will be encountered. It was assumed that the burrowing terrestrial receptors such as short-tailed shrew, white-footed mice, voles, eastern cottontail rabbit, and red foxes are not occupying dens or burrows more than 3 ft bgs. Similarly, it was assumed that earthworms would not occur deeper than 3 ft bgs. Therefore, the terrestrial wildlife species are not contacting subsurface soils at the CFI Site.

7.6.2 Stream Sediment

Benthic invertebrate receptor species are assumed to be contacting COPECs in stream sediment from Threemile Creek adjacent to the CFI Site. The maximum concentrations detected in stream sediments at the CFI Site were used for evaluating the risk to the benthic invertebrate receptor species. This method of using the maximum concentrations detected in stream sediments for evaluating stream sediment exposure by representative benthic invertebrate receptor species is conservative in that it assumes the receptor will be exposed to the highest detected concentration of each COPEC.

7.6.3 Surface Water

Based on the presence of fish in Threemile Creek, aquatic invertebrates, and aquatic plants are assumed to be contacting COPECs in surface water. All the terrestrial wildlife receptor species, including the short-tailed shrew, white-footed mouse, meadow vole, eastern cottontail rabbit, red fox, raccoon, white-tailed deer, American robin, and red-tailed hawk, are assumed to be ingesting water from Threemile Creek adjacent to the CFI Site. The maximum concentrations of COPECs detected in surface water at the CFI Site were used for evaluating the risk to terrestrial wildlife. This method of using the maximum concentrations detected in surface water for evaluating surface water exposure by representative terrestrial wildlife species is conservative in that it assumes the receptor is spending all of its time within the vicinity and/or is habitually drinking from the location along Threemile Creek that contains the highest detected concentration of each COPEC. However, it is unlikely that an individual animal will consistently ingest the maximum chemical concentrations. The representative terrestrial wildlife species that drink from Threemile Creek are likely to also use other perennial water sources within their home range. Other representative wildlife species, such as shrews, mice, voles, and rabbits, may actually get most their water from the plants and animals that they ingest, rather than from ponds or surface water sources.

7.7 Bioaccumulation in Food

The potential for COPECs to be transferred from soil to plants, soil to soil invertebrates (earthworm), stream sediments to benthic invertebrates, and surface water to fish, aquatic plants, and aquatic invertebrates by uptake was evaluated in this SLERA. It was assumed that the terrestrial insectivorous, herbivorous, and omnivorous species consume vegetation and/or earthworms that have been exposed and accumulated COPECs by root uptake (plants) or by direct ingestion of soils (earthworms). Similarly, the terrestrial carnivores were assumed to consume the small mammals (shrew, white-footed mouse, vole, and eastern cottontail rabbit) that inhabit the CFI Site. These small mammals consume soils, surface water, soil organisms (earthworms), and vegetation that may contain concentrations of COPECs.

It was also assumed that the raccoon only consumes fish and benthic invertebrates that have been exposed and accumulated COPECs by absorption or by direct ingestion of surface water and stream sediments. The fish are assumed to consume stream sediments, surface water, and aquatic and benthic invertebrates that may contain concentrations of COPECs.

7.8 Risk Characterization

Risk characterization assesses the likelihood of adverse ecological effects associated with exposure to site contamination. The risk characterization combines the quantitative evaluation with the qualitative assessment to conclude if significant risk to ecological receptors exists (USEPA, 1997b). After ecological receptors were identified, receptors with available toxicity data or benchmarks were selected. A benchmark value is a known concentration of a substance that elicits known effects ranging from no effect to death for the ecological receptor under study. Some benchmarks for the COPECs were not available for fish, avian, mammal, plant, or invertebrate receptor species. Benchmarks for the individual dioxins/furans congeners were calculated by applying the ecological TEFs to the screening levels for 2,3,7,8-TCDD as outlined in USEPA's July 2008 *Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment*.

The process to characterizing risk was based on a multi-step process outlined below.

Step 1: COPECs were identified primarily through a comparison of exposure point concentrations (i.e., maximum detected concentrations in surface soil, subsurface soil, stream sediment, and surface water) to ecological-based screening levels (Tables 7-2 through 7-6). Constituents with detections greater than ecological screening levels, detected constituents without ecological screening levels, and bioaccumulative compounds were also retained.

Step 2: Using the maximum detected concentrations, the COPECs identified during the first step were evaluated using the HQ method. HQs were calculated by dividing the chemical concentration in the medium being evaluated (surface soil, subsurface soil, stream sediment, and surface water) by the corresponding medium-specific benchmark screening value for each lower trophic level receptor species – soil invertebrates, benthic invertebrates, aquatic invertebrates, aquatic plants, terrestrial plants, and fish (Tables 7-11 through 7-17). Mammals and avian benchmarks for COPECs are presented in Table 7-18.

Step 3: Using the maximum detected concentrations, food web exposures were calculated for each of the COPECs identified during the first step (Tables 7-19 through 7-27). HQs were calculated by dividing the resulting chemical exposure concentrations from the food web calculations by the corresponding NOAEL benchmark screening value for each upper trophic level receptor species – short-tailed shrew, white-footed mouse, meadow vole, eastern cottontail rabbit, red fox, raccoon, white-tailed deer, American robin, and red-tailed hawk (Table 7-28). HQs based on the NOAEL evaluation method that exceeded 1.0 were recalculated using the corresponding LOAEL benchmark screening value for each upper trophic level receptor species. HQs greater than or equal to 1.0 do not necessarily indicate that risks are present or impacts are occurring. COPECs with an HQ greater than 1.0 indicates that a chemical-pathway-receptor combinations may require further evaluation. HQs that are less than 1.0 indicate that risk is very unlikely.

Step 4: Using the calculated 95% UCL concentrations for surface soil, subsurface soil, stream sediment, and surface water, the COPECs with HQs greater than 1.0 from Steps 2 were evaluated using the HQ method. HQs were calculated by dividing the chemical concentration in the medium being evaluated (surface soil, subsurface soil, stream sediment, and surface water) by the corresponding medium-specific benchmark screening value for each lower trophic level receptor species – soil invertebrates, benthic invertebrates, aquatic invertebrates, aquatic plants, terrestrial plants, and fish (Tables 7-29 through 7-35).

Step 5: Using the calculated 95% UCL concentrations for surface soil, subsurface soil, stream sediment, and surface water, food web exposures were calculated for each of the COPECs with HQs greater than 1.0 in Step 3 (Tables 7-36 through 7-44). HQs were calculated by dividing the resulting chemical exposure concentrations from the food web calculations by the corresponding NOAEL benchmark screening value for each upper trophic level receptor species – short-tailed shrew, white-footed mouse, meadow vole, eastern cottontail rabbit, red fox, raccoon, and American robin (Table 7-45). HQs based on the NOAEL evaluation method that exceeded 1.0 were recalculated using the corresponding LOAEL benchmark screening value for each upper trophic level receptor species.

The UCLs were calculated using USEPA's ProUCL software Version 5.1 (USEPA, 2016c). Nondetect chemical concentrations were entered into ProUCL, which uses a statistical analysis to incorporate those nondetects into the output. The program's statistical output for each compound in each data set is provided in Appendix Q.

7.8.1 Soil Invertebrate Evaluation Method

The availability of benchmarks for the COPECs for soil invertebrates (earthworms) was limited. All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected in the surface soils at the CFI Site was divided by the available benchmarks for earthworms (USEPA ECOTOX Database [http://cfpub.epa.gov/ecotox/], USEPA, 2016e and Efroymson et al., 1997a) to yield the HQ (see Tables 7-11). As indicated on Table 7-11, there were no published lowest observable effects concentrations for dibenzofuran, calcium, magnesium, potassium, sodium, and thallium. Calcium, magnesium, potassium, and sodium are nutrients.

7.8.2 Benthic Invertebrate Evaluation Method

The availability of benchmarks for the COPECs for benthic invertebrates was limited. Threshold effect concentration benchmarks for freshwater stream sediment for each COPEC were used to evaluate the potential risk to benthic invertebrates (Jones et. al., 1997). All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected for each COPEC in the stream sediments at the CFI Site was divided by the threshold effect concentration benchmark to yield the HQ (see Table 7-12). As indicated on Table 7-12, there was not a published threshold effect concentration benchmark for beryllium, calcium, magnesium, potassium, sodium, and vanadium. Calcium, magnesium, potassium, and sodium are nutrients.

7.8.3 Terrestrial Plant Evaluation Method

The most important factor affecting terrestrial plant exposure to contamination is substance solubility and the plant's ability to uptake substances through its root system. All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected for each COPEC in the surface and subsurface soils at the CFI Site was divided by the available published benchmarks (USEPA ECOTOX Database [http://cfpub.epa.gov/ecotox/] USEPA, 2016e and Efroymson et al., 1997b) to yield the HQ (see Tables 7-13 and 7-14). As indicated on Tables 7-13 and 7-14, there was not a published lowest observable effects concentration for dioxins/furans, TPH-DRO, dibenzofuran, calcium, iron, magnesium, potassium, and sodium. Calcium, iron, magnesium, potassium, and sodium are nutrients.

7.8.4 Aquatic Plant Evaluation Method

The most important factor affecting aquatic plant exposure to contamination is substance solubility because only the amount of a substance that is soluble is available to plants. This is referred to as plant bioavailability. All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected for each COPEC in the surface water of Threemile Creek adjacent to the CFI Site was divided by the available published lowest chronic value for aquatic plants (USEPA ECOTOX Database [http://cfpub.epa.gov/ecotox/] USEPA, 2016e and Suter and Tsao, 1996 [ES/ER/TM-96/R2]) to yield the HQ (see Table 7-15). As indicated on Table 7-15, there was not a published lowest chronic value for dioxins/furans, and TPH-DRO.

7.8.5 Aquatic Invertebrate Evaluation Method

The availability of benchmarks for the COPECs for aquatic invertebrates was limited. All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected for each COPEC in the surface water of the perennial stream (Threemile Creek) adjacent to the CFI Site was divided by the available published lowest chronic value benchmarks for daphnids (USEPA ECOTOX Database [http://cfpub.epa.gov/ecotox/] USEPA, 2016e and Suter and Tsao, 1996 [ES/ER/TM-96/R2]) to yield the HQ (see Table 7-16). As indicated on Table 7-16, there was not a published lowest chronic value for TPH-DRO.

7.8.6 Fish Evaluation Method

The availability of benchmarks for the COPECs for fish was limited. All chemicals detected were assumed to be 100% bioavailable. Therefore, the maximum concentration detected for each COPEC in the surface water of Threemile Creek adjacent to the CFI Site was divided by the available published lowest chronic value benchmarks for fish (Suter and Tsao, 1996 [ES/ER/TM-96/R2]) to yield the HQ (see Table 7-17). As indicated on Table 7-17, there was not a published lowest chronic value for TPH-DRO.

7.8.7 Wildlife Benchmark Evaluation Method

Based on the available habitat at the CFI Site, wildlife receptors potentially present were identified and compared to a list of species for which benchmarks have been established. Terrestrial receptors selected as representative species included the short-tailed shrew, white-footed mouse, meadow vole (close relative and surrogate for the prairie vole), eastern cottontail rabbit, red fox, raccoon, white-tailed deer, American robin, and red-tailed hawk. Benchmarks for these receptors were obtained from the Oak Ridge National Laboratories' (ORNL) *Toxicological Benchmarks for Wildlife: 1996 Revision* (ORNL, 1996) and the USEPA ECOTOX Database (http://cfpub.epa.gov/ecotox/) (USEPA, 2016e). Information regarding the benchmarks used is provided in Table 7-18. Natural history characteristics (see Tables 7-8, 7-9, and 7-10) used to calculate exposure were obtained from the *Wildlife Exposure Factors Handbook Vol. I & II* (USEPA, 1993), *Preliminary Remediation Goals for Ecological Endpoints* (Efroymson et. al., 1997c), *Toxicological Benchmarks for Wildlife: 1996 Revision* (ORNL, 1996), and The *Mammals of Kansas* (Timm et. al., 2016).

The wildlife screening used the most conservative benchmarks expressed as the NOAEL. The NOAEL is the highest level of a stressor evaluated in a toxicity test or biological field survey that causes no difference in effect compared with the controls or reference site (USEPA, 1997b). All contaminant exposure levels were initially assumed to equal the maximum detected concentrations and conservative assumptions were used in determining the initial exposure parameters. Exposure parameters are those physical factors that might influence receptor exposure. All contaminants exceeding the preliminary screening (see Tables 7-1 through 7-6) were considered COPECs and retained for the site-specific wildlife evaluations.

7.8.8 Estimation of Intake

For this SLERA, the primary routes of exposure for terrestrial and aquatic wildlife are through ingestion of food (either plant or animal), surface water, and soil and/or stream sediment (either ingested incidentally while foraging or purposefully to meet nutrient needs). The preliminary ingestion dose for a given route of exposure (food, water, soil, or stream sediment) was calculated by multiplying the food, water, soil, or stream sediment ingestion rate and the maximum detected concentration in the respective medium (see Tables 7-19 through 7-26). Rates of food, water, and soil ingestion for the receptor species were taken from available literature (see Table 7-8). The total exposure experienced by a wildlife species is represented by the sum of the exposures from each individual source and may be represented by the following equation from ORNL (1996):

$E_{total} = E_{food} + E_{water} + E_{soil}$

E_{total} = exposure from all sources

E_{food} = exposure from food consumption

E_{water} = exposure from water consumption

E_{soil} = exposure through consumption of soil or stream sediment (either incidental or deliberate)

The total exposure experienced by each representative wildlife species is provided in Table 7-27. The exposure from all sources was divided by the weight normalized NOAEL to get the HQ (see Table 7-28). The body mass estimates for wildlife species were taken from available literature (see Table 7-9). An HQ greater than 1 indicates that the exposure to the contaminant has the potential to cause adverse effects in the organism. For the wildlife receptors, the NOAEL was expressed in mg/kg/day. NOAEL benchmarks were not available for many of the SVOCs as well as cobalt and silver. Additionally, NOAEL benchmarks were not available for the nutrients: calcium, iron, magnesium, potassium, and sodium.

7.9 Exposure Values

Factors affecting wildlife exposure may include home range size; the amount of time a given species spends in a given area; chemical bioavailability; and food, water, soil, and stream sediment ingestion rates. Assumptions were made regarding receptor species with home ranges larger than the CFI Site. The red fox, raccoon, white-tailed deer, and red-tailed hawk were assumed to only spend a fraction of their time foraging within the CFI Site. Smaller receptor species with home range areas less than the total area of the CFI Site (short-tailed shrew, white-footed mouse, meadow vole, eastern cottontail rabbit, and American robin) were assumed to spend 100 percent of their time within the CFI Site. Smaller receptor species such as fish, benthic and aquatic invertebrates, soil invertebrates, and sessile receptor species such as terrestrial and aquatic plants were assumed to also spend their entire lives within the CFI Site.

The contaminants at the CFI Site were identified in soil, surface water, and stream sediments, and it was assumed that the ingestion route was completed by ingesting soil, surface water, stream sediments, and plants and animals that may have accumulated chemical contaminants from the soils, surface water, and stream sediments. Although it was assumed that not all representative species ingested soil or stream sediments, it was assumed that each species ingested surface water from the CFI Site. It was also assumed that all of the chemical ingested by the representative wildlife species was absorbed into the organism's tissue (100% bioavailability for each chemical detected at the CFI Site).

Chemical concentrations that exceeded benchmarks were detected in soils, stream sediments, and surface water. Although no visible adverse ecological effects to terrestrial and aquatic receptors were observed during field investigations conducted by a BMcD biologist, the quantitative assessment, discussed below, indicates that the plant and wildlife communities within the CFI Site may be experiencing some adverse effects due to the detected contaminants.

7.9.1 Soil to Soil Organism Bioconcentration

The concentration of constituents in soil organisms (earthworms) was used to determine the exposure from consumption of earthworms by insectivorous and omnivorous receptor species, such as the short-tailed shrew, meadow vole, and American robin. In the case of the omnivores (vole and American robin) it was assumed that a portion of their exposure came from consuming earthworms and a portion came from consuming vegetation or another food source. The soil to soil organism uptake of COPECs was estimated using soil-to-soil organism bioconcentration factors (BCFs). Reported BCFs for soil organisms (USEPA, 1999) for each of the COPECs were used to calculate the estimated concentration of each COPEC in earthworms. BCFs provide an estimate of the uptake of compounds from a medium, such as soil, to applicable receptor food items, such as soil organisms and, specifically, earthworms. Where an appropriate BCF was not available, a regression equation based on the compound's log K_{ow} value was used to calculate the recommended BCF value (USEPA, 1999). The estimated concentrations of site-specific chemicals in soil invertebrates to which insectivorous and omnivorous wildlife are exposed are provided in Table 7-22.

7.9.2 Soil to Plant Bioconcentration

The concentration of site-specific chemicals in plants was used to determine the exposure from consumption of vegetation by herbivorous and omnivorous receptor species, such as the white-footed mouse, meadow vole, eastern cottontail rabbit, raccoon, white-tailed deer, and American robin. In the case of the omnivores (vole and American robin) it was assumed that a portion of their exposure came from consuming vegetation and a portion came from consuming earthworms or another food source. The soil-to-plant uptake of COPECs was estimated using soil-to-plant BCFs. Reported BCFs for plants (USEPA, 1999) for each of the COPECs were used to calculate the estimated concentration of each COPEC in vegetation. BCFs provide an estimate of the uptake of compounds from a medium, such as soil, to applicable receptor food items, such as plants. Where an appropriate BCF was not available, a regression equation based on the compound's log K_{ow} value was used to calculate the recommended BCF value (USEPA, 1999). The estimated concentrations of site-specific chemicals in vegetation that herbivorous wildlife is exposed to are provided in Table 7-23.

7.9.3 Sediment to Benthic Invertebrates Bioconcentration

The concentration of site-specific constituents in benthic invertebrates was used to determine the exposure that the raccoon received from consuming benthic invertebrates. It was assumed that one-half of the raccoon's exposure came from consuming benthic invertebrates, and one-half came from consuming fish. The sediment-to-benthic invertebrate uptake of COPECs was estimated using sediment-to-benthic invertebrate BCFs. Reported BCFs for benthic invertebrates (USEPA, 1999) for each of the COPECs were used to calculate the estimated concentration of each COPEC in benthic invertebrates. BCFs provide an estimate of the uptake of compounds from a medium, such as stream sediments, to applicable receptor food items, such as benthic invertebrates. The estimated concentrations of site-specific chemicals in benthic invertebrates to which raccoons are exposed are provided in Table 7-24.

7.9.4 Surface Water to Fish Bioconcentration

The concentration of site-specific constituents in fish was used to determine the exposure that the raccoon received from consuming fish. It was assumed that one-half of the raccoon's exposure came from consuming fish, and one-half came from consuming other sources of food. The surface water-to-fish uptake of COPECs was estimated using surface water-to-fish BCFs. Reported BCFs for fish (USEPA, 1999) for each of the COPECs were used to calculate the estimated concentration of each COPEC in fish. BCFs provide an estimate of the uptake of compounds from a medium, such as surface water, to applicable receptor food items, such as fish. Where an appropriate BCF was not available, a regression equation based on the compound's log K_{ow} value was used to calculate the recommended BCF value (USEPA, 1999). The estimated concentrations of site-specific chemicals in fish to which raccoons are exposed are provided in Table 7-25.

7.9.5 Prey to Predator Biotransfer

The exposure of prey species to site-specific chemicals was used to determine the exposure for predatory receptor species, such as the red fox and red-tailed hawk, from consumption of small mammals like the short-tailed shrew, white-footed mouse, meadow vole, and eastern cottontail rabbit. Specifically, the total intake for predatory receptor species was based on the product of the predatory food intake rate and the calculated chemical dose estimates for the short-tailed shrew, white-footed mouse, meadow vole, and eastern cottontail rabbit averaged across all four species.

The terrestrial predator's chemical intake, the average dose received for each of the four small mammal prey species based on ingestion of small mammal prey, is calculated in Table 7-26. Each predator (red fox and red-tailed hawk) was assumed to consume an equal amount, by weight, of the small mammals (shrew, white-footed mouse, vole, and eastern cottontail rabbit) that inhabit the CFI Site and that the chemicals were 100% bio-available through trophic levels of the food-web. This was estimated to be the total exposure from small mammal prey consumption for the red fox and red-tailed hawk.

7.9.6 Home Range

The size of the receptor species home range is also factored into the receptor species total exposure from all sources. For example, the approximate two-acre CFI Site represents a fraction of total area within the home ranges of the red fox, raccoon, white-tailed deer, and red-tailed hawk (see Table 7-10). This SLERA, the potential for risk is determined by the amount of time that each species is present in the vicinity of a COPEC. Since the red fox, raccoon, white-tailed deer, and red-tailed hawk are likely to spend equal amounts of time in the different regions of their home range, it was assumed that the amount of risk that these animals are exposed to is proportional to what fraction that the CFI Site makes up in their home range. This represents the fraction of the time that these species will spend within the CFI Site. The total dose received by each receptor species, based on the fraction of the species home range within the CFI Site, is provided in Table 7-28.

7.10 Screening Level Risk Characterization and Hazard Quotient Analysis

The information generated during the problem formulation, exposure assessment, and effects assessment was used to estimate potential risks to ecological receptors for the risk characterization of this SLERA. As stated in Section 7.8, a multi-step process was used for the risk calculations. The COPECs for this SLERA were determined using a HQ analysis for each of the steps. HQs that equal or exceed 1.0 indicate that there is a potential for risk because the chemical concentration or dose (exposure) equals or exceeds the screening value (effect) for that chemical and species and the chemical-pathway-receptor combination requires further evaluation. Chemicals with an HQ greater than 1.0 indicates that a chemical-pathway-receptor combinations may require further evaluation. HQs that are less than 1.0 indicate that risk is very unlikely.

Tables 7-11 through 7-17, and 7-28 provide the calculated HQs based on available benchmarks, for the plants and wildlife receptors at the CFI Site using the maximum concentrations detected in soil, surface water, and stream sediment. Tables 7-29 through 7-35, and 7-45 provide the calculated HQs based on the available benchmarks, for the plants and wildlife receptors at the CFI Site using the calculated 95% UCL for concentrations detected in soil, surface water, and stream sediment for the COPECs determined using the maximum concentrations in step one.

A total of 13 chemicals (TPH-DRO, acenaphthylene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, cobalt, iron, and silver) were not evaluated quantitatively for the short-tailed shrew, white-footed mouse, meadow vole, eastern cottontail rabbit, red fox, raccoon, and white-tailed deer due to a lack of toxicity data. A total of 24 chemicals (TPH-DRO, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, dimethyl phthalate, fluoranthene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, antimony, beryllium, cobalt, iron, silver, and thallium) were not evaluated quantitatively for the American robin and red-tailed hawk. Screening values for aluminum and iron are based on pH, with no toxicity expected at a relatively neutral pH. No surface soil pH data were collected for this project. Typical of the soils in the Great Plains, the soils in the vicinity of the CFI Site occur over limestone bedrock and formed from limestone and alluvium parent material. These soils were assumed to be basic; thus, the potential risk for exposure to aluminum and iron was calculated for the receptors at the CFI Site.

The following sections summarize HQs and identify the largest potential contributors to overall risk experienced by a given species. This constitutes the ecological risk characterization for the CFI Site.

7.10.1 Soil Invertebrates

The results of the soil invertebrate evaluation based on maximum detections in surface soils, presented in Table 7-11, indicates that there may be a potential for risk from exposure to TPH-DRO, naphthalene, aluminum, arsenic, chromium, copper, iron, lead, manganese, mercury, vanadium, and zinc for soil invertebrates at the CFI Site. The results of the soil invertebrate evaluation based on calculated 95% UCL detections in surface soils, presented in Table 7-29, indicates that there may be a potential for risk from exposure to naphthalene, aluminum, chromium, iron, manganese, mercury, vanadium, and zinc for soil invertebrates at the CFI Site. All other chemicals evaluated in the surface soils resulted in HQs less than 1. Toxicity data, lowest observable effects concentration benchmarks, were not available for dibenzofuran and thallium, which were not evaluated quantitatively. Benthic Invertebrates

The results of the benthic invertebrate evaluation based on maximum detections in stream sediments presented in Table 7-12 and 95% UCL detections in stream sediments presented in Table 7-30 indicates that there may be a potential for risk from exposure to barium, cadmium, and methyl mercury for the benthic invertebrates within Threemile Creek near the CFI Site. All other chemicals evaluated resulted in HQs less than 1. Toxicity data were not available for beryllium, and vanadium, which were not evaluated quantitatively.

7.10.2 Terrestrial Plants

The results of the terrestrial plant evaluation based on maximum detections in surface soils, presented in Table 7-13 indicate that there may be potential for risk from exposure to naphthalene, aluminum, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, vanadium, and zinc for the terrestrial plants at the CFI Site. The results of the terrestrial plant evaluation based on the 95% UCL for detections in surface soils, presented in Table 7-31 indicate that there may be potential for risk from exposure to aluminum, arsenic, chromium, copper, lead, mercury, nickel, vanadium, and zinc for the terrestrial plants at the CFI Site.

The results of the terrestrial plant evaluation based on maximum detections in subsurface soils, presented in Table 7-14 indicate that the terrestrial plants at the CFI Site potentially experienced risk from exposure to naphthalene, aluminum, arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, thallium, vanadium, and zinc in subsurface soils. The results of the terrestrial plant evaluation based on the 95% UCL for detections in subsurface soils, presented in Table 7-32 indicate that the terrestrial plants at the CFI Site potentially experienced risk from exposure to aluminum, arsenic, chromium, lead, vanadium, and zinc in subsurface soils. All other chemicals evaluated in the surface and subsurface soils resulted in HQs less than 1. Toxicity data were not available for dioxins/furans, TPH-DRO, dibenzofuran and iron, which were not evaluated quantitatively.

7.10.3 Aquatic Plants

The results of the aquatic plant evaluation based on maximum detections in surface water, presented in Table 7-15 indicate that there may be a potential for risk from exposure to copper and zinc for the aquatic plants in Threemile Creek near the CFI Site. The results of the aquatic plant evaluation based on maximum detections in surface water, presented in Table 7-33 indicate that there may be a potential for risk from exposure to copper for the aquatic plants in Threemile Creek near the CFI Site. All other chemicals evaluated resulted in HQs less than 1. Toxicity data were available for all the COPECs detected in surface water except dioxins/furans, and TPH-DRO, which were not evaluated quantitatively. Aquatic Invertebrates

The results of the aquatic invertebrate evaluation based on maximum detections in surface water, presented in Table 7-16, and the 95% UCL for detections in surface water, presented in Table 7-34, indicate that there may be a potential for risk from exposure to barium and copper for the aquatic invertebrates in Threemile Creek near the CFI Site. All other chemicals evaluated resulted in HQs less than 1. Toxicity data were available for all the COPECs detected in surface water except TPH-DRO, which was not evaluated quantitatively.

7.10.4 Fish

The results of the fish evaluation based on maximum detections in surface water, presented in Table 7-17 indicate that there may be a potential for risk from exposure to barium and zinc for fish in Threemile Creek adjacent to the CFI Site. The results of the fish evaluation based on the 95% UCL for detections in surface water, presented in Table 7-35 indicate that there may be a potential for risk from exposure to barium for fish in Threemile Creek adjacent to the CFI Site. All other chemicals detected in surface water that were evaluated resulted in HQs less than 1. Toxicity data were available for all the COPECs detected in surface water except TPG-DRO, which was not evaluated quantitatively.

7.10.5 Short-tailed Shrew

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF), aluminum, antimony, arsenic, barium, cadmium, lead, selenium, thallium, vanadium, and zinc for the short-tailed shrew at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-28). Additionally, the food web calculations for the short-tailed shrew for aluminum, arsenic, barium, thallium and vanadium also exceeded LOAEL–based screening values. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the short-tailed shrew based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to aluminum, arsenic, barium, thallium, and vanadium for the short-tailed shrew at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-45). Additionally, the food web calculations for the short-tailed shrew for aluminum, arsenic, barium, and vanadium also exceeded LOAEL–based screening values.

7.10.6 White-footed Mouse

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to aluminum, arsenic, barium, and vanadium for the white-footed mouse at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-28). Additionally, the food web calculations for the white-footed mouse for aluminum also exceeded LOAEL–based screening values. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the white-footed mouse based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to aluminum and vanadium for the white-footed mouse at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-45). Additionally, the food web calculations for the white-footed mouse for aluminum also exceeded LOAEL–based screening values.

7.10.7 Meadow Vole

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to aluminum, arsenic, barium, thallium, and vanadium for the meadow vole at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-28). Additionally, the food web calculations for the meadow vole for aluminum also exceeded LOAEL–based screening values. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the meadow vole based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to aluminum, arsenic, and vanadium for the meadow vole at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-45). Additionally, the food web calculations for the meadow vole for aluminum also exceeded LOAEL–based screening values..

7.10.8 Eastern Cottontail Rabbit

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to aluminum, antimony, arsenic, barium, cadmium, copper, lead, thallium, and vanadium for the eastern cottontail rabbit at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-28). Additionally, the food web calculations for the eastern cottontail rabbit for aluminum, arsenic, barium, copper, and vanadium also exceeded LOAEL–based screening values. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the eastern cottontail rabbit based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to aluminum, arsenic, barium, thallium, and vanadium for the eastern cottontail rabbit at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-45). Additionally, the food web calculations for the eastern cottontail rabbit for aluminum, barium, and vanadium also exceeded LOAEL–based screening values.

7.10.9 Red Fox

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to aluminum because this chemical exceeded the NOAEL–based screening value for the red fox at the CFI Site (see Table 7-28). No chemicals exceeded LOAEL–based screening values based on the evaluation using maximum detection limits. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the red fox based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to aluminum for the red fox at the CFI Site because this chemical exceeded the NOAEL–based screening value (see Table 7-45). No chemicals exceeded LOAEL–based screening values based on the evaluation using 95% UCL detection limits.

7.10.10 Raccoon

Based on maximum detections in surface water, stream sediment, and food web calculations, there may be a potential for risk from exposure to aluminum because this chemical exceeded the NOAEL–based screening value for the raccoon at the CFI Site (see Table 7-28). No chemicals exceeded LOAEL–based screening values based on the evaluation using maximum detection limits. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the raccoon based on calculated 95% UCL detections in surface water, stream sediment, and food web calculations indicates that there may be a potential for risk from exposure to aluminum for the raccoon at the CFI Site because this chemical exceeded the NOAEL–based screening value (see Table 7-45). No chemicals exceeded LOAEL–based screening values based on the evaluation using 95% UCL detection limits.

7.10.11 White-tailed Deer

Based on maximum detections in surface soil, surface water, and food web calculations, there may not be a potential for risk from exposure for the white-tailed deer at the CFI Site. All chemicals evaluated had HQs less than 1 (see Table 7-28).

7.10.12 American Robin

Based on maximum detections in surface soil, surface water, and food web calculations, there may be a potential for risk from exposure to 2,3,4,7,8-pentachlorodibenzofuran (PeCDF), fluorene, aluminum, arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, vanadium, and zinc because these chemicals exceeded the NOAEL–based screening value for the American robin at the CFI Site (see Table 7-28). Additionally, the food web calculations for the American robin for aluminum, arsenic, barium, lead, mercury, and zinc also exceeded LOAEL–based screening values. All other chemicals evaluated had HQs less than 1.

The results of the evaluation for the American robin based on calculated 95% UCL detections in surface soil, surface water, and food web calculations indicates that there may be a potential for risk from exposure to fluorene, aluminum, barium, cadmium, chromium, lead, vanadium, and zinc for the American robin at the CFI Site because these chemicals exceeded NOAEL–based screening values (see Table 7-45). Additionally, the food web calculations for the American robin for aluminum, barium, lead, and zinc also exceeded LOAEL–based screening values.

7.10.13 Red-tailed Hawk

Based on maximum detections in surface soil, surface water, and food web calculations, there may not be a potential for risk from exposure for the red-tailed hawk at the CFI Site. All chemicals evaluated had HQs less than 1 (see Table 7-28).

7.11 Predicted Future Conditions and Potential Risk

Currently, the CFI Site consists of a grassy open area adjacent to road and railroad corridors and a floodplain forest. The current development in the vicinity of the CFI Site makes it unlikely to attract new populations of rare or protected species. Wildlife species that are tolerant of humans and disturbances will remain in the area and continue to use the CFI Site. It was assumed that, regardless of the future of the CFI Site, the existing representative aquatic and wildlife species would continue to occupy the CFI Site and continue to come into contact with COPECs through various daily activities.

7.12 Uncertainties

When evaluating the ecological risks, several inherent uncertainties exist. These uncertainties pertain to all aspects of the risk analysis. To evaluate the potential ecological risk, several assumptions must be made. Uncertainties associated with this ecological evaluation are presented in the following assumptions.

- The samples collected adequately cover all areas of concern and accurately represent what is occurring at the CFI Site.
- All ecological receptors, including plants and wildlife, are present at the CFI Site.
- All chemicals are identified.
- Reported chemical concentrations are accurate.
- Chemicals identified are 100% biologically available, co-located, and do not interact in a synergistic manner.
- Relevant exposure pathways have been identified.
- Species are consistently exposed to the maximum concentrations of COPECs at the CFI Site.
- Species exposure values under laboratory conditions are applicable to natural conditions.
- Wildlife exposure values are applicable to species of similar size and life history.
- Ingestion rates for representative species are accurate.

- The sizes of home ranges for representative species are comparable to what occurs in the field.
- Uptake modeling, including the use of bioconcentration factors, is representative of actual events that occur in the field
- Wildlife benchmark calculations using ecological TEFs are representative of actual events that occur in the field.
- The CFI Site is inhabited by the plant and wildlife receptor species for at least some portion of their lives and that use is a reflection of the percentage of the species range composed by the area.
- Groundwater was not part of a completed pathway and animals that inhabit the CFI Site would not be exposed to site-related constituents through direct contact and/or ingestion of groundwater.
- Percentage of soil, surface water, stream sediment, and food ingested by ecological receptors is related to the percentage of time receptors spend within the CFI Site.

These uncertainties may combine to over-estimate risks for some compounds, but may potentially underestimate risk for others. This risk characterization relies on many assumptions to calculate risk. While the current data consists of surface soil samples, subsurface soil samples, surface water samples, and stream sediment samples, no biological (plant or animal) tissue samples were collected or analyzed.

An additional source of uncertainty results from the wildlife toxicity benchmarks, which are often extrapolated from laboratory or domesticated species rather than the receptor species of concern. For example, the use of NOAEL-based benchmarks developed for captive ringed doves, Japanese pheasants, rats, mice, or chickens may not reflect actual effects on short-tailed shrews, white-footed mice, meadow voles, eastern cottontail rabbits, red fox, raccoons, white-tailed deer, American robins, and red-tailed hawks. As can be seen from Table 7-28, a significant proportion of the COPECs were lacking wildlife benchmarks and could not be evaluated.

The uncertainties associated with the NOAEL-based benchmarks and HQs are not necessarily reflective of chemical mixtures. Chemical speciation is normally assumed to be in the most toxic form, increasing the chance for overestimation of adverse effects. Although an additive approach of HQs was assumed for this SLERA, there is very limited information on the toxicity of simultaneous exposure to mixtures of contaminants.

Lastly, this SLERA does not take into account any exposure of the receptor species to contaminants that might occur adjacent to the CFI Site. Wide-ranging receptor species, such as red fox, raccoons, white-tailed deer, and red-tailed hawks, may be visiting other contaminated areas. Species may roam on and off the CFI Site, home range boundaries may change over time, and seasonal migrations occur. These exposure scenarios are also not taken into account in this SLERA.

7.13 Summary

The CFI Site was evaluated both qualitatively and quantitatively to assess risk to ecological receptors. An ecological survey was conducted on November 18, 2014 at the CFI Site to identify any wildlife or potential habitat affected by site-related constituents. The entire CFI Site was evaluated for the presence of completed ecological exposure pathways. Based on the site visit, it was concluded that flora and fauna could be exposed to site-related constituents through direct contact and/or ingestion of soil, surface water, and stream sediments and that area fauna could be exposed through the bioaccumulation of site-related constituents in benthic invertebrates, aquatic and terrestrial invertebrates, aquatic and terrestrial plants, small mammal prey, and fish.

The results of the qualitative assessment of the CFI Site concluded that no significant effects were observed during the November 14, 2014, site visit. The CFI Site and adjacent areas were occupied by a variety of common plant and animal species tolerant of human disturbances. Fish were observed in Threemile Creek adjacent to the CFI Site. No areas devoid of vegetation were observed at or in the vicinity of the CFI Site. Similarly, no areas consisting of stressed, dead, or dying vegetation, or patches of unusually high densities of a less dominant species were observed at or in the vicinity of the CFI Site.

Based on the results of the quantitative evaluations, terrestrial plants may be experiencing more risk from surface soils than from subsurface soils (see Table 7-29). Aquatic plants also may be experiencing less risk than terrestrial plants. Among invertebrates, aquatic invertebrates may be experiencing less risk than benthic invertebrates. The terrestrial invertebrates (earthworms) experienced more risk than the benthic invertebrates and aquatic invertebrates. The quantitative evaluations also indicate that fish may be experiencing less risk than terrestrial wildlife exposed to CFI Site soils.

The toxicological responses of mammal and bird species would be potentially more severe than those of plants and invertebrates; therefore, it is difficult to compare and contrast the amount of potential risk that the plants, invertebrates, mammals, and birds are exposed to. Based on the results of the quantitative evaluations to assess risk to terrestrial wildlife, ecological receptors exposed to soils and ash/cinder deposits and consuming soil invertebrates that may be affected by ash/cinder deposits from the CFI Site (e.g., short-tailed shrew, American robin) experienced the most potential risk. Among the small mammals, ecological receptors that are exposed to soils and ash/cinder deposits and consume plants (e.g., white-footed mouse, meadow vole, and eastern cottontail rabbit) experienced less potential risk than ecological receptors exposed to soils and ash/cinder deposits and consuming soil invertebrates. Ecological receptor species with large home ranges (e.g., white-tailed deer, red fox, and red-tailed hawk) experienced the least amount of potential risk. The raccoon, which consumed fish, benthic invertebrates, surface water, and stream sediment, experienced less potential risk than burrowing terrestrial mammal species exposed to soils and ash/cinder deposits. Additionally, six chemicals (aluminum, arsenic, barium, lead, vanadium, and zinc) were determined to pose potential ecological risk to representative wildlife species.

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8.0 SUMMARY AND CONCLUSIONS

8.1 Summary

8.1.1 Nature and Extent of Contamination

Surface and subsurface soil, stream sediment, surface water, and groundwater samples were collected from the CFI Site during Phase I RI field activities and analyzed for TAL metals (23 elements), BTEX, TPH-GRO, TPH-DRO, MeHg, SVOCs (phenols and PAHs), and dioxins/furans. Surface and subsurface soil, surface water, and groundwater samples were collected from the CFI Site during Phase II and Phase III RI field activities and analyzed for TAL metals (23 elements), PAHs, and dioxins/furans. The analytical results from the samples collected during the RI were compared to their appropriate screening levels. Nature and extent of contaminants and the media affected at the CFI Site can be summarized by the following statements:

- BTEX – There were no exceedances of BTEX compounds in any of the media sampled during the RI.
- TPH-DRO – There were no exceedances of TPH-GRO in any of the media sampled during the RI.
- TPH-GRO – There were no exceedances of TPH-DRO in any of the media sampled during the RI.
- SVOCs (phenols and PAHs)
    - Surface Soil – PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Exceedances of benzo(a)pyrene were present in all three depositional environments. Exceedances of benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were present on the floodplain slope.
    - Subsurface Soil – PAHs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above their respective screening levels. Exceedances of benzo(a)pyrene were present on the upland terrace and floodplain slope. Benzo(a)anthracene exceedances were present on the floodplain slope and Kansas River floodplain in samples containing ash material. Dibenzo(a,h)anthracene exceedances occurred on both the upland terrace and floodplain slope.
    - Stream Sediment – There were no exceedances of SVOC in stream sediment during the RI.
    - Surface Water – PAHs, benzo(a)pyrene, benzo(k)fluoranthene, and chrysene were detected above their respective screening levels. These exceedances were detected at one surface water sample point during five surface water sampling events.

  - Groundwater – There were no SVOC exceedances in groundwater samples collected from direct-push borings during Phase I or Phase II. Additionally, there were no SVOC exceedances in groundwater samples collected from the monitoring wells during the four sampling events.

- Metals

  - Surface Soil – Arsenic, iron, and thallium were the metals detected above their respective screening levels during the RI. Arsenic, lead and mercury also exceeded screening levels in historical surface soil samples. Arsenic exceedances were ubiquitous throughout the investigation area with the highest detections present in samples containing soil/ash or ash material on the upland terrace and the floodplain slope. Iron exceedances were present in samples collected on the floodplain slope containing soil/ash or ash material. Thallium exceedances located on the floodplain slope were in samples containing soil/ash or ash material. One exceedance of thallium was present in the drainage swale on the Kansas River floodplain. Historical lead and mercury detections were located on the floodplain slope.
  - Subsurface Soil – Arsenic, iron, and thallium were the metals detected above their respective screening levels during the RI. Arsenic also exceeded its screening levels in historical subsurface soil samples. Arsenic exceedances were ubiquitous throughout the investigation area with the highest detections present on in samples containing ash material on the floodplain slope and Kansas River floodplain. Iron exceedances were present in samples collected on the floodplain slope and Kansas River floodplain containing ash material. Thallium exceedances were present in samples collected on the floodplain slope containing ash material.
  - Stream Sediment – Arsenic was the only metal that was detected in excess of its screening level. Arsenic exceedances were ubiquitous in stream sediment throughout the Threemile Creek stream bed.
  - Surface Water – There were no exceedances of metals in surface water samples from Threemile Creek during the RI.
  - Groundwater – Cobalt and manganese were the metals detected above their respective screening levels. Two of the three cobalt exceedances were located in direct-push groundwater samples collected on the toe of the floodplain slope, with the other cobalt exceedance being located down gradient on the Kansas River Floodplain. Manganese exceedances were located in the two furthest down gradient direct-push groundwater samples. There were no metals exceedances in groundwater samples collected from the monitoring wells during the four quarterly sampling events.

- MeHg – There were no exceedances of MeHg in any of the media sampled during the RI.

- Dioxins/Furans

  - Surface Soil – There were three samples with an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level. Dioxins/furans exceedances were located on the upland terrace (one sample) and the floodplain slope (two samples). There were no dioxins/furans exceedances on the Kansas River floodplain.
  - Subsurface Soil – There were two samples with an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level. Dioxins/furans exceedances were located on the floodplain slope (one sample) and the Kansas River floodplain (one sample). There were no

dioxins/furans exceedances on the upland terrace. Dioxins/furans exceedances were present only in samples containing ash material

- Stream Sediment – There were no exceedances of dioxins/furans in stream sediment samples from Threemile Creek.
- Surface Water – All three surface water sample locations had an exceedance of the total 2,3,7,8-TCDD equivalent above the screening level during Phase I and Phase III RI activities.
- Groundwater – There were no dioxins/furans exceedances in groundwater samples collected from direct-push borings during Phase I or Phase II. Additionally, there were no dioxins/furans exceedances in groundwater samples collected from the monitoring wells during the four sampling events.

8.1.2 Fate and Transport

The available data indicates that little, if any, leaching of contaminants at the CFI Site is occurring. Five metals (arsenic, cobalt, iron, lead, manganese, and thallium) were detected above screening levels in one or more of the various media evaluated during the RI field activities. Lead and mercury were also detected above their screening levels in historical surface soil samples. Four SVOCs (PAHs), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were detected above screening levels in surface and subsurface soils. Three SVOCs (PAHs), benzo(a)pyrene, benzo(k)fluoranthene, and chrysene were detected above screening levels in surface water. Dioxins/furans were detected above screening levels in surface and subsurface soils and surface water.

Metals are by far the most widespread of the contaminants at the CFI Site. SVOCs (PAHs) and dioxins/furans were detected above screening levels, but to a much lesser extent. Although there were chemical exceedances in surface water and stream sediment, surface run-off to surface water and stream sediment is not likely at the CFI Site. Based on visual observations of the surface water drainage and measured piezometric surfaces during quarterly groundwater sampling activities, it appears that there is very little, if any, hydrologic or hydrogeologic connection between the location of the former incinerator operations area and Threemile Creek.

COPCs detected above their respective screening levels at the CFI Site were detected primarily in surface and subsurface soils. Arsenic exceedances were ubiquitous throughout the surface and subsurface soil samples collected from three depositional environments; however, the highest concentrations were present in samples containing ash/soil or ash material. All but one thallium exceedance, and all iron exceedances were in samples containing ash/soil or ash material. Additionally, a majority of the PAH and dioxins/furans exceedances were in samples containing ash/soil or ash material. Excluding arsenic, there were no exceedances of COPCs in subsurface soil below ash/cinder deposits on the floodplain slope or the Kansas River floodplain, with arsenic exceedances being similar to background level. On the upland terrace there were three exceedances of PAHs in subsurface soils, indicating that minor leaching from surface soils and ash/cinder deposits may potentially be occurring, or have occurred in the past at the CFI Site; therefore, leaching is a possible contaminant transport mechanism at the CFI Site. Although several contaminant groups were detected in the soils, very little migration of these contaminants to groundwater appears to be occurring. The constituents appear to be remaining in the ash/cinder deposits and areas where soil and ash/cinder deposits are well mixed.

8.1.3 Human Health Risk Assessment

The potential for human health risk from exposure to COPCs at the CFI Site was evaluated for soil, stream sediment, and surface water. Detected constituents in each medium that exceeded the screening process were retained as COPCs. Media evaluated in the HHRA were surface soil, subsurface soil, stream sediment, and surface water.

Land use at Camp Funston is related to the operations of an active Army installation. Camp Funston is used to support active military training, housing, and military operations which are expected to continue into the next century. According to the Fort Riley RPMP, the land use for the area where the CFI Site is located is currently classified as open space (Black & Veatch, 2007). Information regarding current and potential future land and water use was used to develop the exposure scenarios evaluated. Based on the current and potential future uses of the CFI Site, current/future upland terrace rail worker, future floodplain slope worker, future Kansas River floodplain worker, future Kansas River floodplain construction worker, current/future site-wide child visitor, current/future site-wide youth visitor, current/future site-wide adult visitor, future Kansas River floodplain child resident, and future Kansas River floodplain adult resident scenarios were evaluated.

All current/future site workers were assumed to be potentially exposed to COPCs in appropriate surface soil data sets through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain construction workers were assumed to be potentially exposed to COPCs in surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide child visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide youth visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Current/future site-wide adult visitors were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain child residents were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact. Future Kansas River floodplain adult residents were assumed to be potentially exposed to COPCs in surface soil through incidental ingestion, dermal contact, and inhalation of dust and vapors in outdoor air, stream sediment through ingestion and dermal contact, and in surface water through ingestion and dermal contact.

Table 6-76 summarizes the noncancer HIs and excess lifetime cancer risk values calculated for each of the potentially exposed populations evaluated in the HHRA. The HI for the future Kansas River floodplain child resident population exceeded the USEPA level of concern for noncancer risk, which is a HI greater than one. No other potentially exposed populations had HIs greater than one. The excess lifetime cancer risk values for the current/future upland terrace rail worker, future floodplain slope worker, future Kansas River floodplain worker, current/future site-wide child visitor, current/future site-wide youth visitor, current/future site-wide adult visitor, and future Kansas River floodplain age-adjusted resident were within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range. A 1E-06 cancer risk and/or HI of 1 is considered the point of departure by the USEPA.

Based on the noncancer and cancer risk levels calculated for the CFI Site, appropriate remedial alternatives and risk management options should be developed and evaluated in the FS.

8.1.4 Screening Level Ecological Risk Assessment

The CFI Site was evaluated both qualitatively and quantitatively to assess risk to ecological receptors. An ecological survey was conducted on November 18, 2014 at the CFI Site to identify any wildlife or potential habitat affected by site-related constituents. The entire CFI Site was evaluated for the presence of completed ecological exposure pathways. Based on the site visit, it was concluded that flora and fauna could be exposed to site-related constituents through direct contact and/or ingestion of soil, surface water, and stream sediments and that area fauna could be exposed through the bioaccumulation of site-related constituents in benthic invertebrates, aquatic and terrestrial invertebrates, aquatic and terrestrial plants, small mammal prey, and fish.

The results of the qualitative assessment of the CFI Site concluded that, no significant effects were observed during the November 14, 2014, site visit. The CFI Site and adjacent areas were occupied by a variety of common plant and animal species tolerant of human disturbances. Fish were observed in Threemile Creek adjacent to the CFI Site. No areas devoid of vegetation were observed at or in the vicinity of the CFI Site. Similarly, no areas consisting of stressed, dead, or dying vegetation, or patches of unusually high densities of a less dominant species were observed at or in the vicinity of the CFI Site.

Based on the results of the quantitative evaluations, terrestrial plants may be experiencing more risk from surface soils than from subsurface soils (see Table 7-29). Aquatic plants also may be experiencing less risk than terrestrial plants. Among invertebrates, aquatic invertebrates may be experiencing less risk than benthic invertebrates. The terrestrial invertebrates (earthworms) experienced more risk than the benthic invertebrates and aquatic invertebrates. The quantitative evaluations also indicate that fish may be experiencing less risk than terrestrial wildlife exposed to CFI Site soils.

The toxicological responses of mammal and bird species would be potentially more severe than those of plants and invertebrates; therefore, it is difficult to compare and contrast the amount of potential risk that the plants, invertebrates, mammals, and birds are exposed to. Based on the results of the quantitative evaluations to assess risk to terrestrial wildlife, ecological receptors exposed to soils and ash/cinder deposits and consuming soil invertebrates that may be affected by ash/cinder deposits from the CFI Site (e.g., short-tailed shrew, American robin) experienced the most potential risk. Among the small mammals, ecological receptors that are exposed to soils and ash/cinder deposits and consume plants (e.g., white-footed mouse, meadow vole, and eastern cottontail rabbit) experienced less potential risk than ecological receptors exposed to soils and ash/cinder deposits and consuming soil invertebrates. Ecological receptor species with large home ranges (e.g., white-tailed deer, red fox, and red-tailed hawk) experienced the least amount of potential risk. The raccoon, which consumed fish, benthic invertebrates, surface water, and stream sediment, experienced less potential risk than burrowing terrestrial mammal species exposed to soils and ash/cinder deposits. Additionally, six chemicals (aluminum, arsenic, barium, lead, vanadium, and zinc) were determined to pose potential ecological risk to representative wildlife species.

8.2 Conclusions

8.2.1 Data Limitations and Recommendations for Future Work

Sufficient data were obtained to adequately characterize the CFI Site, evaluate nature and extent of contamination, determine fate and transport, construct an appropriate human health and ecological CSMs, and calculate human health and ecological risk. Data obtained met goals for field and analytical completeness (LBG-BMcD, 2014b, 2015b, 2015c, 2015d, 2015e, 2016a, and 2016b) and was determined to be usable overall. No data gaps were identified during the course of RI activities. No future field investigations are recommended based on the results of the RI. Based on data obtained during the RI and the results of the HHRA and SLERA, the CFI Site is adequately characterized and the recommended path forward is to proceed to the FS.

8.2.2 Recommended Remedial Action Objectives

The extent to which the CFI Site should be remediated will be decided based on the results of the risk assessments (HHRA and SLERA) and technical and economic factors that will be presented in the FS. Based upon the data obtained during the RI and the results of the HHRA and SLERA, the HI for the future Kansas River floodplain child resident population (2E+00) exceeded the USEPA level of concern for noncancer risk, which is a HI greater than one. The excess lifetime cancer risk values for the current/future upland terrace rail worker, future floodplain slope worker, future Kansas River floodplain worker, current/future site-wide child visitor, current/future site-wide youth visitor, current/future site-wide adult visitor, and future Kansas River floodplain age-adjusted resident were within the USEPA 1E-04 to 1E-06 (one in 10,000 to one in a million) risk management range. Risks within the risk management range of 1E-04 to 1E-06 (one in 10,000 to one in a million) or HQs less than 3 are not necessarily considered protective, but require site-specific risk management decisions to be made. Additionally, six chemicals (aluminum, arsenic, barium, lead, vanadium, and zinc) were determined to pose potential ecological risk to representative wildlife species. Based on the future Kansas River floodplain child resident population HI and the potential risk to representative wildlife species, remediation may be warranted. Remediation and/or risk management options to address impacted soils and ash/cinder deposits present on the upland terrace, floodplain slope, and Kansas River Floodplain will be addressed in the FS.

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TABLES

Table 2-1
Summary of Remedial Investigation Field Activities
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Phase I Remedial Investigation Field Activities

Field Activitiy	Date(s) Activity Performed	Sample Location IDs	Number of Sample Locations	Number of Samples Collected	Number of Duplicate Samples Collected	Number of MS/MSD Samples Collected	Chemical Analyses (Methods)
Site Preparation	12/16/2013 - 12/18/2013	--	Clearing of timber and brush on the Kansas River floodplain to facilitate direct-push sampling and monitoring well installation.				
Background Soil Sampling	1/9/2014	BG01 - BG12	12	24	3	2	TAL Metals (6010B and 7471A) and PAH (8270C SIM)
Stream Sediment Sampling	1/10/2014	SD01 - SD03	3	3	1	1	BTEX (8206B), SVOCs (8270C), TAL Metals ((6010B and 7471A), MeHg (1630), TPH-GRO (8015B), TPH-DRO (8015B), and Dioxin/Furans (8290A)
Surface Water Sampling	1/10/2014	SW01 - SW03	3	3	1	1	BTEX (8206B), SVOCs (8270C), TAL Metals (6010B and 7470A), MeHg (1630), TPH-GRO (8015B), TPH-DRO (8015B), and Dioxin/Furans (8290A)
Surface Soil Sampling	1/9/2014	SS01 - SS05	5	5	1	1	BTEX (8206B), SVOCs (8270C), TAL Metals (6010B and 7471A), MeHg (1630), TPH-GRO (8015B), TPH-DRO (8015B), and Dioxin/Furans (8290A)
Direct-Push Soil Sampling	01/13/2014 - 01/14/2014	DP01 - DP07	7	29	3	2	BTEX (8206B), SVOCs (8270C), TAL Metals (6010B and 7471A), MeHg (1630), TPH-GRO (8015B), TPH-DRO (8015B), and Dioxin/Furans (8290A)
Direct-Push Groundwater Sampling	1/15/2014	DP08 - DP12	5	5	1	1	BTEX (8206B), SVOCs (8270C), TAL Metals (6010B and 7470A), MeHg (1630), TPH-GRO (8015B), TPH-DRO (8015B), and Dioxin/Furans (8290A)
Surveying	8/18/2014	--	Surveyed Phase I sample points.				

Notes:

BTEX - benzene, toluene, ethylbenzene, and xylenes
DRO - diesel range organic
GRO - gasoline range organic
MeHg - methyl mercury
MS - matrix spike
MSD - matrix spike duplicate
PAH - polycyclic aromatic hydrocarbon
SIM - selective ion monitoring
SVOC - semivolatile organic compounds
TAL - target analyte list
TPH - total petroleum hydrocarbon

Table 2-1
Summary of Remedial Investigation Field Activities
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Phase II Remedial Investigation Field Activities

Field Activitiy	Date(s) Activity Performed	Sample IDs	Number of Sample Locations	Number of Samples to be Collected	Number of Duplicate Samples Collected	Number of MS/MSD Samples Collected	Chemical Analyses (Methods)
Stream Sediment Sampling	11/17/2014	SD04 - SD11	8	8	1	1	TAL Metals (6020 and 7471A)
Surface Soil Sampling	11/17/2014	SS06 - SS08	3	3	1	1	TAL Metals (6020 and 7471A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Upland Terrace Soil Sampling	11/19/2014	UT01 - UT07	7	14	1	1	TAL Metals (6020 and 7471A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Direct-Push Soil Sampling	11/19/2014 - 11/20/2014	DP14 - DP24	12	48	6	3	TAL Metals (6020 and 7471A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Direct-Push Groundwater Sampling	11/21/2014 - 11/25/2014	DP25 - DP37	13	13	2	1	TAL Metals (6020 and 7470A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Surveying	12/23/2014	--	Surveyed Phase II sample points.				

Notes:
MS - matrix spike
MSD - matrix spike duplicate
PAH - polycyclic aromatic hydrocarbon
SIM - selective ion monitoring
TAL - target analyte list

Table 2-1
Summary of Remedial Investigation Field Activities
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Phase III Remedial Investigation Field Activities

Field Activitiy	Date(s) Activity Performed	Sample IDs	Number of Sample Locations	Number of Samples to be Collected	Number of Duplicate Samples Collected	Number of MS/MSD Samples Collected	Chemical Analyses (Methods)
Monitoring Well Installation and Development	04/13/2015 - 04/16/2015	CFIMW15-01 - CFIMW15-04	Installation and development of four (4) monitoring wells.				
Aquifer Testing	5/5/2015	CFIMW15-01 - CFIMW15-04	In-situ hydraulic conductivitiy testing (slug testing) of the four (4) newly installed monitoring wells.				
Quarterly Surface Water Sampling	May, August, and November 2015 and February 2016	SW01 - SW03	3	12	4	4	TAL Metals (6020 and 7471A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Quarterly Monitoring Well Groundwater Sampling	May, August, and November 2015 and February 2016	CFIMW15-01 - CFIMW15-04	4	16	4	4	TAL Metals (6020 and 7471A), PAHs (8270C SIM), and Dioxin/Furans (8290A)
Surveying	4/17/2015 and 02/08/2016	--	Surveyed monitoring wells. Topographic survey of upland terrace, floodplian slope, and Kansas River floodplain.				
IDW Management	07/16/2015 and 04/28/2016	--	Management of soil and water IDW generated during field activities.				

Notes:
IDW - investigation derived waste
MS - matrix spike
MSD - matrix spike duplicate
PAH - polycyclic aromatic hydrocarbon
SIM - selective ion monitoring
TAL - target analyte list

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample Point ID	Sample Designator	Sample Depth (feet)	Date(s) Sampled	Investigation Phase	Survey Data			Total Depth (feet)	Matrix Sampled
					Northing (feet)	Easting (feet)	Ground Surface Elevation (feet amsl)		
DP01	SB01	0 - 0.5	1/14/2014	Phase I	14205545.51	2279775.43	1063.48	36	Soil
	SB02	3 - 4.5							
	SB03	6 - 7.5							
	SB04	18 - 20							
	SB05	30 - 32							
DP02	SB01	0 - 0.5	1/13/2014	Phase I	14205463.68	2279700.73	1056.33	20	Soil
	SB02	3 - 6							
	SB03	7 - 8							
	SB04	16 - 17							
DP03	SB01	0 - 0.5	1/13/2014	Phase I	14205505.62	2279753.71	1054.95	16	Soil
	SB02	3 - 5							
	SB03	5.5 - 6.5							
	SB04	14 - 15.5							
DP04	SB01	0 - 0.5							
	SB02	1 - 3							
	SB03	3 - 4							
	SB04	10- 12	1/13/2014	Phase I	14205532.07	2279813.83	1052.63	13	Soil
DP05	SB01	0 - 0.5							
	SB02	1.5 - 2.5							
	SB03	2.5 - 3.5							
	SB04	10 - 12	1/14/2014	Phase I	14205547.32	2279880.56	1048.27	12	Soil
DP06	SB01	0 - 0.5							
	SB02	3 - 4.5							
	SB03	6 - 7.5							
	SB04	16.5 - 18.5	1/14/2014	Phase I	14205399.55	2279782.51	1046.04	20	Soil
DP07	SB01	0 - 0.5							
	SB02	3 - 4.5							
	SB03	6 - 7.5							
	SB04	18 - 20	1/14/2014	Phase I	14205484.41	2279880.60	1046.58	20	Soil
DP08	GW01	34-38	1/15/2014	Phase I	14205537.22	2279724.08	1065.47	38	Groundwater
DP09	GW01	22-26	1/15/2014	Phase I	14205433.72	2279701.97	1047.70	26	Groundwater
DP10	GW01	22-26	1/15/2014	Phase I	14205490.45	2279823.06	1046.39	26	Groundwater
DP11	GW01	22-26	1/15/2014	Phase I	14205296.70	2279859.05	1046.06	26	Groundwater
DP12	GW01	22-26	1/15/2014	Phase I	14205484.58	2279985.53	1046.73	26	Groundwater

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample Point ID	Sample Designator	Sample Depth (feet)	Date(s) Sampled	Investigation Phase	Survey Data			Total Depth (feet)	Matrix Sampled
					Northing (feet)	Easting (feet)	Ground Surface Elevation (feet amsl)		
DP13	SB01	0 - 0.5	11/19/2014	Phase II	14205462.87	2279632.90	1063.16	24	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	20 - 21							
DP14	SB01	0 - 0.5	11/19/2014	Phase II	14205550.71	2279812.80	1061.99	11	Soil
	SB02	1.5 - 2.5							
	SB03	4.5 - 5.5							
	SB04	9.5 - 10.5							
DP15	SB01	0 - 0.5	11/19/2014	Phase II	14205479.52	2279726.90	1054.39	20	Soil
	SB02	3 - 4							
	SB03	10.5 - 11.5							
	SB04	16 - 17							
DP16	SB01	0 - 0.5	11/19/2014	Phase II	14205546.18	2279843.83	1053.01	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	14 - 15							
DP17	SB01	0 - 0.5	11/20/2014	Phase II	14205491.29	2279768.71	1048.94	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	14.5 - 15.5							
DP18	SB01	0 - 0.5	11/20/2014	Phase II	14205429.53	2279682.09	1048.27	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	14 - 15							
DP19	SB01	0 - 0.5	11/20/2014	Phase II	14205434.75	2279756.57	1045.70	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	15 - 16							
DP20	SB01	0 - 0.5	11/20/2014	Phase II	14205490.46	2279825.35	1046.75	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	14 - 15							

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample Point ID	Sample Designator	Sample Depth (feet)	Date(s) Sampled	Investigation Phase	Survey Data: Northing (feet)	Survey Data: Easting (feet)	Survey Data: Ground Surface Elevation (feet amsl)	Total Depth (feet)	Matrix Sampled
DP21	SB01	0 - 0.5	11/20/2014	Phase II	14205544.61	2279916.38	1045.76	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	11 - 12							
DP22	SB01	0 - 0.5	11/20/2014	Phase II	14205426.62	2279705.69	1046.65	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	14 - 15							
DP23	SB01	0 - 0.5	11/20/2014	Phase II	14205464.48	2279791.43	1045.71	16	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	15 - 16							
DP24	SB01	0 - 0.5	11/20/2014	Phase II	14205517.2	2279893.08	1046.92	20	Soil
	SB02	3 - 4							
	SB03	6 - 7							
	SB04	15 - 16							
DP25	GW01	32.4-36.4	11/21/2014	Phase II	14205595.72	2279819.42	1065.23	36.4	Groundwater
DP26	GW01	26-30	11/25/2014	Phase II	14205420.58	2279679.62	1046.97	30	Groundwater
DP27	GW01	26-30	11/25/2014	Phase II	14205454.61	2279741.85	1048.21	30	Groundwater
DP28	GW01	22-26	11/21/2014	Phase II	14205513.13	2279804.02	1048.36	26	Groundwater
DP29	GW01	22-26	11/21/2014	Phase II	14205544.61	2279916.38	1045.76	26	Groundwater
DP30	GW01	18-22	11/24/2014	Phase II	14205464.48	2279791.43	1045.71	22	Groundwater
DP31	GW01	22-26	11/21/2014	Phase II	14205517.2	2279893.08	1046.92	26	Groundwater
DP32	GW01	29.5-33.5	11/24/2014	Phase II	14205503.99	2279962.47	1047.40	33.5	Groundwater
DP33	GW01	21-25	11/25/2014	Phase II	14205333.54	2279725.26	1045.97	25	Groundwater
DP34	GW01	19-23	11/24/2014	Phase II	14205377.55	2279802.45	1046.22	23	Groundwater
DP35	GW01	26.5-30.5	11/24/2014	Phase II	14205433.2	2279884.90	1046.70	30.5	Groundwater
DP36	GW01	26-30	11/24/2014	Phase II	14205477.48	2279940.05	1046.43	30	Groundwater
DP37	GW01	21-25	11/24/2014	Phase II	14205489.62	2280036.85	1046.94	25	Groundwater
UT01	SB01	0 - 0.5	11/19/2014	Phase II	14205478.74	2279654.70	1063.76	4	Soil
	SB02	3 - 4							
UT02	SB01	0 - 0.5	11/19/2014	Phase II	14205513.44	2279698.83	1064.18	4	Soil
	SB02	3 - 4							
UT03	SB01	0 - 0.5	11/19/2014	Phase II	14205516.87	2279682.11	1064.67	4	Soil
	SB02	3 - 4							

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample Point ID	Sample Designator	Sample Depth (feet)	Date(s) Sampled	Investigation Phase	Survey Data: Northing (feet)	Survey Data: Easting (feet)	Survey Data: Ground Surface Elevation (feet amsl)	Total Depth (feet)	Matrix Sampled
UT04	SB01	0 - 0.5	11/19/2014	Phase II	14205538.38	2279724.72	1065.37	4	Soil
	SB02	3 - 4							
UT05	SB01	0 - 0.5	11/19/2014	Phase II	14205547.23	2279753.71	1064.22	4	Soil
	SB02	3 - 4							
UT06	SB01	0 - 0.5	11/19/2014	Phase II	14205576.05	2279794.76	1064.70	4	Soil
	SB02	3 - 4							
UT07	SB01	0 - 0.5	11/19/2014	Phase II	14205570.54	2279833.00	1064.19	4	Soil
	SB02	3 - 4							
SS01	SB01	0 - 0.5	1/9/2014	Phase I	14205561.11	2279973.25	1045.78	0.5	Soil
SS02	SB01	0 - 0.5	1/9/2014	Phase I	14205580.41	2280035.60	1046.25	0.5	Soil
SS03	SB01	0 - 0.5	1/9/2014	Phase I	14205598.39	2280098.91	1045.62	0.5	Soil
SS04	SB01	0 - 0.5	1/9/2014	Phase I	14205612.44	2280168.98	1046.17	0.5	Soil
SS05	SB01	0 - 0.5	1/9/2014	Phase I	14205617.53	2280237.65	1040.65	0.5	Soil
SS06	SB01	0 - 0.5	11/17/2014	Phase II	14205616.5	2280260.63	1043.24	0.5	Soil
SS07	SB01	0 - 0.5	11/17/2014	Phase II	14205592.97	2280237.58	1042.55	0.5	Soil
SS08	SB01	0 - 0.5	11/17/2014	Phase II	14205643.42	2280236.60	1042.09	0.5	Soil
BG01	SB01	0 - 0.5	1/9/2014	Phase I	14202307.44	2276504.15	1064.30	4	Soil
	SB02	3 - 4							
BG02	SB01	0 - 0.5	1/9/2014	Phase I	14202288.92	2276507.08	1063.93	4	Soil
	SB02	3 - 4							
BG03	SB01	0 - 0.5	1/9/2014	Phase I	14202281.65	2276517.62	1061.69	4	Soil
	SB02	3 - 4							
BG04	SB01	0 - 0.5	1/9/2014	Phase I	14202288.92	2276507.08	1063.93	4	Soil
	SB02	3 - 4							
BG05	SB01	0 - 0.5	1/9/2014	Phase I	14202269.12	2276510.7	1061.27	4	Soil
	SB02	3 - 4							
BG06	SB01	0 - 0.5	1/9/2014	Phase I	14202281.65	2276517.62	1061.69	4	Soil
	SB02	3 - 4							
BG07	SB01	0 - 0.5	1/9/2014	Phase I	14202265.41	2276519.91	1057.01	4	Soil
	SB02	3 - 4							
BG08	SB01	0 - 0.5	1/9/2014	Phase I	14202274.36	2276525.91	1056.57	4	Soil
	SB02	3 - 4							
BG09	SB01	0 - 0.5	1/9/2014	Phase I	14202254.84	2276534.70	1050.75	4	Soil
	SB02	3 - 4							
BG10	SB01	0 - 0.5	1/9/2014	Phase I	14202264.57	2276547.03	1050.50	4	Soil
	SB02	3 - 4							

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

<table>
<tr><th rowspan="2">Sample Point ID</th><th rowspan="2">Sample Designator</th><th rowspan="2">Sample Depth (feet)</th><th rowspan="2">Date(s) Sampled</th><th rowspan="2">Investigation Phase</th><th colspan="3">Survey Data</th><th rowspan="2">Total Depth (feet)</th><th rowspan="2">Matrix Sampled</th></tr>
<tr><th>Northing (feet)</th><th>Easting (feet)</th><th>Ground Surface Elevation (feet amsl)</th></tr>
<tr><td rowspan="2">BG11</td><td>SB01</td><td>0 - 0.5</td><td rowspan="2">1/9/2014</td><td rowspan="2">Phase I</td><td rowspan="2">14202241.81</td><td rowspan="2">2276549.55</td><td rowspan="2">1050.22</td><td rowspan="2">4</td><td rowspan="2">Soil</td></tr>
<tr><td>SB02</td><td>3 - 4</td></tr>
<tr><td rowspan="2">BG12</td><td>SB01</td><td>0 - 0.5</td><td rowspan="2">1/9/2014</td><td rowspan="2">Phase I</td><td rowspan="2">14202249.63</td><td rowspan="2">2276565.83</td><td rowspan="2">1050.06</td><td rowspan="2">4</td><td rowspan="2">Soil</td></tr>
<tr><td>SB02</td><td>3 - 4</td></tr>
<tr><td>SD01</td><td>SD01</td><td>--</td><td>1/9/2014</td><td>Phase I</td><td>14205925.91</td><td>2280519.45</td><td>1038.57</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD02</td><td>SD01</td><td>--</td><td>1/9/2014</td><td>Phase I</td><td>14205812.19</td><td>2280252.92</td><td>1038.68</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD03</td><td>SD01</td><td>--</td><td>1/9/2014</td><td>Phase I</td><td>14205909.00</td><td>2279777.43</td><td>1040.96</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD04</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206096.46</td><td>2279643.98</td><td>1042.70</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD05</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206199.75</td><td>2279720.83</td><td>1042.68</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD06</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206362.20</td><td>2279985.01</td><td>1042.69</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD07</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206475.45</td><td>2279893.26</td><td>1042.75</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD08</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206659.30</td><td>2280054.05</td><td>1042.82</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD09</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14206890.72</td><td>2279971.49</td><td>1044.35</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD10</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14207065.91</td><td>2280065.05</td><td>1044.42</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SD11</td><td>SD01</td><td>--</td><td>11/17/2014</td><td>Phase II</td><td>14207185.56</td><td>2280230.09</td><td>1044.82</td><td>NA</td><td>Stream Sediment</td></tr>
<tr><td>SW01</td><td>SW01
SW02
SW03
SW04
SW05</td><td>--</td><td>01/10/2014
05/04/2015
08/10/2015
11/10/2015
02/11/2016</td><td>Phase I & III</td><td>14205925.91</td><td>2280519.45</td><td>1038.57</td><td>NA</td><td>Surface Water</td></tr>
<tr><td>SW02</td><td>SW01
SW02
SW03
SW04
SW05</td><td>--</td><td>01/10/2014
05/04/2015
08/10/2015
11/10/2015
02/11/2016</td><td>Phase I & III</td><td>14205812.19</td><td>2280252.92</td><td>1038.68</td><td>NA</td><td>Surface Water</td></tr>
<tr><td>SW03</td><td>SW01
SW02
SW03
SW04
SW05</td><td>--</td><td>01/10/2014
05/04/2015
08/10/2015
11/10/2015
02/11/2016</td><td>Phase I & III</td><td>14205909.00</td><td>2279777.43</td><td>1040.96</td><td>NA</td><td>Surface Water</td></tr>
<tr><td>CFIMW15-01</td><td>GW01
GW02
GW03
GW04</td><td>--</td><td>05/06/2015
08/11/2015
11/10/2015
02/12/2016</td><td>Phase III</td><td>14205481.85</td><td>2279643.61</td><td>1064.08</td><td>NA</td><td>Groundwater</td></tr>
<tr><td>CFIMW15-02</td><td>GW01
GW02
GW03
GW04</td><td>--</td><td>05/05/2015
08/11/2015
11/10/2015
02/11/2016</td><td>Phase III</td><td>14205497.79</td><td>2279797.41</td><td>1046.91</td><td>NA</td><td>Groundwater</td></tr>
</table>

Table 2-2
Remedial Investigation Sample Summary
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample Point ID	Sample Designator	Sample Depth (feet)	Date(s) Sampled	Investigation Phase	Survey Data			Total Depth (feet)	Matrix Sampled
					Northing (feet)	Easting (feet)	Ground Surface Elevation (feet amsl)		
CFIMW15-03	GW01 GW02 GW03 GW04	--	05/06/2015 08/11/2015 11/10/2015 02/12/2016	Phase III	14205238.12	2279735.23	1045.47	NA	Groundwater
CFIMW15-04	GW01 GW02 GW03 GW04	--	05/05/2015 08/11/2015 11/10/2015 02/12/2016	Phase III	14205457.37	2280166.65	1047.84	NA	Groundwater

Notes:
[1] Indictes direct-push drop-screen interval.
amsl = above mean sea level
NA = Not Applicable

Table 2-3

Monitoring Well Construction Summary

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Well Number	Date Installed	Location				Elevation GS (ft amsl)	Elevation TOC (ft amsl)	Depth from TOC (ft)	Elevation Top of Screen from TOC (ft amsl)	Screen Length (ft)	Formation(s) Screened
		Northing (ft)	Easting (ft)	Latitude	Longitude						
CFIMW15-01	4/14/2015	14205481.85	2279643.61	39.09594	96.74701	1064.08	1066.21	40.02	1041.17	14.98	Alluvial
CFIMW15-02	4/13/2015	14205497.79	2279797.41	39.09597	96.74647	1046.91	1049.01	23.54	1040.47	15.00	Alluvial
CFIMW15-03	4/13/2015	14205238.12	2279735.23	39.09526	96.74671	1045.47	1047.76	23.04	1039.68	14.96	Alluvial
CFIMW15-04	4/14/2015	14205457.37	2280166.65	39.09584	96.74517	1047.84	1050.19	25.03	1040.14	14.98	Alluvial

Notes:
amsl - Above Mean Sea Level
ft - Feet
GS - Ground Surface
TOC - Top of Casing

Table 2-4
IDW Sample Results (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	Soil IDW Drum	CFIMW15-01	CFIMW15-01	CFIMW15-02	CFIMW15-03	CFIMW15-04
			Sample Designator:	IDW01	Solid IDW 1	Solid IDW 2	Solid IDW 1	Solid IDW 1	Solid IDW 1
			Date Sampled:	11/25/2014	4/16/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015
Parameter	**Units**	**Screening Level**	**Source**						
Semivolatile Organic Compounds									
Acenaphthene	mg/kg	3,420	RSK	**0.0036 J**	**0.00093 J**	0.00052 U	0.00057 U	NA	NA
Acenaphthylene	mg/kg	NA	--	**0.00047 J**	**0.00062 J**	0.00036 U	**0.00040 J**	NA	NA
Anthracene	mg/kg	18,000	RSK	**0.0051 J**	**0.0013 J**	0.00044 U	**0.00075 J**	NA	NA
Benzo(a)anthracene	mg/kg	10.9	RSK	**0.022**	**0.0041 J**	**0.0011 J**	**0.0032 J**	NA	NA
Benzo(a)pyrene	mg/kg	1.09	RSK	**0.021**	**0.0039 J**	**0.00083 J**	**0.0036 J**	NA	NA
Benzo(b)fluoranthene	mg/kg	10.9	RSK	**0.022**	**0.0060 J**	**0.0016 J**	**0.0066**	NA	NA
Benzo(g,h,i)perylene	mg/kg	NA	--	**0.013**	**0.01 J**	**0.0024 J**	**0.0033 J**	NA	NA
Benzo(k)fluoranthene	mg/kg	109	RSK	**0.014**	**0.0032 J**	0.00084 U	**0.0027 J**	NA	NA
Chrysene	mg/kg	1,090	RSK	**0.047**	**0.0078 J**	**0.0015 J**	**0.0049 J**	NA	NA
Dibenzo(a,h)anthracene	mg/kg	1.09	RSK	**0.0039 J**	**0.0026 J**	0.0013 U	0.0015 U	NA	NA
Fluoranthene	mg/kg	2,440	RSK	**0.029**	**0.0074 J**	**0.0014 J**	**0.0044 J**	NA	NA
Fluorene	mg/kg	2,360	RSK	**0.0061**	**0.0014 J**	0.00054 U	0.00060 U	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	10.9	RSK	**0.0049 J**	**0.0042 J**	**0.00089 J**	**0.0029 J**	NA	NA
Naphthalene	mg/kg	30.5	RSK	**0.036**	**0.0078 J**	**0.0013 J**	**0.01**	NA	NA
Phenanthrene	mg/kg	NA	--	**0.19**	**0.036 J**	**0.0062**	**0.012**	NA	NA
Pyrene	mg/kg	1,830	RSK	**0.03**	**0.0065 J**	**0.0013 J**	**0.0045 J**	NA	NA
Metals									
Aluminum	mg/kg	NA	--	**16,000**	**16,000 J**	**7,900**	**20,000**	**15,000**	**7,600**
Antimony	mg/kg	31.3	RSK	**0.30 J**	**0.24 J**	0.22 U	**0.35 J**	0.28 U	0.21 U
Arsenic	mg/kg	18.9	RSK	**4.9**	**4.6**	**3.1**	**6.1**	**3.6**	**2.5**
Barium	mg/kg	15,300	RSK	**200**	**150 J**	**92**	**460**	**170**	**98**
Beryllium	mg/kg	155	RSK	**0.74**	**0.67**	**0.41**	**0.97**	**0.68**	**0.35**
Cadmium	mg/kg	39	RSK	**0.44**	**0.26**	**0.16 J**	**0.61**	**0.47**	**0.12 J**
Calcium	mg/kg	NA	--	**11,000**	**7,100 J**	**6,600**	**11,000**	**10,000**	**5,700**
Chromium	mg/kg	33.6	RSK	**17**	**25 J**	**13**	**21**	**18**	**11**
Cobalt	mg/kg	23.4	RSK	**7.8**	**5.9**	**3.5**	**7.4**	**5.4**	**3.1**
Copper	mg/kg	3,130	RSK	**12**	**9.7**	**6.1**	**15**	**11**	**4.6**
Iron	mg/kg	NA	--	**17,000**	**14,000 J**	**9,600**	**19,000**	**14,000**	**7,800**
Lead	mg/kg	400	RSK	**17**	**12**	**7.0**	**23**	**13**	**5.2**
Magnesium	mg/kg	NA	--	**3,700**	**3,000 J**	**1,800**	**4,300**	**3,900**	**1,900**
Manganese	mg/kg	9,300	RSK	**240**	**310 J**	**160**	**380**	**250**	**150**
Mercury	mg/kg	2	RSK	**0.024 J**	NA	NA	NA	NA	NA
Nickel	mg/kg	1,540	RSK	**17**	**14**	**8.0**	**19**	**13**	**6.5**
Potassium	mg/kg	NA	--	**3,100**	**3,200 J**	**1,600**	**3,700**	**3,500**	**1,500**
Selenium	mg/kg	391	RSK	**0.66 J**	**0.25 J**	**0.13 J**	**0.46**	**0.57**	**0.22 J**
Silver	mg/kg	391	RSK	**0.074 J**	**0.048 J**	0.033 U	**0.085 J**	**0.052 J**	0.032 U
Sodium	mg/kg	NA	--	**140**	**62 J**	**81 J**	**180**	**97 J**	**77 J**
Thallium	mg/kg	NA	--	**0.28**	**0.23**	**0.13 J**	**0.29**	**0.26**	**0.13 J**
Vanadium	mg/kg	NA	--	**34**	**30**	**20**	**35**	**30**	**18**
Zinc	mg/kg	23,500	RSK	**120 J**	**49**	**28**	**110**	**56**	**26**

Notes:

1. Screening levels for soil samples are the KDHE RSK (residential soil pathway).
2. Screening levels for groundwater samples are the USEPA MCL.
3. Sources are as follows:
   - RSK - Kansas Department of Health and Environment, Risk-Based Standards for Kansas, RSK Manual - 5th Version, Revised Tables, September 2015.
   - MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

KDHE - Kansas Department of Health and Environment

MCL - maximum contaminant level

mg/kg - milligrams per kilogram

NA - not available

RSK - Risk-Based Standards for Kansas

U - compound was not detected

USEPA - United States Environmental Protection Agency

ug/L = micrograms per Liter

Table 2-4
IDW Sample Results (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	Water Drum	Drilling Decon H_20	CFIMW15-01	CFIMW15-02	CFIMW15-03	CFIMW15-04
			Sample Designator:	IDW01	Liquid IDW	Liquid IDW	Liquid IDW	Liquid IDW	Liquid IDW
			Date Sampled:	11/25/2014	4/16/2015	4/16/2015	4/16/2015	4/16/2015	4/16/2015
Parameter	**Units**	**Screening Level**	**Source**						
Semivolatile Organic Compounds									
Acenaphthene	ug/L	NA	--	0.00047 U	**0.014 J**	NA	NA	NA	NA
Acenaphthylene	ug/L	NA	--	0.00047 U	**0.016 J**	NA	NA	NA	NA
Anthracene	ug/L	NA	--	0.00042 U	**0.037 J**	NA	NA	NA	NA
Benzo(a)anthracene	ug/L	NA	--	0.00044 U	**0.01 J**	NA	NA	NA	NA
Benzo(a)pyrene	ug/L	0.2	MCL	0.00042 U	**0.0085 J**	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	--	0.0012 U	0.012 U	NA	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	NA	--	0.00052 U	**0.0087 J**	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	--	0.00074 U	0.0074 U	NA	NA	NA	NA
Chrysene	ug/L	NA	--	0.00038 U	**0.0097 J**	NA	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	NA	--	0.0014 U	0.014 U	NA	NA	NA	NA
Fluoranthene	ug/L	NA	--	**0.00042 J**	**0.044 J**	NA	NA	NA	NA
Fluorene	ug/L	NA	--	**0.0010 J**	**0.011 J**	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	NA	--	0.0013 U	0.013 U	NA	NA	NA	NA
Naphthalene	ug/L	NA	--	**0.0013 J**	**0.0075 J**	NA	NA	NA	NA
Phenanthrene	ug/L	NA	--	**0.0017 J**	**0.01 J**	NA	NA	NA	NA
Pyrene	ug/L	NA	--	**0.00082 J**	**0.066**	NA	NA	NA	NA
Metals									
Aluminum	ug/L	NA	--	**40 J**	**550**	**770**	**300**	**62 J**	**7,500**
Antimony	ug/L	6	MCL	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	10	MCL	**3.0 J**	**2.2 J**	1.0 U	**1.8 J**	**2.2 J**	**21**
Barium	ug/L	2,000	MCL	**45**	**95**	**220**	**130**	**130**	**280**
Beryllium	ug/L	4	MCL	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**3.9**
Cadmium	ug/L	5	MCL	**0.61 J**	0.50 U	0.50 U	0.50 U	0.50 U	**1.9**
Calcium	ug/L	NA	--	**64,000**	**68,000**	**180,000**	**170,000 J**	**160,000**	**310,000**
Chromium	ug/L	100	MCL	**1.5 J**	1.5 U	**1.7 J**	1.5 U	1.5 U	**7.1**
Cobalt	ug/L	NA	--	**5.8**	**1.2 J**	**1.3 J**	1.0 U	1.0 U	**12**
Copper	ug/L	1,300	MCL	**7.3**	**9.3**	**1.8 J**	**1.1 J**	1.0 U	**19**
Iron	ug/L	NA	--	**140**	**520**	**580**	**2,800**	**390**	**11,000**
Lead	ug/L	15	MCL	**3.1**	**1.8 J**	**2.2**	**1.5 J**	0.60 U	**49**
Magnesium	ug/L	NA	--	**15,000**	**12,000**	**32,000**	**33,000 J**	**31,000**	**41,000**
Manganese	ug/L	NA	--	**1,000**	**70**	**61**	**18**	**21**	**730**
Mercury	ug/L	2	MCL	0.10 U	NA	NA	NA	NA	NA
Nickel	ug/L	NA	--	**20**	**6.2**	**4.0**	**6.1**	**3.8**	**37**
Potassium	ug/L	NA	--	**12,000**	**8,100**	**2,800**	**3,300**	**3,500**	**5,300**
Selenium	ug/L	50	MCL	**19**	**7.1**	1.0 U	**2.6 J**	**1.6 J**	**1.1 J**
Silver	ug/L	NA	--	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Sodium	ug/L	NA	--	**230,000**	**30,000**	**52,000**	**50,000 J**	**63,000**	**44,000**
Thallium	ug/L	2	MCL	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vanadium	ug/L	NA	--	**6.4 J**	6.0 U	6.0 U	6.0 U	6.0 U	**46**
Zinc	ug/L	NA	--	**100**	**26**	**6.1 J**	**9.6 J**	**8.0 J**	**73**

Notes:
1. Screening levels for soil samples are the KDHE RSK (residential soil pathway).
2. Screening levels for groundwater samples are the USEPA MCL.
3. Sources are as follows:
- RSK - Kansas Department of Health and Environment, Risk-Based Standards for Kansas, RSK Manual - 5th Version, Revised Tables, September 2015.
- MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.

Bold - compound was detected
Highlighted - concentration exceeds screening level
J - estimated value
KDHE - Kansas Department of Health and Environment
MCL - maximum contaminant level
mg/kg - milligrams per kilogram
NA - not available
RSK - Risk-Based Standards for Kansas
U - compound was not detected
USEPA - United States Environmental Protection Agency
ug/L = micrograms per Liter

Table 2-5
IDW Sample Results (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

				Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
				Sample Point:	**Soil Drum**	**CFIMW15-01**	**CFIMW15-01**	**CFIMW15-02**	**CFIMW15-03**	**CFIMW15-04**
				Sample Designator:	**IDW01**	**Solid IDW01**	**Solid IDW02**	**Solid IDW01**	**Solid IDW01**	**Solid IDW01**
				Date Sampled:	**11/25/2014**	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/16/2015**
				Notes:	-	-	-	-	-	-
Parameter	**Units**	**TEF**	**Screening Level**	**Source**						
Dioxins/Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	--	**4.3 J**	**66**	**8.1 J**	**9.1 J**	NA	NA
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	--	**36**	**620 J**	**70**	**110**	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	--	**2.8 J**	**39**	**3.2 J**	**8.5**	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	--	**4.3 J**	**78**	**7.9**	**17**	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	--	0.29 U	**2.0 J**	0.23 JU	0.44 JU	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	--	0.48 U	**1.8 J**	**0.24 J**	**0.57 J**	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	--	0.59 U	**1.3 J**	0.11 JU	0.23 JU	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	--	0.40 U	**1.9 J**	0.27 JU	**0.56 J**	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	--	0.49 U	**3.0 J**	**0.39 J**	**0.71 J**	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	--	0.49 U	0.19 U	0.059 U	0.10 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA		0.45 U	**3.0 J**	0.32 JU	**1.1 J**	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	--	0.87 U	0.14 U	**0.14 J**	**0.22 J**	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	--	0.36 U	**0.29 J**	0.086 U	0.17 U	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	--	0.45 U	**1.3 J**	0.22 JU	**0.46 J**	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	--	0.90 U	0.14 U	**0.12 J**	**0.19 J**	NA	NA
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	--	0.41 U	0.31 U	0.24 U	0.40 U	NA	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	--	0.21 U	0.082 U	0.051 U	0.068 U	NA	NA
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	--	**4.3 J**	**76**	**7.4 J**	**14 J**	NA	NA
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	--	**8.3**	**140**	**14**	**33**	NA	NA
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	--	0.49 U	**31**	**2.8 J**	**7.4 J**	NA	NA
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	--	**1.1 J**	**28 J**	**2.5 J**	**8.6 J**	NA	NA
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	--	0.90 U	**5.3 J**	**1.3 J**	**3.1 J**	NA	NA
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	--	0.36 U	**2.1 J**	**0.10 J**	**0.61 J**	NA	NA
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	--	0.41 U	**0.88 J**	**0.16 J**	**2.2 J**	NA	NA
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	--	0.21 U	**0.74 J**	**0.13 J**	**0.84 J**	NA	NA
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**42.8**	**RSK**	**0.0831**	**2.9158**	**0.7146**	**0.6943**	NA	NA

Notes:

1. Screening levels for soil samples are the KDHE RSK (residential soil pathway).
2. Screening levels for groundwater samples are the USEPA MCL.
3. Sources are as follows:
   - RSK - Kansas Department of Health and Environment, Risk-Based Standards for Kansas, RSK Manual - 5th Version, Revised Tables, September 2015.
   - MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.
4. TEQ values are calculated using only positive detections.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

KDHE - Kansas Department of Health and Environment

MCL - maximum contaminant level

NA - not available / not sampled

pg/g - picograms per gram

pg/L - picograms per liter

RSK - Risk-Based Standards for Kansas

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

USEPA - United States Environmental Protection Agency

Table 2-5
IDW Sample Results (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

				Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
				Sample Point:	**Water Drum**	**Drilling Decon H20**	**CFIMW15-01**	**CFIMW15-02**	**CFIMW15-03**	**CFIMW15-04**
				Sample Designator:	**IDW01**	**Liquid IDW**	**Liquid IDW**	**Liquid IDW**	**Liquid IDW**	**Liquid IDW**
				Date Sampled:	**11/25/2014**	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/16/2015**	**4/16/2015**
				Notes:	-	-	-	-	-	-
Parameter	**Units**	**TEF**	**Screening Level**	**Source**						
Dioxins/Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	--	1.1 U	2.5 JU	NA	NA	NA	NA
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	--	**3.5 J**	7.3 JU	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	1.1 U	1.2 JU	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	--	0.58 U	1.7 JU	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	1.3 U	0.38 U	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	1.3 U	**0.53 J**	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	1.6 U	**0.60 J**	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	1.1 U	**0.62 J**	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	1.4 U	**0.54 J**	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	1.3 U	0.25 U	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA		1.2 U	**0.86 J**	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.03	NA	--	3.7 U	0.30 U	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	--	2.4 U	0.43 U	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	1.2 U	**0.63 J**	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	--	3.9 U	0.31 U	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	--	2.0 U	0.26 U	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	1	NA	--	1.1 U	0.38 U	NA	NA	NA	NA
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	--	1.3 U	1.2 JU	NA	NA	NA	NA
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	--	0.58 U	3.2 JU	NA	NA	NA	NA
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	--	1.3 U	**1.8 J**	NA	NA	NA	NA
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	--	1.6 U	**2.0 J**	NA	NA	NA	NA
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	--	3.9 U	0.31 U	NA	NA	NA	NA
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	--	2.4 U	0.43 U	NA	NA	NA	NA
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	--	2.0 U	0.26 U	NA	NA	NA	NA
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	NA	NA	--	1.1 U	0.38 U	NA	NA	NA	NA
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**MCL**	**0.0011**	**0.3780**	NA	NA	NA	NA

Notes:

1. Screening levels for soil samples are the KDHE RSK (residential soil pathway).
2. Screening levels for groundwater samples are the USEPA MCL.
3. Sources are as follows:
   - RSK - Kansas Department of Health and Environment, Risk-Based Standards for Kansas, RSK Manual - 5th Version, Revised Tables, September 2015.
   - MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.
4. TEQ values are calculated using only positive detections.

Bold - compound was detected
Highlighted - concentration exceeds screening level
J - estimated value
KDHE - Kansas Department of Health and Environment
MCL - maximum contaminant level
NA - not available / not sampled
pg/g - picograms per gram
pg/L - picograms per liter
RSK - Risk-Based Standards for Kansas
TEF - Toxicity Equivalence Factor
TEQ - Toxicity Equivalence
U - compound was not detected
USEPA - United States Environmental Protection Agency

Table 2-6
Monitoring Well IDW Sample Results (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-02	CFIMW15-02	CFIMW15-02	CFIMW15-03	CFIMW15-03	CFIMW15-03
			Sample Designator:	GW02	GW03	GW04	GW02	GW03	GW04	GW02	GW03	GW04
			Date Sampled:	8/11/2015	11/10/2015	2/12/2016	8/11/2015	11/10/2015	2/11/2016	8/11/2015	11/10/2015	2/12/2016
			Notes:									
Parameter	**Units**	**Screening Level**	**Source**									
Semivolatile Organic Compounds												
Acenaphthene	ug/L	NA	--	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0047 U
Acenaphthylene	ug/L	NA	--	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0047 U
Anthracene	ug/L	NA	--	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0043 U	0.0042 U
Benzo(a)anthracene	ug/L	NA	--	0.0043 U	0.0044 U	0.0044 U	0.0043 U	0.0044 U	0.0043 U	0.0044 U	0.0044 U	0.0044 U
Benzo(a)pyrene	ug/L	0.2	MCL	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Benzo(b)fluoranthene	ug/L	NA	--	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Benzo(g,h,i)perylene	ug/L	NA	--	0.0052 U	0.0053 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0053 U	0.0052 U
Benzo(k)fluoranthene	ug/L	NA	--	0.0074 U	0.0075 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0075 U	0.0074 U
Chrysene	ug/L	NA	--	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U
Dibenzo(a,h)anthracene	ug/L	NA	--	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Fluoranthene	ug/L	NA	--	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U
Fluorene	ug/L	NA	--	0.0038 U	0.0039 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0039 U	0.0038 U
Indeno(1,2,3-cd)pyrene	ug/L	NA	--	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Naphthalene	ug/L	NA	--	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0047 U
Phenanthrene	ug/L	NA	--	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0061 U	0.0060 U
Pyrene	ug/L	NA	--	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Metals												
Aluminum	ug/L	NA	--	25 U	25 U	25 U	**100 J**	25 U	25 U	58 JU	25 U	**46 J**
Antimony	ug/L	6	MCL	2 U	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2 U	2.0 U	2.0 U
Arsenic	ug/L	10	MCL	**1.6 J**	**1.3 J**	**1.7 J**	**3.7 J**	**3.5 J**	**3.5 J**	**2.6 J**	**2.8 J**	**2.7 J**
Barium	ug/L	2,000	MCL	**190**	**210**	**220**	**110**	**140**	**120**	**110**	**110**	**110**
Beryllium	ug/L	4	MCL	0.2 U	0.20 U	0.20 U	0.2 U	0.20 U	0.20 U	0.2 U	0.20 U	0.20 U
Cadmium	ug/L	5	MCL	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U
Calcium	ug/L	NA	--	**180,000**	**170,000**	**190,000**	**180,000 J**	**280,000 J**	**260,000 J**	**150,000**	**150,000**	**150,000**
Chromium	ug/L	100	MCL	1.5 U	**1.5 J**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	NA	--	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Copper	ug/L	1,300	MCL	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Iron	ug/L	NA	--	25 U	25.0 U	25.0 U	87 JU	25.0 U	25.0 U	43 JU	25.0 U	**35.0 J**
Lead	ug/L	15	MCL	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Magnesium	ug/L	NA	--	**35,000**	**32,000**	**36,000**	**42,000 J**	**51,000 J**	**55,000 J**	**31,000**	**30,000**	**32,000**
Manganese	ug/L	NA	--	2 U	2.0 U	2.0 U	2 U	2.0 U	2.0 U	**3.1 J**	2.0 U	2.0 U
Mercury	ug/L	2	MCL	0.1 U	0.10 U	0.10 U	0.1 U	0.10 U	0.10 U	0.1 U	0.10 U	0.10 U
Nickel	ug/L	NA	--	**1.4 J**	**1.6 J**	**1.5 J**	**1.7 J**	**1.7 J**	**1.7 J**	**2.9 J**	**2.5 J**	**2.7 J**
Potassium	ug/L	NA	--	**3,100**	**2,700**	**3,100**	**3,200**	**3,200**	**3,500 J**	**2,600**	**2,400**	**2,500**
Selenium	ug/L	50	MCL	**3.8**	**2.4 J**	**2.6 J**	**4.7**	**13**	**12**	1 U	**1.0 J**	1.0 U
Silver	ug/L	NA	--	0.3 U	0.30 U	0.30 U	0.3 U	0.30 U	0.30 U	0.3 U	0.30 U	0.30 U
Sodium	ug/L	NA	--	**39,000**	**39,000**	**41,000**	**41,000 J**	**45,000 J**	**50,000 J**	**47,000**	**45,000**	**48,000**
Thallium	ug/L	2	MCL	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U
Vanadium	ug/L	NA	--	6 U	6.0 U	6.0 U	9.3 J	**10 J**	**10 J**	6 U	6.0 U	6.0 U
Zinc	ug/L	NA	--	4 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U

Table 2-6
Monitoring Well IDW Sample Results (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	CFIMW15-04	CFIMW15-04	CFIMW15-04	CFIMW15-04	CFIMW15-04	CFIMW15-04
			Sample Designator:	GW02	GW22	GW03	GW33	GW44	GW44
			Date Sampled:	8/11/2015	8/11/2015	11/10/2015	11/10/2015	2/12/2016	2/12/2016
			Notes:		Duplicate		Duplicate		Duplicate
Parameter	**Units**	**Screening Level**	**Source**						
Semivolatile Organic Compounds									
Acenaphthene	ug/L	NA	--	0.0047 U	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0047 U
Acenaphthylene	ug/L	NA	--	0.0047 U	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0047 U
Anthracene	ug/L	NA	--	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Benzo(a)anthracene	ug/L	NA	--	0.0043 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U
Benzo(a)pyrene	ug/L	0.2	MCL	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Benzo(b)fluoranthene	ug/L	NA	--	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Benzo(g,h,i)perylene	ug/L	NA	--	0.0052 U	0.0052 U	0.0053 U	0.0052 U	0.0052 U	0.0052 U
Benzo(k)fluoranthene	ug/L	NA	--	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U
Chrysene	ug/L	NA	--	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U
Dibenzo(a,h)anthracene	ug/L	NA	--	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Fluoranthene	ug/L	NA	--	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U
Fluorene	ug/L	NA	--	0.0038 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U
Indeno(1,2,3-cd)pyrene	ug/L	NA	--	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Naphthalene	ug/L	NA	--	0.0047 U	0.0047 U	0.0048 U	0.0048 U	0.0047 U	0.0047 U
Phenanthrene	ug/L	NA	--	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U
Pyrene	ug/L	NA	--	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Metals									
Aluminum	ug/L	NA	--	25 U	25 U	25 U	25 U	25 U	25 U
Antimony	ug/L	6	MCL	2 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	10	MCL	**6.3**	**6.5**	**7.3**	**7.6**	**7.1**	**7.1**
Barium	ug/L	2,000	MCL	**110**	**110**	**100**	**100**	**100**	**110**
Beryllium	ug/L	4	MCL	0.2 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	ug/L	5	MCL	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U
Calcium	ug/L	NA	--	**150,000**	**150,000**	**140,000**	**140,000**	**140,000**	**150,000**
Chromium	ug/L	100	MCL	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	NA	--	1 U	1 U	1.0 U	1.0 U	**1.0 J**	**1.0 J**
Copper	ug/L	1,300	MCL	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Iron	ug/L	NA	--	39 JU	39 JU	**36 J**	**38 J**	**100**	**110**
Lead	ug/L	15	MCL	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Magnesium	ug/L	NA	--	**32,000**	**32,000**	**27,000**	**28,000**	**31,000**	**31,000**
Manganese	ug/L	NA	--	**280**	**280**	**230**	**280**	**260**	**260**
Mercury	ug/L	2	MCL	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	ug/L	NA	--	**3.8**	**3.8**	**3.6**	**3.7**	**3.7**	**4.2**
Potassium	ug/L	NA	--	**3,500**	**3,500**	**3,100**	**3,300**	**3,300**	**3,400**
Selenium	ug/L	50	MCL	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Silver	ug/L	NA	--	0.3 U	0.3 U	0.30 U	0.30 U	0.30 U	0.30 U
Sodium	ug/L	NA	--	**39,000**	**39,000**	**38,000**	**39,000**	**40,000**	**41,000**
Thallium	ug/L	2	MCL	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U
Vanadium	ug/L	NA	--	6 U	6 U	6.0 U	6.0 U	6.0 U	6.0 U
Zinc	ug/L	NA	--	4 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U

Notes:

1. Screening levels for groundwater samples are the USEPA MCL.
2. Sources are as follows:
   - MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

MCL - maximum contaminant level

NA - not available

U - compound was not detected

USEPA - United States Environmental Protection Agency

ug/L = micrograms per Liter

Table 2-7
Monitoring Well IDW Sample Results (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

				Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
				Sample Point:	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-02	CFIMW15-02	CFIMW15-02	CFIMW15-03	CFIMW15-03	CFIMW15-03
				Sample Designator:	GW02	GW03	GW04	GW02	GW03	GW04	GW02	GW03	GW04
				Date Sampled:	8/11/2015	11/10/2015	2/12/2016	8/11/2015	11/10/2015	2/11/2016	8/11/2015	11/10/2015	2/12/2016
				Notes:									
Parameter	**Units**	**TEF**	**Screening Level**	**Source**									
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	--	**2.7 J**	4.6 JU	3.4 JU	3.3 JU	1.2 JU	2.5 JU	**2.1 J**	**300**	4.9 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	--	0.53 U	5.8 JU	3.2 JU	1.3 JU	11.0 JU	2.4 JU	**0.81 J**	**89 J**	4.7 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	--	**0.53 J**	1.2 JU	0.86 JU	0.69 JU	0.84 JU	0.74 JU	**0.24 J**	**13 J**	2.1 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	**0.24 J**	2.1 JU	0.96 JU	0.38 JU	2.2 JU	0.46 JU	**0.19 J**	**19 J**	1.6 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	0.14 U	**1.0 J**	0.35 U	0.55 JU	**1.1 J**	0.30 U	0.15 U	**2.7 J**	1.3 JU
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	0.25 U	0.15 U	0.29 U	0.25 U	0.16 U	0.26 U	0.23 U	0.11 U	0.36 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	0.27 U	0.26 U	0.30 U	0.31 U	0.50 U	0.23 U	0.22 U	2.3 JU	1.0 JU
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	0.22 U	0.12 U	0.28 U	0.43 JU	0.13 U	0.25 U	0.20 U	0.086 U	0.35 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	0.24 U	**0.59 J**	0.28 U	0.27 U	0.40 U	0.21 U	0.19 U	**0.71 J**	1.0 JU
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	0.21 U	0.77 JU	0.25 U	0.21 U	0.12 U	0.22 U	0.19 U	0.36 JU	1.8 JU
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA		0.28 U	0.90 JU	0.31 U	0.32 U	0.49 U	0.24 U	0.23 U	0.49 JU	1.8 JU
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	--	0.33 U	0.17 U	0.38 U	0.41 U	0.15 U	0.48 U	0.27 U	0.13 U	0.48 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.03	NA	--	0.25 U	0.44 JU	0.25 U	0.26 U	0.23 U	0.28 U	0.21 U	0.21 JU	0.38 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	0.26 U	0.94 JU	0.29 U	0.35 JU	0.47 U	0.23 U	0.21 U	0.41 U	1.4 JU
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	--	0.26 U	0.33 JU	0.25 U	0.27 U	0.24 U	0.28 U	0.22 U	0.15 U	0.78 JU
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	1	NA	--	0.34 U	0.12 U	0.28 U	0.31 U	0.13 U	0.37 U	0.31 U	0.15 U	0.34 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	--	0.25 U	**0.18 J**	0.22 U	0.29 U	0.16 U	0.25 U	0.21 U	0.080 U	0.28 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	--	**1.1 J**	1.9 JU	1.7 JU	1.4 JU	2.0 JU	1.8 JU	**1.0 J**	**22 J**	2.9 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	--	**0.24 J**	3.1 JU	0.96 JU	0.93 JU	3.3 JU	0.46 JU	**0.19 J**	**44 J**	2.9 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	--	0.25 U	0.77 JU	0.29 U	0.43 JU	0.16 U	0.26 U	0.23 U	0.60 JU	1.8 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	--	0.28 U	2.4 JU	0.31 U	0.35 JU	0.50 U	0.24 U	0.23 U	4.70 JU	5.2 JU
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	--	0.33 U	0.17 U	0.38 U	0.41 U	0.15 U	0.48 U	0.27 U	0.13 U	0.48 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	--	0.26 U	0.77 JU	0.25 U	0.27 U	0.24 U	0.28 U	0.22 U	0.21 JU	0.78 JU
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	NA	NA	--	0.34 U	0.12 U	0.28 U	0.31 U	0.13 U	0.37 U	0.31 U	0.15 U	0.34 U
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	--	0.25 U	**0.18 J**	0.22 U	0.29 U	0.16 U	0.25 U	0.21 U	0.080 U	0.280 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**MCL**	**0.0085**	**0.0280**	0	0	**0.0110**	0	**0.0052**	**0.5347**	0

Table 2-7
Monitoring Well IDW Sample Results (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

				Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
				Sample Point:	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**
				Sample Designator:	**GW02**	**GW22**	**GW03**	**GW33**	**GW44**	**GW44**
				Date Sampled:	**8/11/2015**	**8/11/2015**	**11/10/2015**	**11/10/2015**	**2/12/2016**	**2/12/2016**
				Notes:		**Duplicate**		**Duplicate**		**Duplicate**
Parameter	**Units**	**TEF**	**Screening Level**	**Source**						
Dioxins/Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	--	**4.8 J**	4.2 JU	4.5 JU	1.8 JU	33 JU	3.2 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	--	3.4 JU	2.5 JU	9.6 JU	7.0 JU	5.9 JU	2.1 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	--	**2.3 J**	1.3 JU	1.3 JU	0.38 JU	4.1 JU	0.26 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	**1.5 J**	0.95 JU	2.5 JU	1.6 JU	2.2 JU	0.53 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	--	**1.2 J**	0.65 JU	**1.2 J**	**0.49 J**	1.9 JU	0.35 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	**1.2 J**	0.25 U	0.14	0.13 U	1.6 JU	0.26 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	**1.2 J**	0.28 U	0.48 JU	0.33 U	1.1 JU	0.51 JU
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	**0.99 J**	0.46 U	0.11	0.11 U	1.8 JU	0.25 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	**1.7 J**	0.25 U	0.33	0.26 U	1.1 JU	0.58 JU
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	--	**0.93 J**	0.40 JU	0.63 JU	0.10 U	1.9 JU	0.45 JU
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA		**0.96 J**	0.29 U	0.84 JU	0.32 U	**1.3 J**	0.69 JU
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	--	**1.6 J**	0.32 U	0.24 JU	0.17 U	**2.1 J**	0.37 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.03	NA	--	**1.4 J**	0.25 U	0.19	0.17 U	**1.6**	0.31 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	--	**1.5 J**	0.28 JU	0.56 JU	0.31 U	1.2 JU	0.49 JU
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	--	**1.1 J**	0.26 U	0.20	0.18 U	**1.2 J**	0.31 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	1	NA	--	0.30 U	0.28 U	0.12	0.11 U	0.35 U	0.26 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	--	0.24 U	0.23 U	0.11	0.10 U	0.31 U	0.19 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	--	**2.8 J**	2.0 JU	2.1 JU	1.0 JU	6.1 JU	0.78 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	--	**2.7 J**	1.6 JU	3.7 JU	2.1 JU	4.1 JU	0.53 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	--	**3.1 J**	0.40 JU	0.63 JU	0.13 U	5.2 JU	0.45 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	--	**5.4 J**	0.28 JU	1.9 JU	0.33 U	4.7 JU	2.3 JU
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	--	**1.6 J**	0.32 U	0.24 JU	0.17 U	**2.1 J**	0.37 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	--	**2.5 J**	0.26 U	0.20	0.18 U	**2.8 J**	0.31 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	NA	NA	--	0.30 U	0.28 U	0.17 JU	0.11 U	0.35 U	0.26 U
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	--	0.24 U	0.23 U	0.11 U	0.10 U	0.31 U	0.19 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**MCL**	**2.8714**	0	**0.0120**	**0.0049**	**2.6380**	0

Notes:

1. Screening levels for groundwater samples are the USEPA MCL.
2. Sources are as follows:
   - MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009.
3. TEQ values are calculated using only positive detections.

Bold - compound was detected
Highlighted - concentration exceeds screening level
J - estimated value
MCL - maximum contaminant level
NA - not available / not sampled
pg/L - picograms per liter
TEF - Toxicity Equivalence Factor
TEQ - Toxicity Equivalence
U - compound was not detected
USEPA - United States Environmental Protection Agency

Table 3-1
Quarterly Groundwater Elevations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Well ID	TOC Elevation (ft amsl)	TOC DTW May 2015 (Spring) (ft)	TOC DTW Aug 2015 (Summer) (ft)	TOC DTW Nov 2015 (Fall) (ft)	TOC DTW Feb 2016 (Winter) (ft)	WL Elevation May 2015 (Spring) (ft amsl)	WL Elevation Aug 2015 (Summer) (ft amsl)	WL Elevation Nov 2015 (Fall) (ft amsl)	WL Elevation Feb 2016 (Winter) (ft amsl)
CFIMW15-01	1066.21	34.19	32.44	33.54	32.85	1032.02	1033.77	1032.67	1033.36
CFIMW15-02	1049.01	17.34	15.68	16.68	16.01	1031.67	1033.33	1032.33	1033.00
CFIMW15-03	1047.76	16.43	14.93	15.94	15.22	1031.33	1032.83	1031.82	1032.54
CFIMW15-04	1050.19	19.33	17.57	18.56	17.87	1030.86	1032.62	1031.63	1032.32

Notes:

amsl - Above Mean Sea Level

DTW - Depth to Water

ft - Feet

TOC - Top of Casing

WL - Water Level

Table 3-2
Summary of *In-Situ* Hydraulic Conductivity Testing
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Estimated Hydraulic Conductivity (K)													
	Test	Bouwer-Rice (Test 1)		Bouwer-Rice (Test 2)		Springer-Gelhar (Test 1)		Springer-Gelhar (Test 2)		Bouwer-Rice Average		Springer-Gelhar Average		Overall Average	
Well ID	Type	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)	K (cm/sec)	K (ft/day)
CFIMW15-01	Rising Head	8.46E-03	23.98	2.06E-02	58.39	5.58E-03	15.82	5.36E-03	15.20	1.45E-02	41.19	5.47E-03	15.51	1.00E-02	28.35
CFIMW15-02	Rising Head	8.41E-03	23.83	1.39E-02	39.43	3.34E-03	9.46	5.38E-03	15.24	1.12E-02	31.63	4.36E-03	12.35	7.76E-03	21.99
CFIMW15-03	Rising Head	7.81E-03	22.13	2.04E-02	57.80	4.51E-03	12.80	9.06E-03	25.68	1.41E-02	39.96	6.79E-03	19.24	1.04E-02	29.60
CFIMW15-04	Rising Head	6.51E-03	18.44	2.18E-02	61.88	5.43E-03	15.39	4.67E-03	13.23	1.42E-02	40.16	5.05E-03	14.31	9.61E-03	27.24
	Maximum K	***8.46E-03***	***23.98***	***2.18E-02***	***61.88***	***5.58E-03***	***15.82***	***9.06E-03***	***25.68***	***1.45E-02***	***41.19***	***6.79E-03***	***19.24***	***1.04E-02***	***29.60***
	Average K	***7.79E-03***	***22.10***	***1.92E-02***	***54.38***	***4.72E-03***	***13.37***	***6.12E-03***	***17.34***	***1.35E-02***	***38.24***	***5.42E-03***	***15.35***	***9.45E-03***	***26.79***
	Minimum K	***6.51E-03***	***18.44***	***1.39E-02***	***39.43***	***3.34E-03***	***9.46***	***4.67E-03***	***13.23***	***1.12E-02***	***31.63***	***4.36E-03***	***12.35***	***7.76E-03***	***21.99***

Notes:
1. Estimated hydraulic conductivities calculated in AQTESOLV computer software using data collected during in-situ hydraulic conductivity testing ("slug tests").
2. Analysis of slug test data was performed using the Bouwer and Rice (1976) and Springer-Gelhar (1991) methods for unconfined/semi-confined conditions.
3. Slug test data is provided in Appendix I.

cm/sec- centimeter per second
ft/day - feet per day
K - hydraulic conductivity

Table 3-3
Listed and Rare Species Occuring and Potentially Occuring in the Fort Riley Area
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Common Name	Scientific Name	Federal Status	State Status	Known to Occur in Geary County	Known to Occur in Riley County
American Burying Beetle	*Nicrophorus americanus*	E	E	Yes	Yes
Black Rail	*Laterallus jamaicensis*	None	SINC	No	Yes
Black Tern	*Chlidonias niger*	None	SINC	Yes	Yes
Blue Sucker	*Cycleptus elongatus*	None	SINC	No	Yes
Bobolink	*Dolichonyx oryzivorus*	None	SINC	Yes	Yes
Common Shiner	*Luxilus cornutus*	None	SINC	Yes	Yes
Eastern Hognose Snake	*Heterodon platirhinos*	None	SINC	Yes	Yes
Eastern Spotted Skunk	*Spilogale putorius*	None	T	Yes	Yes
Eastern Whip-Poor-Will	*Caprimulgus vociferus*	None	SINC	Yes	Yes
Ferruginous Hawk	*Buteo regalis*	None	SINC	Yes	Yes
Franklin's Ground Squirrel	*Spermophilus franklinii*	None	SINC	No	Yes
Golden Eagle	*Aquila chrysaetos*	None	SINC	Yes	Yes
Greenside Darter	*Etheostoma blennioides*	None	SINC	No	Yes
Henslow's Sparrow	*Ammodramus henslowii*	None	SINC	Yes	Yes
Highfin Carpsucker	*Carpiodes velifer*	None	SINC	No	Yes
Johnny Darter	*Etheostoma nigurm*	None	SINC	Yes	Yes
Least Tern	*Sterna antillarum*	E	E	Yes-Critical Habitat Designated[1]	Yes-Critical Habitat Designated[1]
Long-billed Curlew	*Numenius americanus*	None	SINC	Yes	Yes
Nothern Long-eared Bat	*Myotis septentrionalis*	T	None	Yes	Yes
Ozark Emerald Dragonfly	*Somatochlora ozarkensis*	None	SINC	No	Yes
Piping Plover	*Charadrius melodus*	T	T	Yes-Critical Habitat Designated[1]	Yes-Critical Habitat Designated[1]
Plains Minnow	*Hybognathus placitus*	None	T	Yes-Temporary Critical Habitat Designated[2]	Yes-Temporary Critical Habitat Designated[2]
Praire Mole Cricket	*Gryllotalpa major*	None	SINC	No	Yes
Shoal Chub	*Macrhybopsis histoma*	None	T	Yes-Temporary Critical Habitat Designated[3]	Yes
Short-Eared Owl	*Asio flammeus*	None	SINC	Yes	Yes
Silver Chub	*Macrhybopsis storeriana*	None	E	Yes-Critical Habitat Designated[4]	Yes
Snowy Plover	*Charadrius alexandrinus*	None	T	Yes	Yes
Southern Bog Lemming	*Synaptomys copperi*	None	SINC	No	Yes
Southern Redbelly Dace	*Chrosomus erythrogaster*	None	SINC	Yes	Yes
Sprague's Pipit	*Anthus spragueii*	C	None	Yes	Yes
Sturgeon Chub	*Macrhybopsis gelida*	C	T	Yes-Critical Habitat Designated[5]	Yes-Critical Habitat Designated[5]
Timber Rattlesnake	*Crotalus horridus*	None	SINC	Yes	Yes
Topeka Shiner	*Notropis topeka*	E	T	Yes-Critical Habitat Designated[6]	Yes-Critical Habitat Designated[6]
Wabash Pigtoe Mussel	*Fusconaia flava*	None	SINC	Yes	No
Western Hognosed Snake	*Heterodon nasicus*	None	SINC	Yes	Yes
Whooping Crane	*Grus americana*	E	E	No	Yes
Yellow-throated Warbler	*Dendroica dominica*	None	SINC	Yes	Yes

Table 3-3
Listed and Rare Species Occuring and Potentially Occuring in the Fort Riley Area
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Notes:

Species listsed on Kansas Wildlife, Parks & Tourism (http://ksoutdoors.com/Services/Threatened-and-Endangered-Wildlife/List-of-all-Kansas-Counties) and USFWS (https://ecos.fws.gov/ipac/) county lists (accessed March 31, 2016).

[1] All the waters within a corridor along the main stem of the Kansas River from the confluence of the Republican River and Smoky Hill River on Fort Riley in Geary County to the confluence of the Missouri River in Kansas City, Wyandotte County.

[2] The Kansas River in Geary and Riley Counties.

[3] The Kansas River in Geary County.

[4] The Kansas River from the confluence of the Republican and Smoky Hill Rivers to the Missouri River (Section 1 & 2, Township 11 South, Range 25 East).

[5] The main stem of the Kansas River from its start at the confluence of the Republican River and Smoky Hill River on Fort Riley in Geary County to the confluence of the Missouri River in Kansas City, Wyandotte County.

[6] Cary Creek and its tributaries in Dickinson County from where it crosses the Dickinson/Geary County line (Sec. 6, T14S, R5E) upstream to its headwaters (Sec. 33, T15S, R3E); Thomas Creek and Dry Creek in Geary County; Little Arkansas Creek and Seven-mile Creek in Riley County; Deep Creek main stem in Riley County from where it crosses the Riley/Wabaunsee County line (Sec. 22, T10S, R9E) upstream to Interstate Highway 70 (Sec. 25, T11S, R9E).

C = Candidate; E = Endangered; SINC = Species in Need of Conservation; T = Threatened

Table 4-1
Human Health Screening Levels Used and Sources
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Soil[1]

Detected Parameter	Units	Screening Level	Carcinogen or Noncarcinogen	Source[4]
Dioxins/Furans				
2,3,7,8-TCDD	pg/g	4.8	Carcinogen	RSL
Total Petroleum Hydrocarbons				
Diesel Range Organics	mg/kg	2,000	Noncarcinogen	RSK
Gasoline Range Organics	mg/kg	220	Noncarcinogen	RSK
Semivolatile Organic Compounds				
Acenaphthene	mg/kg	3,600	Noncarcinogen	RSL
Acenapthylene	mg/kg	NA	Noncarcinogen	NA
Anthracene	mg/kg	18,000	Noncarcinogen	RSL
Benzo(a)anthracene	mg/kg	0.16	Carcinogen	RSL
Benzo(a)pyrene	mg/kg	0.016	Carcinogen	RSL
Benzo(b)fluoranthene	mg/kg	0.16	Carcinogen	RSL
Benzo(g,h,i)perylene	mg/kg	NA	Carcinogen	NA
Benzo(k)fluoranthracene	mg/kg	1.6	Carcinogen	RSL
Chrysene	mg/kg	16	Carcinogen	RSL
Dibenzo(a,h)anthracene	mg/kg	0.016	Carcinogen	RSL
Dibenzofuran	mg/kg	73	Noncarcinogen	RSL
Dimethyl phthalate	mg/kg	NA	Noncarcinogen	NA
Fluoranthene	mg/kg	2,400	Noncarcinogen	RSL
Fluorene	mg/kg	2,400	Noncarcinogen	RSL
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	Carcinogen	RSL
1-Methylnaphthalene	mg/kg	18	Carcinogen	RSL
2-Methylnaphthalene	mg/kg	240	Noncarcinogen	RSL
Naphthalene	mg/kg	3.8	Carcinogen	RSL
Phenanthrene	mg/kg	NA	Noncarcinogen	NA
Pyrene	mg/kg	1,800	Noncarcinogen	RSL

Detected Parameter	Units	Screening Level	Carcinogen or Noncarcinogen	Source[4]
Metals				
Aluminum	mg/kg	77,000	Noncarcinogen	RSL
Antimony	mg/kg	31	Noncarcinogen	RSL
Arsenic	mg/kg	0.68	Carcinogen	RSL
Barium	mg/kg	15,000	Noncarcinogen	RSL
Beryllium	mg/kg	160	Noncarcinogen	RSL
Cadmium	mg/kg	71	Noncarcinogen	RSL
Calcium	mg/kg	NA	Noncarcinogen	NA
Chromium[5]	mg/kg	33.6	Carcinogen	RSK
Cobalt	mg/kg	23	Noncarcinogen	RSL
Copper	mg/kg	3,100	Noncarcinogen	RSL
Iron	mg/kg	55,000	Noncarcinogen	RSL
Lead	mg/kg	400	Carcinogen	RSL
Magnesium	mg/kg	NA	Noncarcinogen	NA
Manganese	mg/kg	1,800	Noncarcinogen	RSL
Mercury[6]	mg/kg	11	Noncarcinogen	RSL
Methyl Mercury	mg/kg	7.8	Noncarcinogen	RSL
Nickel	mg/kg	1,500	Noncarcinogen	RSL
Potassium	mg/kg	NA	Noncarcinogen	NA
Selenium	mg/kg	390	Noncarcinogen	RSL
Silver	mg/kg	390	Noncarcinogen	RSL
Sodium	mg/kg	NA	Noncarcinogen	NA
Thallium[7]	mg/kg	0.78	Noncarcinogen	RSL
Vanadium	mg/kg	390	Noncarcinogen	RSL
Zinc	mg/kg	23,000	Noncarcinogen	RSL

Stream Sediment[1]

Detected Parameter	Units	Screening Level	Carcinogen or Noncarcinogen	Source[4]
Dioxins/Furans				
2,3,7,8-TCDD	pg/g	4.8	Carcinogen	RSL
Total Petroleum Hydrocarbons				
Diesel Range Organics	mg/kg	2,000	Noncarcinogen	RSK
Metals				
Aluminum	mg/kg	77,000	Noncarcinogen	RSL
Antimony	mg/kg	31	Noncarcinogen	RSL
Arsenic	mg/kg	0.68	Carcinogen	RSL
Barium	mg/kg	15,000	Noncarcinogen	RSL
Beryllium	mg/kg	160	Noncarcinogen	RSL
Cadmium	mg/kg	71	Noncarcinogen	RSL
Calcium	mg/kg	NA	Noncarcinogen	NA
Chromium[5]	mg/kg	33.6	Carcinogen	RSK
Cobalt	mg/kg	23	Noncarcinogen	RSL
Copper	mg/kg	3,100	Noncarcinogen	RSL
Iron	mg/kg	55,000	Noncarcinogen	RSL
Lead	mg/kg	400	Carcinogen	RSL
Magnesium	mg/kg	NA	Noncarcinogen	NA
Manganese	mg/kg	1,800	Noncarcinogen	RSL
Mercury[6]	mg/kg	11	Noncarcinogen	RSL
Methyl Mercury	mg/kg	7.8	Noncarcinogen	RSL
Nickel	mg/kg	1,500	Noncarcinogen	RSL
Potassium	mg/kg	NA	Noncarcinogen	NA
Selenium	mg/kg	390	Noncarcinogen	RSL
Silver	mg/kg	390	Noncarcinogen	RSL
Sodium	mg/kg	NA	Noncarcinogen	NA
Vanadium	mg/kg	390	Noncarcinogen	RSL
Zinc	mg/kg	23,000	Noncarcinogen	RSL

Table 4-1
Human Health Screening Levels Used and Sources
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Surface Water[2]				
Detected Parameter	**Units**	**Screening Level**	**Carcinogen or Noncarcinogen**	**Source[4]**
Dioxins/Furans				
2,3,7,8-TCDD	pg/L	0.013[8]	Carcinogen	KSWQS
Total Petroleum Hydrocarbons				
Diesel Range Organics	µg/L	NA	Noncarcinogen	NA
Semivolatile Organic Compounds				
Benzo(a)pyrene	µg/L	0.0028[8]	Carcinogen	KSWQS
Benzo(k)fluoranthene	µg/L	0.0038[8]	Carcinogen	KSWQS
Chrysene	µg/L	0.0038[8]	Carcinogen	KSWQS
Pyrene	µg/L	960[8]	Noncarcinogen	KSWQS
Metals				
Aluminum, dissolved	µg/L	NA	Noncarcinogen	NA
Arsenic, dissolved	µg/L	10	Carcinogen	KSWQS
Barium, dissolved	µg/L	2,000	Noncarcinogen	KSWQS
Calcium, dissolved	µg/L	NA	Noncarcinogen	NA
Copper, dissolved	µg/L	1,000	Noncarcinogen	KSWQS
Magnesium, dissolved	µg/L	NA	Noncarcinogen	NA
Manganese, dissolved	µg/L	NA	Noncarcinogen	NA
Mercury, dissolved	µg/L	2	Noncarcinogen	KSWQS
Methyl Mercury	µg/L	NA	Noncarcinogen	NA
Nickel, dissolved	µg/L	610	Noncarcinogen	KSWQS
Potassium, dissolved	µg/L	NA	Noncarcinogen	NA
Sodium, dissolved	µg/L	NA	Noncarcinogen	NA
Vanadium, dissolved	µg/L	NA	Noncarcinogen	NA
Zinc, dissolved	µg/L	5,000	Noncarcinogen	KSWQS

Groundwater[3]				
Detected Parameter	**Units**	**Screening Level**	**Carcinogen or Noncarcinogen**	**Source[4]**
Dioxins/Furans				
2,3,7,8-TCDD	pg/L	30	Carcinogen	MCL
Volatile Organic Compounds				
Ethylbenzene	µg/L	700	Carcinogen	MCL
Toluene	µg/L	1,000	Noncarcinogen	MCL
Semivolatile Organic Compounds				
Acenapthylene	µg/L	NA	Noncarcinogen	NA
Fluoranthene	µg/L	800	Noncarcinogen	RSL
Naphthalene	µg/L	0.17	Carcinogen	RSL
Phenanthrene	µg/L	NA	Noncarcinogen	NA
Pyrene	µg/L	120	Noncarcinogen	RSL
Metals				
Aluminum, dissolved and total	µg/L	20,000	Noncarcinogen	RSL
Arsenic, dissolved and total	µg/L	10	Carcinogen	MCL
Barium, dissolved and total	µg/L	2,000	Noncarcinogen	MCL
Beryllium, dissolved and total	µg/L	4	Noncarcinogen	MCL
Calcium, dissolved and total	µg/L	NA	Noncarcinogen	NA
Chromium, dissolved and total	µg/L	100	Carcinogen	MCL
Cobalt, dissolved and total	µg/L	6	Noncarcinogen	RSL
Copper, dissolved and total	µg/L	1,300	Noncarcinogen	MCL
Iron, dissolved and total	µg/L	14,000	Noncarcinogen	RSL
Lead, dissolved and total	µg/L	15	Carcinogen	MCL
Magnesium, dissolved and total	µg/L	NA	Noncarcinogen	NA
Manganese, dissolved and total	µg/L	430	Noncarcinogen	RSL
Methyl Mercury	µg/L	2	Noncarcinogen	RSL
Nickel, dissolved and total	µg/L	390	Noncarcinogen	RSL
Potassium, dissolved and total	µg/L	NA	Noncarcinogen	NA
Selenium, dissolved and total	µg/L	50	Noncarcinogen	MCL
Sodium, dissolved and total	µg/L	NA	Noncarcinogen	NA
Vanadium, dissolved and total	µg/L	86	Noncarcinogen	RSL
Zinc, dissolved and total	µg/L	6,000	Noncarcinogen	RSL
Groundwater Quality Parameters				
Chloride	mg/L	250	Noncarcinogen	sMCL
Nitrogen, Nitrate	mg/L	10	Noncarcinogen	sMCL
Nitrogen, Nitrite	mg/L	1	Noncarcinogen	sMCL
Sulfate	mg/L	25	Noncarcinogen	sMCL

Table 4-1
Human Health Screening Levels Used and Sources
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Notes:

[1] Screening levels for soil and stream sediment samples, in order of applicability, are: USEPA RSLs (residential) or KDHE RSKs (residential) with the exception of chromium (see Note 5).

[2] Screening levels for surface water samples, in order of applicability, are: KDHE SWQs (public health domestic water supply) or USEPA NRWQCs, Human Health Criteria Table (human health for the consumption of water plus organism).

[3] Screening levels for groundwater samples, in order of applicability, are: USEPA MCLs, USEPA RSLs (tapwater), or KDHE RSKs (residential groundwater).

[4] Sources are as follows:

- RSL - United States Environmental Protection Agency, Regional Screening Level (RSL) THQ 1.0 Summary Table, May 2016. Access: http://www.epa.gov/region9/superfund/prg/
- RSK - Kansas Department of Health and Environment, Risk-Based Standards for Kansas, RSK Manual - 5th Version, Revised Tables, September 2015. Access: http://www.kdheks.gov/remedial/download/RSK_Manual_15.pdf
- MCL - United States Environmental Protection Agency, National Primary (and/or Secondary) Drinking Water Regulations, EPA 816-F-09-004, May 2009. Access: http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf
- NRWQC - National Recommended Water Quality Criteria, Human Health Criteria Table. Access: http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#content
- KSWQS - Kansas Department of Health and Environment, Kansas Surface Water Quality Standards, January 2015. Access: http://www.kdheks.gov/water/download/kwqs_plus_supporting.pdf

[5] Value represents KDHEs total chromium screening value.

[6] Value represents elemental mercury.

[7] Value represents thallium (soluble salts).

KDHE = Kansas Department of Health and Environment
KSWQS = Kansas Department of Health and Environment Surface Water Quality Standards
MCL = Maximum Contaminant Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = Not available
NRWQC = National Recommended Water Quality Criteria
pg/g = picograms per gram
pg/L = picograms per liter
RSK = Risk-Based Standards for Kansas
RSL = Regional Screening Level
sMCL = Secondary Maximum Contaminant Level (non-enforceable guidelines regarding contaminants that may cause cosmetic effects[such as skin or tooth discoloration] or aesthetic effects [such as taste, odor, or color] in drinking water)
USEPA = United States Environmental Protection Agency
µg/L = micrograms per liter
2,3,7,8-TCDD = 2,3,7,8-Tetrachlorodibenzo-p-dioxin

Table 4-2
Toxicity Equivalence Factors
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Compound	Toxicity Equivalence Factor[1]
Dioxins/Furans	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.0003
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	0.0003
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.01
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.01
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.1
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.03
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.3
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1
Total Heptachlorodibenzofuran (HpCDF)	NA
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA
Total Hexachlorodibenzofuran (HxCDF)	NA
Total Hexachlorodibenzo-p-dioxin (HxCDD)	NA
Total Pentachlorodibenzofuran (PeCDF)	NA
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA
Total Tetrachlorodibenzofuran (TCDF)	NA
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA

Notes:
[1] Toxicity equivalence factors obtained from the World Health Organization (Van den Berg et al., 2006).
NA - not applicable

Table 4-3
Background Soil Samples, Detected Analytes
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Group Name:		CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
Sample Point:		BG01	BG01	BG02	BG02	BG02	BG03	BG03	BG04	BG04	BG04	BG05	BG05	BG06	BG06	BG07	BG07
Sample Designator:		SB01	SB02	SB01	SB11	SB02	SB01	SB02	SB01	SB02	SB22	SB01	SB02	SB01	SB02	SB01	SB02
Sample Interval (ft bgs):		0 - 0.5	3 - 4	0 - 0.5	0 - 0.5	3 - 4	0 - 0.5	3 - 4	0 - 0.5	3 - 4	3 - 4	0 - 0.5	3 - 4	0 - 0.5	3 - 4	0 - 0.5	3 - 4
Sample Location:		UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	FPS	FPS	FPS	FPS	FPS	FPS
Date Sampled:		1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014
Notes:					Duplicate						Duplicate						
Parameter	**Units**																
Semivolatile Organic Compounds																	
Acenaphthene	mg/kg	**0.0068**	0.00081 U	**0.016**	**0.0047**	0.00084 U	**0.0025**	0.00079 U	**0.0028**	0.00083 U	0.00083 U	0.00083 U	0.00082 U	0.00082 U	0.00081 U	0.00085 U	0.00084 U
Acenaphthylene	mg/kg	**0.016**	0.0004 U	**0.033**	**0.024**	0.00042 U	**0.0062**	0.00039 U	**0.0071**	0.00042 U	0.00042 U	**0.0015 J**	0.00041 U	**0.0014 J**	0.00041 U	**0.0014 J**	0.00042 U
Anthracene	mg/kg	**0.023**	0.0004 U	**0.041**	**0.03**	**0.00049 J**	**0.0095**	0.00039 U	**0.012**	**0.00059 J**	0.00042 U	**0.0022**	0.00041 U	**0.002 J**	0.00041 U	**0.0022**	0.00042 U
Benzo(a)anthracene	mg/kg	**0.038**	0.00081 U	**0.062**	**0.039**	**0.00089 J**	**0.019**	0.00079 U	**0.022**	**0.0012 J**	0.00083 U	**0.0058**	0.00082 U	**0.0037**	0.00081 U	**0.0028**	0.00084 U
Benzo(a)pyrene	mg/kg	**0.034**	0.00081 U	**0.065**	**0.04**	**0.00088 J**	**0.015**	0.00079 U	**0.019**	**0.0011 J**	0.00083 U	**0.0045**	0.00082 U	**0.0031**	0.00081 U	**0.0032**	0.00084 U
Benzo(b)fluoranthene	mg/kg	**0.085**	**0.0014 J**	**0.18**	**0.12**	**0.0025**	**0.052**	**0.0022**	**0.069**	**0.0039**	**0.001 J**	**0.017**	**0.0027**	**0.014**	**0.0028**	**0.013**	0.00084 U
Benzo(g,h,i)perylene	mg/kg	**0.019**	0.00081 U	**0.029**	**0.018**	**0.0012 J**	**0.0074**	0.00079 U	**0.009**	**0.0015 J**	0.00083 U	**0.0045**	0.00082 U	**0.0033**	0.00081 U	**0.0032**	0.00084 U
Benzo(k)fluoranthene	mg/kg	**0.026**	0.00081 U	**0.061**	**0.035**	0.00084 U	**0.014**	0.00079 U	**0.015**	**0.00093 J**	0.00083 U	**0.0033**	0.00082 U	**0.0031**	0.00081 U	**0.0027**	0.00084 U
Chrysene	mg/kg	**0.077**	**0.0012 J**	**0.14**	**0.091**	**0.0022**	**0.057**	**0.0014 J**	**0.067**	**0.0039**	**0.001 J**	**0.015**	**0.0011 J**	**0.012**	**0.00087 J**	**0.01**	0.00042 U
Dibenzo(a,h)anthracene	mg/kg	**0.0072**	0.00081 U	**0.012**	**0.0085**	0.00084 U	**0.0038**	0.00079 U	**0.0043**	0.00083 U	0.00083 U	**0.0013 J**	0.00082 U	**0.00097 J**	0.00081 U	**0.00095 J**	0.00084 U
Fluoranthene	mg/kg	**0.097**	**0.0016 J**	**0.15**	**0.096**	**0.0023**	**0.061**	**0.0011 J**	**0.08**	**0.0038**	**0.0011 J**	**0.015**	0.00082 U	**0.012**	0.00081 U	**0.0086**	0.00084 U
Fluorene	mg/kg	**0.0072**	0.00081 U	**0.011**	**0.0066**	0.00084 U	**0.0058**	0.00079 U	**0.0059**	**0.0022**	0.00083 U	**0.0027**	0.00082 U	**0.0029**	0.00081 U	**0.0075**	0.00084 U
Indeno(1,2,3-cd)pyrene	mg/kg	**0.019**	0.00081 U	**0.029**	**0.019**	**0.00096 J**	**0.0072**	0.00079 U	**0.0086**	**0.0012 J**	0.00083 U	**0.0036**	0.00082 U	**0.003**	0.00081 U	**0.0027**	0.00084 U
1-Methylnaphthalene	mg/kg	**0.13**	**0.00093 J**	**0.24**	**0.24**	**0.0035**	**0.13**	0.00079 U	**0.14**	**0.0035**	**0.0012 J**	**0.024**	0.00082 U	**0.014**	0.00081 U	**0.0052**	0.00084 U
2-Methylnaphthalene	mg/kg	**0.16**	**0.0012 J**	**0.28**	**0.32**	**0.0038**	**0.15**	0.00079 U	**0.16**	**0.0039**	**0.0013 J**	**0.026**	0.00082 U	**0.015**	0.00081 U	**0.0064**	0.00084 U
Naphthalene	mg/kg	**0.075**	**0.002 J**	**0.15**	**0.14**	**0.0021**	**0.079**	0.00079 U	**0.085**	**0.003**	**0.00086 J**	**0.014**	0.00082 U	**0.0096**	0.00081 U	**0.0064**	0.00084 U
Phenanthrene	mg/kg	**0.17**	**0.0022**	**0.0013 J**	**0.21**	**0.0044**	**0.15**	**0.0017 J**	**0.17**	**0.0058**	**0.0015 J**	**0.033**	**0.00093 J**	**0.021**	**0.001 J**	**0.0097**	0.00084 U
Pyrene	mg/kg	**0.087**	**0.0013 J**	**0.13**	**0.095**	**0.0019 J**	**0.043**	**0.00094 J**	**0.054**	**0.0028**	0.00083 U	**0.013**	0.00082 U	**0.0092**	0.00081 U	**0.0075**	0.00084 U
Metals																	
Aluminum	mg/kg	**9,600**	**15,000**	**9,700**	**9,100**	**23,000**	**9,200**	**15,000**	**9,100**	**20,000**	**21,000**	**12,000**	**18,000**	**12,000**	**17,000**	**11,000**	**23,000**
Arsenic	mg/kg	**11**	**6.4**	**9.9**	**9.9**	**7.5**	**4.3 J**	**3.1 J**	**4.5 J**	**4.0 J**	**3.5 J**	**4.1 J**	**3.3 J**	**3.6 J**	**3.4 J**	**2.8 J**	**7.1**
Barium	mg/kg	**130**	**200**	**130**	**160**	**270**	**140**	**130**	**160**	**130**	**120**	**140**	**310**	**140**	**210**	**140**	**250**
Beryllium	mg/kg	**0.61**	**0.80**	**0.72**	**0.68**	**1.1**	**0.59**	**0.76**	**0.62**	**0.98**	**1.1**	**0.61**	**0.97**	**0.62**	**0.86**	**0.57**	**1.1**
Cadmium	mg/kg	**0.50**	**0.75**	**0.55**	**0.56**	**0.48**	**0.56**	**0.29 J**	**0.66**	**0.34 J**	**0.27 J**	**0.41**	**0.20 J**	**0.30 J**	**0.38**	**0.47**	**0.42**
Calcium	mg/kg	**14,000**	**4,300**	**14,000**	**13,000**	**6,800**	**7,100**	**4,500**	**9,800**	**5,900**	**6,400**	**5,700**	**5,500**	**4,400**	**5,000**	**6,700**	**5,900**
Chromium	mg/kg	**10**	**15**	**11**	**11**	**21**	**10**	**15**	**10**	**20**	**20**	**13**	**19**	**13**	**25**	**12**	**21**
Cobalt	mg/kg	**3.9**	**15**	**4.3**	**4.0**	**13**	**3.9**	**5.5**	**3.9**	**7.7**	**5.3**	**4.5**	**5.3**	**5.1**	**6.1**	**4.5**	**7.1**
Copper	mg/kg	**15**	**15**	**17**	**21**	**20**	**13**	**14**	**15**	**17**	**17**	**12**	**18**	**11**	**16**	**12**	**21**
Iron	mg/kg	**12,000**	**13,000**	**14,000**	**15,000**	**20,000**	**10,000**	**13,000**	**11,000**	**18,000**	**18,000**	**11,000**	**17,000**	**11,000**	**15,000**	**11,000**	**21,000**
Lead	mg/kg	**30**	**17**	**31**	**30**	**15**	**20**	**9.4**	**23**	**13**	**11**	**14**	**12**	**11**	**9.7**	**13**	**16**
Magnesium	mg/kg	**2,100**	**3,500**	**2,300**	**2,100**	**5,600**	**2,200**	**3,200**	**2,300**	**4,800**	**4,900**	**2,900**	**4,400**	**2,600**	**3,900**	**2,700**	**4,900**
Manganese	mg/kg	**240**	**1,300**	**240**	**250**	**800**	**230**	**340**	**230**	**350**	**230**	**240**	**200**	**300**	**400**	**240**	**430**
Mercury	mg/kg	**0.048 J**	**0.026 J**	**0.053**	**0.029 J**	**0.013 J**	**0.044 J**	**0.010 J**	**0.055**	**0.013 J**	**0.013 J**	**0.030 J**	**0.013 J**	**0.013 J**	0.0095 U	**0.035 J**	**0.024 J**
Nickel	mg/kg	**10**	**26**	**12**	**13**	**25**	**9.8**	**14**	**10**	**17**	**16**	**11**	**15**	**11**	**19**	**10**	**19**
Potassium	mg/kg	**2,100**	**3,200**	**2,300**	**2,200**	**4,500**	**2,300**	**2,900**	**2,700**	**4,300**	**4,400**	**2,900**	**4,100**	**2,700**	**3,800**	**2,800**	**4,200**
Sodium	mg/kg	**82 J**	**86 J**	**100 J**	**81 J**	**140**	**72 J**	**96 J**	**72 J**	**110 J**	**110 J**	**80 J**	**110 J**	**59 J**	**99 J**	**57 J**	**75 J**
Vanadium	mg/kg	**19**	**26**	**18**	**17**	**32**	**17**	**19**	**16**	**25**	**23**	**21**	**22**	**21**	**22**	**17**	**35**
Zinc	mg/kg	**78**	**43**	**91**	**89**	**66**	**66**	**44**	**80**	**65**	**66**	**47**	**65**	**41**	**58**	**89**	**87**

Table 4-3
Background Soil Samples, Detected Analytes
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

	Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
	Sample Point:	BG08	BG08	BG09	BG09	BG10	BG10	BG11	BG11	BG11	BG12	BG12
	Sample Designator:	SB01	SB02	SB01	SB02	SB01	SB02	SB01	SB11	SB02	SB01	SB02
	Sample Interval (ft bgs):	0 - 0.5	3 - 4	0 - 0.5	3 - 4	0 - 0.5	3 - 4	0 - 0.5	0 - 0.5	3 - 4	0 - 0.5	3 - 4
	Sample Location:	FPS	FPS	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP
	Date Sampled:	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014
	Notes:								Duplicate			
Parameter	**Units**											
Semivolatile Organic Compounds												
Acenaphthene	mg/kg	0.00095 U	0.00083 U	0.00079 U	0.0008 U	0.00083 U	0.00073 U	0.00084 U	NS	0.00071 U	0.00084 U	0.00072 U
Acenaphthylene	mg/kg	**0.0078**	0.00042 U	**0.001 J**	**0.00078 J**	**0.0015 J**	**0.00039 J**	**0.0014 J**	NS	0.00036 U	**0.00097 J**	0.00036 U
Anthracene	mg/kg	**0.0097**	0.00042 U	**0.0015 J**	**0.0007 J**	**0.0024**	**0.0004 J**	**0.0015 J**	NS	0.00036 U	**0.0039**	0.00036 U
Benzo(a)anthracene	mg/kg	**0.011**	0.00083 U	**0.0046**	**0.0027**	**0.0041**	**0.0018 J**	**0.0032**	NS	0.00071 U	**0.003**	0.00072 U
Benzo(a)pyrene	mg/kg	**0.011**	0.00083 U	**0.0047**	**0.0031**	**0.0041**	**0.0022**	**0.0031**	NS	**0.00075 J**	**0.0029**	**0.00076 J**
Benzo(b)fluoranthene	mg/kg	**0.045**	**0.001 J**	**0.0097**	**0.008**	**0.012**	**0.004**	**0.011**	NS	**0.0015 J**	**0.011**	**0.0016 J**
Benzo(g,h,i)perylene	mg/kg	**0.0074**	0.00083 U	**0.0041**	**0.003**	**0.0031**	**0.0011 J**	**0.0032**	NS	0.00071 U	**0.0018 J**	**0.00077 J**
Benzo(k)fluoranthene	mg/kg	**0.011**	0.00083 U	**0.0034**	**0.0023**	**0.0041**	**0.0013 J**	**0.0037**	NS	0.00071 U	**0.0038**	0.00072 U
Chrysene	mg/kg	**0.034**	**0.0013 J**	**0.0078**	**0.0061**	**0.0088**	**0.0025**	**0.008**	NS	**0.00086 J**	**0.0065**	**0.00096 J**
Dibenzo(a,h)anthracene	mg/kg	**0.0026**	0.00083 U	**0.00096 J**	**0.00089 J**	0.00083 U	0.00073 U	0.00084 U	NS	0.00071 U	0.00084 U	0.00072 U
Fluoranthene	mg/kg	**0.046**	**0.0016 J**	**0.011**	**0.006**	**0.011**	**0.0027**	**0.0082**	NS	0.00071 U	**0.0068**	**0.00085 J**
Fluorene	mg/kg	**0.007**	**0.0011 J**	0.00079 U	0.0008 U	0.00083 U	0.00073 U	0.00084 U	NS	0.00071 U	0.00084 U	0.00072 U
Indeno(1,2,3-cd)pyrene	mg/kg	**0.0067**	0.00083 U	**0.0029**	**0.0026**	**0.0024**	**0.001 J**	**0.0024**	NS	0.00071 U	**0.0019 J**	0.00072 U
1-Methylnaphthalene	mg/kg	**0.012**	0.00083 U	**0.0041**	**0.0041**	**0.0037**	0.00073 U	**0.0033**	NS	0.00071 U	**0.0017 J**	0.00072 U
2-Methylnaphthalene	mg/kg	**0.017**	0.00083 U	**0.0048**	**0.0047**	**0.0044**	0.00073 U	**0.0043**	NS	0.00071 U	**0.0018 J**	0.00072 U
Naphthalene	mg/kg	**0.025**	**0.0012 J**	**0.0034**	**0.0037**	**0.0058**	**0.00091 J**	**0.0067**	NS	0.00071 U	**0.004**	0.00072 U
Phenanthrene	mg/kg	**0.051**	**0.0018 J**	**0.0076**	**0.0066**	**0.0086**	**0.0017 J**	**0.0065**	NS	0.00071 U	**0.0064**	**0.00079 J**
Pyrene	mg/kg	**0.027**	**0.0012 J**	**0.008**	**0.0046**	**0.0074**	**0.0025**	**0.0071**	NS	**0.00085 J**	**0.0057**	**0.00092 J**
Metals												
Aluminum	mg/kg	**12,000**	**23,000**	**11,000**	**17,000**	**15,000**	**8,600**	**14,000**	**14,000**	**8,100**	**14,000**	**9,500**
Arsenic	mg/kg	**17**	**5.2**	**3.0 J**	**5.2**	**4.1 J**	**3.3 J**	**4.4 J**	**4.0 J**	**2.6 J**	**4.2 J**	**3.8 J**
Barium	mg/kg	**170**	**260**	**130**	**180**	**150**	**120**	**140**	**140**	**120**	**150**	**150**
Beryllium	mg/kg	**0.64**	**1.1**	**0.49**	**0.75**	**0.65**	**0.40**	**0.63**	**0.62**	**0.38**	**0.61**	**0.43**
Cadmium	mg/kg	**1.7**	**0.36**	**0.56**	**0.32 J**	**0.75**	**0.19 J**	**0.73**	**0.81**	**0.17 J**	**0.76**	**0.16 J**
Calcium	mg/kg	**9,400**	**5,500**	**8,700**	**12,000**	**7,900**	**10,000**	**8,100**	**8,600**	**6,700**	**11,000**	**8,300**
Chromium	mg/kg	**13**	**22**	**11**	**16**	**15**	**9.1**	**13**	**14**	**8.8**	**13**	**10**
Cobalt	mg/kg	**4.8**	**6.1**	**4.4**	**5.4**	**5.1**	**3.3**	**5.2**	**5.3**	**3.0**	**5.1**	**3.7**
Copper	mg/kg	**18**	**20**	**10**	**13**	**11**	**6.8**	**12**	**12**	**6.0**	**11**	**8.2**
Iron	mg/kg	**14,000**	**19,000**	**11,000**	**15,000**	**13,000**	**8,900**	**13,000**	**13,000**	**8,100**	**13,000**	**9,200**
Lead	mg/kg	**31**	**15**	**13**	**11**	**17**	**6.3**	**15**	**16**	**5.9**	**13**	**6.2**
Magnesium	mg/kg	**2,900**	**4,900**	**3,200**	**4,500**	**3,800**	**2,600**	**3,600**	**3,700**	**2,600**	**4,000**	**2,800**
Manganese	mg/kg	**300**	**260**	**230**	**300**	**310**	**150**	**290**	**290**	**140**	**270**	**190**
Mercury	mg/kg	**0.056 J**	**0.028 J**	**0.047 J**	**0.014 J**	**0.033 J**	**0.011 J**	**0.041 J**	**0.037 J**	**0.010 J**	**0.040 J**	**0.012 J**
Nickel	mg/kg	**12**	**16**	**10**	**13**	**12**	**7.6**	**12**	**12**	**6.9**	**12**	**8.4**
Potassium	mg/kg	**2,900**	**4,200**	**2,500**	**3,500**	**3,200**	**2,000**	**3,000**	**3,000**	**1,900**	**3,300**	**2,100**
Sodium	mg/kg	**68 J**	**96 J**	**88 J**	**90 J**	**77 J**	**90 J**	**74 J**	**73 J**	**110**	**82 J**	**110**
Vanadium	mg/kg	**22**	**33**	**21**	**29**	**25**	**20**	**23**	**24**	**18**	**24**	**21**
Zinc	mg/kg	**560**	**90**	**52**	**51**	**63**	**27**	**56**	**60**	**25**	**55**	**27**

Notes:

Bold - compound was detected
bgs - below ground surface
ft - feet
FPS - floodplain slope
J - estimated value
KRFR - Kansas River floodplain
mg/kg - milligrams per kilogram
NA - not available
NS- not sampled
U - compound was not detected
UT - upland terrace

Table 4-4A
Summary of Background Soil Outliers
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Outlier Value (mg/kg)	Outlier Type	Outlier at 5% Significance Level	Outlier at 1% Significance Level
Sitewide Surface Soil (0 - 0.5 ft bgs)				
Semivolatile Organic Compounds				
Acenaphthene	0.016	Upper Tail	Yes	Yes
Acenaphthylene	0.33	Upper Tail	Yes	Yes
Anthracene	0.041	Upper Tail	Yes	Yes
Benzo(a)anthracene	0.062	Upper Tail	Yes	Yes
Benzo(a)pyrene	0.065	Upper Tail	Yes	Yes
Benzo(b)fluoranthene	0.180	Upper Tail	Yes	Yes
Benzo(g,h,i)perylene	0.029	Upper Tail	Yes	Yes
Benzo(k)fluoranthene	0.061	Upper Tail	Yes	Yes
Chrysene	0.14	Upper Tail	Yes	No
Dibenzo(a,h)anthracene	0.012	Upper Tail	Yes	Yes
Indeno(1,2,3-cd)pyrene	0.029	Upper Tail	Yes	Yes
Pyrene	0.013	Upper Tail	Yes	No
Inorganic Compounds				
Beryllium	0.49	Lower Tail	Yes	No
Cadmium	1.7	Upper Tail	Yes	Yes
Copper	21	Upper Tail	Yes	No
Zinc	560	Upper Tail	Yes	Yes

Notres:
mg/kg - miligrams per kilogram

Table 4-4A
Summary of Background Soil Outliers
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Outlier Value (mg/kg)	Outlier Type	Outlier at 5% Significance Level	Outlier at 1% Significance Level
Sitewide Subsurface Soil (3 - 4 ft bgs)				
Semivolatile Organic Compounds				
Acenaphthylene	0.00078	Upper Tail	Yes	Yes
Benzo(a)anthracene	0.0027	Upper Tail	Yes	No
Benzo(a)pyrene	0.0031	Upper Tail	Yes	Yes
Benzo(b)fluoranthene	0.008	Upper Tail	Yes	No
Benzo(g,h,i)perylene	0.003	Upper Tail	Yes	Yes
Benzo(k)fluoranthene	0.0023	Upper Tail	Yes	Yes
Chrysene	0.0061	Upper Tail	Yes	Yes
Dibenzo(a,h)anthracene	0.00089	Upper Tail	Yes	Yes
Fluoranthene	0.0022	Upper Tail	Yes	Yes
Indeno(1,2,3-cd)pyrene	0.0026	Upper Tail	Yes	Yes
Inorganic Compounds				
Cadmium	0.75	Upper Tail	Yes	No
Cobalt	15	Upper Tail	Yes	No
Manganese	1300	Upper Tail	Yes	Yes
Sodium	140	Upper Tail	Yes	No

Notres:
mg/kg - miligrams per kilogram

Table 4-4B
Summary of Background Soil UTLs and Selected Concentrations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Nornal Data Distribution	95% UTL w/ 95% Coverage for KM Normal Distribution (mg/kg)	95% UTL w/ 95% Coverage for Normal Distribution (mg/kg)	Gamma Data Distribution	95% UTL w/ 95% Coverage for Gamma ROS WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma ROS HW Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for WH Gamma Distribution (mg/kg)	95% UTL w/ 95% Coverage for HW Gamma Distribution (mg/kg)	Lognormal Data Distribution	95% UTL w/ 95% Coverage for Lognormal Distribution (mg/kg)	95% UTL w/ 95% Coverage for ROS Lognormal Distribution (mg/kg)	95% Bootstrap UTL w/ 95% Cowewrage for Lognormal Distibution (mg/kg)	95% UTL w/ 95% Coverage for KM Lognormal Distribution (mg/kg)	Nonparametric Data Distribution	95% UTL w/ 95% Coverage for Nonparametric Distribution (mg/kg)	Selected Background Concentration (mg/kg)
Sitewide Surface Soil (0 - 0.5 ft bgs)																		
Semivolatile Organic Compounds																		
Acenaphthene*	Yes	0.00666	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Not Calculated	0.01760	0.00680	0.00902	No	Not Applicable	0.00666
Acenaphthylene*	Yes	0.0163	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Not Calculated	0.0289	0.016	0.033	No	Not Applicable	0.016
Anthracene*	Yes	0.024	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Not Calculated	0.0418	0.023	0.0486	No	Not Applicable	0.023
Benzo(a)anthracene*	Yes	0.0412	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Not Calculated	0.0672	0.038	0.0826	No	Not Applicable	0.038
Benzo(a)pyrene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.034	0.034
Benzo(b)fluoranthene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.085	0.085
Benzo(g,h,i)perylene	No	Not Applicable	Not Applicable	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.0237	0.0248	Yes	0.0306	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.0237
Benzo(k)fluoranthene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.026	0.026
Chrysene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.261	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.261
Dibenzo(a,h)anthracene	Yes	0.00781	Not Calculated	Yes	0.0253	0.0286	0.01	0.0106	Not Calculated	Not Calculated	Yes	Not Calculated	0.0307	0.0072	0.0137	No	Not Applicable	0.0072
Fluoranthene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.509	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.509
Fluorene	Yes	0.0134	Not Calculated	Yes	0.0194	0.0204	0.0217	0.0246	Not Calculated	Not Calculated	Yes	Not Calculated	0.0254	0.011	0.0457	No	Not Applicable	0.011
Indeno(1,2,3-cd)pyrene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.0309	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.0309
1-Methylnaphthalene	No	Not Applicable	Not Applicable	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.51	0.62	Yes	2.143	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.51
2-Methylnaphthalene	No	Not Applicable	Not Applicable	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.63	0.764	Yes	2.669	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.63
Naphthalene	No	Not Applicable	Not Applicable	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.276	0.318	Yes	0.706	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.276
Phenanthrene	No	Not Applicable	Not Applicable	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.513	0.605	Yes	1.526	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.513
Pyrene	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.233	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.233
Inorganic Compounds																		
Aluminum	Yes	Not Claculated	17,014	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	17,718	17,829	Yes	18,204	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	17,014
Arsenic	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	17	17
Barium	Yes	Not Claculated	179.8	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	181.6	181.9	Yes	182.7	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	179.8
Beryllium	Yes	Not Claculated	0.733	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.736	0.737	Yes	0.738	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.733
Cadmium	Yes	Not Claculated	1.019	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	1.151	1.176	Yes	1.275	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	1.019
Calcium	Yes	Not Claculated	17,073	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	19,337	19,794	Yes	21,611	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	17,073
Chromium	Yes	Not Claculated	16.67	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	17.2	17.28	Yes	17.54	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	16.67
Cobalt	Yes	Not Claculated	5.968	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	6.104	6.124	Yes	6.189	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	5.968
Copper	Yes	Not Claculated	19.4	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	20.05	20.15	Yes	20.5	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	19.4
Iron	Yes	Not Claculated	16,201	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	16,542	16,593	Yes	16,758	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	16,201
Lead	Yes	Not Claculated	40.12	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	45.54	46.60	Yes	50.72	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	40.12
Magnesium	Yes	Not Claculated	4,686	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	4,973	5,021	Yes	5,189	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	4,686
Manganese	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	310	310
Mercury	Yes	Not Claculated	0.0749	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.0929	0.097	Yes	0.116	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.0749
Nickel	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	13	13
Potassium	Yes	Not Claculated	3,736	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	3,865	3,885	Yes	3,951	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	3,736
Sodium	Yes	Not Claculated	108.5	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	112.7	113.4	Yes	115.7	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	108.5
Vanadium	Yes	Not Claculated	28.7	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	29.76	29.92	Yes	30.46	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	28.7
Zinc	Yes	Not Claculated	113.1	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	123.9	125.9	Yes	133.1	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	113.1

Notres:
UTL values calculated using ProUCL Version 5.1.
Selected background concentration is lowest of the calculated UTLs.
*Data set does not contain enough detected values to compute meaingful or reliable statistic and estimates.

bgs - below ground surface
HM - Hawkins Wixley
KM - Kaplan-Meier
mg/kg - miligrams per kilogram
ROS - regression on order statistics
UTL - upper tolerance limit
WH - Wilson Hilferty

Table 4-4B
Summary of Background Soil UTLs and Selected Concentrations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Nornal Data Distribution	95% UTL w/ 95% Coverage for KM Normal Distribution (mg/kg)	95% UTL w/ 95% Coverage for Normal Distribution (mg/kg)	Gamma Data Distribution	95% UTL w/ 95% Coverage for Gamma ROS WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma ROS HW Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for WH Gamma Distribution (mg/kg)	95% UTL w/ 95% Coverage for HW Gamma Distribution (mg/kg)	Lognormal Data Distribution	95% UTL w/ 95% Coverage for Lognormal Distribution (mg/kg)	95% UTL w/ 95% Coverage for ROS Lognormal Distribution (mg/kg)	95% Bootstrap UTL w/ 95% Covewrage for Lognormal Distibution (mg/kg)	95% UTL w/ 95% Coverage for KM Lognormal Distribution (mg/kg)	Nonparametric Data Distribution	95% UTL w/ 95% Coverage for Nonparametric Distribution (mg/kg)	Background Concentration (mg/kg)
Sitewide Subsurface Soil (3 - 4 ft bgs)																		
Semivolatile Organic Compounds																		
Acenaphthylene*	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Anthracene	Yes	0.00071839	Not Applicable	Yes	0.0435	0.0544	0.00073756	0.00074067	Not Calculated	Not Calculated	Yes	Not Calculated	0.00101	0.0007	0.00075128	No	Not Applicable	0.0007
Benzo(a)anthracene**	Yes	0.00179	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Not Calculated	0.00345	0.0018	0.00188	No	Not Applicable	0.00179
Benzo(a)pyrene	Yes	0.0021	Not Applicable	Yes	0.0369	0.0439	0.0021	0.0021	Not Calculated	Not Calculated	Yes	Not Calculated	0.00225	0.0022	0.00211	No	Not Applicable	0.0021
Benzo(b)fluoranthene	Yes	0.00511	Not Applicable	Yes	0.0117	0.0122	0.00634	0.00663	Not Calculated	Not Calculated	Yes	Not Calculated	0.00912	0.004	0.00794	No	Not Applicable	0.004
Benzo(g,h,i)perylene	Yes	0.00159	Not Applicable	Yes	0.0372	0.044	0.00166	0.00168	Not Calculated	Not Calculated	No	Not Calculated	0.00209	0.0015	0.00172	No	Not Applicable	0.0015
Benzo(k)fluoranthene**	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.0013	0.0013
Chrysene	No	Not Applicable	Not Applicable	Yes	0.0114	0.0119	0.00506	0.0053	Not Calculated	Not Calculated	No	Not Calculated	0.00698	0.0039	0.00649	No	Not Applicable	0.0039
Dibenzo(a,h)anthracene**	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Fluoranthene	Yes	0.00427	Not Applicable	Yes	0.0259	0.029	0.00525	0.00549	Not Calculated	Not Calculated	No	Not Calculated	0.0102	0.0038	0.00661	No	Not Applicable	0.0038
Fluorene*	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Indeno(1,2,3-cd)pyrene**	Yes	0.00126	Not Applicable	Yes	0.0373	0.0441	0.00129	0.0013	Not Calculated	Not Calculated	No	Not Calculated	0.00146	0.0012	0.00131	No	Not Applicable	0.0012
1-Methylnaphthalene	Yes	0.00501	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	0.00501
2-Methylnaphthalene	Yes	0.00565	Not Applicable	Yes	0.0252	0.0276	0.00704	0.00738	Not Calculated	Not Calculated	Yes	Not Calculated	0.0128	0.0047	0.00898	No	Not Applicable	0.0047
Naphthalene	Yes	0.00415	Not Applicable	Yes	0.0283	0.0318	0.00501	0.00521	Not Calculated	Not Calculated	Yes	Not Calculated	0.00986	0.0037	0.00613	No	Not Applicable	0.0037
Phenanthrene	Yes	0.00779	Not Applicable	Yes	0.0227	0.0252	0.0102	0.0108	Not Calculated	Not Calculated	Yes	Not Calculated	0.0212	0.0066	0.0144	No	Not Applicable	0.0066
Pyrene	Yes	0.00467	Not Applicable	Yes	0.0209	0.0229	0.00539	0.00556	Not Calculated	Not Calculated	Yes	Not Calculated	0.0106	0.0046	0.00633	No	Not Applicable	0.0046
Inorganic Compounds																		
Aluminum	Yes	Not Applicable	31,643	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	37,727	38,997	Yes	44,238	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	31,643
Arsenic	Yes	Not Applicable	9.144	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	10.27	10.49	Yes	11.32	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	9.144
Barium	Yes	Not Applicable	375.4	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	425.5	435.1	Yes	472.2	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	375.4
Beryllium	Yes	Not Applicable	1.581	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	1.93	2.005	Yes	2.324	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	1.581
Cadmium	Yes	Not Applicable	0.606	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	0.719	0.742	Yes	0.837	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	0.606
Calcium	Yes	Not Applicable	13,058	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	14,116	14,314	Yes	15,057	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	13,058
Chromium	Yes	Not Applicable	31.61	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	37.11	38.23	Yes	42.74	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	31.61
Cobalt	Yes	Not Applicable	13.77	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	15.63	16.05	Yes	17.86	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	13.77
Copper	Yes	Not Applicable	28.81	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	35.81	37.37	Yes	44.19	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	28.81
Iron	Yes	Not Applicable	26,885	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	30,840	31,611	Yes	34,624	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	26,885
Lead	Yes	Not Applicable	22.18	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	26.23	27.07	Yes	30.48	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	22.18
Magnesium	Yes	Not Applicable	6,800	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	7,506	7,633	Yes	8,101	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	6,800
Manganese	Yes	Not Applicable	847.8	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	999.6	1,038	Yes	1,212	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	847.8
Mercury	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	0.028	0.028
Nickel	Yes	Not Applicable	32.54	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	39.36	40.88	Yes	47.44	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	32.54
Potassium	Yes	Not Applicable	6,053	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	6,977	7,156	Yes	7,855	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	6,053
Sodium	Yes	Not Applicable	130.6	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	134.8	135.4	Yes	137.5	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	130.6
Vanadium	Yes	Not Applicable	41.11	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	43.75	44.19	Yes	45.74	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	41.11
Zinc	Yes	Not Applicable	114.4	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	138.9	144.3	Yes	167.8	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	114.4

Notres:
UTL values calculated using ProUCL Version 5.1.
Selected background concentration is lowest of the calculated UTLs.
*Data set contains only one distinct detected data value. Unalbe to calculate UCL.
**Data set does not contain enough detected values to compute meanigful or reliable statistic and estimates.
bgs - below ground surface
HM - Hawkins Wixley
KM - Kaplan-Meier
mg/kg - miligrams per kilogram
ROS - regression on order statistics
UTL - upper tolerance limit
WH - Wilson Hilferty

Table 4-5
Surface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Group Name:			CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
Sample Point:			DP01	DP02	DP03	DP04	DP04	DP05	DP05	DP06	DP07	DP07	DP13	DP14	DP14	DP15	DP16	DP16
Sample Designator:			SB01	SB01	SB01	SB01	SB02	SB01	SB02	SB01	SB01	SB11	SB01	SB01	SB02	SB01	SB01	SB11
Sample Interval (ft bgs):			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1 - 3	0 - 0.5	1.5 - 2.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	1.5 - 2.5	0 - 0.5	0 - 0.5	0 - 0.5
Sample Location:			UT	FPS	FPS	FPS	FPS	FPS	FPS	KRFP	KRFP	KRFP	UT	UT	UT	FPS	FPS	FPS
Material Sampled:			Soil/Ash	Soil/Ash	Soil/Ash	Soil/Ash	Ash	Soil	Soil/Ash	Soil	Soil	Soil	Soil/Ash	Soil/Ash	Soil	Soil/Ash	Soil/Ash	Soil/Ash
Date Sampled:			1/14/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
Investigation Phase:			Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
Notes:												Duplicate						Duplicate
Parameter	**Units**	**Screening Level[1]**																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	**39**	**290 J**	**130**	**39**	**86**	**6.2**	**5.7**	**3.6 J**	**4.6 J**	**4.0 J**	NS	NS	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	0.37 U	**10**	**2.0 J**	**5.4**	**11**	0.39 U	0.42 U	0.42 U	0.38 U	0.42 U	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.014 U	0.013 U	0.014 U	**0.0046 J**	**0.0039 J**	0.00051 U	**0.025 J**	**0.0053 J**	**0.0059 J**
Acenaphthylene	mg/kg	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.024 U	0.022 U	0.024 U	**0.0010 J**	0.0019 U	0.00036 U	0.0039 U	0.00037 U	0.0019 U
Anthracene	mg/kg	18,000	0.02 U	0.02 U	0.02 U	0.02 U	0.019 U	0.02 U	0.02 U	0.024 U	0.022 U	0.024 U	**0.0046 J**	**0.01 J**	**0.0011 J**	**0.045 J**	**0.018**	**0.022 J**
Benzo(a)anthracene	mg/kg	0.16	0.024 U	**0.036 J**	**0.046 J**	0.024 U	0.022 U	0.024 U	0.023 U	0.028 U	0.025 U	0.028 U	**0.02**	**0.043**	**0.0035 J**	**0.21**	**0.067**	**0.081**
Benzo(a)pyrene	mg/kg	0.016	0.024 U	0.024 U	**0.03 J**	0.024 U	0.022 U	0.024 U	0.023 U	0.028 U	0.025 U	0.028 U	**0.03 J**	**0.034**	**0.0026 J**	**0.14**	**0.053**	**0.056**
Benzo(b)fluoranthene	mg/kg	0.16	0.031 U	0.031 U	**0.048 J**	0.031 U	0.029 U	0.031 U	0.03 U	0.037 U	0.033 U	0.037 U	**0.026 J**	**0.043**	**0.0024 J**	**0.16**	**0.06**	**0.074**
Benzo(g,h,i)perylene	mg/kg	NA	**0.026 J**	0.019 U	**0.035 J**	0.019 U	0.018 U	0.019 U	0.018 U	0.022 U	0.02 U	0.022 U	**0.024 J**	**0.024 J**	0.0011 U	**0.11**	**0.025**	**0.042**
Benzo(k)fluoranthene	mg/kg	1.6	0.048 U	0.048 U	0.048 UJ	0.048 U	0.045 U	0.048 U	0.046 U	0.056 U	0.051 U	0.056 U	**0.018**	**0.03**	**0.0019 J**	**0.13**	**0.036**	**0.041**
Chrysene	mg/kg	16	0.032 U	**0.049 J**	**0.066 J**	0.032 U	0.03 U	0.032 U	0.031 U	0.038 U	0.034 U	0.038 U	**0.037 J**	**0.076**	**0.0042 J**	**0.35**	**0.12**	**0.17**
Dibenzo(a,h)anthracene	mg/kg	0.016	0.023 U	0.023 U	0.023 U	0.023 U	0.021 U	0.023 U	0.022 U	0.027 U	0.024 U	0.027 U	**0.0052 J**	**0.0075 J**	0.0013 U	**0.032 J**	**0.0086**	**0.013 J**
Dibenzofuran	mg/kg	73	0.024 U	**0.13 J**	**0.1 J**	0.024 U	**0.044 J**	0.024 U	0.023 U	0.028 U	0.025 U	0.028 U	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	**0.15 J**	0.028 U	**0.071 J**	0.027 U	0.026 U	**0.19 J**	**0.49**	**0.21 J**	**0.56**	**0.39 J**	NS	NS	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	0.043 U	**0.046 J**	**0.051 J**	0.043 U	0.04 U	0.043 U	0.042 U	0.05 U	0.046 U	0.05 U	**0.03 J**	**0.052**	**0.0027 J**	**0.26**	**0.092**	**0.12**
Fluorene	mg/kg	2,400	0.022 U	0.022 U	0.022 U	0.021 U	0.02 U	0.021 U	0.021 U	0.025 U	0.023 U	0.025 U	**0.0067**	**0.0043 J**	0.00053 U	**0.026 J**	**0.0072**	**0.0096 J**
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.026 U	0.026 U	0.026 U	0.026 U	0.025 U	0.026 U	0.025 U	0.031 U	0.028 U	0.031 U	**0.019 J**	**0.012 J**	0.00052 U	**0.057 J**	**0.012**	**0.018 J**
2-Methylnaphthalene	mg/kg	240	0.023 U	**0.23 J**	**0.15 J**	0.023 U	**0.054 J**	0.023 U	0.022 U	0.027 U	0.024 U	0.027 U	NS	NS	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	0.037 U	**0.13 J**	**0.068 J**	0.037 U	0.035 U	0.037 U	0.036 U	0.043 U	0.039 U	0.043 U	**0.058 J**	**0.17**	**0.0031 J**	**1.4**	**0.11**	**0.85**
Phenanthrene	mg/kg	NA	**0.049 J**	**0.28 J**	**0.25 J**	**0.027 J**	**0.1 J**	0.02 U	0.02 U	0.024 U	0.022 U	0.024 U	**0.19 J**	**0.28**	**0.013**	**1.5**	**0.54**	**0.83**
Pyrene	mg/kg	1,800	**0.035 J**	**0.038 J**	**0.053 J**	0.014 U	**0.019 J**	0.014 U	0.014 U	0.017 U	0.015 U	0.017 U	**0.026**	**0.054**	**0.0029 J**	**0.26**	**0.091**	**0.11**
Metals																		
Aluminum	mg/kg	77,000	**8,900**	**8,900**	**11,000**	**9,800**	**9,500**	**15,000**	**23,000**	**15,000**	**13,000**	**15,000**	**12,000 J**	**12,000**	**12,000**	**12,000**	**13,000**	**14,000**
Antimony	mg/kg	31	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.2 UJ	1.3 UJ	1.3 UJ	1.3 UJ	0.24 UJ	**0.84 J**	0.21 UJ	**1.3 J**	**0.75 J**	**0.87 J**
Arsenic	mg/kg	0.68	**9.2**	**31**	**35**	**12**	**27**	**4.2 J**	**8.1**	**5.1 J**	**4.7 J**	**4.6 J**	**4.6**	**14**	**3.7**	**21**	**19**	**13**
Barium	mg/kg	15,000	**150**	**170**	**1,300**	**570**	**300**	**170**	**230**	**170**	**140**	**170**	**120 J**	**420**	**140**	**680**	**520**	**470**
Beryllium	mg/kg	160	**0.73**	**2.3**	**2.7**	**1.3**	**1.7**	**0.81**	**1.2**	**0.83**	**0.73**	**0.82**	**0.51**	**1.2**	**0.62**	**2.0**	**1.5**	**1.5**
Cadmium	mg/kg	71	**1.3**	**5.3**	**2.8**	**1.6**	**1.8**	**0.46**	**0.40**	**0.63**	**0.39 J**	**0.60**	**0.33**	**1.6**	**0.67**	**3.8**	**2.3**	**2.0**
Calcium	mg/kg	NA	**51,000**	**21,000**	**27,000**	**10,000**	**9,500**	**14,000**	**7,800**	**16,000 J**	**9,600**	**9,400**	**7,400 J**	**14,000**	**14,000**	**26,000**	**9,800**	**9,100**
Chromium	mg/kg	33.6	**11**	**16**	**14**	**11**	**17**	**15**	**21**	**15**	**14**	**15**	**13**	**15**	**13**	**19**	**17**	**19**
Cobalt	mg/kg	23	**5.2**	**16**	**13**	**8.2**	**13**	**5.9**	**7.8**	**6.5**	**5.9**	**6.2**	**4.9**	**9.5**	**6.9**	**14**	**12**	**11**
Copper	mg/kg	3,100	**65**	**87**	**65**	**30**	**200**	**14**	**17**	**14**	**12**	**13**	**10**	**29**	**13**	**53**	**30**	**30**
Iron	mg/kg	55,000	**14,000**	**56,000**	**35,000**	**25,000**	**76,000**	**14,000**	**20,000**	**15,000**	**13,000**	**15,000**	**13,000 J**	**31,000**	**12,000**	**50,000**	**39,000**	**32,000**
Lead	mg/kg	400	**26**	**370**	**350**	**78**	**180**	**16**	**18**	**15**	**13**	**17**	**15**	**74**	**10**	**150**	**100**	**110**
Magnesium	mg/kg	NA	**2,300**	**790**	**1,500**	**1,800**	**1,600**	**3,900**	**4,700**	**4,400**	**3,200**	**3,900**	**2,400 J**	**2,300**	**2,600**	**2,200**	**2,800**	**2,800**
Manganese	mg/kg	1,800	**290**	**440**	**290**	**350**	**360**	**330**	**430**	**390**	**290**	**330**	**260 J**	**340**	**330**	**380**	**380**	**360**
Mercury	mg/kg	11	**0.034 J**	**0.093**	**0.12**	**0.054**	**0.15**	**0.037 J**	**0.024 J**	**0.033 J**	**0.034 J**	**0.038 J**	**0.021 J**	**0.059**	**0.013 J**	**0.18**	**0.054**	**0.046**
Methyl Mercury	mg/kg	7.8	**0.000120**	**0.000029 J**	**0.000172**	**0.000265**	**0.000225**	**0.000078**	**0.000028 J**	**0.000062**	**0.000051**	**0.000094**	NS	NS	NS	NS	NS	NS
Nickel	mg/kg	1,500	**17**	**87**	**74**	**35**	**66**	**15**	**20**	**16**	**13**	**15**	**12**	**45**	**17**	**78**	**42**	**45**
Potassium	mg/kg	NA	**2,000**	**1,900**	**1,300**	**2,100**	**1,900**	**3,300**	**3,900**	**3,300**	**2,700**	**3,300**	**2,500 J**	**2,300**	**2,100**	**2,200**	**2,900**	**3,100**
Selenium	mg/kg	390	1.7 U	**2.4 J**	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	2.0 U	1.9 U	1.9 U	0.12 UJ	**0.66 J**	**0.19 J**	**0.73 J**	**0.65 J**	**0.57 J**
Silver	mg/kg	390	0.11 U	**0.79**	**0.54 J**	0.16 JU	**0.76**	0.11 U	0.11 U	0.13 U	0.12 U	0.12 U	**0.047 J**	**0.25**	**0.037 J**	**0.45**	**0.88**	**0.97**
Sodium	mg/kg	NA	**140**	**440**	**620**	**190**	**270**	**76 J**	**71 J**	**91 J**	**70 J**	**92 J**	**75 J**	**230**	**56 J**	**470**	**220**	**250**
Thallium	mg/kg	0.78	1.0 U	**1.8 J**	**1.6 J**	1.0 U	**2.0 J**	1.0 U	1.0 U	1.2 U	1.1 U	1.1 U	**0.18**	**0.26**	**0.16**	**0.33**	**0.36**	**0.35**
Vanadium	mg/kg	390	**18**	**20**	**30**	**19**	**24**	**23**	**34**	**27**	**24**	**25**	**26**	**28**	**24**	**33**	**34**	**36**
Zinc	mg/kg	23,000	**260**	**980**	**520**	**340**	**500**	**59**	**70**	**63**	**46**	**59**	**57 J**	**390 J**	**72 J**	**730 J**	**430 J**	**450 J**

Table 4-5
Surface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	DP17	DP18	DP19	DP20	DP21	DP21	DP22	DP22	DP23	DP24	UT01	UT02	UT03	UT04	UT05	UT06
		Sample Designator:	SB01	SB01	SB01	SB01	SB01	SB11	SB01	SB11	SB01	SB01	SB01	SB01	SB01	SB01	SB01	SB01
		Sample Interval (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Location:	FPS	FPS	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	UT	UT	UT	UT	UT	UT
		Material Sampled:	Soil/Ash	Soil/Ash	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Date Sampled:	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
		Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
		Notes:						Duplicate		Duplicate								
Parameter	**Units**	**Screening Level[1]**																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	**0.0096 J**	**0.0044 J**	**0.00085 J**	0.00061 U	0.00059 U	0.00060 U	**0.0038 J**	**0.0034 J**	0.00060 U	0.00051 U	**0.0069 J**	0.0028 U	**0.0080 J**	0.0054 U	0.0050 U	0.0055 U
Acenaphthylene	mg/kg	NA	0.0018 U	**0.00079 J**	**0.00058 J**	0.00043 U	0.00041 U	**0.00042 J**	**0.0010 J**	**0.00079 J**	**0.00060 J**	**0.00039 J**	**0.0071 J**	**0.0047 J**	**0.0070 J**	**0.019 J**	**0.0050 J**	**0.0086 J**
Anthracene	mg/kg	18,000	**0.026 J**	**0.0095**	**0.0025 J**	0.00051 U	**0.00079 J**	**0.0010 J**	**0.0077**	**0.0040 J**	**0.00080 J**	0.00043 U	**0.014 J**	**0.0058 J**	**0.013 J**	**0.017 J**	**0.0084 J**	**0.011 J**
Benzo(a)anthracene	mg/kg	0.16	**0.12**	**0.039**	**0.011**	**0.0019 J**	**0.0027 J**	**0.0042 J**	**0.03**	**0.02**	**0.0023 J**	**0.0016 J**	**0.043 J**	**0.017 J**	**0.048 J**	**0.074**	**0.022 J**	**0.016 J**
Benzo(a)pyrene	mg/kg	0.016	**0.081**	**0.028**	**0.012**	**0.0024 J**	**0.0027 J**	**0.0041 J**	**0.022**	**0.016**	**0.0026 J**	**0.0022 J**	**0.049 J**	**0.023 J**	**0.046 J**	**0.075**	**0.022 J**	**0.019 J**
Benzo(b)fluoranthene	mg/kg	0.16	**0.11**	**0.036**	**0.013**	**0.0028 J**	**0.0036 J**	**0.0059 J**	**0.03**	**0.021**	**0.0030 J**	**0.0027 J**	**0.062**	**0.026 J**	**0.068**	**0.087**	**0.03 J**	**0.034 J**
Benzo(g,h,i)perylene	mg/kg	NA	**0.054**	**0.016**	**0.011**	**0.0017 J**	**0.0025 J**	**0.0037 J**	**0.011**	**0.0087**	**0.0023 J**	**0.0017 J**	**0.054 J**	**0.029 J**	**0.052 J**	**0.051 J**	**0.021 J**	**0.023 J**
Benzo(k)fluoranthene	mg/kg	1.6	**0.065**	**0.022**	**0.0082**	**0.0019 J**	**0.0028 J**	**0.0034 J**	**0.017**	**0.012**	**0.0028 J**	**0.0019 J**	**0.047 J**	**0.019 J**	**0.033 J**	**0.069**	**0.022 J**	**0.017 J**
Chrysene	mg/kg	16	**0.21**	**0.073**	**0.017**	**0.0027 J**	**0.0047 J**	**0.0069**	**0.062**	**0.042**	**0.0039 J**	**0.0026 J**	**0.09**	**0.031 J**	**0.085**	**0.09**	**0.042 J**	**0.03 J**
Dibenzo(a,h)anthracene	mg/kg	0.016	**0.019 J**	**0.0052 J**	**0.0025 J**	0.0015 U	0.0015 U	0.0015 U	**0.0045 J**	**0.0031 J**	0.0015 U	0.0013 U	0.013 U	**0.0077 J**	0.014 U	**0.015 J**	0.013 U	0.014 U
Dibenzofuran	mg/kg	73	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	**0.17**	**0.052**	**0.014**	**0.0033 J**	**0.0046 J**	**0.0065**	**0.042**	**0.032**	**0.0040 J**	**0.0023 J**	**0.062**	**0.025 J**	**0.073**	**0.12**	**0.044 J**	**0.03 J**
Fluorene	mg/kg	2,400	**0.014 J**	**0.0059 J**	**0.0012 J**	0.00063 U	0.00061 U	0.00062 U	0.00063 U	**0.0044 J**	0.00062 U	0.00054 U	**0.0075 J**	0.0029 U	**0.0090 J**	0.0056 U	0.0052 U	0.0057 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	**0.031**	**0.0085**	**0.0068**	**0.0017 J**	**0.0020 J**	**0.0031 J**	**0.0081**	**0.0059**	**0.0020 J**	**0.0018 J**	**0.033 J**	**0.017 J**	**0.026 J**	**0.049 J**	**0.014 J**	**0.016 J**
2-Methylnaphthalene	mg/kg	240	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	**0.33**	**0.2**	**0.037**	**0.00045 J**	**0.0071**	**0.0059 J**	**0.24**	**0.16**	**0.00091 J**	**0.00041 J**	**0.049 J**	**0.026 J**	**0.039 J**	**0.036 J**	**0.073**	**0.024 J**
Phenanthrene	mg/kg	NA	**0.83**	**0.31**	**0.062**	**0.0017 J**	**0.011**	**0.021**	**0.33**	**0.18**	**0.0040 J**	**0.0014 J**	**0.26**	**0.064 J**	**0.29**	**0.099**	**0.12**	**0.072**
Pyrene	mg/kg	1,800	**0.19**	**0.053**	**0.014**	**0.0031 J**	**0.0045 J**	**0.0063 J**	**0.042**	**0.029**	**0.0038 J**	**0.0022 J**	**0.056**	**0.024 J**	**0.068**	**0.11**	**0.04 J**	**0.027 J**
Metals																		
Aluminum	mg/kg	77,000	**14,000**	**17,000**	**17,000**	**22,000**	**21,000**	**19,000**	**17,000**	**18,000**	**18,000**	**15,000**	**12,000**	**12,000 J**	**11,000**	**11,000**	**10,000**	**12,000**
Antimony	mg/kg	31	**1.7 J**	**0.77 J**	**0.38 J**	0.24 UJ	**0.26 J**	**0.28 J**	**0.46 J**	**0.42 J**	0.25 UJ	0.24 UJ	**0.25 J**	**0.25 J**	**0.35 J**	**0.57 J**	**0.36 J**	**0.94 J**
Arsenic	mg/kg	0.68	**22**	**19**	**5.6**	**5.3**	**4.2**	**4.1**	**6.5**	**6.2**	**3.8**	**3.9**	**6.1**	**4.7**	**6.1**	**7.0**	**6.5**	**6.2**
Barium	mg/kg	15,000	**1,100**	**320**	**200**	**220**	**230**	**230**	**200**	**250**	**190**	**140**	**120**	**130 J**	**120**	**140**	**130**	**130**
Beryllium	mg/kg	160	**2.0**	**1.2**	**0.93**	**0.88**	**0.90**	**0.83**	**0.90**	**0.88**	**0.70**	**0.65**	**0.50**	**0.55 J**	**0.53**	**0.56**	**0.55**	**0.52**
Cadmium	mg/kg	71	**3.4**	**1.7**	**0.94**	**0.41**	**0.59**	**0.57**	**0.93**	**0.82**	**0.62**	**0.29**	**0.31**	**0.37**	**0.52**	**0.55**	**0.46**	**0.36**
Calcium	mg/kg	NA	**12,000**	**7,800**	**13,000**	**12,000**	**16,000**	**18,000**	**11,000**	**13,000**	**13,000**	**9,300**	**12,000**	**20,000 J**	**19,000**	**19,000**	**20,000**	**17,000**
Chromium	mg/kg	33.6	**17**	**18**	**19**	**21**	**21**	**20**	**18**	**18**	**17**	**16**	**13**	**14**	**13**	**14**	**13**	**14**
Cobalt	mg/kg	23	**14**	**9.3**	**7.3**	**7.5**	**8.1**	**7.5**	**7.2**	**7.7**	**6.4**	**5.9**	**5.2**	**5.5**	**5.2**	**5.2**	**5.2**	**5.2**
Copper	mg/kg	3,100	**41**	**27**	**16**	**14**	**16**	**15**	**17**	**17**	**13**	**10**	**14**	**20 J**	**23**	**130**	**130**	**22**
Iron	mg/kg	55,000	**43,000**	**39,000**	**20,000**	**21,000**	**21,000**	**19,000**	**23,000**	**21,000**	**17,000**	**15,000**	**13,000**	**13,000 J**	**19,000**	**14,000**	**13,000**	**13,000**
Lead	mg/kg	400	**220**	**89**	**27**	**14**	**21**	**43**	**35**	**34**	**18**	**12**	**18**	**16**	**20**	**29**	**19**	**17**
Magnesium	mg/kg	NA	**2,100**	**2,900**	**4,500**	**5,000**	**5,300**	**5,200**	**4,000**	**4,400**	**4,300**	**3,500**	**2,500**	**3,000 J**	**2,600**	**2,700**	**2,500**	**2,700**
Manganese	mg/kg	1,800	**320**	**310**	**340**	**380**	**450**	**420**	**350**	**360**	**330**	**300**	**280**	**290 J**	**300**	**290**	**290**	**280**
Mercury	mg/kg	11	**0.16**	**0.083**	**0.041 J**	**0.032 J**	**0.049**	**0.047 J**	**0.038 J**	**0.037 J**	**0.026 J**	**0.022 J**	**0.070**	**0.083**	**0.17**	**0.42**	**0.78**	**0.16**
Methyl Mercury	mg/kg	7.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	mg/kg	1,500	**55**	**38**	**22**	**18**	**19**	**17**	**20**	**21**	**15**	**13**	**12**	**13**	**13**	**13**	**13**	**12**
Potassium	mg/kg	NA	**2,600**	**3,500**	**4,300**	**4,300**	**4,700**	**4,400**	**3,800**	**3,800**	**3,700**	**3,100**	**2,600**	**2,600 J**	**2,400**	**2,700**	**2,400**	**2,500**
Selenium	mg/kg	390	**0.84 J**	**0.55 J**	**0.51 J**	**0.21 J**	**0.48 J**	**0.46 J**	**0.40 J**	**0.58 J**	**0.46 J**	**0.16 J**	**0.14 J**	**0.22 J**	**0.22 J**	**0.24 J**	**0.28 J**	**0.28 J**
Silver	mg/kg	390	**0.47**	**0.42**	**0.10 J**	**0.062 J**	**0.071 J**	**0.062 J**	**0.11 J**	**0.12**	**0.057 J**	**0.043 J**	**0.048 J**	**0.052 J**	**0.056 J**	**0.14**	**0.060 J**	**0.044 J**
Sodium	mg/kg	NA	**490**	**210**	**110**	**90**	**81 J**	**79 J**	**93**	**99**	**72 J**	**62 J**	**72 J**	**86**	**84 J**	**100**	**79 J**	**74 J**
Thallium	mg/kg	0.78	**0.38**	**0.38**	**0.33**	**0.36**	**0.33**	**0.31**	**0.29**	**0.30**	**0.27**	**0.22**	**0.17 J**	**0.18**	**0.18**	**0.20**	**0.17**	**0.19**
Vanadium	mg/kg	390	**35**	**35**	**34**	**43**	**36**	**34**	**34**	**33**	**31**	**30**	**24**	**25**	**24**	**24**	**23**	**24**
Zinc	mg/kg	23,000	**580 J**	**350 J**	**140 J**	**56 J**	**78 J**	**85 J**	**150 J**	**120 J**	**64 J**	**43 J**	**120 J**	**70 J**	**100 J**	**140 J**	**120 J**	**62 J**

Table 4-5
Surface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Group Name:			CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
Sample Point:			UT07	SS01	SS02	SS03	SS03	SS04	SS05	SS06	SS06	SS07	SS08
Sample Designator:			SB01	SS01	SS01	SS01	SS11	SS01	SS01	SS01	SS11	SS01	SS01
Sample Interval (ft bgs):			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
Sample Location:			UT	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS
Material Sampled:			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Sampled:			11/19/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	1/9/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014
Investigation Phase:			Phase II	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase II	Phase II	Phase II	Phase II
Notes:							Duplicate				Duplicate		
Parameter	**Units**	**Screening Level[1]**											
Total Petroleum Hydrocarbons													
Diesel Range Organics	mg/kg	2,000	NS	32	16	17	26	26	21	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	NS	0.59 U	0.49 U	0.43 U	0.47 U	0.45 U	0.52 U	NS	NS	NS	NS
Semivolatile Organic Compounds													
Acenaphthene	mg/kg	3,600	0.0050 J	0.013 U	0.013 U	0.012 U	0.013 U	0.014 U	0.016 U	0.00058 U	0.00062 U	0.00064 U	0.00058 U
Acenaphthylene	mg/kg	NA	0.0019 U	0.022 U	0.022 U	0.02 U	0.022 U	0.024 U	0.027 U	0.00090 J	0.00057 J	0.00045 U	0.00041 U
Anthracene	mg/kg	18,000	0.015 J	0.022 U	0.022 U	0.02 U	0.022 U	0.024 U	0.027 U	0.00060 J	0.00053 U	0.00054 U	0.00048 U
Benzo(a)anthracene	mg/kg	0.16	0.049	0.025 U	0.026 U	0.024 U	0.026 U	0.028 U	0.031 U	0.0030 J	0.0020 J	0.0017 J	0.0012 J
Benzo(a)pyrene	mg/kg	0.016	0.032	0.025 U	0.026 U	0.024 U	0.026 U	0.028 U	0.031 U	0.0058 J	0.0027 J	0.0023 J	0.0015 J
Benzo(b)fluoranthene	mg/kg	0.16	0.042	0.033 U	0.034 U	0.032 U	0.034 U	0.036 U	0.041 U	0.0060 J	0.0037 J	0.0034 J	0.0017 J
Benzo(g,h,i)perylene	mg/kg	NA	0.017 J	0.02 U	0.021 U	0.019 U	0.021 U	0.022 U	0.025 U	0.0031 J	0.0020 J	0.0017 J	0.0013 J
Benzo(k)fluoranthene	mg/kg	1.6	0.028 J	0.051 U	0.052 U	0.048 U	0.051 U	0.055 U	0.063 U	0.0053 J	0.0024 J	0.0019 J	0.0017 J
Chrysene	mg/kg	16	0.082	0.034 U	0.035 U	0.032 U	0.035 U	0.037 U	0.042 U	0.0047 J	0.0029 J	0.0028 J	0.0019 J
Dibenzo(a,h)anthracene	mg/kg	0.016	0.0068 U	0.024 U	0.025 U	0.023 U	0.024 U	0.026 U	0.03 U	0.0015 U	0.0016 U	0.0016 U	0.0015 U
Dibenzofuran	mg/kg	73	NS	0.025 U	0.026 U	0.024 U	0.026 U	0.028 U	0.031 U	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	NS	0.13 J	0.076 J	0.028 U	0.052 J	0.11 J	0.14 J	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	0.059	0.046 U	0.047 U	0.043 U	0.046 U	0.05 U	0.057 U	0.0032 J	0.0032 J	0.0033 J	0.0021 J
Fluorene	mg/kg	2,400	0.0047 J	0.023 U	0.023 U	0.022 U	0.023 U	0.025 U	0.028 U	0.00060 U	0.00065 U	0.00067 U	0.00060 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.0087 J	0.028 U	0.029 U	0.026 U	0.028 U	0.031 U	0.035 U	0.0035 J	0.0021 J	0.0017 J	0.0012 J
2-Methylnaphthalene	mg/kg	240	NS	0.024 U	0.025 U	0.023 U	0.024 U	0.026 U	0.03 U	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	0.21	0.039 U	0.04 U	0.037 U	0.04 U	0.043 U	0.049 U	0.00061 J	0.00073 J	0.00055 J	0.00038 U
Phenanthrene	mg/kg	NA	0.36	0.022 U	0.022 U	0.02 U	0.022 U	0.024 U	0.027 U	0.0019 J	0.0023 J	0.0016 J	0.0012 J
Pyrene	mg/kg	1,800	0.061	0.015 U	0.016 U	0.015 U	0.016 U	0.017 U	0.019 U	0.0034 J	0.0032 J	0.0030 J	0.0020 J
Metals													
Aluminum	mg/kg	77,000	11,000	16,000	12,000	19,000	20,000	19,000	21,000	21,000	21,000	18,000	21,000 J
Antimony	mg/kg	31	0.56 J	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.4 UJ	1.6 UJ	0.25 UJ	0.24 UJ	0.26 UJ	0.25 UJ
Arsenic	mg/kg	0.68	7.6	3.8 J	3.7 J	4.9 J	4.8 J	5.3 J	6.4 J	4.5	4.0	3.4	4.0
Barium	mg/kg	15,000	330	160	140	170	180	190	200	200	190	170	210 J
Beryllium	mg/kg	160	0.75	0.72	0.56	0.87	0.87	0.90	1.0	0.82	0.81	0.71	0.86
Cadmium	mg/kg	71	1.0	0.43	0.31 J	0.42	0.45	0.59	0.79	0.40	0.47	0.52	0.88
Calcium	mg/kg	NA	9,400	13,000 J	12,000	10,000	12,000	13,000	15,000	9,900	11,000	15,000	18,000 J
Chromium	mg/kg	33.6	16	16	13	18	18	18	20	23	20	18	21
Cobalt	mg/kg	23	8.2	6.4	5.6	6.9	6.9	7.6	8.3	8.2	7.3	6.5	7.6
Copper	mg/kg	3,100	19	14	11	15	15	17	19	13	13	12	16
Iron	mg/kg	55,000	22,000	14,000	11,000	16,000	16,000	17,000	19,000	19,000	19,000	16,000	19,000 J
Lead	mg/kg	400	44	16	12	16	17	20	22	17	16	15	19
Magnesium	mg/kg	NA	2,400	4,100	3,200	4,200	4,300	4,700	5,300	4,700	4,600	4,500	5,300 J
Manganese	mg/kg	1,800	270	360	330	370	370	410	390	380	340	270	340 J
Mercury	mg/kg	11	0.035 J	0.034 J	0.026 J	0.035 J	0.042 J	0.043 J	0.057 J	0.033 J	0.038 J	0.050 J	0.048 J
Methyl Mercury	mg/kg	7.8	NS	0.000104 J	0.000039	0.000111	0.000139	0.000112	0.000081	NS	NS	NS	NS
Nickel	mg/kg	1,500	34	15	12	16	16	17	19	18	17	15	18
Potassium	mg/kg	NA	2,600	3,300	2,600	3,300	3,500	3,700	4,200	4,500	4,300	3,700	4,500 J
Selenium	mg/kg	390	0.50 J	1.8 U	1.8 U	1.8 U	1.8 U	2.0 U	2.3 U	0.48 J	0.49 J	0.56 J	0.77 J
Silver	mg/kg	390	0.28	0.12 U	0.12 U	0.12 U	0.12 U	0.13 U	0.15 U	0.063 J	0.063 J	0.057 J	0.067 J
Sodium	mg/kg	NA	140	68 J	59 J	67 J	68 J	76 J	82 J	78 J	76 J	70 J	77 J
Thallium	mg/kg	0.78	0.21	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.5 J	0.32	0.30	0.27	0.32
Vanadium	mg/kg	390	26	25	22	29	29	30	32	36	36	31	35
Zinc	mg/kg	23,000	210 J	57 J	45	60	59	74	80	57 J	59 J	58 J	80 J

Notes:
[1] For source of screening levels, see Table 4-1.
Bold - compound was detected
Highlighted - concentration exceeds screening level
bgs - below ground surface
DS - drainage swale
ft - feet
FPS - floodplain slope
J - estimated value
KRFP - Kansas River floodplain
mg/kg - milligrams per kilogram
NA - not available
NS - not sampled
U - compound was not detected
UT - upland terrace

Table 4-6
Surface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
			Sample Point:	**DP01**	**DP02**	**DP03**	**DP04**	**DP04**	**DP05**	**DP05**	**DP06**	**DP07**	**DP07**	**DP13**	**DP14**	**DP14**	**DP15**	**DP16**	**DP16**
			Sample Designator:	**SB01**	**SB01**	**SB01**	**SB01**	**SB02**	**SB01**	**SB02**	**SB01**	**SB01**	**SB11**	**SB01**	**SB01**	**SB02**	**SB01**	**SB01**	**SB11**
			Sample Interval (ft bgs):	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**1 - 3**	**0 - 0.5**	**1.5 - 2.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**1.5 - 2.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**
			Sample Location:	**UT**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**KRFP**	**KRFP**	**KRFP**	**UT**	**UT**	**UT**	**FPS**	**FPS**	**FPS**
			Material Sampled:	**Soil/Ash**	**Soil/Ash**	**Soil/Ash**	**Soil/Ash**	**Ash**	**Soil**	**Soil/Ash**	**Soil**	**Soil**	**Soil**	**Soil/Ash**	**Soil/Ash**	**Soil**	**Soil/Ash**	**Soil/Ash**	**Soil/Ash**
			Date Sampled:	**1/14/2014**	**1/13/2014**	**1/13/2014**	**1/13/2014**	**1/13/2014**	**1/14/2014**	**1/14/2014**	**1/14/2014**	**1/14/2014**	**1/14/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**
			Investigation Phase:	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
			Notes:										**Duplicate**						**Duplicate**
Parameter	**Units**	**TEF**	**Screening Level[1]**																
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	**22**	**20**	**18**	**57**	**4.2 J**	**20**	1.7 JU	**7.7 J**	3.8 JU	3.1 JU	**130**	**43**	0.92 JU	**53**	**26**	**24**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	**280**	**120**	**76**	**520**	**33**	**240**	8.3 JU	**110**	0.32 U	0.26 U	**1,200**	**510**	**13**	**550**	**320**	**310**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	10 U	**50**	**30**	**42**	**5.6**	**15**	0.32 JU	8.2 U	2.9 JU	2.0 JU	**88**	**45**	**0.50 J**	**40**	**25**	**26**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	**32**	**29**	**14**	**79**	**5.1 J**	**38**	0.59 JU	**18**	**8.6**	**6.7**	**170**	**84**	1.3 JU	**70**	**47**	**50**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	**0.61 J**	**4.6 J**	**1.8 J**	**1.6 J**	0.22 U	**0.53 J**	0.036 U	0.12 U	**0.22 J**	0.090 U	3.0 JU	1.4 JU	0.073 U	1.7 JU	0.81 JU	0.92 JU
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.84 JU	**11**	**6.7**	**3.6 J**	**3.4 J**	0.68 JU	0.039 U	0.55 JU	0.26 JU	0.25 JU	**3.3 J**	**3.8 J**	**0.059 J**	**5.4 J**	**3.7 J**	**3.6 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.38 J**	**1.6 J**	**0.77 J**	**1.3 J**	**0.38 J**	**0.45 J**	0.036 U	**0.20 J**	0.049 U	0.15 U	**1.7 J**	**1.1 J**	0.083 U	**0.82 J**	**0.73 J**	**0.78 J**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.58 JU	**14**	**5.1 J**	**2.8 J**	**2.0 J**	0.69 JU	0.029 U	0.50 JU	0.19 JU	0.057 U	**4.3 J**	**2.9 J**	0.035 U	**3.3 J**	**2.3 J**	**2.1 J**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.94 J**	**2.5 J**	**1.1 J**	**2.8 J**	**0.48 J**	**1.1 J**	**0.12 J**	**0.53 J**	**0.32 J**	**0.25**	**4.9 J**	**2.7 J**	0.068 U	**2.5 J**	**1.8 J**	**1.8 J**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.079 JU	0.71 U	0.48 U	0.29 U	0.20 U	0.090 U	0.10 JU	0.079 U	0.063 U	0.074 U	0.59 U	0.31 U	0.043 U	0.31 U	0.23 U	0.20 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**1.1 J**	**4.5 J**	**1.2 J**	**3.0 J**	**0.85 J**	**1.1 J**	**0.21 J**	**0.65 J**	**0.35 J**	**0.48 J**	**5.0 J**	**3.0 J**	**0.13 J**	**2.5 J**	**2.2 J**	**2.4 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	**0.25 J**	**12**	**2.3 J**	**0.93 J**	**1.5 J**	**0.14 J**	0.033 U	0.067 U	0.048 U	0.059 U	**0.38 J**	**1.2 J**	0.035 U	**1.7 J**	**1.1 J**	**1.4 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	**0.20 J**	**2.0 J**	**0.59 J**	**0.51 J**	**0.48 J**	**0.25 J**	0.051 U	0.088 U	0.073 U	0.078 U	**0.59 J**	**0.46 J**	0.095 U	**0.70 J**	**0.45 J**	**0.43 J**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**0.42 J**	**12**	**3.5 J**	**1.7 J**	**1.3 J**	**0.85 J**	0.034 U	**0.47 J**	0.057 U	0.067 U	**3.0 J**	**1.7 J**	0.040 U	**2.3 J**	**2.3 J**	**2.3 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	**0.28 J**	**17**	**3.1 J**	**1.2 J**	**1.7 J**	**0.14 J**	**0.063 J**	0.070 U	**0.061 J**	0.062 U	**0.39 J**	**0.97 J**	0.036 U	**2.1 J**	**1.4 J**	**1.2 J**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	**0.28 J**	12	**1.9**	1.0 U	**1.7**	0.16	0.093 U	0.2 U	0.12 U	0.24 U	**0.18 J**	0.82 J	0.69 U	**1.9**	**1.5**	**1.1**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.064 U	**0.82 J**	**0.25 J**	0.13 U	**0.22 J**	0.044 U	0.034 U	0.050 U	0.051 U	0.048 U	0.072 U	0.15 U	0.053 U	**0.16 J**	**0.17 J**	**0.12 J**
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	**22**	**70**	**43**	**76**	**7.7**	**27**	0.32 JU	**13**	6.2 JU	4.4 JU	**160**	**74**	1.0 JU	**73**	41 JU	**41**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	**74**	**50**	**29**	**150**	**9.7**	**69**	1.4 JU	**35**	**19**	**13**	**300**	**150**	3.1 JU	**130**	**93**	**99**
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	**9.1**	**110**	**40**	**40**	**13**	**12**	0.10 JU	**8.0**	3.4 JU	2.1 JU	**68 J**	**38**	0.43 JU	**39 J**	**27**	**24**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**10**	**28**	**13**	**30**	**5.9**	**12**	**1.1 J**	**7.3**	**4.0 J**	**3.6 J**	**43**	**24 J**	**0.62 J**	**22 J**	**19**	**19 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	**3.5 J**	**150**	**35**	**13**	**18**	**2.8 J**	**0.15 J**	**1.6 J**	**1.2 J**	**1.0 J**	**12 J**	**16**	**0.21 J**	**21**	**15 J**	**12 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	**2.8 J**	**19**	**6.0 J**	**5.9 J**	**4.1 J**	**2.4 J**	**0.16 J**	**1.4 J**	**0.88 J**	**0.43 J**	**4.6 J**	**5.5 J**	**0.12 J**	**6.5 J**	**5.0 J**	**4.3 J**
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	**3.7**	**190**	**37**	**18**	**25**	**1.6**	**0.99 J**	**1.1 J**	**1.0 J**	**1.0 J**	**2.4 J**	**18 J**	**0.54 J**	**24**	**19 J**	**14 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	**6.7**	**20**	**7.4**	**3.2**	**5.0**	**0.61 J**	**0.39 J**	**0.31 J**	**0.34 J**	**0.40 J**	**2.2 J**	**7.4 J**	**0.21 J**	**6.8 J**	**4.4 J**	**3.5 J**
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**1.0202**	**14.9180**	**4.3522**	**3.8170**	**2.3842**	**1.2755**	**0.0519**	**0.4003**	**0.1735**	**0.1400**	**5.9354**	**3.8449**	**0.0278**	**4.6939**	**3.3498**	**3.2202**

Table 4-6
Surface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP17	DP18	DP19	DP20	DP21	DP21	DP22	DP22	DP23	DP24	UT01	UT02	UT03	UT04	UT05	UT06
			Sample Designator:	SB01	SB01	SB01	SB01	SB01	SB11	SB01	SB11	SB01	SB01	SB01	SB01	SB01	SB01	SB01	SB01
			Sample Interval (ft bgs):	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
			Sample Location:	FPS	FPS	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	UT	UT	UT	UT	UT	UT
			Material Sampled:	Soil/Ash	Soil/Ash	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Date Sampled:	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
			Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
			Notes:						Duplicate		Duplicate								
Parameter	**Units**	**TEF**	**Screening Level[1]**																
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	16 U	33	21	3.4 JU	47	52	37	44	7.4 JU	2.3 JU	160	27	73	27	21	39
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	180	340	240	41	510	520	430	470	77	36	1,500	350	700	320	470	600
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	24	35	22	1.9 J	22	24	46	47	6.7	1.6 J	110	23	25	16	11	18
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	32	56	45	6.0 JU	65	70	81	83	13 J	4.8 JU	220	45	73	41	52	82
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.79 JU	1.2 JU	0.82 JU	0.22 U	1.1 J	1.4 JU	1.2 JU	1.7 JU	0.40 U	0.15 U	3.7 J	0.65 J	1.7 J	0.77 J	0.52 J	0.79 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	3.3 J	3.8 J	2.2 J	0.31 U	1.1 J	1.2 J	2.7 J	2.8 J	0.35 J	0.12 J	3.6 J	1.2 J	1.3 J	1.2 J	0.97 J	0.79 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.74 J	0.92 J	0.54 J	0.26 U	0.62 J	0.74 J	1.2 J	1.0 J	0.24 U	0.11 U	2.3 J	0.50 J	0.65 J	0.63 J	0.15 U	0.66 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	2.6 J	3.1 J	2.0 J	0.26 U	0.97 J	1.2 J	2.9 J	3.0 J	0.53 J	0.094 J	4.5 J	1.2 J	1.1 J	1.0 J	0.65 J	0.72 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	1.3 J	2.1 J	1.6 J	0.22 U	2.2 J	2.1 J	2.8 J	3.1 J	0.49 J	0.30 J	6.4	1.3 J	1.9 J	1.3 J	1.4 J	1.6 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.23 U	0.25 U	0.28 U	0.32 U	0.18 U	0.20 U	0.28 U	0.29 U	0.27 U	0.068 U	0.66 U	0.13 U	0.20 U	0.13 U	0.15 U	0.19 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	1.6 J	2.6 J	2.2 J	0.50 U	2.1 J	2.3 J	3.4 J	3.8 J	0.63 J	0.44 J	6.5	1.5 J	1.9 J	1.5 J	0.99 J	1.9 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	1.7 J	1.3 J	0.67 J	0.61 U	0.14 J	0.16 J	0.54 J	0.39 J	0.66 U	0.053 U	0.16 U	0.19 J	0.26 J	0.26 J	0.087 U	0.087 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.45 J	0.54 J	0.43 J	0.38 U	0.29 J	0.37 J	0.55 J	0.46 J	0.38 U	0.15 U	0.78 J	0.14 J	0.18 U	0.17 U	0.14 U	0.17 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	1.9 J	2.2 J	1.6 J	0.29 U	0.58 J	0.74 J	1.9 J	2.2 J	0.25 U	0.16 J	3.1 J	0.94 J	0.81 J	0.77 J	0.33 J	0.59 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	1.9 J	1.3 J	0.59 J	0.64 U	0.16 J	0.22 J	0.58 J	0.55 J	0.69 U	0.054 U	0.41 J	0.27 J	0.31 J	0.34 J	0.30 J	0.089 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	1.8	1.1 J	0.85 U	0.26 U	0.2 J	0.18 U	0.78 U	0.49 J	0.23 U	0.042 U	0.15 U	0.15	0.27 J	0.35 J	0.27 J	0.24 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.15 J	0.097 J	0.13 U	0.17 U	0.069 J	0.085 J	0.076 J	0.090 U	0.19 U	0.062 U	0.048 U	0.054 U	0.058 U	0.064 U	0.064 U	0.060 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	33	55	37	4.2 JU	49	54	72	75	11 J	2.8 JU	200	38	62	32	26	41
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	62	110	88	12 J	120	130	150	160	25	9.9 J	420	100	140	88	220	280
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	26 J	32	23 J	1.7 JU	17 J	20 J	41 J	37 J	5.6 JU	1.7 JU	93	19	20	15	11	16 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	14	23 J	20 J	2.3 J	18	19 J	29	30	5.3 J	2.6 J	65 J	15	17 J	15	16 J	27
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	21	12 J	8.2 J	0.64 U	3.6 J	4.0 J	9.6 J	6.8 J	0.69 U	0.89 J	18 J	4.6 J	7.2 J	5.4 J	4.0 J	5.8 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	5.3 J	5.9 J	4.2 J	0.38 U	2.8 J	3.0 J	4.6 J	3.8 J	0.38 U	0.17 U	9.4 J	3.1 J	2.2 J	3.2 J	1.8 J	3.4 J
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	27 J	13 J	5.2 J	0.41 J	2.0 J	1.9 J	5.7 J	4.2 J	0.23 U	0.64 J	3.3 J	2.3 J	4.3 J	4.3 J	3.3 J	2.5 J
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	5.5 J	3.1 J	0.96 J	0.17 U	0.85 J	0.96 J	1.2 J	0.87 J	0.22 J	0.42 J	4.2 J	2.0	4.5	5.3 J	8.2 J	6.7 J
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**3.1590**	**3.6699**	**2.3894**	**0.0313**	**2.2363**	**2.4654**	**3.7163**	**3.7299**	**0.4201**	**0.1382**	**7.3780**	**1.6903**	**2.1227**	**1.4936**	**1.3335**	**1.8256**

Table 4-6
Surface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
			Sample Point:	**UT07**	**SS01**	**SS02**	**SS03**	**SS03**	**SS04**	**SS05**	**SS06**	**SS06**	**SS07**	**SS08**
			Sample Designator:	**SB01**	**SS01**	**SS01**	**SS01**	**SS11**	**SS01**	**SS01**	**SS01**	**SS11**	**SS01**	**SS01**
			Sample Interval (ft bgs):	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**
			Sample Location:	**UT**	**DS**	**DS**	**DS**	**DS**	**DS**	**DS**	**DS**	**DS**	**DS**	**DS**
			Material Sampled:	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
			Date Sampled:	**11/19/2014**	**1/9/2014**	**1/9/2014**	**1/9/2014**	**1/9/2014**	**1/9/2014**	**1/9/2014**	**11/17/2014**	**11/17/2014**	**11/17/2014**	**11/17/2014**
			Investigation Phase:	**Phase II**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
			Notes:					**Duplicate**				**Duplicate**		
Parameter	**Units**	**TEF**	**Screening Level[1]**											
Dioxins/Furans														
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	**10 J**	**14**	**5.6 J**	**4.7 J**	**6.4 J**	**16**	**5.8 J**	8.1 JU	8.0 JU	4.9 JU	7.3 JU
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	**130**	**160**	**61**	**63**	**58**	**68**	**82**	**140**	**89**	**74**	**100**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	**12**	**8.6**	3.3 JU	2.9 JU	3.2 JU	**6.2 J**	3.8 JU	**3.7 J**	**3.9 J**	**3.5 J**	**4.6 J**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	**21**	**23**	**8.8**	**9.4**	**8.3**	**11**	**12**	**16**	**12**	**9.5**	**15**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	**0.45 J**	0.38 JU	0.41 JU	0.22 JU	0.44 JU	2.0 JU	0.18 JU	0.26 U	**0.30 J**	0.16 U	0.35 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**1.6 J**	0.55 JU	0.41 JU	0.38 JU	0.50 JU	1.8 JU	0.56 JU	**0.52 J**	**0.66 J**	**0.32 J**	0.41 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.36 J**	**0.29 J**	**0.19 J**	**0.16 J**	**0.28 J**	**0.21 J**	**0.31 J**	**0.59 J**	0.13 U	**0.19 J**	0.63 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**1.2 J**	**0.53 J**	**0.27 J**	**0.20 J**	**0.35 J**	**1.6 J**	**0.42 J**	**0.47 J**	**0.32 J**	**0.18 J**	0.33 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.72 J**	**0.92 J**	**0.47 J**	**0.46 J**	**0.58 J**	**0.57 J**	**0.73 J**	**1.2 J**	**0.33 J**	**0.50 J**	**1.4 J**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.11 U	0.13 U	0.16 U	0.11 U	**0.36 J**	**0.25 J**	0.12 U	0.15 U	0.14 U	0.15 U	0.40 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.95 J**	**0.85 J**	**0.53 J**	**0.59 J**	**0.66 J**	**0.75 J**	**0.70 J**	**1.8 J**	**0.91 J**	**0.42 J**	**1.4 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	**0.50 J**	0.20 U	0.20 U	0.18 U	0.16 U	**0.25 J**	0.16 U	0.12 U	0.17 U	0.18 U	0.12 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.15 U	0.13 U	0.15 U	0.11 U	**0.18 J**	**0.23 J**	**0.30 J**	0.32 U	0.18 U	0.22 U	0.43 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**0.78 J**	0.37 JU	0.40 JU	0.24 JU	0.36 JU	0.66 JU	0.46 JU	**0.42 J**	0.14 U	**0.18 J**	0.37 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	**0.61 J**	0.21 U	0.20 U	0.19 U	0.17 U	**0.40 J**	**0.24 J**	0.12 U	0.19 U	0.19 U	0.12 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	**0.54 J**	0.21 U	0.11 U	0.25U	0.23 U	0.27 U	0.280 U	0.13 U	0.14 U	0.13 U	0.16 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	**0.093 J**	0.061 U	0.066 U	0.057 U	0.058 U	0.07 U	0.140 U	0.079 U	0.12 U	0.13 U	0.12 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	**18**	**18**	6.2 JU	5.7 JU	5.9 JU	**13**	**7.7 J**	**8.2**	**9.3 J**	**6.2 J**	**9.0**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	**41**	**46**	**18**	**20**	**17**	**22**	**26**	**31**	**22**	**19**	**31**
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	**13 J**	**9.1**	2.1 JU	3.3 JU	4.2 JU	**12**	**5.1 J**	**4.3 J**	**3.6 J**	**2.9 J**	**2.8 J**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**8.7 J**	**8.0**	**3.3**	**4.7 J**	**4.4 J**	**5.1 J**	**7.0 J**	**9.4 J**	**5.5 J**	**5.8 J**	**9.9 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	**7.6 J**	**2.5 J**	0.20 U	**1.2 J**	**0.81 J**	**2.8 J**	**1.9 J**	**1.6 J**	**2.2 J**	**3.0 J**	**1.9 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	**3.0 J**	**1.9 J**	0.15 U	**0.62 J**	**0.66 J**	**1.4 J**	**2.8 J**	**0.58 J**	**0.82 J**	**0.69 J**	0.43 U
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	**9.4 J**	**1.4**	0.11 U	**0.66 J**	**0.65 J**	**0.40 J**	**1.3 J**	**1.5 J**	**2.1 J**	**4.0 J**	**0.93 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	**3.9 J**	**0.56 J**	**0.12 J**	**0.31 J**	**0.46 J**	**0.25 J**	**1.2 J**	**0.39 J**	**0.55 J**	**0.46 J**	**1.0 J**
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**1.1895**	**0.6272**	**0.2540**	**0.2553**	**0.5053**	**0.8927**	**0.7343**	**0.7390**	**0.4107**	**0.3312**	**0.5060**

Notes:

TEQ values are calculated using only positive detections

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

bgs - below ground surface

DS - drainage swale

ft - feet

FPS - floodplain slope

J - estimated value

KRFP - Kansas River floodplain

NA - not available

pg/g - picograms per gram

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

UT - upland terrace

Table 4-7
Historical XRF Surface Soil Field Screening Data
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample ID	Depth (ft bgs)	Sample Location	Barium (mg/kg)	SD Barium	Copper (mg/kg)	SD Copper	Lead (mg/kg)	SD Lead	Tin (mg/kg)	SD Tin	Zinc (mg/kg)	SD Zinc
Screening Level[1]			**15,000**		**3,100**		**400**		**47,000**		**23,000**	
INC010006	0 - 0.5	UT	762	27.7	63	33.0	BD	BD	37	29.3	38	30.7
INC020006	0 - 0.5	UT	918	30.8	44	32.3	23	14	BD	BD	45	31.6
INC020612	0.5 - 1	UT	850	29.3	62	32.7	25	14.3	BD	BD	53	31.2
INC021224	1 - 2	UT	891	30.1	68	33	21	14	BD	BD	BD	BD
INC030006	0 - 0.5	UT	595	25.1	BD	BD	74	17.5	BD	BD	197	39.5
INC040006	0 - 0.5	UT	468	22.8	36	33.0	154	21.7	37	27.6	292	44.4
INC050006	0 - 0.5	UT	940	31.4	BD	BD	40	15.3	BD	BD	211	39.7
INC050612	0.5 - 1	UT	593	24.6	54	32.9	17	13.8	BD	BD	134	36
INC060006	0 - 0.5	UT	373	20.6	135	39.4	120	19.6	BD	BD	393	47.9
INC070006	0 - 0.5	UT	389	20.9	BD	BD	200	23.6	BD	BD	940	65.3
INC080006	0 - 0.5	UT	943	31.3	48	33.5	108	19.6	BD	BD	111	35.6
INC080612	0.5 - 1	UT	785	28.1	70	33.7	30	14.6	BD	BD	66	32.1
INC081224	1 - 2	UT	818	28.9	34	31.4	50	16	BD	BD	54	31.8
INC090006	0 - 0.5	UT	754	29.4	52	35.7	123	21.3	BD	BD	255	44.6
INC090612	0.5 - 1	UT	932	31.7	81	36.3	20	14.8	BD	BD	84	35.4
INC100006	0 - 0.5	UT	716	28.2	123	38.6	544	35.4	70	31.5	556	53.3
INC100612	0.5 - 1	UT	895	30.8	BD	BD	206	24	71	32.7	142	36.8
INC110006	0 - 0.5	UT	1447	43.2	81	41.7	204	27.8	BD	BD	980	73.5
INC110612	0.5 - 1	UT	1150	36.3	40	33.8	168	23.6	BD	BD	282	44.3
INC120006	0 - 0.5	UT	1938	51.6	100	43.6	232	10.3	52	37.1	583	62.3
INC120612	0.5 - 1	UT	870	29.8	BD	BD	BD	BD	BD	BD	97	33.8
INC130006	0 - 0.5	UT	1737	50.2	108	48.1	272	32.8	44	39.9	2010	106
INC130612	0.5 - 1	UT	1852	55.2	255	62.3	515	45.4	55	45.1	2120	117
INC140006	0 - 0.5	UT	820	29.2	76	34.5	45	16.2	37	29.9	120	35.9
INC140612	0.5 - 1	UT	957	32.6	104	38.6	72	18.6	BD	BD	302	45.1
INC141224	1 - 2	UT	1640	45.4	82	40.5	149	24.8	BD	BD	569	59.2
INC150006	0 - 0.5	FPS	1150	41.6	158	50.8	365	37.4	97	41.6	1570	96.3
INC160006	0 - 0.5	FPS	826	29.9	BD	BD	BD	BD	BD	BD	68	33.6
INC160612	0.5 - 1	FPS	969	31.9	BD	BD	32	15.2	BD	BD	91	34.7
INC170006	0 - 0.5	FPS	1052	33.5	89	37.2	BD	BD	BD	BD	60	34
INC170612	0.5 - 1	FPS	811	28.8	74	33.8	BD	BD	BD	BD	BD	BD
INC180006	0 - 0.5	FPS	802	28.9	47	32.6	51	16.2	BD	BD	63	32.5
INC180612	0.5 - 1	FPS	875	30.2	BD	BD	55	16.7	BD	BD	BD	BD
INC190006	0 - 0.5	KRFP	858	29.6	BD	BD	16	14.3	BD	BD	47	31.2
INC190612	0.5 - 1	KRFP	821	29.2	BD	BD	BD	BD	BD	BD	BD	BD
INC191224	1 - 2	KRFP	879	30.4	BD	BD	28	15	67	BD	66	32.8
INC200006	0 - 0.5	KRFP	946	31.6	BD	BD	25	14.9	BD	BD	45	32.1
INC200612	0.5 - 1	KRFP	811	28.8	75	34	33	14.7	BD	BD	74	32.7
INC210006	0 - 0.5	KRFP	910	30.9	50	33.3	BD	BD	BD	BD	104	35.2
INC210612	0.5 - 1	KRFP	812	28.9	77	34.5	51	16.5	BD	BD	BD	BD
INC211224	1 - 2	KRFP	824	28.8	91	34.5	36	14.8	37	29.7	BD	BD

Table 4-7
Historical XRF Surface Soil Field Screening Data
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Sample ID	Depth (ft bgs)	Sample Location	Barium (mg/kg)	SD Barium	Copper (mg/kg)	SD Copper	Lead (mg/kg)	SD Lead	Tin (mg/kg)	SD Tin	Zinc (mg/kg)	SD Zinc
INC220006	0 - 0.5	KRFP	869	30.2	80	34.5	59	17	BD	BD	57	32.3
INC220612	0.5 - 1	KRFP	857	29.7	51	32.7	BD	BD	BD	BD	BD	BD
INC230006	0 - 0.5	KRFP	748	27.8	BD	BD	29	14.6	BD	BD	BD	BD
INC230612	0.5 - 1	KRFP	760	28.2	BD	BD	BD	BD	BD	BD	82	33.2
INC240006	0 - 0.5	KRFP	893	30.3	BD	BD	32	14.7	BD	BD	53	32.1
INC240612	0.5 - 1	KRFP	848	29.7	BD	BD	15	14.6	BD	BD	94	34.3
INC250006	0 - 0.5	FPS	803	29.1	41	32.5	37	15.8	BD	BD	127	36.1
INC250612	0.5 - 1	FPS	797	28.6	93	35.3	35	14.9	BD	BD	BD	BD
INC251224	1 - 2	FPS	892	30.4	64	33.8	BD	BD	43	31	BD	BD
INC260006	0 - 0.5	UT	810	28.5	132	37.5	18	14.3	BD	BD	51	31.5
INC260612	0.5 - 1	UT	781	27.9	53	31.6	40	14.6	BD	BD	BD	BD
INC270006	0 - 0.5	UT	308	18.7	BD	BD	119	19.3	BD	BD	269	43.1
INC280006	0 - 0.5	UT	462	22.2	59	34.8	150	21.2	BD	BD	448	50
INC290006	0 - 0.5	UT	831	28.9	BD	BD	36	15	BD	BD	BD	BD
INC290612	0.5 - 1	UT	787	27.7	36	30.8	20	13.4	BD	BD	35	30.2
INC300006	0 - 0.5	UT	633	26	84	35.9	36	15.4	BD	BD	135	32.1
INC300612	0.5 - 1	UT	902	30.6	68	33.8	45	16.9	BD	BD	228	40.2

Notes:

XRF samples were analyzed on April 2, 2001.

[1] For source of screening levels, see Table 4-1.

Highlighted - concentration exceeds screening level

Hatched - removed during upland terrace remedial action

BD - low results suppressed by XRF instrumentation

bgs - below ground surface

ft - feet

FPS - floodplain slope

KRFP - Kansas River floodplain

mg/kg - milligrams per kilogram

SD - standard deviation

UT - upland terrace

Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	**INC010006-L**	**INC030006-L**	**INC060006-L**	**INC070006-L**	**INC080006-L**	**INC100006-L**	**INC100006-LD**	**INC110612-L**	**INC130006-L**	**INC141224-L**	**INC150006-L**	**INC190612-L**	**INC220612-L**	**INC220612-LD**	**INC240612-L**	**INC260612-L**	**INC280006-L**
		Sample Interval (ft bgs):	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0.5 - 1.0**	**0 - 0.5**	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**0.5 - 1**	**0.5 - 1**	**0.5 - 1**	**0.5 - 1**	**0 - 0.5**
		Sample Location:	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**FPS**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**UT**	**UT**
		Investigation Phase:	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**	**2001**
		Notes:							**Duplicate**							**Duplicate**			
Parameter	**Units**	**Screening Level[1]**																	
Metals																			
Antimony	mg/kg	31	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	mg/kg	0.68	**2.9**	**3.2**	**4.8**	**5.6**	**4.6**	**5.5**	**7.4**	**7.6**	**23.3**	**12.9**	**23.3**	**4.3**	**4.2**	**4.1**	**3.3**	**3.4**	**4.0**
Barium	mg/kg	15,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	mg/kg	71	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chromium	mg/kg	33.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper	mg/kg	3,100	**20.0**	**21.5**	**33.8**	**27.5**	**16.0**	**2,320**	**88.2**	**20.2**	**51.9**	**28.7**	**60.0**	**10.7**	**11.5**	**11.3**	**9.8**	**7.6**	**23.7**
Lead	mg/kg	400	**11.2**	**33.8**	**67.8**	**110**	**68.7**	**448**	**488**	**130**	**160**	**62.5**	**170**	**11.4**	**12.5**	**11.9**	**10.9**	**12.6**	**76.5**
Mercury	mg/kg	11	0.1 U	**0.1**	0.1 U	**0.2**	0.1 U	**0.2**	**0.2**	0.1 U	0.1 U	0.1 U	**0.2**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Selenium	mg/kg	390	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Silver	mg/kg	390	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	mg/kg	23,000	**74**	**144**	**245**	**561**	**94.1**	**663**	**624**	**231**	**1,040**	**301**	**1,380**	**45.6**	**50.2**	**48.7**	**43.8**	**37.6**	**284**

Notes:

[1] For source of screening levels, see Table 4-1.

Highlighted - concentration exceeds screening level

Hatched - removed during upland terrace remedial action

bgs - below ground surface

FPS - floodplain slope

ft - feet

J - estimated value

NS - not sampled

mg/kg - milligrams per kilogram

RA - remedial action

SAA - soil above ash

SBA - soil below ash

SNA - soil no ash

U - compound was not detected

UT - upland terrace

Table 4-8

Historical Soil Samples, Detected Analytes (Metals)

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-03	CFI06-03	CFI06-03	CFI06-04	CFI06-04	CFI06-04	CFI06-05	CFI06-05	CFI06-05	CFI06-06	CFI06-06	CFI06-06	CFI06-07	CFI06-07	CFI06-08	CFI06-08	CFI06-08	CFI06-09
		Sample Interval (ft bgs):	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5
		Sample Location:	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006
		Notes:																		
Parameter	**Units**	**Screening Level**[1]																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	4.92	4.48	3.28	3.65	3.41	2.73	6.00	3.82	2.50	2.65	2.74	3.08	64.4	52.4	8.75	3.82	2.68	5.86
Barium	mg/kg	15,000	138	93.2	106	93.1	85.4	97.3	835	253	142	135	116	101	206	120	268	103	100	121
Cadmium	mg/kg	71	0.901	0.158	0.0478 J	0.712	0.0823	0.0468 J	0.475	0.2	0.0858 U	0.259	0.0668 J	0.105 U	0.858	0.725	7.35	0.0994 U	0.0906 U	0.331
Chromium	mg/kg	33.6	5.57	6.56	6.65	5.57	5.74	5.54	6.02	5.76	5.69	6.99	6.86	6.82	5.77	5.98	25.9	6.92	5.76	5.83
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	67.8	23.7	16.0	48.5	16.2	13.1	220.0	23.4	13.8	32.0	17.6	16.0	189.0	70.7	1,300	16.9	15.2	40.9
Mercury	mg/kg	11	0.115	0.07	0.016 J	0.422	0.028	0.014 J	0.221	0.042	0.021	0.05	0.02 J	0.012 J	0.129	0.504	0.085	0.165	0.025	0.059
Selenium	mg/kg	390	0.721 J	0.89 U	1.14 U	0.570 J	0.996 U	0.899 U	0.7 J	0.461 J	0.762 U	0.601 J	0.958 U	0.847 U	1.13	0.696 J	0.881 U	0.897 U	0.963 U	0.708 J
Silver	mg/kg	390	0.249 U	0.273 U	0.226 U	0.953	0.204 U	0.234 U	0.228 U	0.231 U	0.214 U	0.281 U	0.267 U	0.262 U	0.285 U	0.278 U	0.258 U	0.248 U	0.227 U	0.226 U
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

[1] For source of screening levels, see Table 4-1.

Highlighted - concentration exceeds screening level

Hatched - removed during upland terrace remedial action

bgs - below ground surface

FPS - floodplain slope

ft - feet

J - estimated value

NS - not sampled

mg/kg - milligrams per kilogram

RA - remedial action

SAA - soil above ash

SBA - soil below ash

SNA - soil no ash

U - compound was not detected

UT - upland terrace

Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-09	CFI06-09	CFI06-10	CFI06-10	CFI06-10	CFI06-11	CFI06-11	CFI06-11	CFI06-12	CFI06-12	CFI06-12	CFI06-13	CFI06-13	CFI06-13	CFI06-14	CFI06-14	CFI06-14	CFI06-15
		Sample Interval (ft bgs):	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5
		Sample Location:	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006
		Notes:																		
Parameter	**Units**	**Screening Level[1]**																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	**3.78**	**3.33**	**4.28**	**2.96**	**2.89**	**2.96**	**3.13**	**2.76**	**4.24**	**2.78**	**3.54**	**9.78**	**2.96**	**3.57**	**3.02**	**2.93**	**3.39**	**3.26**
Barium	mg/kg	15,000	**95.0**	**112**	**158**	**103**	**94.1**	**78.3**	**91.7**	**96.5**	**139**	**96.9**	**87.6**	**168**	**85.1**	**107**	**101**	**103**	**89.7**	**144**
Cadmium	mg/kg	71	**0.119**	**0.283**	**0.287**	**0.155**	0.0913 U	**0.249**	**0.0516 J**	**0.0537 J**	**0.241**	**0.0634 J**	0.0815 U	**0.559**	0.1 U	0.0951 U	0.101 U	0.11 U	**0.298**	**0.677**
Chromium	mg/kg	33.6	**5.85**	**6.62**	**6.96**	**6.16**	**5.75**	**5.84**	**7.09**	**5.7**	**7.25**	**7.23**	**6.33**	**5.2**	**5.82**	**7.2**	**6.4**	**5.89**	**5.85**	**6.98**
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	**19.6**	**19.6**	**46.3**	**16.1**	**12.5**	**21.7**	**14.6**	**13.0**	**42.5**	**15.0**	**15.7**	**136**	**11.1**	**13.8**	**18.0**	**15.6**	**24.8**	**54.5**
Mercury	mg/kg	11	**0.054**	**0.468**	**0.115**	**0.02**	0.019 U	**0.034**	**0.016 J**	**0.021**	**0.291**	**0.02**	**0.025**	**0.101**	**0.012 J**	**0.011 J**	**0.141**	**0.117**	**0.093**	**0.147**
Selenium	mg/kg	390	0.999 U	**0.486 J**	0.972 U	0.941 U	0.898 U	0.984 U	1.05 U	0.849 U	1.04 U	1.05 U	0.982 U	**0.884 J**	0.938 U	**0.501 J**	0.928 U	1.0 U	1.15 U	**0.75 J**
Silver	mg/kg	390	0.25 U	0.213 U	0.241 U	0.237 U	0.228 U	0.261 U	0.218 U	0.268 U	0.248 U	0.238 U	0.204 U	0.263 U	0.25 U	0.238 U	0.253 U	0.275 U	0.267 U	0.299 U
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

[1] For source of screening levels, see Table 4-1.

Highlighted - concentration exceeds screening level

Hatched - removed during upland terrace remedial action

bgs - below ground surface

FPS - floodplain slope

ft - feet

J - estimated value

NS - not sampled

mg/kg - milligrams per kilogram

RA - remedial action

SAA - soil above ash

SBA - soil below ash

SNA - soil no ash

U - compound was not detected

UT - upland terrace

Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-15	CFI06-16	CFI06-16	CFI06-16	CFI06-17	CFI06-17	CFI06-17	CFI06-18	CFI06-18	CFI06-18	CFI06-19	CFI06-19	CFI06-19	CFI06-20	CFI06-20	CFI06-20	CFI06-21	CFI06-21
		Sample Interval (ft bgs):	0.5 - 1	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1
		Sample Location:	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006
		Notes:																		
Parameter	Units	Screening Level[1]																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	**2.89**	**2.74**	**3.58**	**3.64**	**4.02**	**4.77**	**2.80**	**3.08**	**2.98**	**3.08**	**18.3**	**10.9**	**4.35**	**9.07**	**11.9**	**5.43**	**20.9**	**14.7**
Barium	mg/kg	15,000	**86.5**	**57.3**	**118**	**112**	**113**	**84.4**	**95.3**	**134**	**119**	**83.6**	**296**	**532**	**143**	**149**	**100**	**136**	**309**	**1,040**
Cadmium	mg/kg	71	**0.337**	**0.645**	**0.0952 J**	**0.0829 J**	**0.56**	**0.751**	**0.113**	**0.316**	**0.187**	0.0883 U	**2.53**	**0.772**	**0.484**	**2.39**	**4.08**	0.103 U	**2.85**	**2.51**
Chromium	mg/kg	33.6	**5.96**	**8.93**	**6.51**	**6.48**	**7.86**	**13.8**	**6.18**	**5.96**	**6.2**	**6.4**	**6.31**	**7.06**	**7.81**	**5.71**	**6.56**	**7.38**	**6.33**	**6.82**
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	**20.9**	**30.5**	**21.2**	**19.7**	**73.1**	**95.4**	**14.1**	**37.0**	**30.9**	**13.6**	**187**	**86.5**	**22.5**	**72.4**	**105**	**19.2**	**172**	**115**
Mercury	mg/kg	11	**0.147**	**0.08**	**0.032**	**0.021**	**0.094**	**0.092**	**0.297**	**0.058**	**0.042**	0.018 U	**0.447**	**0.053**	**0.021**	**0.112**	**0.076**	**0.024**	**0.082**	**0.062**
Selenium	mg/kg	390	**0.468 J**	**0.684 J**	1.07 U	0.958 U	**0.522 J**	**0.542 J**	**0.383 J**	**0.581 J**	**0.483 J**	0.869 U	**0.948 J**	**0.951**	**0.551 J**	**0.891 J**	**0.752 J**	**0.504 J**	**0.785 J**	**0.872 J**
Silver	mg/kg	390	0.229 U	**2.51**	0.259 U	0.254 U	0.23 U	**0.775**	0.222 U	0.229 U	0.217 U	0.221 U	0.215 U	0.212 U	0.224 U	0.387 U	0.266 U	0.257 U	0.197 U	0.215 U
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
[1] For source of screening levels, see Table 4-1.
Highlighted - concentration exceeds screening level
Hatched - removed during upland terrace remedial action
bgs - below ground surface
FPS - floodplain slope
ft - feet
J - estimated value
NS - not sampled
mg/kg - milligrams per kilogram
RA - remedial action
SAA - soil above ash
SBA - soil below ash
SNA - soil no ash
U - compound was not detected
UT - upland terrace

Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-21	CFI06-22	CFI06-22	CFI06-22	CFI06-23	CFI06-23	CFI06-23	CFI06-24	CFI06-24	CFI06-24	CFI06-25	CFI06-25	CFI06-25	CFI06-26	CFI06-26	CFI06-26	CFI06-27	CFI06-27
		Sample Interval (ft bgs):	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1
		Sample Location:	UT	UT	UT	UT	UT	UT	UT	UT	UT	UT	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006
		Notes:																		
Parameter	**Units**	**Screening Level[1]**																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	**14.6**	**3.70**	**22.2**	**16.2**	**4.85**	**4.95**	**4.94**	**3.80**	**3.20**	**4.46**	**5.61**	**5.46**	**4.41**	**16.4**	**20.7**	**26.2**	**47.4**	**37.5**
Barium	mg/kg	15,000	**867**	**77.0**	**374**	**1,100**	**212**	**119**	**135**	**113**	**128**	**118**	**185**	**133**	**128**	**269**	**265**	**175**	**510**	**559**
Cadmium	mg/kg	71	**3.07**	**1.19**	**2.99**	**1.72**	**0.632**	**0.488**	**0.379**	**0.504**	**0.204**	**0.137**	**0.725**	**0.398**	**0.269**	**3.66**	**11.7**	**6.25**	**9.57**	**10.8**
Chromium	mg/kg	33.6	**19.3**	**9.83**	**9.01**	**9.66**	**6.97**	**6.19**	**7.35**	**6.87**	**6.75**	**5.84**	**7.78**	**7.33**	**6.77**	**11.22**	**11.5**	**9.64**	**11.8**	**10.9**
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	**96.5**	**63.5**	**264**	**270**	**55.0**	**40.8**	**37.8**	**39.2**	**22.1**	**26.4**	**47.8**	**33.7**	**22.1**	**509**	**123**	**362**	**844**	**277**
Mercury	mg/kg	11	**0.044**	**0.128**	**0.078**	**0.06**	**0.151**	**0.07**	**0.035**	**0.046**	**0.025**	**0.028**	**0.057**	**0.041**	**0.023**	**0.238**	**16.5**	**0.024**	**0.073**	**0.057**
Selenium	mg/kg	390	**0.981 J**	**0.623 J**	**1.07**	**0.686 J**	**0.487 J**	0.859 U	0.83 U	**0.556 J**	1.01 U	0.919 U	**0.884 J**	**0.645 J**	**0.659 J**	**0.99**	**1.31**	**1.01**	**1.35**	**1.34**
Silver	mg/kg	390	0.231 U	**2.85**	0.219 U	0.244 U	0.227 U	0.232 U	0.247 U	0.252 U	0.242 U	0.251 U	0.238 U	0.212 U	0.255 U	0.221 U	0.242 U	0.21 U	0.234 U	0.23 U
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

[1] For source of screening levels, see Table 4-1.

Highlighted - concentration exceeds screening level

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Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	**CFI06-27**	**CFI06-28**	**CFI06-28**	**CFI06-28**	**CFI06-29**	**CFI06-29**	**CFI06-29**	**CFI06-30**	**CFI06-30**	**CFI06-30**	**CFI06-31**	**CFI06-31**	**CFI06-31**	**CFI06-32**	**CFI06-32**	**CFI06-32**	**CFI06-33**	**CFI06-33**
		Sample Interval (ft bgs):	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**1 - 2**	**0 - 0.5**	**0.5 - 1**	**1 - 2**	**0 - 0.5**	**0.5 - 1**
		Sample Location:	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**FPS**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**
		Investigation Phase:	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**	**2006**
		Notes:																		
Parameter	**Units**	**Screening Level[1]**																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	**36.2**	**15.2**	**16.8**	**14.3**	**15.2**	**25.9**	**21.1**	**2.98**	**3.14**	**3.53**	**7.40**	**6.69**	**5.26**	**5.43**	**15.2**	**22.3**	**13.7**	**11.7**
Barium	mg/kg	15,000	**395**	**614**	**640**	**406**	**359**	**440**	**644**	**131**	**132**	**123**	**182**	**169**	**158**	**173**	**277**	**311**	**188**	**266**
Cadmium	mg/kg	71	**4.98**	**1.89**	**1.27**	**1.92**	**3**	**4.19**	**1.97**	**0.12**	0.087 U	0.0941 U	**0.225**	**0.126**	**0.0583**	**1.12**	**4.91**	**6.81**	**1.78**	**2.2**
Chromium	mg/kg	33.6	**10.0**	**9.22**	**8.32**	**11.3**	**7.87**	**9.01**	**8.05**	**6.53**	**7.41**	**7.59**	**10.2**	**9.23**	**9.16**	**10.8**	**11.7**	**12.7**	**8.93**	**10.3**
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	**344**	**220**	**106**	**136**	**147**	**333**	**143**	**26.6**	**18.4**	**15.6**	**25.7**	**22.7**	**22.4**	**91.8**	**439**	**400**	**110**	**107**
Mercury	mg/kg	11	**0.048**	**0.079**	**0.058**	**0.037**	**0.064**	**0.075**	**0.077**	**0.034**	**0.015 J**	**0.014 J**	**0.026**	**0.02 J**	**0.019 J**	**0.037**	**0.059**	**0.041**	**0.093**	**0.224**
Selenium	mg/kg	390	**1.63**	**0.868 J**	**1.06**	**0.879 J**	**0.935 J**	**1.06**	**0.888 J**	**0.517 J**	0.962 U	1.0 U	**0.619 J**	**0.595 J**	**0.482 J**	**0.775 J**	**0.627 J**	**0.796 J**	**1.07**	**0.87 J**
Silver	mg/kg	390	0.22 U	0.278 U	0.19 U	0.239 U	0.252 U	0.243 U	0.278 U	0.253 U	0.218 U	0.235 U	0.26 U	0.244 U	0.255 U	0.269 U	0.238 U	0.254 U	0.219 U	0.247 U
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
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Highlighted - concentration exceeds screening level
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Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-33	CFI06-34	CFI06-34	CFI06-34	CFI06-35	CFI06-35	CFI06-35	CFI06-36	CFI06-36	CFI06-36	CFI TP-1	CFI TP-1 30'	CFI TP-1 55'	CFI TP-1 65'	CFI TP-2	CFI TP-2 20'	CFI TP-2 55'	CFI TP-3
		Sample Interval (ft bgs):	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	Composite	3'	2'	3.5	Composite	3'	2'	Composite
		Sample Location:	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006	2006	2010	2010	2010	2010	2010	2010	2010	2010
		Notes:												SBA	SAA	ASH		SBA	SAA	
Parameter	**Units**	**Screening Level[1]**																		
Metals																				
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	**8.87**	**6.24**	**4.56**	**6.54**	**4.66**	**5.40**	**5.40**	**4.25**	**4.98**	**5.44**	**16.2**	**5.0**	**5.2**	**6.4**	**22.8**	**4.5**	**4.2**	**20.7**
Barium	mg/kg	15,000	**191**	**196**	**158**	**203**	**169**	**173**	**188**	**148**	**151**	**215**	**784**	**156**	**192**	**199**	**354**	**139**	**174**	**1,380**
Cadmium	mg/kg	71	**0.828**	**0.253**	**0.085**	**0.0589 J**	**0.192**	**0.0589 J**	**0.179**	**0.111**	0.0959 U	**0.0672 J**	**1.3**	0.059 U	0.066 U	**0.36 J**	**3.2**	**0.25 J**	**0.15 J**	**1.7**
Chromium	mg/kg	33.6	**9.71**	**10.1**	**9.19**	**10.7**	**9.05**	**9.28**	**9.78**	**8.4**	**8.8**	**10.0**	**16.2**	**13.9**	**17.5**	**16.8**	**11.4**	**11.8**	**16.3**	**11.5**
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	**52.8**	**26.7**	**21.3**	**26.5**	**24.2**	**22.6**	**33.3**	**22.6**	**20.5**	**23.5**	**76.8**	**44.0**	**13.7**	**30.4**	**126**	**149**	**13.0**	**120**
Mercury	mg/kg	11	**0.035**	**0.035**	**0.022**	**0.03**	**0.035**	**0.025**	**0.029**	**0.034**	**0.021**	**0.03**	**0.110**	**0.023 J**	**0.026 J**	**0.064**	**0.074**	**0.015 J**	**0.067**	**0.057**
Selenium	mg/kg	390	**0.908**	**0.777 J**	**0.532 J**	**0.665 J**	**0.715 J**	**0.613 J**	**0.588 J**	**0.759 J**	0.959 U	**0.635 J**	**0.66 J**	0.48 U	0.540 U	0.50 U	0.42 U	0.42 U	0.42 U	**0.86 J**
Silver	mg/kg	390	0.242 U	0.271 U	0.208 U	0.257 U	0.239 U	0.232 U	0.258 U	0.236 U	0.24 U	0.271 U	**0.11 J**	0.073 U	0.081 U	0.074 U	**0.27 J**	0.063 U	0.062 U	**0.24 J**
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

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Highlighted - concentration exceeds screening level

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Table 4-8
Historical Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI TP-3 25'	CFI TP-3 60'	CFI TP-3 60'	CFI TP-4	CFI TP-4 65'	CFI TP-4 65'	CFI TP-5	CFI TP-5 70'	CFI TP-5 80'	CFI TP-6	CFI TP-6 15'	CFI TP-6 60'	CFI TP-6 60'	CFI-Q1	CFI-Q2	CFI-Q3	CFI-Q4	CFI-Q5	CFI-PAD-C
		Sample Interval (ft bgs):	3'	3'	3.5'	Composite	5'	2.5'	Composite	4.5'	2'	Composite	6'	2'	4'	Composite	Composite	Composite	Composite	Composite	Composite
		Sample Location:	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	UT	UT	UT	UT	UT	UT
		Investigation Phase:	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010
		Notes:	SBA	SAA	ASH		ASH	SAA		ASH	SAA		SNA	SAA	ASH	Post RA	Post RA	Post RA	Post RA	Post RA	Post RA
Parameter	Units	Screening Level[1]																			
Metals																					
Antimony	mg/kg	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	mg/kg	0.68	3.3	5.2	10.7	22.3	86.9	5.0	27.1	21.8	3.7	34.4	3.5	5.4	26.8	4.5	4.2	3.7	2.9	5.0	3.2
Barium	mg/kg	15,000	113	184	1,030	439	370	191	763	368	129	542	126	198	244	109	106	97.5	90.5	99.7	78.5
Cadmium	mg/kg	71	0.11 J	0.092 J	1.8	3.1	2.2	0.13 J	7.3	15.6	0.051 U	3.7	0.048 U	0.061 U	1.9	0.27 J	0.30 J	0.44 J	0.17 J	0.40 J	0.13 J
Chromium	mg/kg	33.6	11.5	17.7	12.6	10.8	13.0	17.4	12.6	8.4	13.2	14.5	13.4	20.3	16.3	7.3	7.5	7.9	7.5	7.7	8.0
Copper	mg/kg	3,100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/kg	400	8.5	14.2	57.0	143	366	14.3	199	91.6	10.3	334	8.9	14.4	182	14.2	12.6	14.6	6.9	16.8	7.0
Mercury	mg/kg	11	0.0086 U	0.025 J	0.072	0.65	0.11	0.016 J	0.2	0.074	0.015 J	0.0096 U	0.0085 U	0.014 J	0.13	0.26	0.070	0.67	0.010 J	0.025 J	0.010 U
Selenium	mg/kg	390	0.39 U	0.44 U	0.46 U	0.73 J	0.84 J	0.41 U	0.54 U	1.0 J	0.41 U	0.59 J	0.39 U	0.50 U	0.49 U	0.30 J	0.22 J	0.31 J	0.28 J	0.22 U	0.25 U
Silver	mg/kg	390	0.059 U	0.066 U	0.070 U	0.32 J	0.94 J	0.061 U	0.42 J	0.19 J	0.062 U	0.41 J	0.059 U	0.074 U	0.53 J	0.15 J	0.14 J	0.17 J	0.12 J	0.16 J	0.13 J
Zinc	mg/kg	23,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

[1] For source of screening levels, see Table 4-1.
Highlighted - concentration exceeds screening level
Hatched - removed during upland terrace remedial action
bgs - below ground surface
FPS - floodplain slope
ft - feet
J - estimated value
NS - not sampled
mg/kg - milligrams per kilogram
RA - remedial action
SAA - soil above ash
SBA - soil below ash
SNA - soil no ash
U - compound was not detected
UT - upland terrace

Table 4-9
Historical TCLP Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-09	CFI06-09	CFI06-09	CFI06-14	CFI06-14	CFI06-14	CFI06-16	CFI06-16	CFI06-16
		Sample Interval (ft bgs):	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2	0 - 0.5	0.5 - 1	1 - 2
		Sample Location:	UT	UT	UT	UT	UT	UT	UT	UT	UT
		Investigation Phase:	2006	2006	2006	2006	2006	2006	2006	2006	2006
		Notes:									
Parameter	**Units**	**TCLP Limits**									
Metals											
Arsenic	mg/L	5	**0.0327**	**0.0286 J**	**0.032**	**0.0228 J**	**0.041**	**0.0349**	**0.0246 J**	**0.037**	**0.0345**
Barium	mg/L	100	**0.579**	**0.39**	**0.423**	**0.751**	**0.777**	**0.588**	**0.475**	**0.944**	**1.050**
Cadmium	mg/L	1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chromium	mg/L	5	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Lead	mg/L	5	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Mercury	mg/L	0.2	**0.000128 J**	0.0002 U	**0.000210**	**0.000146 J**	0.0002 U	**0.000109 J**	0.0002 U	0.0002 U	0.0002 U
Selenium	mg/L	1	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Silver	mg/L	5	0.01 U	0.01 U	**0.00608 J**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:

Highlighted - concentration exceeds TCLP limits
Hatched - removed during upland terrace remedial action
bgs - below ground surface
FPS - floodplain slope
ft - feet
J - estimated value
mg/L - milligrams per liter
TCLP - toxicity characteristic leaching procedure
U - compound was not detected
UT - upland terrace

Table 4-9
Historical TCLP Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI06-27	CFI06-27	CFI06-27	CFI TP-1	CFI TP-1 65'	CFI TP-2	CFI TP-3	CFI TP-3 60'	CFI TP-4
		Sample Interval (ft bgs):	0 - 0.5	0.5 - 1	1 - 2	Composite	3.5	Composite	Composite	3.5'	Composite
		Sample Location:	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS
		Investigation Phase:	2006	2006	2006	2010	2010	2010	2010	2010	2010
		Notes:					ASH			ASH	
Parameter	**Units**	**TCLP Limits**									
Metals											
Arsenic	mg/L	5	**0.0767**	**0.0499**	**0.0385**	0.050 U	0.050 U	**0.094 J**	0.050 U	0.050	0.050 U
Barium	mg/L	100	**0.802**	**0.873**	**0.787**	**1.6**	**0.96 J**	**0.6 J**	**1.1**	**1.0**	**0.5 J**
Cadmium	mg/L	1	**0.0114**	**0.00823**	**0.0126**	0.0056 U	0.0058 U	**0.017 J**	**0.014 J**	**0.019 J**	**0.023 J**
Chromium	mg/L	5	0.004 U	0.004 U	0.004 U	0.010 U	**0.011 J**	0.010 U	0.010 U	**0.014 J**	0.010 U
Lead	mg/L	5	**0.0767**	0.02 U	**0.0242**	**0.10 J**	0.018 U	**0.034 J**	**0.069 J**	**0.068 J**	**0.06 J**
Mercury	mg/L	0.2	**0.000132 J**	**0.000109 J**	**0.000111 J**	0.000049 U	0.000049 U	**0.000200 J**	**0.000120 J**	0.000049 U	0.000049 U
Selenium	mg/L	1	0.03 U	0.03 U	0.03 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U
Silver	mg/L	5	0.01 U	0.01 U	0.01 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0099 U

Notes:

Highlighted - concentration exceeds TCLP limits
Hatched - removed during upland terrace remedial action
bgs - below ground surface
FPS - floodplain slope
ft - feet
J - estimated value
mg/L - milligrams per liter
TCLP - toxicity characteristic leaching procedure
U - compound was not detected
UT - upland terrace

Table 4-9
Historical TCLP Soil Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFI TP-4 65'	CFI TP-5	CFI TP-5 70'	CFI TP-6	CFI TP-6 60'
		Sample Interval (ft bgs):	5'	Composite	4.5'	Composite	4'
		Sample Location:	FPS	FPS	FPS	FPS	FPS
		Investigation Phase:	2010	2010	2010	2010	2010
		Notes:	ASH		ASH		ASH
Parameter	**Units**	**TCLP Limits**					
Metals							
Arsenic	mg/L	5	0.050	0.050 U	0.050 U	**0.060 J**	0.050 U
Barium	mg/L	100	**0.97 J**	**0.20 J**	**0.38 J**	**0.65 J**	**0.98 J**
Cadmium	mg/L	1	**0.017 J**	**0.031 J**	**0.013 J**	**0.028 J**	**0.010 J**
Chromium	mg/L	5	**0.015 J**	0.010 U	0.010 U	**0.012 J**	0.010 U
Lead	mg/L	5	**0.037 J**	**0.042 J**	**0.02 J**	**0.094 J**	**0.034 J**
Mercury	mg/L	0.2	0.000049 U	0.000049 U	0.000049 U	0.000049 U	0.000049 U
Selenium	mg/L	1	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U
Silver	mg/L	5	**0.011 J**	0.0099 U	0.0099 U	0.0099 U	0.0099 U

Notes:
Highlighted - concentration exceeds TCLP limits
Hatched - removed during upland terrace remedial action
bgs - below ground surface
FPS - floodplain slope
ft - feet
J - estimated value
mg/L - milligrams per liter
TCLP - toxicity characteristic leaching procedure
U - compound was not detected
UT - upland terrace

Table 4-10
Subsurface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	DP01	DP01	DP01	DP01	DP01	DP02	DP02	DP02	DP03	DP03	DP03	DP04	DP04	DP04	DP05	DP05
		Sample Designator:	SB02	SB22	SB03	SB04	SB05	SB02	SB03	SB04	SB02	SB03	SB04	SB03	SB033	SB04	SB03	SB04
		Sample Interval (ft bgs):	3 - 4.5	3 - 4.5	6 - 7.5	18 - 20	30 - 32	3 - 6	7 - 8	16 - 17	3 - 5	5.5 - 6.5	14 - 15.5	3 - 4	3 - 4	10 - 12	2.5 - 3.5	10 - 12
		Sample Location:	UT	UT	UT	UT	UT	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS
		Material Sampled:	Soil	Soil	Soil	Soil	Soil	Ash	Soil	Soil	Ash	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Date Sampled:	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/14/2014	1/14/2014
		Investigation Phase:	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I
		Notes:		Duplicate											Duplicate			
Parameter	Units	Screening Level[1]																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	1.6 J	1.8 J	0.84 J	1.0 J	0.93 J	290 J	5.1	0.83 U	190	2.1 J	1.6 J	9.9	6.6	1.7 J	7.4	2.4 J
Gasoline Range Organics	mg/kg	220	0.40 U	0.49 U	0.35 U	0.40 U	0.45 U	7.2	0.38 U	0.35 U	11 J	0.39 U	0.36 U	0.39 U	0.35 U	0.40 U	0.37 U	0.40 U
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.013 U	0.012 U	0.012 U	0.012 U	0.011 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U	0.012 U
Acenaphthylene	mg/kg	NA	0.019 U	0.019 U	0.019 U	0.021 U	0.021 U	0.021 U	0.02 U	0.02 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.018 U	0.019 U	0.02 U
Anthracene	mg/kg	18,000	0.019 U	0.019 U	0.019 U	0.021 U	0.021 U	0.021 U	0.02 U	0.02 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.018 U	0.019 U	0.02 U
Benzo(a)anthracene	mg/kg	0.16	0.023 U	0.023 U	0.023 U	0.024 U	0.025 U	0.025 U	0.024 U	0.023 U	0.023 U	0.022 U	0.024 U	0.022 U	0.022 U	0.021 U	0.022 U	0.024 U
Benzo(a)pyrene	mg/kg	0.016	0.023 U	0.023 U	0.023 U	0.024 U	0.025 U	0.025 U	0.024 U	0.023 U	0.023 U	0.022 U	0.024 U	0.022 U	0.022 U	0.021 U	0.022 U	0.024 U
Benzo(b)fluoranthene	mg/kg	0.16	0.03 U	0.03 U	0.03 U	0.032 U	0.033 U	0.032 U	0.031 U	0.03 U	0.03 U	0.029 U	0.032 U	0.029 U	0.029 U	0.027 U	0.029 U	0.031 U
Benzo(g,h,i)perylene	mg/kg	NA	0.018 U	0.018 U	0.018 U	0.019 U	0.02 U	0.02 U	0.019 U	0.018 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.017 U	0.018 U	0.019 U
Benzo(k)fluoranthene	mg/kg	1.6	0.045 U	0.045 U	0.046 U	0.048 U	0.05 U	0.049 U	0.047 U	0.046 U	0.046 U	0.044 U	0.048 U	0.044 U	0.045 U	0.041 U	0.044 U	0.048 U
Chrysene	mg/kg	16	0.031 U	0.031 U	0.031 U	0.033 U	0.034 U	0.033 U	0.032 U	0.031 U	0.031 U	0.03 U	0.033 U	0.03 U	0.03 U	0.028 U	0.03 U	0.032 U
Dibenzo(a,h)anthracene	mg/kg	0.016	0.021 U	0.022 U	0.022 U	0.023 U	0.024 U	0.023 U	0.022 U	0.022 U	0.022 U	0.021 U	0.023 U	0.021 U	0.021 U	0.02 U	0.021 U	0.023 U
Dibenzofuran	mg/kg	73	0.023 U	0.023 U	0.023 U	0.024 U	0.025 U	0.064 J	0.024 U	0.023 U	0.025 J	0.022 U	0.024 U	0.022 U	0.022 U	0.021 U	0.022 U	0.024 U
Dimethyl phthalate	mg/kg	NA	0.12 J	0.25 J	0.13 J	0.29 J	0.38 J	0.028 U	0.027 U	0.026 U	0.026 U	0.025 U	0.028 U	0.025 U	0.026 U	0.025 J	0.45	0.25 J
Fluoranthene	mg/kg	2,400	0.041 U	0.041 U	0.041 U	0.043 U	0.045 U	0.044 U	0.042 U	0.041 U	0.041 U	0.039 U	0.044 U	0.04 U	0.04 U	0.037 U	0.039 U	0.043 U
Fluorene	mg/kg	2,400	0.02 U	0.02 U	0.021 U	0.022 U	0.023 U	0.022 U	0.021 U	0.021 U	0.021 U	0.02 U	0.022 U	0.02 U	0.02 U	0.019 U	0.02 U	0.021 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.025 U	0.025 U	0.025 U	0.027 U	0.028 U	0.027 U	0.026 U	0.025 U	0.025 U	0.024 U	0.027 U	0.024 U	0.025 U	0.023 U	0.024 U	0.026 U
2-Methylnaphthalene	mg/kg	240	0.021 U	0.022 U	0.022 U	0.023 U	0.024 U	0.06 J	0.022 U	0.022 U	0.023 J	0.021 U	0.023 U	0.021 U	0.021 U	0.02 U	0.021 U	0.023 U
Naphthalene	mg/kg	3.8	0.035 U	0.035 U	0.035 U	0.037 U	0.039 U	0.038 U	0.036 U	0.036 U	0.035 U	0.034 U	0.038 U	0.034 U	0.035 U	0.032 U	0.034 U	0.037 U
Phenanthrene	mg/kg	NA	0.019 U	0.019 U	0.019 U	0.021 U	0.021 U	0.16 J	0.02 U	0.02 U	0.063 J	0.019 U	0.021 U	0.019 U	0.019 U	0.018 U	0.019 U	0.02 U
Pyrene	mg/kg	1,800	0.014 U	0.014 U	0.014 U	0.015 U	0.015 U	0.025 J	0.014 U	0.014 U	0.018 J	0.013 U	0.015 U	0.013 U	0.013 U	0.013 U	0.013 U	0.014 U
Metals																		
Aluminum	mg/kg	77,000	12,000	10,000	14,000	17,000	14,000	9,600	13,000	5,100	13,000	12,000	14,000	12,000	11,000	13,000	14,000	16,000
Antimony	mg/kg	31	1.1 UJ	1.0 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.1 UJ	1.2 UJ	0.82 UJ	1.1 UJ	1.0 UJ	1.2 UJ	1.1 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.2 UJ
Arsenic	mg/kg	0.68	4.3 J	4.2 J	5.8	4.6 J	4.2 J	30	5.1	3.3 J	26	7.4	7.4	4.9	5.1	5.7	4.6	6.1
Barium	mg/kg	15,000	130	140	170	140	160	210	160	85	1,900	300	380	170	140	200	140	170
Beryllium	mg/kg	160	0.62	0.54	0.74	0.91	0.77	1.9	0.82	0.32	3.0	0.89	0.74	0.70	0.72	0.72	0.78	0.84
Cadmium	mg/kg	71	0.13 J	0.14 J	0.19 J	0.16 J	0.21 J	3.3	0.35 J	0.077 J	3.9	0.87	0.48	0.38	0.40	0.24 J	0.24 J	0.12 J
Calcium	mg/kg	NA	14,000	9,900	15,000	7,000	13,000	24,000	4,500	12,000	21,000	9,200	69,000	8,500	7,800	26,000	5,400	14,000
Chromium	mg/kg	33.6	12	12	14	17	18	20	14	6.3	12	13	14	13	12	16	15	17
Cobalt	mg/kg	23	6.4	5.2	8.1	7.8	7.6	14	6.2	2.8	16	6.9	8.4	6.2	6.2	8.4	6.0	5.7
Copper	mg/kg	3,100	8.2	8.0	11	13	12	120	12	4.5	61	15	13	12	12	12	12	13
Iron	mg/kg	55,000	12,000	10,000	13,000	16,000	14,000	55,000	14,000	6,800	34,000	15,000	14,000	13,000	13,000	13,000	14,000	15,000
Lead	mg/kg	400	11	9.6	13	12	11	340	11	4.3	110	30	10	19	18	12	11	12
Magnesium	mg/kg	NA	3,100	2,700	3,600	4,600	3,900	1,100	2,700	1,800	1,200	2,700	5,600	2,900	2,800	3,800	3,300	4,100
Manganese	mg/kg	1,800	360	280	480	480	540	330	330	73	240	320	670	330	330	450	310	360
Mercury	mg/kg	11	0.0098 U	0.021 J	0.013 J	0.015 J	0.014 J	0.12 J	0.015 J	0.048 U	0.028 J	0.024 J	0.049 U	0.019 J	0.016 J	0.013 J	0.014 J	0.012 J
Methyl Mercury	mg/kg	7.8	0.000030 UR	0.000029 UR	0.000126	0.000033 U	0.000032 U	0.000014 J	0.000011 J	0.000035 UJ	0.000033 U	0.000017 J	0.000033 U	0.000029 J	0.000016 J	0.000029 U	0.000030 J	0.000029 U
Nickel	mg/kg	1,500	12	11	15	18	16	83	24	5.8	60	20	26	17	17	17	14	15
Potassium	mg/kg	NA	2,000	1,900	2,200	2,900	2,400	2,000	2,900	1,200	1,200	2,500	2,800	2,700	2,600	2,500	2,900	2,700
Selenium	mg/kg	390	1.6 U	1.0 U	1.6 U	1.8 U	1.8 U	1.7 U	1.7 U	1.2 U	1.7 U	1.5 U	1.8 U	1.6 U	1.5 U	1.5 U	1.6 U	1.8 U
Silver	mg/kg	390	0.11 U	1.5 U	0.10 U	0.12 U	0.12 U	1.5	0.11 U	0.078 U	0.56 J	0.10 U	0.11 U	0.10 U	0.098 U	0.099 U	0.10 U	0.12 U
Sodium	mg/kg	NA	57 J	62 J	65 J	450	250	1,000	100 J	140	1,100	160	410	77 J	82 J	90 J	76 J	140
Thallium	mg/kg	0.78	0.98 U	0.91 U	0.95 U	1.1 U	1.1 U	1.6 J	1.0 U	0.7 U	1.4 J	0.9 U	1.1 U	0.96 U	0.92 U	0.93 U	0.93 U	1.1 U
Vanadium	mg/kg	390	23	20	25	24	23	22	23	17	41	23	39	22	21	24	23	26
Zinc	mg/kg	23,000	30	32	36	50	42	1,000	98	21	880	170	49	71	71	44	44	48

Table 4-10
Subsurface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	DP06	DP06	DP06	DP07	DP07	DP07	DP13	DP13	DP13	DP13	DP14	DP14	DP15	DP15	DP15	DP16
		Sample Designator:	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB22	SB03	SB04	SB03	SB04	SB02	SB03	SB04	SB02
		Sample Interval (ft bgs):	3 - 4.5	6 - 7.5	16.5 - 18.5	3 - 4.5	6 - 7.5	18 - 20	3 - 4	3 - 4	6 - 7	20 - 21	4.5 - 5.5	9.5 - 10.5	3 - 4	10.5 - 11.5	16 - 17	3 - 4
		Sample Location:	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	UT	UT	UT	UT	UT	UT	FPS	FPS	FPS	FPS
		Material Sampled:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Ash	Soil	Soil	Soil
		Date Sampled:	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
		Investigation Phase:	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
		Notes:								Duplicate								
Parameter	**Units**	**Screening Level[1]**																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	**5.6**	**4.6**	**1.3 J**	**4.5 J**	**3.0 J**	**1.5 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	0.58 U	0.44 U	0.47 U	0.43 U	0.40 U	0.39 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	0.012 U	0.011 U	0.013 U	0.013 U	0.011 U	0.014 U	0.00062 U	0.00054 U	0.00052 U	0.00051 U	0.00051 U	0.00057 U	**0.014**	0.00053 U	0.00061 U	0.00051 U
Acenaphthylene	mg/kg	NA	0.02 U	0.019 U	0.022 U	0.021 U	0.018 U	0.022 U	0.00044 U	0.00038 U	0.00036 U	0.00036 U	0.00036 U	0.00040 U	0.00039 U	0.00037 U	0.00043 U	0.00036 U
Anthracene	mg/kg	18,000	0.02 U	0.019 U	0.022 U	0.021 U	0.018 U	0.022 U	0.00052 U	0.00045 U	0.00044 U	0.00043 U	0.00043 U	0.00048 U	**0.028**	0.00044 U	0.00051 U	0.00043 U
Benzo(a)anthracene	mg/kg	0.16	0.023 U	0.022 U	0.026 U	0.024 U	0.021 U	0.026 U	0.00040 U	0.00035 U	0.00033 U	**0.00048 J**	**0.00057 J**	0.00037 U	**0.13**	0.00034 U	0.00039 U	0.00033 U
Benzo(a)pyrene	mg/kg	0.016	0.023 U	0.022 U	0.026 U	0.024 U	0.021 U	0.026 U	0.00053 U	0.00046 U	0.00044 U	0.00043 U	**0.00046 J**	0.00048 U	**0.086**	0.00045 U	0.00052 U	0.00044 U
Benzo(b)fluoranthene	mg/kg	0.16	0.03 U	0.029 U	0.034 U	0.032 U	0.028 U	0.034 U	0.00067 U	0.00058 U	0.00056 U	0.00054 U	0.00055 U	0.00061 U	**0.11**	0.00057 U	0.00065 U	0.00055 U
Benzo(g,h,i)perylene	mg/kg	NA	0.018 U	0.018 U	0.021 U	0.019 U	0.017 U	0.021 U	0.0013 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	**0.027**	0.0011 U	0.0013 U	0.0011 U
Benzo(k)fluoranthene	mg/kg	1.6	0.046 U	0.044 U	0.052 U	0.049 U	0.042 U	0.053 U	0.0010 U	0.00087 U	0.00084 U	0.00082 U	0.00083 U	0.00092 U	**0.072**	0.00085 U	0.00098 U	0.00083 U
Chrysene	mg/kg	16	0.031 U	0.03 U	0.035 U	0.033 U	0.029 U	0.036 U	0.00046 U	0.00040 U	0.00038 U	**0.00072 J**	**0.00072 J**	0.00042 U	**0.23**	0.00039 U	0.00045 U	0.00038 U
Dibenzo(a,h)anthracene	mg/kg	0.016	0.022 U	0.021 U	0.025 U	0.023 U	0.02 U	0.025 U	0.0016 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0015 U	**0.012**	0.0013 U	0.0016 U	0.0013 U
Dibenzofuran	mg/kg	73	0.023 U	0.022 U	0.026 U	0.024 U	0.021 U	0.026 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	**0.52**	**0.49**	**0.46**	**0.23 J**	**0.39**	**1.1**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	0.041 U	0.04 U	0.047 U	0.044 U	0.038 U	0.047 U	0.00039 U	0.00033 U	0.00032 U	**0.00055 J**	**0.00065 J**	0.00035 U	**0.18**	0.00033 U	0.00038 U	0.00032 U
Fluorene	mg/kg	2,400	0.021 U	0.02 U	0.024 U	0.022 U	0.019 U	0.024 U	0.00065 U	0.00056 U	0.00054 U	0.00053 U	0.00054 U	0.00059 U	**0.02**	0.00055 U	0.00063 U	0.00053 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.025 U	0.024 U	0.029 U	0.027 U	0.023 U	0.029 U	0.00063 U	0.00055 U	0.00053 U	0.00052 U	0.00052 U	0.00058 U	**0.014**	0.00054 U	0.00062 U	0.00052 U
2-Methylnaphthalene	mg/kg	240	0.022 U	0.021 U	0.025 U	0.023 U	0.02 U	0.025 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	0.036 U	0.034 U	0.04 U	0.038 U	0.033 U	0.041 U	0.00040 U	0.00035 U	0.00034 U	**0.0021 J**	**0.0012 J**	**0.00040 J**	**1.7**	**0.00046 J**	0.00040 U	**0.00069 J**
Phenanthrene	mg/kg	NA	0.02 U	0.019 U	0.022 U	0.021 U	0.018 U	0.022 U	0.00046 U	0.00040 U	0.00039 U	**0.0031 J**	**0.0033 J**	**0.0010 J**	**1.4**	0.00081 JU	0.00045 U	**0.0011 J**
Pyrene	mg/kg	1,800	0.014 U	0.013 U	0.016 U	0.015 U	0.013 U	0.016 U	0.00046 U	0.00040 U	0.00039 U	**0.00050 J**	**0.00059 J**	0.00042 U	**0.17**	0.00039 U	0.00045 U	0.00038 U
Metals																		
Aluminum	mg/kg	77,000	**18,000**	**14,000**	**13,000**	**24,000**	**13,000**	**15,000**	**20,000**	**22,000**	**17,000**	**10,000**	**15,000**	**16,000**	**8,700**	**13,000**	**11,000**	**15,000**
Antimony	mg/kg	31	1.2 UJ	1.1 UJ	1.2 UJ	1.1 UJ	1.1 UJ	1.2 UJ	0.23 UJ	0.23 UJ	0.24 UJ	0.23 UJ	0.23 UJ	0.22 UJ	**1.7 J**	0.23 UJ	0.24 UJ	0.22 UJ
Arsenic	mg/kg	0.68	**6.1**	**3.9 J**	**5.6**	**8.1**	**4.2 J**	**7.4**	**5.0**	**5.0**	**4.6**	**3.5**	**3.0**	**3.7**	**37**	**3.6**	**2.8**	**3.9**
Barium	mg/kg	15,000	**180**	**140**	**180**	**220**	**150**	**200**	**140**	**150**	**150**	**160**	**140**	**170**	**450**	**140**	**170**	**150**
Beryllium	mg/kg	160	**0.93**	**0.78**	**0.73**	**1.2**	**0.76**	**0.81**	**0.82**	**0.81**	**0.75**	**0.48**	**0.59**	**0.61**	**1.6**	**0.54**	**0.51**	**0.62**
Cadmium	mg/kg	71	**0.24 J**	**0.23 J**	**0.67**	**0.27 J**	**0.23 J**	**0.64**	**0.19**	**0.18**	**0.16 J**	**0.21**	**0.20**	**0.23**	**5.1**	**0.49**	**0.14 J**	**0.26**
Calcium	mg/kg	NA	**6,600**	**7,700**	**35,000**	**8,300**	**8,500**	**34,000**	**3,200**	**3,100**	**3,300**	**14,000**	**5,100**	**9,200**	**19,000**	**16,000**	**17,000**	**8,300**
Chromium	mg/kg	33.6	**17**	**14**	**15**	**22**	**14**	**16**	**18**	**20**	**17**	**13**	**16**	**17**	**19**	**14**	**11**	**16**
Cobalt	mg/kg	23	**6.7**	**6.5**	**6.1**	**7.9**	**6.3**	**6.9**	**6.5**	**6.5**	**6.7**	**4.4**	**6.2**	**6.5**	**14**	**4.6**	**4.0**	**6.0**
Copper	mg/kg	3,100	**13**	**12**	**15**	**17**	**12**	**16**	**11**	**11**	**11**	**6.8**	**9.3**	**10**	**51**	**8.0**	**6.0**	**9.0**
Iron	mg/kg	55,000	**16,000**	**13,000**	**13,000**	**20,000**	**13,000**	**15,000**	**17,000**	**18,000**	**17,000**	**11,000**	**14,000**	**15,000**	**100,000**	**13,000**	**10,000**	**14,000**
Lead	mg/kg	400	**13**	**11**	**10**	**16**	**11**	**11**	**11**	**11**	**11**	**7.5**	**9.2**	**10**	**120**	**7.8**	**6.8**	**9.8**
Magnesium	mg/kg	NA	**3,800**	**3,600**	**3,600**	**5,100**	**3,500**	**4,200**	**3,500**	**3,600**	**3,500**	**3,000**	**3,500**	**4,000**	**1,300**	**3,200**	**3,300**	**3,500**
Manganese	mg/kg	1,800	**360**	**360**	**380**	**480**	**330**	**320**	**310**	**320**	**340**	**200**	**330**	**360**	**440**	**200**	**120**	**330**
Mercury	mg/kg	11	**0.022 J**	**0.014 J**	**0.021 J**	**0.027 J**	**0.022 J**	**0.022 J**	**0.011 J**	**0.010 J**	**0.012 J**	0.010 U	0.0092 U	**0.0091 J**	**0.027 J**	**0.011 J**	0.010 U	**0.015 J**
Methyl Mercury	mg/kg	7.8	0.000031 U	0.000030 U	**0.000022 J**	**0.000024 J**	0.000030 U	0.000038 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	mg/kg	1,500	**16**	**15**	**17**	**20**	**15**	**19**	**15**	**15**	**14**	**10**	**13**	**14**	**63**	**14**	**8.4**	**13**
Potassium	mg/kg	NA	**3,000**	**2,700**	**3,000**	**3,500**	**2,700**	**3,200**	**3,500**	**3,700**	**2,800**	**2,300**	**2,800**	**2,800**	**2,100**	**2,800**	**2,300**	**3,000**
Selenium	mg/kg	390	1.7 U	1.7 U	1.8 U	1.7 U	1.6 U	1.8 U	0.12 UJ	**0.15 J**	0.12 UJ	0.11 UJ	**0.15 J**	**0.11 J**	**1.7 J**	0.12 UJ	0.12 UJ	0.11 UJ
Silver	mg/kg	390	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U	0.11 U	**0.045 J**	**0.048 J**	**0.040 J**	0.034 U	0.035 U	**0.035 J**	**0.41**	0.035 U	0.035 U	**0.041 J**
Sodium	mg/kg	NA	**60 J**	**67 J**	**210**	**71 J**	**66 J**	**170**	**54 J**	**57 J**	**64 J**	**150**	**63 J**	**130**	**700**	**110**	**250**	**67 J**
Thallium	mg/kg	0.78	1.0 U	1.0 U	1.1 U	1.0 U	0.98 U	1.1 U	**0.26**	**0.27**	**0.24**	**0.21**	**0.19**	**0.21**	**0.29**	**0.23**	**0.22**	**0.20**
Vanadium	mg/kg	390	**28**	**22**	**38**	**37**	**21**	**38**	**36**	**38**	**36**	**28**	**26**	**29**	**36**	**29**	**26**	**29**
Zinc	mg/kg	23,000	**50**	**44**	**53**	**59**	**43**	**57**	**44 J**	**45 J**	**38 J**	**31 J**	**37 J**	**38 J**	**1,300 J**	**110 J**	**34 J**	**42 J**

Table 4-10
Subsurface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	DP16	DP16	DP17	DP17	DP17	DP18	DP18	DP18	DP19	DP19	DP19	DP20	DP20	DP20	DP20	DP21
		Sample Designator:	SB03	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB03	SB33	SB04	SB02
		Sample Interval (ft bgs):	6 - 7	14 - 15	3 - 4	6 - 7	14.5 - 15.5	3 - 4	6 - 7	14 - 15	3 - 4	6 - 7	15 - 16	3 - 4	6 - 7	6 - 7	14 - 15	3 - 4
		Sample Location:	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP
		Material Sampled:	Soil	Soil	Soil	Soil	Soil	Ash	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Date Sampled:	11/19/2014	11/19/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014
		Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
		Notes:														Duplicate		
Parameter	Units	Screening Level[1]																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	0.00052 U	0.00052 U	0.00057 U	0.00050 U	0.00047 U	0.031 J	0.0010 J	0.00062 U	0.00067 U	0.00055 U	0.00062 U	0.00067 U	0.00054 U	0.00058 U	0.00066 U	0.00047 U
Acenaphthylene	mg/kg	NA	0.00037 U	0.00036 U	0.00040 U	0.00035 U	0.00033 U	0.0021 U	0.00036 U	0.00044 U	0.00057 J	0.00038 U	0.00044 U	0.00047 U	0.00038 U	0.00041 U	0.00047 U	0.00033 U
Anthracene	mg/kg	18,000	0.00044 U	0.00043 U	0.00048 U	0.00071 J	0.00039 U	0.038	0.00097 J	0.00053 U	0.00057 U	0.00046 U	0.00052 U	0.00056 U	0.00045 U	0.00049 U	0.00056 U	0.00040 U
Benzo(a)anthracene	mg/kg	0.16	0.00034 U	0.00033 U	0.0020 J	0.0026 J	0.00030 U	0.16	0.0041 J	0.00040 U	0.0027 J	0.00035 U	0.00040 U	0.0011 J	0.00035 U	0.00038 U	0.00043 U	0.00031 U
Benzo(a)pyrene	mg/kg	0.016	0.00044 U	0.00044 U	0.0023 J	0.0019 J	0.00040 U	0.12	0.0022 J	0.00053 U	0.0028 J	0.00046 U	0.00053 U	0.0014 J	0.00046 U	0.00050 U	0.00056 U	0.00040 U
Benzo(b)fluoranthene	mg/kg	0.16	0.00056 U	0.00055 U	0.0035 J	0.0023 J	0.00050 U	0.15	0.0031 J	0.00067 U	0.0034 J	0.00059 U	0.00067 U	0.0015 J	0.00058 U	0.00063 U	0.00071 U	0.00051 U
Benzo(g,h,i)perylene	mg/kg	NA	0.0011 U	0.0011 U	0.0018 J	0.0012 J	0.00099 U	0.049	0.0011 U	0.0013 U	0.0020 J	0.0012 U	0.0013 U	0.0014 U	0.0011 U	0.0012 U	0.0014 U	0.0010 U
Benzo(k)fluoranthene	mg/kg	1.6	0.00084 U	0.00083 U	0.0017 J	0.0011 J	0.00075 U	0.074	0.0024 J	0.0010 U	0.0024 J	0.00089 U	0.0010 U	0.0011 U	0.00087 U	0.00094 U	0.0011 U	0.00077 U
Chrysene	mg/kg	16	0.00038 U	0.00038 U	0.0032 J	0.0042 J	0.00034 U	0.35	0.0075	0.00046 U	0.0032 J	0.00040 U	0.00046 U	0.0014 J	0.00040 U	0.00043 U	0.00049 U	0.00035 U
Dibenzo(a,h)anthracene	mg/kg	0.016	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0012 U	0.022 J	0.0013 U	0.0016 U	0.0017 U	0.0014 U	0.0016 U	0.0017 U	0.0014 U	0.0015 U	0.0017 U	0.0012 U
Dibenzofuran	mg/kg	73	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	0.00032 U	0.00032 U	0.0033 J	0.0028 J	0.00029 U	0.24	0.0056	0.00039 U	0.0038 J	0.00034 U	0.00065 J	0.0019 J	0.00034 U	0.00036 U	0.00041 U	0.00030 U
Fluorene	mg/kg	2,400	0.00054 U	0.00054 U	0.00059 U	0.00052 U	0.00049 U	0.044	0.0020 J	0.00065 U	0.00070 U	0.00057 U	0.00065 U	0.00070 U	0.00056 U	0.00061 U	0.00069 U	0.00049 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.00053 U	0.00053 U	0.0016 J	0.00068 J	0.00048 U	0.02 J	0.00053 U	0.00064 U	0.0023 J	0.00056 U	0.00063 U	0.00087 J	0.00055 U	0.00060 U	0.00068 U	0.00048 U
2-Methylnaphthalene	mg/kg	240	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	0.00034 U	0.00034 U	0.0020 J	0.0065	0.00030 U	1.2	0.052 R	0.00045 J	0.00055 J	0.00036 U	0.00049 J	0.00044 U	0.00035 U	0.00038 U	0.00049 J	0.00031 U
Phenanthrene	mg/kg	NA	0.00039 U	0.00059 J	0.0041 J	0.014	0.00035 U	2	0.046 R	0.00060 J	0.0020 J	0.00041 U	0.00096 J	0.0011 J	0.00043 J	0.00044 U	0.00067 J	0.00045 J
Pyrene	mg/kg	1,800	0.00039 U	0.00038 U	0.0036 J	0.0031 J	0.00035 U	0.25	0.0049 J	0.00047 U	0.0042 J	0.00041 U	0.00095 J	0.0020 J	0.00040 U	0.00044 U	0.00049 U	0.00035 U
Metals																		
Aluminum	mg/kg	77,000	14,000	14,000	28,000	17,000	630	21,000	20,000 J	19,000	32,000	18,000	15,000	35,000	17,000	19,000	21,000	13,000
Antimony	mg/kg	31	0.22 UJ	0.22 UJ	0.38 J	0.29 J	0.21 UJ	0.86 J	0.26 J	0.24 J	0.38 J	0.23 J	0.44 J	0.30 J	0.22 UJ	0.24 UJ	0.46 J	0.22 UJ
Arsenic	mg/kg	0.68	3.4	4.5	7.2	4.5	1.5	20	5.6	2.5	8.4	4.3	5.5	7.9	4.5	4.4	3.3	3.3
Barium	mg/kg	15,000	140	170	280	190	19	410	170 J	130	360	170	240	310	150	160	140	130
Beryllium	mg/kg	160	0.64	0.59	1.2	0.88	0.052 J	1.6	0.78 J	0.72	1.5	0.79	0.69	1.4	0.70	0.74	0.86	0.59
Cadmium	mg/kg	71	0.21	0.20	0.43	0.48	0.052 U	1.6	0.37	0.061 U	0.58	0.24	0.68	0.53	0.25	0.34	0.86	0.24
Calcium	mg/kg	NA	13,000	27,000	12,000	12,000	2,600	9,500	3,200 J	5,700	23,000	13,000	35,000	21,000	11,000	12,000	44,000	6,900
Chromium	mg/kg	33.6	15	15	27	20	1.3	23	21	17	30	20	18	30	18	19	22	15
Cobalt	mg/kg	23	6.1	5.7	8.6	7.5	0.77	10	9.5	4.7	11	6.6	7.9	11	6.7	7.7	6.8	5.4
Copper	mg/kg	3,100	8.8	8.2	17	13	0.63	44	17	9.7	21	11	13	22	10	12	17	8.4
Iron	mg/kg	55,000	14,000	13,000	25,000	18,000	2,200	41,000	26,000 J	15,000	29,000	17,000	16,000	30,000	17,000	18,000	20,000	13,000
Lead	mg/kg	400	9.6	9.4	32	18	1.4	64	18	10	21	11	10	21	10	11	13	8.8
Magnesium	mg/kg	NA	3,400	4,100	6,300	4,900	200	3,400	3,800 J	3,800	8,900	4,900	4,300	8,900	4,400	4,700	5,000	3,300
Manganese	mg/kg	1,800	330	410	420	380	26	360	230 J	70	600	300	400	600	360	440	230	290
Mercury	mg/kg	11	0.010 J	0.0096 U	0.026 J	0.014 J	0.0076 U	1.0	0.022 J	0.0096 U	0.019 J	0.0091 U	0.011 U	0.025 J	0.011 J	0.016 J	0.012 J	0.013 J
Methyl Mercury	mg/kg	7.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	mg/kg	1,500	13	13	21	18	1.4	48	28 J	13	23	15	18	23	15	17	24	12
Potassium	mg/kg	NA	2,800	2,300	5,400	3,800	170	3,600	3,500 J	2,800	6,700	3,500	3,300	7,100	3,200	3,600	4,000	2,800
Selenium	mg/kg	390	0.11 UJ	0.16 J	0.20 J	0.12 J	0.10 UJ	1.7 J	0.24 J	0.28 J	0.25 J	0.12 UJ	0.24 J	0.29 J	0.11 UJ	0.12 UJ	0.68 J	0.11 UJ
Silver	mg/kg	390	0.036 J	0.039 J	0.085 J	0.057 J	0.031 U	0.59	0.095 J	0.037 U	0.093	0.043 J	0.057 J	0.091 J	0.038 J	0.041 J	0.068 J	0.032 U
Sodium	mg/kg	NA	69 J	210	110	110	26 U	290	98	320	140	96	250	100	69 J	71 J	230	65 J
Thallium	mg/kg	0.78	0.19	0.19	0.43	0.29	0.052 U	0.33	0.32	0.23	0.51	0.26	0.39	0.48	0.24	0.27	0.52	0.18
Vanadium	mg/kg	390	27	30	50	36	5.8	43	35	33	62	36	49	60	33	35	71	26
Zinc	mg/kg	23,000	38 J	35 J	78 J	74 J	3.9 J	390 J	150 J	37 J	88 J	48 J	52 J	79 J	49 J	47 J	64 J	44 J

Table 4-10
Subsurface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
		Sample Point:	**DP21**	**DP21**	**DP22**	**DP22**	**DP22**	**DP23**	**DP23**	**DP23**	**DP24**	**DP24**	**DP24**	**DP24**	**UT01**	**UT02**	**UT03**	**UT04**
		Sample Designator:	**SB03**	**SB04**	**SB02**	**SB03**	**SB04**	**SB02**	**SB03**	**SB04**	**SB02**	**SB03**	**SB04**	**SB44**	**SB02**	**SB02**	**SB02**	**SB02**
		Sample Interval (ft bgs):	**6 - 7**	**11 - 12**	**3 - 4**	**6 - 7**	**14 -15**	**3 - 4**	**6 - 7**	**15 - 16**	**3 - 4**	**6 - 7**	**15 -16**	**15 -16**	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**
		Sample Location:	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**UT**	**UT**	**UT**	**UT**
		Material Sampled:	**Soil**	**Soil**	**Ash**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
		Date Sampled:	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**
		Investigation Phase:	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
		Notes:												**Duplicate**				
Parameter	**Units**	**Screening Level[1]**																
Total Petroleum Hydrocarbons																		
Diesel Range Organics	mg/kg	2,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthene	mg/kg	3,600	0.00056 U	0.00060 U	**0.01 J**	0.00054 U	0.00059 U	0.00058 U	0.00053 U	0.00064 U	0.00056 U	0.00056 U	0.00063 U	0.00071 U	0.00051 U	0.00055 U	0.0053 U	0.00051 U
Acenaphthylene	mg/kg	NA	0.00039 U	0.00042 U	0.0017 U	0.00038 U	0.00041 U	0.00041 U	0.00037 U	0.00045 U	0.00040 U	0.00039 U	0.00044 U	0.00050 U	0.00036 U	0.00039 U	**0.0060 J**	0.00036 U
Anthracene	mg/kg	18,000	0.00047 U	0.00051 U	**0.025 J**	0.00045 U	0.00049 U	0.00049 U	0.00044 U	0.00054 U	0.00047 U	0.00047 U	0.00053 U	0.00059 U	0.00043 U	0.00046 U	**0.0099 J**	0.00043 U
Benzo(a)anthracene	mg/kg	0.16	0.00036 U	0.00039 U	**0.093**	**0.0019 J**	**0.00093 J**	**0.0010 J**	0.00034 U	0.00042 U	**0.0013 J**	0.00036 U	0.00040 U	0.00046 U	**0.00046 J**	0.00036 U	**0.021 J**	0.00033 U
Benzo(a)pyrene	mg/kg	0.016	0.00047 U	0.00051 U	**0.059**	**0.0013 J**	0.00050 U	**0.0013 J**	0.00045 U	0.00055 U	**0.0017 J**	0.00047 U	0.00053 U	0.00060 U	0.00044 U	0.00047 U	**0.025 J**	0.00043 U
Benzo(b)fluoranthene	mg/kg	0.16	0.00060 U	0.00065 U	**0.061**	**0.0020 J**	**0.00097 J**	**0.0015 J**	0.00057 U	0.00069 U	**0.0017 J**	0.00060 U	0.00067 U	0.00076 U	0.00055 U	0.00059 U	**0.038 J**	0.00055 U
Benzo(g,h,i)perylene	mg/kg	NA	0.0012 U	0.0013 U	**0.036**	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0014 U	**0.0013 J**	0.0012 U	0.0013 U	0.0015 U	0.0011 U	0.0012 U	**0.027 J**	0.0011 U
Benzo(k)fluoranthene	mg/kg	1.6	0.00090 U	0.00097 U	**0.051**	0.00087 U	0.00095 U	**0.0015 J**	0.00086 U	0.0010 U	**0.0017 J**	0.00090 U	0.0010 U	0.0011 U	0.00083 U	0.00089 U	**0.027 J**	0.00083 U
Chrysene	mg/kg	16	0.00041 U	0.00044 U	**0.17**	**0.0035 J**	**0.0014 J**	**0.0015 J**	0.00039 U	0.00048 U	**0.0019 J**	0.00041 U	0.00046 U	0.00052 U	**0.00073 J**	0.00041 U	**0.04 J**	0.00038 U
Dibenzo(a,h)anthracene	mg/kg	0.016	0.0014 U	0.0015 U	**0.012 J**	0.0014 U	0.0015 U	0.0015 U	0.0014 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0018 U	0.0013 U	0.0014 U	0.014 U	0.0013 U
Dibenzofuran	mg/kg	73	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	0.00035 U	0.00038 U	**0.13**	**0.0022 J**	**0.0013 J**	**0.0017 J**	0.00033 U	**0.00041 J**	**0.0021 J**	0.00035 U	0.00039 U	0.00044 U	**0.00067 J**	0.00034 U	**0.035 J**	**0.00034 J**
Fluorene	mg/kg	2,400	0.00058 U	0.00063 U	**0.012 J**	0.00056 U	0.00061 U	0.00061 U	0.00055 U	0.00067 U	0.00059 U	0.00058 U	0.00065 U	0.00074 U	0.00054 U	0.00058 U	0.0056 U	0.00053 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	0.00057 U	0.00061 U	**0.017 J**	0.00055 U	0.00060 U	**0.0010 J**	0.00054 U	0.00066 U	**0.0012 J**	0.00057 U	0.00064 U	0.00072 U	0.00052 U	0.00056 U	**0.02 J**	0.00052 U
2-Methylnaphthalene	mg/kg	240	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	0.00036 U	0.00039 U	**0.28**	**0.019**	**0.0025 J**	**0.00049 J**	0.00035 U	**0.00049 J**	0.00037 U	0.00037 U	0.00041 U	0.00046 U	**0.00088 J**	0.00036 U	**0.018 J**	0.00033 U
Phenanthrene	mg/kg	NA	0.00041 U	0.00045 U	**0.81**	**0.016**	**0.0062**	**0.0012 J**	0.00039 U	**0.00070 J**	**0.0015 J**	0.00042 U	0.00047 U	**0.00055 J**	0.0018 JU	**0.00041 J**	**0.094**	**0.00057 J**
Pyrene	mg/kg	1,800	0.00041 U	0.00045 U	**0.13**	**0.0024 J**	**0.0014 J**	**0.0017 J**	0.00039 U	**0.00050 J**	**0.0022 J**	0.00042 U	0.00047 U	0.00053 U	**0.00054 J**	0.00041 U	**0.031 J**	0.00038 U
Metals																		
Aluminum	mg/kg	77,000	**14,000**	**20,000**	**13,000**	**20,000**	**17,000**	**28,000 J**	**20,000**	**18,000**	**35,000**	**18,000**	**28,000**	**25,000**	**19,000**	**18,000**	**12,000**	**11,000**
Antimony	mg/kg	31	0.22 UJ	**0.39 J**	**1.8 J**	**0.29 J**	**0.66 J**	**0.39 J**	**0.34 J**	**0.51 J**	**0.36 J**	0.22 UJ	**0.31 J**	**0.55 J**	0.24 UJ	0.24 UJ	**0.32 J**	0.23 UJ
Arsenic	mg/kg	0.68	**2.7**	**4.3**	**41**	**4.8**	**5.1**	**7.1**	**5.5**	**8.9**	**9.5**	**3.5**	**6.0**	**8.6**	**4.4**	**4.0**	**5.0**	**3.9**
Barium	mg/kg	15,000	**130**	**220**	**290**	**200**	**240**	**290 J**	**190**	**130**	**320**	**160**	**260**	**290**	**160**	**180**	**140**	**95**
Beryllium	mg/kg	160	**0.63**	**0.87**	**2.1**	**0.90**	**0.86**	**1.1**	**0.97**	**0.85**	**1.4**	**0.73**	**1.1**	**1.0**	**0.73**	**0.69**	**0.52**	**0.45**
Cadmium	mg/kg	71	**0.14 J**	**0.79**	**24**	**0.57**	**0.81**	**0.41**	**0.39**	**0.76**	**0.51**	**0.38**	**0.70**	**0.98**	**0.20**	**0.22**	**0.33**	**0.18**
Calcium	mg/kg	NA	**12,000**	**46,000**	**30,000**	**9,500**	**41,000**	**15,000 J**	**16,000**	**41,000**	**20,000**	**11,000**	**44,000**	**52,000**	**3,400**	**4,800**	**20,000**	**3,800**
Chromium	mg/kg	33.6	**16**	**23**	**20**	**22**	**18**	**25**	**22**	**20**	**31**	**19**	**28**	**26**	**18**	**19**	**13**	**13**
Cobalt	mg/kg	23	**5.3**	**5.3**	**15**	**8.2**	**9.3**	**9.0**	**8.4**	**9.1**	**11**	**7.3**	**6.6**	**12**	**6.5**	**6.8**	**5.1**	**5.2**
Copper	mg/kg	3,100	**8.8**	**16**	**56**	**14**	**16**	**17**	**13**	**17**	**21**	**12**	**19**	**19**	**10**	**9.9**	**19**	**7.1**
Iron	mg/kg	55,000	**14,000**	**17,000**	**85,000**	**20,000**	**23,000**	**24,000 J**	**19,000**	**16,000**	**31,000**	**17,000**	**26,000**	**26,000**	**17,000**	**17,000**	**14,000**	**12,000**
Lead	mg/kg	400	**9.1**	**13**	**200**	**15**	**18**	**17**	**13**	**12**	**22**	**11**	**15**	**14**	**10**	**10**	**13**	**7.7**
Magnesium	mg/kg	NA	**3,800**	**5,500**	**2,500**	**5,100**	**4,800**	**6,300 J**	**5,600**	**4,800**	**8,800**	**4,700**	**6,800**	**6,300**	**3,200**	**3,500**	**2,700**	**2,400**
Manganese	mg/kg	1,800	**180**	**350**	**430**	**440**	**440**	**430 J**	**450**	**230**	**640**	**390**	**250**	**510**	**310**	**350**	**290**	**270**
Mercury	mg/kg	11	**0.012 J**	**0.023 J**	**1.2**	**0.030 J**	**0.045 J**	**0.020 J**	**0.011 J**	**0.012 J**	**0.025 J**	**0.027 J**	**0.017 J**	0.012 U	**0.013 J**	**0.014 J**	**0.17**	0.0095 U
Methyl Mercury	mg/kg	7.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	mg/kg	1,500	**12**	**20**	**74**	**20**	**24**	**20**	**19**	**21**	**24**	**16**	**19**	**26**	**14**	**15**	**12**	**11**
Potassium	mg/kg	NA	**2,800**	**3,700**	**2,200**	**4,100**	**3,100**	**4,900 J**	**4,000**	**3,700**	**6,600**	**3,700**	**5,000**	**4,700**	**3,700**	**3,700**	**2,500**	**2,400**
Selenium	mg/kg	390	0.11 UJ	**0.25 J**	**0.74 J**	0.11 UJ	**0.39 J**	**0.13 J**	**0.18 J**	**1.6 J**	**0.45 J**	**0.14 J**	**0.39 J**	**0.58 J**	**0.17 J**	**0.31 J**	**0.21 J**	**0.24 J**
Silver	mg/kg	390	**0.035 J**	**0.070 J**	**0.64**	**0.066 J**	**0.098 J**	**0.083 J**	**0.052 J**	**0.067 J**	**0.085 J**	**0.041 J**	**0.069 J**	**0.072 J**	**0.044 J**	**0.049 J**	**0.041 J**	0.035 U
Sodium	mg/kg	NA	**85**	**220**	**550**	**140**	**390**	**93 J**	**120**	**310**	**100**	**74 J**	**220**	**240**	**49 J**	**70 J**	**73 J**	**63 J**
Thallium	mg/kg	0.78	**0.21**	**0.53**	**0.39**	**0.30**	**0.47**	**0.39**	**0.33**	**0.53**	**0.50**	**0.26**	**0.49**	**0.60**	**0.24**	**0.25**	**0.17**	**0.15 J**
Vanadium	mg/kg	390	**28**	**64**	**33**	**38**	**53**	**50**	**44**	**65**	**64**	**33**	**68**	**85**	**35**	**35**	**24**	**24**
Zinc	mg/kg	23,000	**46 J**	**61 J**	**6,500 J**	**110 J**	**79 J**	**66 J**	**55 J**	**67 J**	**82 J**	**49 J**	**70 J**	**71 J**	**41 J**	**190 J**	**59 J**	**28 J**

Table 4-10
Subsurface Soil Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	UT05	UT06	UT06	UT07
		Sample Designator:	SB02	SB02	SB22	SB02
		Sample Interval (ft bgs):	3 - 4	3 - 4	3 - 4	3 - 4
		Sample Location:	UT	UT	UT	UT
		Material Sampled:	Soil	Soil	Soil	Soil
		Date Sampled:	11/19/2014	11/19/2014	11/19/2014	11/19/2014
		Investigation Phase:	Phase II	Phase II	Phase II	Phase II
		Notes:			Duplicate	
Parameter	**Units**	**Screening Level[1]**				
Total Petroleum Hydrocarbons						
Diesel Range Organics	mg/kg	2,000	NS	NS	NS	NS
Gasoline Range Organics	mg/kg	220	NS	NS	NS	NS
Semivolatile Organic Compounds						
Acenaphthene	mg/kg	3,600	0.00058 U	0.00057 U	0.0029 U	**0.0050 J**
Acenaphthylene	mg/kg	NA	0.00041 U	**0.00044 J**	0.0020 U	0.0017 U
Anthracene	mg/kg	18,000	**0.00051 J**	**0.0011 J**	0.0024 U	**0.025 J**
Benzo(a)anthracene	mg/kg	0.16	**0.0011 J**	**0.0042 J**	**0.0039 J**	**0.078**
Benzo(a)pyrene	mg/kg	0.016	**0.0010 J**	**0.0082**	**0.019 J**	**0.046**
Benzo(b)fluoranthene	mg/kg	0.16	**0.0017 J**	**0.015**	**0.013 J**	**0.082**
Benzo(g,h,i)perylene	mg/kg	NA	**0.0023 J**	**0.022**	**0.042**	**0.027**
Benzo(k)fluoranthene	mg/kg	1.6	0.00094 U	**0.0073**	0.0047 U	**0.033**
Chrysene	mg/kg	16	**0.0025 J**	**0.012**	**0.01 J**	**0.11**
Dibenzo(a,h)anthracene	mg/kg	0.016	0.0015 U	**0.0085**	**0.021 J**	**0.0085 J**
Dibenzofuran	mg/kg	73	NS	NS	NS	NS
Dimethyl phthalate	mg/kg	NA	NS	NS	NS	NS
Fluoranthene	mg/kg	2,400	**0.0019 J**	**0.0065**	**0.0036 J**	**0.09**
Fluorene	mg/kg	2,400	0.00061 U	0.00060 U	0.0030 U	0.0026 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.16	**0.0010 J**	**0.0078**	**0.017 J**	**0.016 J**
2-Methylnaphthalene	mg/kg	240	NS	NS	NS	NS
Naphthalene	mg/kg	3.8	**0.0025 J**	**0.0057 J**	**0.0096 J**	**0.11**
Phenanthrene	mg/kg	NA	**0.0058 J**	**0.022**	**0.014 J**	**0.34**
Pyrene	mg/kg	1,800	**0.0017 J**	**0.0067**	**0.0037 J**	**0.094**
Metals						
Aluminum	mg/kg	77,000	**13,000**	**12,000**	**12,000**	**12,000**
Antimony	mg/kg	31	0.23 UJ	0.23 UJ	0.23 UJ	**0.29 J**
Arsenic	mg/kg	0.68	**4.7**	**3.4**	**3.7**	**5.6**
Barium	mg/kg	15,000	**130**	**120**	**120**	**190**
Beryllium	mg/kg	160	**0.52**	**0.49**	**0.50**	**0.61**
Cadmium	mg/kg	71	**0.21**	**0.31**	**0.31**	**0.40**
Calcium	mg/kg	NA	**22,000**	**20,000**	**16,000**	**11,000**
Chromium	mg/kg	33.6	**14**	**14**	**14**	**14**
Cobalt	mg/kg	23	**6.7**	**5.5**	**5.8**	**6.5**
Copper	mg/kg	3,100	**8.7**	**9.5**	**9.6**	**10**
Iron	mg/kg	55,000	**13,000**	**13,000**	**13,000**	**16,000**
Lead	mg/kg	400	**10**	**12**	**13**	**20**
Magnesium	mg/kg	NA	**3,400**	**3,000**	**3,300**	**2,800**
Manganese	mg/kg	1,800	**380**	**320**	**330**	**310**
Mercury	mg/kg	11	**0.012 J**	**0.038 J**	**0.029 J**	**0.015 J**
Methyl Mercury	mg/kg	7.8	NS	NS	NS	NS
Nickel	mg/kg	1,500	**13**	**12**	**13**	**17**
Potassium	mg/kg	NA	**2,600**	**2,600**	**2,700**	**2,200**
Selenium	mg/kg	390	**0.20 J**	**0.27 J**	**0.19 J**	**0.26 J**
Silver	mg/kg	390	**0.034 J**	**0.039 J**	**0.039 J**	**0.10 J**
Sodium	mg/kg	NA	**56 J**	**84 J**	**100**	**77 J**
Thallium	mg/kg	0.78	**0.16 J**	**0.16 J**	**0.17**	**0.17**
Vanadium	mg/kg	390	**29**	**24**	**25**	**27**
Zinc	mg/kg	23,000	**31 J**	**45 J**	**46 J**	**80 J**

Notes:
[1] For source of screening levels, see Table 4-1.
Bold - compound was detected
Highlighted - concentration exceeds screening level
bgs - below ground surface
ft - feet
FPS - floodplain slope
J - estimated value
KRFP - Kansas River Floodplain
mg/kg - milligrams per kilogram
NA - not available
NS - not sampled
R - data was rejected during QA/QC review
U - compound was not detected
UT - upland terrace

Table 4-11
Subsurface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP01	DP01	DP01	DP01	DP01	DP02	DP02	DP02	DP03	DP03	DP03	DP04	DP04	DP04	DP05
			Sample Designator:	SB02	SB22	SB03	SB04	SB05	SB02	SB03	SB04	SB02	SB03	SB04	SB03	SB33	SB04	SB03
			Sample Interval (ft bgs):	3 - 4.5	3 - 4.5	6 - 7.5	18 - 20	30 - 32	3 - 6	7 - 8	16 - 17	3 - 5	5.5 - 6.5	14 - 15.5	3 - 4	3 - 4	10 - 12	2.5 - 3.5
			Sample Location:	UT	UT	UT	UT	UT	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS
			Material Sampled:	Soil	Soil	Soil	Soil	Soil	Ash	Soil	Soil	Ash	Soil	Soil	Soil	Soil	Soil	Soil
			Date Sampled:	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/13/2014	1/14/2014
			Investigation Phase:	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I
			Notes:		Duplicate											Duplicate		
Parameter	**Units**	**TEF**	**Screening Level[1]**															
Dioxins/Furans																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	**1.9 J**	**4.0 J**	**1.7 J**	0.34 JU	**2.1 J**	**10 J**	**0.82 J**	**0.39 J**	**2.0 J**	**0.71 J**	**2.9 J**	**1.7 J**	**5.0 J**	**1.0 J**	0.14 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	12 U	**31**	**35**	8.4 JU	7.3 JU	**19**	**5.4 J**	**1.0 J**	**3.5 J**	**7.0 J**	**3.6 J**	**17**	**25**	**12**	5.8 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.99 JU	2.3 JU	1.7 JU	0.19 JU	1.1 JU	**42**	**0.68 J**	**0.18 J**	**7.8**	**0.72 J**	**0.25 J**	**1.4 J**	**1.9 J**	**0.42 J**	0.18 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	1.3 JU	**4.3 J**	**4.5 J**	0.39 JU	0.86 JU	**7.2**	**0.39 J**	0.087 U	**1.6 J**	**0.77 J**	**0.45 J**	**2.0 J**	**3.0 J**	**0.60 J**	0.68 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.13 JU	0.14 JU	0.039 U	0.044 U	0.15 JU	**3.3 J**	0.18 U	0.093 U	0.32 U	0.11 U	0.13 U	0.11 U	0.16 U	0.12 U	0.052 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.33 JU	0.47 JU	0.21 JU	0.14 JU	0.32 JU	**12**	0.14 U	0.11 U	**1.8 J**	**0.41 J**	0.17 U	**0.43 J**	**0.46 J**	0.12 U	0.043 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.037 U	0.030 U	0.015 U	0.042 U	0.027 U	**1.2 J**	0.16 U	0.10 U	**0.39 J**	0.15 U	0.21 U	0.15 U	0.15 U	0.16 U	0.042 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.084 JU	0.19 JU	0.11 JU	0.11 JU	0.12 JU	**14**	0.13 U	0.10 U	**1.9 J**	**0.27 J**	0.14 U	**0.27 J**	**0.23 J**	0.096 U	0.059 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.026 U	**0.13 J**	**0.35 J**	0.030 U	0.019 U	**1.2 J**	0.16 U	0.099 U	**0.33 J**	0.13 U	0.18 U	0.13 U	0.13 U	0.13 U	0.030 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.029 U	0.049 U	0.051 JU	0.038 U	0.13 JU	**1.5 J**	0.16 U	0.12 U	0.21 U	0.12 U	0.17 U	0.12 U	0.14 U	0.12 U	0.041 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.083 J**	**0.19 J**	**0.23 J**	**0.17 J**	**0.087 J**	**2.2 J**	0.14 U	0.091 U	**0.68 J**	0.12 U	0.17 U	**0.19 J**	0.12 U	0.12 U	**0.16 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	0.021 U	0.044 U	**0.15 J**	0.045 U	**0.14 J**	**14**	0.32 U	0.23 U	**1.3 J**	0.35 U	0.31 U	0.25 U	0.30 U	0.28 U	0.036 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.057 U	0.072 U	0.041 U	0.046 U	0.042 U	**1.5 J**	0.41 U	0.47 U	**0.78 J**	0.23 U	0.24 U	0.18 U	0.22 U	0.24 U	0.065 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.026 U	**0.13 J**	**0.059 J**	0.034 U	0.043 U	**8.3**	0.14 U	0.11 U	**1.8 J**	0.11 U	0.16 U	**0.23 J**	0.13 U	0.11 U	0.037 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	0.059 U	0.028 U	0.026 U	0.032 U	**0.062 J**	**16**	0.35 U	0.25 U	**1.9 J**	0.37 U	0.33 U	0.26 U	0.32 U	0.30 U	0.038 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	0.074 U	0.020 U	0.11 U	0.083 U	0.086 U	**13**	0.20 U	0.17 U	**1.4**	0.23 U	0.23 U	0.22 U	0.29 U	0.17 U	0.027 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.032 U	0.030 U	0.026 U	0.029 U	0.026 U	**0.76 J**	0.26 U	0.20 U	**0.44 J**	0.12 U	0.14 U	0.15 U	0.11 U	0.10 U	0.039 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	1.7 JU	4.1 JU	5.9 U	0.19 JU	1.9 JU	**54**	**0.68 J**	**0.18 J**	**9.3**	**1.0 J**	**0.25 J**	**2.1 J**	**3.6 J**	**0.42 J**	0.18 JU
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	2.9 JU	**8.7**	**7.7 J**	1.1 JU	1.7 JU	**13**	**0.80 J**	**0.14 J**	**3.1 J**	**1.9 J**	**1.4 J**	**4.0 J**	**6.0**	**1.6 J**	1.5 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	0.79 JU	1.7 JU	4.2 JU	0.25 JU	1.2 JU	**100**	0.16 U	0.12 U	**12**	**1.2 J**	0.17 U	**1.5 J**	**1.6 J**	0.12 U	0.059 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.38 J**	**1.5 J**	**1.2 J**	**0.95 J**	**0.56 J**	**16**	0.16 U	0.10 U	**4.3 J**	**0.36 J**	**0.74 J**	**0.70 J**	**0.44 J**	**0.71 J**	**0.57 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	**0.16 J**	**0.29 J**	**0.55 J**	0.045 U	**0.27 J**	**160**	0.35 U	0.25 U	**19**	0.37 U	0.33 U	**0.42 J**	0.32 U	0.30 U	0.053 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	0.057 U	0.072 U	0.15 U	0.070 U	0.042 U	**14**	0.41 U	0.47 U	**8.9**	0.23 U	0.24 U	0.18 U	0.32 U	0.24 U	0.065 U
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	**0.20 J**	**0.098 J**	**0.27 J**	**0.49 J**	**0.38 J**	**190**	0.20 U	0.17 U	**25**	**0.68 J**	0.23 U	**0.49 J**	0.29 U	0.17 U	**0.29 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	0.032 U	**0.21 J**	0.046 U	**0.51 J**	**0.40 J**	**16**	0.26 U	0.20 U	**20**	0.12 U	0.27 U	0.38 U	0.20 U	0.23 U	**0.28 J**
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**0.0089**	**0.0985**	**0.1244**	**0.0170**	**0.0321**	**13.3537**	**0.0126**	**0.0022**	**2.7547**	**0.0852**	**0.0090**	**0.1516**	**0.1270**	**0.0141**	**0.0160**

Table 4-11
Subsurface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP05	DP06	DP06	DP06	DP07	DP07	DP07	DP13	DP13	DP13	DP13	DP14	DP14	DP15	DP15
			Sample Designator:	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB22	SB03	SB04	SB03	SB04	SB02	SB03
			Sample Interval (ft bgs):	10 - 12	3 - 4.5	6 - 7.5	16.5 - 18.5	3 - 4.5	6 - 7.5	18 - 20	3 - 4	3 - 4	6 - 7	20 - 21	4.5 - 5.5	9.5 - 10.5	3 - 4	10.5 - 11.5
			Sample Location:	FPS	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	UT	UT	UT	UT	UT	UT	FPS	FPS
			Material Sampled:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Ash	Soil
			Date Sampled:	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	1/14/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/19/2014
			Investigation Phase:	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
			Notes:									Duplicate						
Parameter	Units	TEF	Screening Level[1]															
Dioxins/Furans																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	0.12 U	**0.95 J**	3.2 JU	1.7 JU	**0.28**	0.075 U	0.18 JU	1.1 JU	0.74 JU	0.49 U	6.1 JU	0.20 JU	0.080 U	1.4 JU	0.13 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	6.6 JU	12 U	6.7 JU	**7.1 J**	**57**	5.4 JU	2.2 JU	**17**	**11 J**	**6.1 J**	**59**	**7.3 J**	**9.0 J**	**4.9 J**	**4.0 J**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.16 JU	0.71 JU	1.5 JU	0.90 JU	0.23 JU	0.11 JU	0.12 JU	**1.0 J**	**0.40 J**	0.26 U	**5.1 J**	0.13 U	0.074 U	**2.8 J**	0.059 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	0.37 JU	1.3 JU	0.67 JU	0.84 JU	**3.7 J**	0.43 JU	0.38 JU	2.5 JU	0.96 JU	0.61 JU	**9.8**	0.65 JU	0.84 JU	1.7 JU	0.53 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.054 U	0.047 U	0.062 U	0.048 U	0.029 U	0.028 U	0.066 JU	0.099 U	0.12 U	0.32 U	0.33 JU	0.16 U	0.089 U	0.30 JU	0.071 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.044 U	0.052 U	0.56 JU	0.27 JU	0.096 JU	0.033 U	0.079 JU	0.076 U	**0.15 J**	0.78 U	**0.37 J**	0.20 U	0.045 U	**2.7 J**	0.058 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.046 U	**0.074 J**	0.046 U	0.034 U	0.037 U	0.033 U	0.029 U	0.11 U	**0.13 J**	0.63 U	**0.20 J**	0.19 U	0.10 U	**0.61 J**	0.061 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.033 U	0.039 U	0.12 JU	0.18 JU	0.071 JU	0.025 U	0.066 JU	0.060 U	**0.13 J**	0.64 U	**0.49 J**	0.16 U	0.036 U	**1.4 J**	0.046 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.033 U	**0.11 J**	0.033 U	**0.097 J**	**0.15 J**	**0.050 J**	0.020 U	0.088 U	**0.11 J**	0.53 U	**0.48 J**	0.16 U	0.086 U	**0.50 J**	0.050 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.043 U	0.16 JU	0.054 U	0.042 U	0.075 JU	0.032 U	0.062 U	0.073 U	0.16 JU	0.79 U	0.24 JU	0.20 U	0.044 U	0.14 U	0.057 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.034 U	**0.23 J**	**0.15 J**	**0.16 J**	**0.19 J**	**0.16 J**	**0.088 J**	0.084 U	0.26 U	0.48 U	**0.64 J**	0.15 U	0.082 U	**1.0 J**	**0.25 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	0.037 U	0.045 U	0.044 U	0.036 U	0.029 U	0.029 U	0.027 U	0.058 U	0.040 U	1.9 U	**0.12 J**	0.47 U	0.038 U	**1.2 J**	0.044 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.074 U	0.082 U	0.063 U	0.059 U	0.055 U	0.064 U	0.042 U	0.15 U	0.086 U	0.73 U	**0.16 J**	0.26 U	0.11 U	**1.1 J**	0.088 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.038 U	0.079 U	0.049 U	0.037 U	0.031 U	0.029 U	0.055 U	0.068 U	0.053 U	0.73 U	**0.34 J**	0.18 U	0.041 U	**0.98 J**	0.053 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	0.038 U	0.047 U	0.046 U	0.038 U	0.030 U	0.031 U	0.028 U	0.060 U	0.041 U	1.9 U	**0.14 J**	0.49 U	0.039 U	**1.5 J**	0.045 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	0.031 U	0.069 U	0.24 U	0.030 U	0.072 U	0.068 U	0.025 U	0.042 U	0.024 U	0.50 U	0.11 U	0.17 U	0.028 U	**1.7**	0.033 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.046 U	0.043 U	0.047 U	0.043 U	0.033 U	0.039 U	0.036 U	0.058 U	0.039 U	0.31 U	0.048 U	0.12 U	0.041 U	**0.76 J**	0.056 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	0.16 JU	0.87 JU	1.8 JU	1.4 JU	0.31 JU	0.11 JU	0.19 JU	1.4 JU	0.40 JU	0.32 U	**9.0**	0.16 U	0.089 U	4.1 JU	0.071 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	1.2 JU	2.7 JU	1.5 JU	1.9 JU	5.9 JU	1.0 JU	0.91 JU	4.6 JU	1.7 JU	1.2 JU	**19**	1.5 JU	1.7 JU	3.0 JU	1.1 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	0.044 U	0.42 JU	0.91 JU	0.58 JU	0.24 JU	0.033 U	0.15 JU	0.25 JU	0.43 JU	0.79 U	4.9 JU	0.20 U	0.045 U	**8.7**	0.058 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.38 J**	**1.4 J**	**0.65 J**	**0.83 J**	**1.2 J**	**0.68 J**	**0.79 J**	**0.58 J**	**0.36 J**	0.63 U	**4.2 J**	**0.48 J**	**0.33 J**	**6.3 J**	**0.73 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	**0.076 J**	0.13 U	**0.12 J**	0.038 U	0.030 U	0.064 U	0.028 U	0.060 U	0.041 U	1.9 U	**0.86 J**	0.49 U	0.039 U	**15 J**	0.045 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	**0.17 J**	0.11 U	**0.13 J**	**0.34 J**	**0.32 J**	0.064 U	0.39 JU	0.15 U	0.097 U	0.73 U	**0.32 J**	0.26 U	**0.17 J**	**18 J**	0.088 U
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	**0.30 J**	**0.56 J**	**0.43 J**	**0.27 J**	**0.64 J**	**0.55 J**	**0.30 J**	0.042 U	0.024 U	0.50 U	**0.088 J**	**0.30 J**	**0.62 J**	**28 J**	**0.057 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	**0.44 J**	**0.28 J**	**0.41 J**	**0.60 J**	**0.45 J**	**0.42 J**	**0.78 J**	0.058 U	0.039 U	0.31 U	0.048 U	**0.53 J**	**0.44 J**	**46 J**	0.056 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	0	**0.0417**	**0.0150**	**0.0278**	**0.0882**	**0.0210**	**0.0088**	**0.0151**	**0.0593**	**0.0018**	**0.6243**	**0.0022**	**0.0027**	**3.2645**	**0.0262**

Table 4-11
Subsurface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP15	DP16	DP16	DP16	DP17	DP17	DP17	DP18	DP18	DP18	DP19	DP19	DP19	DP20	DP20
			Sample Designator:	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB03	SB04	SB02	SB03
			Sample Interval (ft bgs):	16 - 17	3 - 4	6 - 7	14 - 15	3 - 4	6 - 7	14.5 - 15.5	3 - 4	6 - 7	14 - 15	3 - 4	6 - 7	15 - 16	3 - 4	6 - 7
			Sample Location:	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	FPS	KRFP	KRFP	KRFP	KRFL	KRFP
			Material Sampled:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Ash	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Date Sampled:	11/19/2014	11/19/2014	11/19/2014	11/19/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014	11/20/2014
			Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
			Notes:															
Parameter	**Units**	**TEF**	**Screening Level[1]**															
Dioxins/Furans																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	0.22 JU	**0.56 J**	0.19 JU	1.2 JU	0.84 JU	1.1 JU	0.46 JU	1.9 JU	0.72 JU	0.79 JU	0.98 JU	0.13 U	0.16 JU	0.28 U	0.29 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	**2.7 J**	**7.7 J**	**12**	**11**	**8.6 J**	**12**	**0.82 J**	**12**	**8.6 J**	**4.7 J**	**9.1 J**	**9.4 J**	**1.7 J**	2.3 JU	**9.2 J**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	**0.082 J**	**0.41 J**	**0.14 J**	**0.88 J**	**0.54 J**	**0.62 J**	**0.13 J**	**3.3 J**	**0.29 J**	**0.25 J**	**0.35 J**	0.071 U	0.085 U	0.20 U	0.11 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	0.32 JU	**0.60 J**	0.48 JU	0.41 JU	1.0 JU	1.3 JU	0.34 JU	1.9 JU	0.86 JU	0.19 U	0.91 JU	0.50 JU	0.21 JU	0.21 U	0.56 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.078 U	0.064 U	0.044 U	0.081 U	0.099 U	0.097 U	0.23 JU	0.15 U	0.12 U	0.13 U	0.14 U	0.13 U	0.10 U	0.24 U	0.14 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.041 U	**0.24 J**	0.034 U	**0.63 J**	**0.11 J**	0.071 U	**0.071 J**	**0.92 J**	0.070 U	0.12 U	0.087 U	0.062 U	0.042 U	0.25 U	0.22 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.068 U	0.060 U	0.051 U	0.073 U	0.12 U	0.095 U	0.055 U	**0.19 J**	0.11 U	0.15 U	0.14 U	0.10 U	0.080 U	0.30 U	0.25 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.033 U	**0.083 J**	0.027 U	**0.17 J**	**0.095 J**	0.056 U	**0.088 J**	**1.1 J**	0.056 U	0.096 U	0.069 U	0.049 U	0.033 U	0.21 U	0.18 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.056 U	0.049 U	0.042 U	0.060 U	0.096 U	0.078 U	0.045 U	**0.30 J**	0.092 U	0.12 U	0.11 U	0.082 U	0.066 U	0.25 U	0.21 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.040 U	0.041 U	0.033 U	0.042 U	0.078 U	0.068 U	0.10 JU	0.11 U	0.068 U	0.12 U	0.084 U	0.060 U	0.041 U	0.26 U	0.22 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.058 U	**0.14 J**	**0.13 J**	0.057 U	**0.45 J**	0.074 U	0.17 U	**0.73 J**	**0.31 J**	0.12 U	0.20 U	0.079 U	**0.19 J**	0.23 U	0.19 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	0.042 U	0.037 U	0.033 U	0.036 U	0.085 U	0.068 U	**0.062 J**	**0.80 J**	0.062 U	0.086 U	0.082 U	0.054 U	0.040 U	0.72 U	0.67 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.088 U	0.081 U	0.075 U	0.091 U	0.17 U	0.15 U	0.082 U	**0.41 J**	0.14 U	0.16 U	0.17 U	0.14 U	0.13 U	0.48 U	0.38 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.037 U	0.038 U	0.030 U	0.039 U	0.072 U	0.064 U	0.038 U	**0.63 J**	0.063 U	0.11 U	0.078 U	0.056 U	0.038 U	0.24 U	0.20 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	0.043 U	0.038 U	0.034 U	**0.078 J**	0.087 U	0.070 U	0.037 U	**1.1 J**	0.064 U	0.088 U	0.083 U	0.056 U	0.041 U	0.74 U	0.69 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	0.039 U	0.11 U	0.021 U	0.11 U	0.14 U	0.044 U	0.027 U	**1.2**	0.048 U	0.037 U	0.069 U	0.037 U	0.033 U	0.32 U	0.18 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.058 U	0.046 U	0.036 U	0.041 U	0.098 U	0.081 U	0.055 U	**0.11 J**	0.093 U	0.066 U	0.10 U	0.074 U	0.059 U	0.19 U	0.14 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	0.082 JU	**0.41 J**	0.14 JU	0.88 JU	0.71 JU	0.84 JU	0.36 JU	4.6 JU	0.29 JU	0.25 JU	0.35 JU	0.13 U	0.10 U	0.24 U	0.14 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	0.82 JU	**1.5 J**	1.3 JU	1.2 JU	2.1 JU	2.9 JU	0.42 JU	3.8 JU	2.2 JU	0.58 JU	1.8 JU	1.1 JU	0.57 JU	0.89 JU	1.4 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	0.041 U	**0.32 J**	0.034 U	0.94 JU	0.36 JU	0.23 JU	0.26 JU	**6.2 J**	0.070 U	0.12 U	0.087 U	0.062 U	0.042 U	0.26 U	0.22 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.36 J**	**0.48 J**	**0.55 J**	**0.51 J**	**1.5 J**	**0.89 J**	0.17 U	**4.0 J**	**1.6 J**	**0.18 J**	**0.83 J**	**0.46 J**	**0.50 J**	**0.54 J**	**0.37 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	0.043 U	**0.089 J**	0.034 U	**0.24 J**	**0.17 J**	**0.11 J**	**0.062 J**	**10 J**	0.11 U	0.088 U	0.083 U	0.10 U	0.041 U	0.74 U	0.69 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	**0.10 J**	0.081 U	0.075 U	0.10 U	**0.39 J**	0.15 U	0.082 U	**4.8 J**	**0.44 J**	0.16 U	**0.38 J**	0.14 U	**0.24 J**	0.48 U	0.38 U
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	0.039 U	**0.17 J**	**0.19 J**	**0.15 J**	**0.72 J**	**0.33 J**	0.027 U	**16 J**	**0.61 J**	0.037 U	**0.39 J**	**0.20 J**	**0.21 J**	0.32 U	0.18 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	0.058 U	**0.095 J**	0.036 U	0.041 U	**0.46 J**	**0.16 J**	0.055 U	**5.3 J**	**0.36 J**	0.066 U	**0.19 J**	0.074 U	**0.36 J**	**0.38 J**	0.14 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**0.0016**	**0.0589**	**0.0180**	**0.1155**	**0.0735**	**0.0098**	**0.0193**	**1.4176**	**0.0365**	**0.0039**	**0.0062**	**0.0028**	**0.0195**	0	**0.0028**

Table 4-11
Subsurface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
			Sample Point:	**DP20**	**DP20**	**DP21**	**DP21**	**DP21**	**DP22**	**DP22**	**DP22**	**DP23**	**DP23**	**DP23**	**DP24**	**DP24**	**DP24**	**DP24**
			Sample Designator:	**SB33**	**SB04**	**SB02**	**SB03**	**SB04**	**SB02**	**SB03**	**SB04**	**SB02**	**SB03**	**SB04**	**SB02**	**SB02**	**SB04**	**SB44**
			Sample Interval (ft bgs):	**6 - 7**	**14 - 15**	**3 - 4**	**6 - 7**	**11 - 12**	**3 - 4**	**6 - 7**	**14 - 15**	**3 - 4**	**6 - 7**	**15 - 16**	**3 - 4**	**6 - 7**	**15 - 16**	**15 - 16**
			Sample Location:	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**
			Material Sampled:	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Ash**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
			Date Sampled:	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**	**11/20/2014**
			Investigation Phase:	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
			Notes:	**Duplicate**														**Duplicate**
Parameter	**Units**	**TEF**	**Screening Level[1]**															
Dioxins/Furans																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	0.26 U	0.17 U	0.23 JU	0.088 U	0.46 JU	11 U	0.60 JU	0.59 JU	0.71 JU	0.62 JU	0.13 U	0.39 JU	1.8 JU	0.24 U	0.25 JU
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	**7.4 J**	1.4 JU	**5.6 J**	**7.1 J**	**7.4 J**	**45**	**9.0 J**	**2.4 J**	**9.5 J**	**8.8 J**	**3.9 J**	**6.6 J**	**12**	3.0 JU	3.8 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.14 U	0.12 U	**0.086 J**	0.069 U	**0.17 J**	**28**	**0.73 J**	**0.49 J**	**0.41 J**	**0.26 J**	0.11 U	0.11 U	**0.38 J**	0.19 U	0.14 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	0.34 JU	0.24 U	0.47 JU	0.63 JU	0.46 JU	**14**	0.63 JU	0.31 JU	0.96 JU	0.79 JU	0.87 JU	0.74 JU	1.0 JU	0.31 JU	0.46 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.17 U	0.15 U	0.058 U	0.083 U	0.092 U	1.5 JU	0.12 U	0.076 U	0.10 U	0.12 U	0.13 U	0.14 U	0.19 U	0.23 U	0.17 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.28 U	0.17 U	0.042 U	0.053 U	0.049 U	**7.6**	**0.37 J**	**0.17 J**	0.11 U	0.15 U	0.11 U	0.078 U	0.26 U	0.25 U	0.20 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.23 U	0.22 U	0.067 U	0.098 U	0.094 U	**1.5 J**	0.12 U	0.078 U	0.13 U	0.15 U	0.16 U	0.13 U	0.28 U	0.29 U	0.25 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.23 U	0.14 U	0.034 U	0.042 U	0.039 U	**7.2**	**0.14 J**	**0.062 J**	0.084 U	0.12 U	0.083 U	0.062 U	0.21 U	0.21 U	0.16 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.20 U	0.19 U	0.055 U	0.080 U	0.077 U	**2.0 J**	0.099 U	0.064 U	0.11 U	0.13 U	0.13 U	0.11 U	0.23 U	0.24 U	0.21 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.28 U	0.18 U	0.041 U	0.051 U	0.048 U	0.61 U	0.087 U	0.047 U	0.10 U	0.14 U	0.10 U	0.075 U	0.26 U	0.25 U	0.20 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.18 U	0.17 U	**0.15 J**	**0.20 J**	0.073 U	**3.4 J**	**0.37 J**	0.061 U	**0.50 J**	0.25 U	0.13 U	**0.31 J**	0.21 U	0.22 U	0.19 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	0.77 U	0.50 U	0.034 U	0.046 U	0.039 U	**5.1 J**	0.091 U	0.054 U	0.071 U	0.099 U	0.077 U	0.059 U	0.69 U	0.81 U	0.67 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.43 U	0.31 U	0.098 U	0.11 U	0.10 U	**1.5 J**	0.18 U	0.13 U	0.19 U	0.17 U	0.15 U	0.17 U	0.38 U	0.43 U	0.39 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.26 U	0.16 U	0.038 U	0.047 U	0.044 U	**7.0**	**0.15 J**	**0.12 J**	0.095 U	0.13 U	0.095 U	0.070 U	0.24 U	0.23 U	0.18 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	0.80 U	0.52 U	0.035 U	0.047 U	0.040 U	**7.2**	**0.16 J**	0.055 U	0.073 U	0.10 U	0.079 U	0.060 U	0.72 U	0.84 U	0.69 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	0.25 U	0.22 U	0.026 U	0.032 U	0.033 U	**5.8**	0.16 U	0.11 U	0.064 U	0.056 U	0.054 U	0.051 U	0.27 U	0.29 U	0.24 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.18 U	0.13 U	0.049 U	0.061 U	0.056 U	**0.50 J**	0.087 U	0.063 U	0.097 U	0.079 U	0.090 U	0.074 U	0.20 U	0.21 U	0.15 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	0.17 U	0.15 U	0.086 JU	0.083 U	0.17 JU	**36 J**	0.73 JU	0.49 JU	0.41 JU	0.26 JU	0.13 U	0.14 U	1.5 JU	0.23 U	0.17 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	1.1 JU	0.27 JU	1.1 JU	1.4 JU	1.1 JU	**28**	1.7 JU	0.86 JU	2.2 JU	1.9 JU	1.4 JU	1.6 JU	2.0 JU	0.69 JU	0.97 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	0.28 U	0.18 U	0.042 U	0.053 U	0.049 U	**55 J**	0.91 JU	0.49 JU	0.11 U	0.15 U	0.11 U	0.078 U	0.26 U	0.25 U	0.20 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.22 J**	**0.44 J**	**0.45 J**	**0.61 J**	**0.30 J**	**27 J**	**1.6 J**	**0.44 J**	**1.6 J**	**0.33 J**	**0.22 J**	**1.2 J**	**0.30 J**	**0.74 J**	**0.37 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	0.80 U	0.52 U	**0.062 J**	0.080 U	0.22 U	**71**	**0.97 J**	**0.10 J**	**0.12 J**	**0.19 J**	0.093 U	**0.097 J**	0.72 U	0.84 U	0.69 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	0.43 U	**0.38 J**	0.098 U	0.11 U	**0.44 J**	**20 J**	0.18 U	0.13 U	0.19 U	0.17 U	**0.22 J**	**0.49 J**	0.38 U	0.43 U	0.39 U
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	0.25 U	0.22 U	**0.18 J**	**0.17 J**	**0.14 J**	**82 J**	**2.3 J**	**0.46 J**	**0.49 J**	**0.10 J**	**0.26 J**	**0.72 J**	0.27 U	0.29 U	0.24 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	0.18 U	**0.35 J**	**0.069 J**	0.061 U	**0.34 J**	**18 J**	**0.20 J**	**0.70 J**	**0.21 J**	**0.11 J**	**0.60 J**	**0.72 J**	0.20 U	**0.47 J**	0.15 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**0.0022**	0	**0.0175**	**0.0221**	**0.0039**	**8.1965**	**0.1610**	**0.0408**	**0.0570**	**0.0052**	**0.0012**	**0.0330**	**0.0074**	0	0

Table 4-11
Subsurface Soil Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	**UT01**	**UT02**	**UT03**	**UT04**	**UT05**	**UT06**	**UT06**	**UT07**
			Sample Designator:	**SB02**	**SB02**	**SB02**	**SB02**	**SB02**	**SB02**	**SB22**	**SB02**
			Sample Interval (ft bgs):	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**	**3 - 4**
			Sample Location:	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**	**UT**
			Material Sampled:	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**	**Soil**
			Date Sampled:	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**	**11/19/2014**
			Investigation Phase:	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
			Notes:							**Duplicate**	
Parameter	**Units**	**TEF**	**Screening Level[1]**								
Dioxins/Furans											
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.0003	NA	**1.4 J**	**0.54 J**	**28**	1.1 JU	**3.3 J**	**9.0 J**	**9.8 J**	**3.2 J**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	NA	**19**	**15**	**350**	7.0 JU	**40**	**100**	**100**	**35**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	**0.82 J**	**0.34 J**	**14**	0.36 JU	**1.7 J**	**6.2**	**6.8**	**3.6 J**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	**2.1 J**	**1.2 J**	**40**	0.78 JU	**4.9 J**	**14**	**15**	**6.1**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	NA	0.13 U	0.10 U	**0.53 J**	0.11 U	0.10 U	**0.25 J**	0.21 U	0.13 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**0.081 J**	0.068 U	**0.66 J**	0.067 U	0.13 JU	0.31 JU	**0.38 J**	**0.48 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.13 U	0.15 U	**0.45 J**	0.11 U	**0.14 J**	**0.24 J**	**0.21 J**	**0.10 J**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	**0.094 J**	0.054 U	**0.62 J**	0.053 U	0.14 JU	**0.36 J**	**0.45 J**	**0.32 J**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.10 U	0.12 U	**1.2 J**	0.089 U	**0.21 J**	**0.49 J**	**0.50 J**	**0.26 J**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.077 U	0.066 U	0.10 U	0.065 U	0.069 U	0.083 U	0.084 U	0.071 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	0.099 U	0.12 U	**1.2 J**	0.085 U	0.44 JU	0.67 JU	**0.61 J**	**0.49 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	NA	0.077 U	0.045 U	**0.14 J**	0.052 U	**0.11 J**	0.052 U	**0.086 J**	**0.22 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	NA	0.15 U	0.13 U	0.14 U	0.14 U	0.16 U	0.15 U	0.11 U	0.12 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	NA	0.072 U	0.061 U	**0.39 J**	0.060 U	**0.15 J**	**0.23 J**	**0.35 J**	**0.26 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	NA	0.078 U	0.046 U	**0.14 J**	0.053 U	0.057 U	0.054 U	0.058 U	**0.22 J**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	NA	0.057 U	0.15 U	0.22 U	0.036 U	0.23 U	0.22 U	0.15 U	**0.18 J**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	NA	0.065 U	0.043 U	0.064 U	0.048 U	0.047 U	0.039 U	**0.050 U**	0.036 U
Total Heptachlorodibenzofuran (HpCDF)	pg/g	NA	NA	**1.3 J**	**0.60 J**	**30**	0.36 JU	**3.0 J**	**11**	**12**	**5.1 J**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	NA	NA	**4.3 J**	**2.7 J**	**94**	**1.7 J**	**10**	**28**	**28**	**12**
Total Hexachlorodibenzofuran (HxCDF)	pg/g	NA	NA	**0.42 J**	0.068 U	**11 J**	0.067 U	**1.3 J**	**4.9 J**	**6.1 J**	**3.4 J**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.37 J**	**0.18 J**	**12**	0.20 JU	**2.4 J**	**4.5 J**	**4.8 J**	**3.0 J**
Total Pentachlorodibenzofuran (PeCDF)	pg/g	NA	NA	0.078 U	0.046 U	**3.3 J**	0.053 U	**0.51 J**	**1.3 J**	**1.3 J**	**2.3 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	NA	NA	0.15 U	**0.34 J**	**1.7 J**	0.14 U	0.16 U	**0.53 J**	**0.19 J**	**0.60 J**
Total Tetrachlorodibenzofuran (TCDF)	pg/g	NA	NA	0.057 U	**0.17 J**	**1.6 J**	0.16 JU	**0.35 J**	**0.83 J**	**0.69 J**	**3.3 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	0.065 U	**0.18 J**	**5.0 J**	0.048 U	**0.59 J**	**0.34 J**	**0.31 J**	**0.91 J**
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**0.0528**	**0.0471**	**1.1919**	0	**0.1323**	**0.4232**	**0.5215**	**0.3721**

Notes:

TEQ values are calculated using only positive detections.

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

bgs - below ground surface

FPS - floodplain slope

ft - feet

J - estimated value

KRFP - Kansas River floodplain

NA - not available

pg/g - picograms per gram

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

UT - upland terrace

Table 4-12
Stream Sediment Samples, Detected Analytes (TPH and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Names:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	SD01	SD02	SD02	SD03
		Sample Designator:	SD01	SD01	SD11	SD01
		Date Sampled:	1/10/2014	1/10/2014	1/10/2014	1/10/2014
		Investigation Phase:	Phase I	Phase I	Phase I	Phase I
		Notes:			Duplicate	
Parameter	**Units**	**Screening Levels[1]**				
Total Petroleum Hydrocarbons						
Diesel Range Organics	mg/kg	2,000	**5.4**	**2.4 J**	**2.3 J**	**3.4 J**
Metals						
Aluminum	mg/kg	77,000	**8,000**	**3,200 J**	**1,100 J**	**3,800**
Arsenic	mg/kg	0.68	**2.7 J**	**2.2 J**	0.86 U	**7.3**
Barium	mg/kg	15,000	**140**	**180 J**	**14 J**	**280**
Beryllium	mg/kg	160	**0.36**	**0.080 J**	**0.068 J**	**0.12 J**
Cadmium	mg/kg	71	**0.59 J**	**0.59 J**	**0.027 J**	**1.1**
Calcium	mg/kg	NA	**130,000**	**150,000 J**	**2,400 J**	**240,000**
Chromium	mg/kg	33.6	**8.1**	**4.4 J**	**1.3 J**	**6.6**
Cobalt	mg/kg	23	**4.7**	**4.6 J**	**0.64 J**	**7.3**
Copper	mg/kg	3,100	**6.6**	**3.9 J**	**1.2 J**	**4.7**
Iron	mg/kg	55,000	**10,000**	**4,300 J**	**1,200 J**	**9,700**
Lead	mg/kg	400	**8.0**	**5.1 J**	**1.4 J**	**7.1**
Magnesium	mg/kg	NA	**3,000**	**2,000 J**	**400 J**	**5,200**
Manganese	mg/kg	1,800	**470**	**920 J**	**32 J**	**990**
Mercury	mg/kg	11	**0.013 J**	**0.0087 J**	**0.010 J**	0.011 U
Methyl Mercury	mg/kg	7.8	**0.000014 J**	**0.000019 J**	**0.000019 J**	**0.000038**
Nickel	mg/kg	1,500	**7.6**	**14 J**	**1.4 J**	**9.1**
Potassium	mg/kg	NA	**1,600**	**680 J**	**250 J**	**830**
Sodium	mg/kg	NA	**150**	**110**	**71**	**200**
Vanadium	mg/kg	390	**12**	**4.9 J**	**2.1 J**	**14**
Zinc	mg/kg	23,000	**29**	**14 J**	**4.4 J**	**37**

Notes:
[1] For source of screening levels, see Table 4-1.
Bold - compound was detected
Highlighted - concentration exceeds screening level
J - estimated value
mg/kg - milligrams per kilogram
U - compound was not detected

Table 4-13
Stream Sediment Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	SD01	SD02	SD02	SD03
			Sample Designator:	SD01	SD01	SD11	SD01
			Date Sampled:	1/10/2014	1/10/2014	1/10/2014	1/10/2014
			Investigation Phase:	Phase I	Phase I	Phase I	Phase I
			Notes:			Duplicate	
Parameter	**Units**	**TEF**	**Screening Level[1]**				
Dioxins/Furans							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	NA	**2.3 J**	**0.34 J**	**0.52 J**	**2.0 J**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	6.2 U	5.9 U	5.8 U	**0.12 J**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	NA	**0.25 J**	5.9 U	5.8 U	6.1 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	NA	NA	**0.74 J**	**0.065 J**	5.8 U	**0.45 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	NA	NA	**0.55 J**	1.2 U	1.2 U	**0.11 J**
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/g**	**NA**	**4.8**	**0.0480**	**0.0034**	**0.0052**	**0.0320**

Notes:

TEQ values are calculated using only positive detections.

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

NA - not available

NS - not sampled

pg/g - picograms per gram

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

Table 4-14
Up-Gradient Stream Sediment Comparison Study Samples, Detected Analytes (Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Group Names:		CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
Sample Point:		SD04	SD05	SD05	SD06	SD07	SD08	SD09	SD10	SD11
Sample Designator:		SD01	SD01	SD11	SD01	SD01	SD01	SD01	SD01	SD01
Date Sampled:		11/17/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014	11/17/2014
Investigation Phase:		Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
Notes:				Duplicate						
Parameter	**Units**									
Metals										
Aluminum	mg/kg	**5,900**	**13,000**	**9,400**	**11,000**	**11,000**	**2,500**	**77**	**12,000 J**	**14,000**
Antimony	mg/kg	0.22 UJ	**0.24 J**	**0.14 J**	**0.20 J**	**0.14 J**	0.21 UJ	0.22 UJ	**0.23 J**	**0.24 J**
Arsenic	mg/kg	**4.8**	**3.8**	**2.7**	**2.6**	**2.3**	**1.1**	**0.18 J**	**2.8**	**3.2**
Barium	mg/kg	**370**	**180**	**130**	**120**	**120**	**43**	**110**	**130 J**	**140**
Beryllium	mg/kg	**0.34**	**0.59**	**0.41**	**0.45**	**0.45**	**0.14**	0.022 U	**0.51**	**0.61**
Cadmium	mg/kg	**1.4**	**0.49**	**0.39**	**0.34**	**0.32**	**0.14 J**	0.055 U	**0.19**	**0.25**
Calcium	mg/kg	**230,000**	**71,000**	**72,000**	**58,000**	**40,000**	**210,000**	**380,000**	**17,000 J**	**7,000**
Chromium	mg/kg	**8.0**	**15**	**11**	**15**	**28**	**5.7**	**0.25 J**	**13**	**14**
Cobalt	mg/kg	**6.8**	**7.9**	**5.1**	**5.5**	**6.2**	**3.1**	**0.11 J**	**5.0**	**5.2**
Copper	mg/kg	**3.6**	**7.9**	**5.0**	**7.2**	**7.6**	**1.9**	**0.22 J**	**8.4**	**9.4**
Iron	mg/kg	**8,100**	**13,000**	**9,500**	**11,000**	**11,000**	**2,400**	**78**	**11,000 J**	**12,000**
Lead	mg/kg	**8.8**	**15**	**9.2**	**14**	**8.9**	**3.1**	**0.17 J**	**10**	**9.6**
Magnesium	mg/kg	**4,300**	**4,400**	**3,300**	**3,400**	**3,700**	**2,800**	**84**	**3,400 J**	**3,100**
Manganese	mg/kg	**430**	**430**	**330**	**210**	**340**	**370**	**660**	**220 J**	**150**
Mercury	mg/kg	**0.024 J**	**0.025 J**	**0.019 J**	**0.026 J**	**0.023 J**	**0.012 J**	**0.016 J**	**0.024 J**	**0.029 J**
Nickel	mg/kg	**7.2**	**12**	**8.3**	**11**	**17**	**6.0**	**0.24 J**	**10**	**12**
Potassium	mg/kg	**1,200**	**2,700**	**1,900**	**2,100**	**2,300**	**650**	**28**	**2,200 J**	**2,300**
Selenium	mg/kg	**0.27 J**	**0.29 J**	**0.23 J**	**0.24 J**	**0.21 J**	0.10 UJ	0.11 UJ	**0.24 J**	**0.33 J**
Silver	mg/kg	0.034 U	**0.033 J**	**0.027 J**	**0.030 J**	**0.035 J**	0.031 U	0.033 U	**0.032 J**	**0.037 J**
Sodium	mg/kg	**180**	**160**	**130**	**150**	**140**	**130**	**1,800**	**98**	**110**
Thallium	mg/kg	**0.13 J**	**0.18**	**0.12**	**0.14**	**0.14**	0.052 U	0.055 U	**0.16**	**0.18**
Vanadium	mg/kg	**13**	**28**	**19**	**21**	**21**	**5.0**	0.66 U	**23**	**28**
Zinc	mg/kg	**27 J**	**36 J**	**24 J**	**32 J**	**32 J**	**14 J**	**0.69 J**	**33 J**	**33 J**

Notes:

Bold - compound was detected mg/kg - milligrams per kilogram

J - estimated value U - compound was not detected

Table 4-15A
Summary of Up-Gradient Stream Sediment Outliers
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Outlier Value (mg/kg)	Outlier Type	Outlier at 5% Significance Level	Outlier at 1% Significance Level
Up-Gradient Stream Sediment				
Inorganic Compounds				
Barium	370	Upper Tail	Yes	Yes
Cadmuim	1.4	Upper Tail	Yes	Yes
Chromium	28	Upper Tail	Yes	No
Magnesium	84	Upper Tail	Yes	No
Sodium	1,800	Upper Tail	Yes	Yes

Notres:
mg/kg - miligrams per kilogram

Table 4-15B
Summary of Up-Gradient Stream Sediment UTLs and Selected Concentrations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Nornal Data Distribution	95% UTL w/ 95% Coverage for KM Normal Distribution (mg/kg)	95% UTL w/ 95% Coverage for Normal Distribution (mg/kg)	Gamma Data Distribution	95% UTL w/ 95% Coverage for Gamma ROS WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma ROS HW Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for Gamma KM Est. WH Distribution (mg/kg)	95% UTL w/ 95% Coverage for WH Gamma Distribution (mg/kg)	95% UTL w/ 95% Coverage for HW Gamma Distribution (mg/kg)	Lognormal Data Distribution	95% UTL w/ 95% Coverage for Lognormal Distribution (mg/kg)	95% UTL w/ 95% Coverage for ROS Lognormal Distribution (mg/kg)	95% Bootstrap UTL w/ 95% Covewrage for Lognormal Distibution (mg/kg)	95% UTL w/ 95% Coverage for KM Lognormal Distribution (mg/kg)	Nonparametric Data Distribution	95% UTL w/ 95% Coverage for Nonparametric Distribution (mg/kg)	Selected Upgradient Concentration (mg/kg)
Up-Gradient Stream Sediment																		
Inorganic Compounds																		
Aluminum	Yes	Not Calculated	25,231	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	25,231
Antimony	Yes	0.323	Not Calculated	Yes	0.345	0.349	0.356	0.362	Not Calculated	Not Calculated	Yes	Not Calculated	0.369	0.24	0.383	No	Not Applicable	0.24
Arsenic	Yes	Not Calculated	7.244	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	14.38	17.54	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	7.244
Barium	Yes	Not Calculated	260.1	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	360.2	386.4	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	260.1
Beryllium	Yes	1.017	Not Calculated	Yes	1.463	1.596	2.061	2.524	Not Calculated	Not Calculated	Yes	Not Calculated	2.443	0.61	8.196	No	Not Applicable	0.61
Cadmium	Yes	0.708	Not Calculated	Yes	1.401	1.656	1.1	1.226	Not Calculated	Not Calculated	Yes	Not Calculated	1.69	0.49	2.059	No	Not Applicable	0.49
Calcium	Yes	Not Calculated	549,830	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	1,105,916	1,371,022	Yes	5,182,858	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	549,830
Chromium	Yes	29.38	Not Calculated	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	78.05	107.3	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	29.38
Cobalt	Yes	12.68	Not Calculated	No	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	12.68
Copper	Yes	16.59	Not Calculated	No	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	16.59
Iron	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	13,000	13,000
Lead	Yes	24.6	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	24.6
Magnesium	Yes	5601	Not Calculated	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	5,951	6,008	Yes	6,205	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	5,601
Manganese	Yes	692.1	Not Calculated	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	897.5	944.6	Yes	1158	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	692.1
Mercury	Yes	0.0402	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	0.0402
Nickel	Yes	25.34	Not Calculated	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	59.04	77.87	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	25.34
Potassium	Yes	4702	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	4,702
Selenium	Yes	Not Calculated	0.472	Yes	0.48	0.49	0.62	0.654	Not Calculated	Not Calculated	Yes	Not Calculated	0.494	0.33	0.816	No	Not Applicable	0.33
Silver	Yes	Not Calculated	0.401	Yes	0.041	0.0411	0.0405	0.0406	Not Calculated	Not Calculated	Yes	Not Calculated	0.0412	0.037	0.0408	No	Not Applicable	0.037
Sodium	Yes	234.9	Not Calculated	Yes	Not Calculated	Not Calculated	Not Calculated	Not Calculated	259	263.3	Yes	279.0	Not Calculated	Not Calculated	Not Calculated	No	Not Applicable	234.9
Thalium	Yes	Not Calculated	0.282	Yes	0.258	0.262	0.387	0.414	Not Calculated	Not Calculated	Yes	Not Calculated	0.265	0.18	0.545	No	Not Applicable	0.18
Vanadium	Yes	Not Calculated	48.01	Yes	75.83	84.54	103.6	130.6	Not Calculated	Not Calculated	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	48.01
Zinc	No	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	36	36

Notes:
UTL values calculated using ProUCL Version 5.1.
Selected upgradient concentration is lowest of the calculated UTLs.

bgs - below ground surface
HM - Hawkins Wixley
KM - Kaplan-Meier
mg/kg - miligrams per kilogram
ROS - regression on order statistics
UTL - upper tolerance limit
WH - Wilson Hilferty

Table 4-16
Surface Water Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	SW01	SW01	SW01	SW01	SW01	SW02	SW02	SW02	SW02	SW02	SW02	SW02	SW02	SW02	SW02
		Sample Designator:	SW01	SW02	SW03	SW04	SW05	SW01	SW11	SW02	SW22	SW03	SW33	SW04	SW44	SW05	SW55
		Date Sampled:	1/10/2014	5/4/2015	8/10/2015	11/10/2015	2/11/2016	1/10/2014	1/10/2014	5/4/2015	5/4/2015	8/10/2015	8/10/2015	11/10/2015	11/10/2015	2/11/2016	2/11/2016
		Investigation Phase :	Phase I	Phase III	Phase III	Phase III	Phase III	Phase I	Phase I	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III
		Notes:		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		Duplicate	1st Quarter	1st Quarter Duplicate	2nd Quarter	2nd Quarter Duplicate	3rd Quarter	3rd Quarter Duplicate	4th Quarter	4th Quarter Duplicate
Parameter	**Units**	**Screening Level[1]**															
Total Petroleum Hydrocarbons																	
Diesel Range Organics	ug/L	NA	31 U	NS	NS	NS	NS	**72 J**	31 U	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																	
Benzo(a)pyrene	ug/L	0.0028	0.29 U	0.0042 UJ	0.0042 U	0.0042 U	0.0042 U	0.29 U	0.29 U	0.0043 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U
Benzo(k)fluoranthene	ug/L	0.0038	0.44 U	0.0075 U	0.0074 U	0.0074 U	0.0074 U	0.44 U	0.44 U	0.0077 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0075 U	0.0074 U	0.0074 U
Chrysene	ug/L	0.0038	0.51 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.51 U	0.51 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U
Pyrene	ug/L	960	0.35 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.35 U	0.35 U	0.0041 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Metals																	
Aluminum, Dissolved	ug/L	NA	48 U	25 U	25 U	25 U	25 U	48 U	**48 J**	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Arsenic, Dissolved	ug/L	10	12 U	**3.1 J**	**2.4 J**	**2.6 J**	**1.6 J**	12 U	12 U	**3.3 J**	**3.3 J**	**2.6 J**	**2.5 J**	**2.7 J**	**2.5 J**	**1.6 J**	**1.6 J**
Barium, Dissolved	ug/L	2,000	**150**	**130**	**170**	**160**	**170**	**160**	**150**	**130**	**130**	**170**	**170**	**160**	**160**	**170**	**170**
Calcium, Dissolved	ug/L	NA	**95,000**	**90,000 J**	**84,000 J**	**85,000**	**94,000 J**	**100,000**	**94,000**	**92,000**	**92,000**	**85,000**	**82,000**	**85,000**	**85,000**	**92,000**	**96,000**
Copper, Dissolved	ug/L	1,000	**2.5 J**	**1.4 J**	1.0 U	**1.9 J**	**1.3 J**	**2.4 J**	**3.2 J**	**1.6 J**	**1.5 J**	**1.4 J**	1.0 U	**1.8 J**	**2.0 J**	**1.1 J**	**1.1 J**
Magnesium, Dissolved	ug/L	NA	**21,000**	**21,000 J**	**20,000 J**	**20,000 J**	**21,000 J**	**22,000**	**21,000**	**21,000**	**21,000**	**20,000**	**20,000**	**20,000**	**20,000**	**21,000**	**21,000**
Manganese, Dissolved	ug/L	NA	**10**	**53**	**15**	**7.3 J**	**18.0**	**9.4 J**	**10**	**48**	**49**	**15**	**15**	**6.8 J**	**6.6 J**	**17.0**	**18.0**
Mercury, Dissolved	ug/L	2	0.10 U	0.10 U	**0.17 J**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methyl Mercury	ug/L	NA	**0.000041 J**	NS	NS	NS	NS	**0.000054**	**0.000050 J**	NS	NS	NS	NS	NS	NS	NS	NS
Nickel, Dissolved	ug/L	610	**2.6 J**	**3.0**	**2.0 J**	**3.2**	**1.6 J**	**3.5 J**	**2.4 J**	**3.0**	**3.0**	**1.9 J**	**1.7 J**	**3.0**	**3.1**	**1.5 J**	**1.4 J**
Potassium, Dissolved	ug/L	NA	6,200 U	**6,600**	**5,100 J**	**7,500**	**4,900**	**6,700**	**6,300**	**7,000**	**6,700**	**4,800**	**5,000**	**7,200**	**7,300**	**4,600**	**4,700**
Sodium, Dissolved	ug/L	NA	**49,000**	**47,000 J**	**36,000 J**	**47,000 J**	**36,000 J**	**53,000**	**50,000**	**48,000**	**49,000**	**35,000**	**35,000**	**46,000**	**47,000**	**35,000**	**36,000**
Vanadium, Dissolved	ug/L	NA	**2.6 J**	6.0 U	6.0 U	6.0 U	6.0 U	**2.9 J**	**2.9 J**	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
Zinc, Dissolved	ug/L	5,000	**10 J**	**4.0 J**	4.0 U	**7.3 J**	**6.0 J**	**9.8 J**	**9.9 J**	**37**	**5.0 J**	**6.4 J**	4.0 U	**7.5 J**	**6.9 J**	**6.0 J**	**5.8 J**

Table 4-16
Surface Water Samples, Detected Analytes (TPH, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	SW03	SW03	SW03	SW03	SW03
		Sample Designator:	SW01	SW02	SW03	SW04	SW05
		Date Sampled:	1/10/2014	5/4/2015	8/10/2015	11/10/2015	2/11/2016
		Investigation Phase :	Phase I	Phase III	Phase III	Phase III	Phase III
		Notes:		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Parameter	**Units**	**Screening Level[1]**					
Total Petroleum Hydrocarbons							
Diesel Range Organics	ug/L	NA	31 U	NS	NS	NS	NS
Semivolatile Organic Compounds							
Benzo(a)pyrene	ug/L	0.0028	0.29 U	0.0042 U	**0.0049 J**	0.0042 U	0.0042 U
Benzo(k)fluoranthene	ug/L	0.0038	0.44 U	0.0074 U	**0.0088 J**	0.0074 U	0.0074 U
Chrysene	ug/L	0.0038	0.51 U	0.0038 U	**0.012 J**	0.0038 U	0.0038 U
Pyrene	ug/L	960	0.35 U	0.0040 U	**0.004 J**	0.0040 U	0.0040 U
Metals							
Aluminum, Dissolved	ug/L	NA	48 U	25 U	25 U	25 U	25 U
Arsenic, Dissolved	ug/L	10	12 U	**3.4 J**	**2.5 J**	**2.7 J**	**1.4 J**
Barium, Dissolved	ug/L	2,000	**150**	**130**	**170**	**160**	**180**
Calcium, Dissolved	ug/L	NA	**93,000**	**94,000**	**84,000**	**88,000**	**99,000**
Copper, Dissolved	ug/L	1,000	**3.1 J**	**1.2 J**	**1.1 J**	**1.8 J**	1.0 U
Magnesium, Dissolved	ug/L	NA	**21,000**	**21,000**	**20,000**	**20,000**	**22,000**
Manganese, Dissolved	ug/L	NA	**9.4 J**	**60**	**19**	**8.6**	**23.0**
Mercury, Dissolved	ug/L	2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methyl Mercury	ug/L	NA	**0.000094 J**	NS	NS	NS	NS
Nickel, Dissolved	ug/L	610	2.4 U	**3.1**	**1.9 J**	**3.3**	**1.5 J**
Potassium, Dissolved	ug/L	NA	**6,200**	**7,200**	**4,900**	**7,400**	**4,800**
Sodium, Dissolved	ug/L	NA	**50,000**	**49,000**	**35,000**	**47,000**	**37,000**
Vanadium, Dissolved	ug/L	NA	**2.7 J**	6.0 U	6.0 U	6.0 U	6.0 U
Zinc, Dissolved	ug/L	5,000	**8.1 J**	**6.1 J**	4.0 U	**7.8 J**	**6.3 J**

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

NA - not available

U - compound was not detected

ug/L - micrograms per liter

Table 4-17
Surface Water Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
			Sample Point:	**SW01**	**SW01**	**SW01**	**SW01**	**SW01**	**SW02**	**SW02**	**SW02**	**SW02**	**SW02**	**SW02**
			Sample Designator:	**SW01**	**SW02**	**SW03**	**SW04**	**SW05**	**SW01**	**SW11**	**SW02**	**SW22**	**SW03**	**SW33**
			Date Sampled:	**1/10/2014**	**5/4/2015**	**8/10/2015**	**11/10/2015**	**2/11/2016**	**1/10/2014**	**1/10/2014**	**5/4/2015**	**5/4/2015**	**8/10/2015**	**8/10/2015**
			Investigation Phase :	**Phase I**	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase I**	**Phase I**	**Phase III**	**Phase III**	**Phase III**	**Phase III**
			Notes:							**Duplicate**		**Duplicate**		**Duplicate**
Parameter	**Units**	**TEF**	**Screening Level[1]**											
Dioxins-Furans														
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	2.3 JU	9.0 JU	**3.8 J**	1.9 JU	6.3 JU	4.0 JU	1.9 JU	12 JU	10 JU	5.4 JU	3.6 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	0.34 U	**2.7 J**	0.51 U	5.8 JU	4.9 JU	0.36 U	0.31 U	**5.6 J**	0.66 U	**2.3 J**	**1.2 J**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	0.28 U	1.9 JU	**0.51 J**	0.52 JU	2.3 JU	1.8 JU	0.85 JU	2.7 JU	1.2 JU	**1.2 J**	0.29 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.95 JU	1.0 JU	**0.70 J**	1.1 JU	2.1 JU	0.87 JU	0.54 JU	2.0 JU	0.84 JU	0.70 JU	0.66 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.23 U	0.37 U	**0.60 J**	0.22 U	1.7 JU	0.25 U	0.22 U	**1.7 J**	0.41 U	**0.31 J**	0.18 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.31 U	**0.74 J**	0.30 U	0.092 U	1.5 JU	**0.31 J**	0.24 U	0.42 U	0.42 U	0.36 U	0.27 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.24 U	**0.91 J**	0.32 U	0.32 U	1.8 JU	0.64 JU	0.26 U	**1.1 J**	0.85 U	0.31 U	0.30 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.30 U	**0.81 J**	0.26 U	0.075 U	1.9 JU	**0.61 J**	0.25 U	0.33 U	0.33 U	0.32 U	0.24 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.22 U	**0.85 J**	0.28 U	0.25 U	1.9 JU	0.73 JU	0.23 U	**1.2 J**	0.22 U	0.27 U	0.26 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.28 U	**1.2 J**	0.24 U	0.071 U	2.1 JU	0.39 JU	0.22 U	**1.9 J**	0.32 U	0.30 U	0.22 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.26 U	**1.0 J**	0.34 U	0.31 U	1.9 JU	0.27 U	0.28 U	**1.4 J**	0.29 U	0.32 U	0.31 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	1.5 U	0.49 U	0.40 U	0.13 U	**3.1 J**	1.1 U	0.96 U	0.57 U	0.51 U	0.41 U	0.42 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.24 U	**1.0 J**	0.31 U	0.29 U	1.8 JU	0.62 JU	0..26 U	**1.4 J**	0.26 U	0.30 U	0.29 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	0.96 U	**1.0 J**	0.31 U	0.19 U	2.6 JU	0.84 U	0.99 U	0.45 U	0.32 U	0.31 U	0.27 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	0.35 U	0.26 U	0.36 U	0.11 U	**0.96 J**	0.36 U	0.42 U	0.26 U	0.26 U	0.33 U	0.38 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	0.85 JU	2.8 JU	**1.8 J**	1.2 JU	3.7 JU	3.0 JU	1.8 JU	4.4 JU	2.7 JU	2.2 JU	0.97 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	0.95 JU	1.0 JU	**1.3 J**	1.4 JU	3.8 JU	0.87 JU	0.54 JU	3.8 JU	0.84 JU	1.0 JU	0.66 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	0.47 U	**2.7 J**	0.30 U	0.092 U	5.5 JU	1.3 JU	0.59 U	**1.9 J**	0.42 U	0.36 U	0.27 U
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	0.26 U	3.8 JU	0.34 U	0.32 U	7.4 JU	2.0 JU	0.28 U	**5.1 J**	0.85 U	0.32 U	0.31 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	1.5 U	0.49 U	0.40 U	0.13 JU	**3.1 J**	1.1 U	0.96 U	0.57 U	0.51 U	0.41 U	0.42 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	0.96 U	**1.0 J**	0.31 U	0.19 U	5.1 JU	0.84 U	0.99 U	0.45 U	0.31 U	0.31 U	0.27 U
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	0.35 U	0.26 U	0.36 U	0.11 U	**0.70 J**	0.36 U	0.42 U	0.26 U	0.26 U	0.33 U	0.38 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**0.013**	0	**0.9518**	**0.1821**	0	**3.1960**	**0.0920**	0	**0.7187**	0	**0.0158**	**0.0004**

Notes:

TEQ values are calculated using only positive detections.

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

NA - not available

pg/L - picograms per liter

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

Table 4-17
Surface Water Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	**SW02**	**SW02**	**SW02**	**SW02**	**SW03**	**SW03**	**SW03**	**SW03**	**SW03**
			Sample Designator:	**SW04**	**SW44**	**SW05**	**SW55**	**SW01**	**SW02**	**SW03**	**SW04**	**SW05**
			Date Sampled:	**11/10/2015**	**11/10/2015**	**2/11/2016**	**2/11/2016**	**1/10/2014**	**5/4/2015**	**8/10/2015**	**11/10/2015**	**2/11/2016**
			Investigation Phase :	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase I**	**Phase III**	**Phase III**	**Phase III**	**Phase III**
			Notes:		**Duplicate**		**Duplicate**					
Parameter	**Units**	**TEF**	**Screening Level[1]**									
Dioxins-Furans												
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	6.0 JU	2.6 JU	5.5 JU	5.2 JU	1.3 JU	14 JU	**5.2 J**	2.0 JU	3.5 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	9.2 JU	6.9 JU	4.1 JU	3.9 JU	0.31 U	**2.3 J**	**2.1 J**	5.5 JU	2.1 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	1.7 JU	0.59 JU	1.5 JU	1.50 JU	0.60 JU	1.5 JU	**1.2 J**	0.48 JU	0.81 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	2.4 JU	0.46 U	1.5 JU	1.2 JU	0.28 JU	0.45 JU	0.22 U	0.42 U	0.49 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.26 U	0.59 U	1.4 JU	1.4 JU	0.20 U	0.49 U	0.27 U	0.53 U	0.36 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.12 U	0.36 U	1.3 JU	0.75 JU	0.24 U	0.36 U	0.28 U	0.28 U	0.30 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.45 U	0.42 U	1.2 JU	1.2 JU	0.27 U	0.27 U	0.40 U	0.29 U	0.23 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.098 U	0.35 U	1.2 JU	1.4 JU	0.23 U	0.28 U	0.24 U	0.28 U	0.29 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.36 U	0.39 U	1.1 JU	1.1 JU	0.24 U	0.20 U	0.35 U	0.26 U	0.25 JU
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.82 JU	0.31 U	1.4 JU	0.92 JU	0.22 U	1.3 U	0.23 U	0.24 U	0.25 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.91 JU	0.43 U	1.5 JU	0.96 JU	0.29 U	0.26 U	0.42 U	0.29 U	0.23 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	0.16 U	0.53 U	0.58 U	**1.0 J**	1.3 U	0.46 U	0.40 U	0.41 U	0.47 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.57 JU	0.41 U	1.7 JU	1.2 JU	0.27 U	0.24 U	0.39 U	0.28 U	0.22 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	0.40 JU	0.35 U	0.36 U	1.3 JU	0.95 U	0.29 U	0.33 U	0.32 U	0.28 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	**0.15 J**	0.35 U	0.36 U	0.25 U	0.41 U	0.25 U	0.27 U	0.28 U	0.28 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	2.4 JU	1.3 JU	2.3 JU	2.6 JU	1.6 JU	3.0 JU	**2.1 J**	2.3 JU	1.9 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	2.4 JU	0.59 U	2.9 JU	2.6 JU	0.28 JU	0.45 JU	0.27 U	0.53 U	0.49 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	1.0 JU	0.36 U	3.9 JU	3.0 JU	0.24 U	1.3 U	0.28 U	0.28 U	0.30 U
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	1.5 JU	0.43 U	5.5 JU	4.5 JU	0.29 U	0.27 U	0.42 U	0.29 U	0.25 JU
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	0.16 U	0.53 U	0.58 U	**1.0 J**	1.3 U	0.46 U	0.40 U	0.41 U	0.47 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	0.84 JU	0.35 U	0.36 U	2.6 JU	0.95 U	0.29 U	0.33 U	0.32 U	0.28 U
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	**0.15 J**	0.35 U	0.36 U	0.25 U	0.41 U	0.25 U	0.27 U	0.28 U	0.28 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**0.013**	**0.0150**	0	0	**1.000**	0	**0.0007**	**0.0142**	0	0

Notes:

TEQ values are calculated using only positive detection

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

J - estimated value

NA - not available

pg/L - picograms per liter

TEF - Toxicity Equivalence Factor

TEQ - Toxicity Equivalence

U - compound was not detected

Table 4-18
Direct-Push Groundwater Samples, Detected Analytes (BTEX, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Group Name:			**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
Sample Point:			**DP08**	**DP09**	**DP10**	**DP11**	**DP12**	**DP12**	**DP25**	**DP25**	**DP26**	**DP27**	**DP28**	**DP29**	**DP30**	**DP31**	**DP32**	**DP33**
Sample Designator:			**GW01**	**GW01**	**GW01**	**GW01**	**GW01**	**GW11**	**GW01**	**GW11**	**GW01**	**GW01**	**GW01**	**GW01**	**GW01**	**GW01**	**GW01**	**GW01**
Sample Location:			**UT**	**FPS**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**UT**	**UT**	**KRFP**	**KRFP**	**FPS**	**KRFP**	**KRFP**	**KRFP**	**KRFP**	**KRFP**
Sample Date:			**1/15/2014**	**1/15/2014**	**1/15/2014**	**1/15/2014**	**1/15/2014**	**1/15/2014**	**11/21/2014**	**11/21/2014**	**11/25/2014**	**11/25/2014**	**11/21/2014**	**11/21/2014**	**11/24/2014**	**11/21/2014**	**11/24/2014**	**11/25/2014**
Investigation Phase:			**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**
Notes:			**-**	**-**	**-**	**-**	**-**	**Duplicate**	**-**	**Duplicate**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Parameter	**Units**	**Screening Levels[1]**																
Volatile Organic Compounds																		
Ethylbenzene	ug/L	700	**0.39 J**	**0.21 J**	**0.34 J**	**0.19 J**	0.16 U	0.16 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Toluene	ug/L	1,000	**0.52 J**	**0.31 J**	**0.52 J**	**0.34 J**	**0.22 J**	**0.28 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Semivolatile Organic Compounds																		
Acenaphthylene	ug/L	NA	0.47 U	0.47 U	0.48 U	0.48 U	0.47 U	0.48 U	0.0050 U	0.0048 U	**0.0063 J**	**0.0094 J**	0.0048 U	0.0048 U	0.0049 UJ	0.0048 U	0.0050 U	0.0049 U
Fluoranthene	ug/L	800	0.19 U	0.19 U	0.19 U	0.20 U	0.19 U	0.20 U	0.0043 U	0.0041 U	0.0041 U	0.0042 U	0.0042 U	0.0042 U	0.0042 UJ	0.0042 U	0.0043 U	0.0042 U
Naphthalene	ug/L	0.17	0.28 U	0.28 U	0.28 U	0.29 U	0.28 U	0.28 U	0.0050 U	0.0048 U	**0.0140 J**	**0.0210 J**	0.0048 U	0.0048 U	0.0049 UJ	0.0048 U	0.0050 U	0.0049 U
Phenanthrene	ug/L	NA	0.25 U	0.25 U	0.25 U	0.26 U	0.25 U	0.25 U	0.0063 U	0.0061 U	0.0060 U	**0.0083 J**	0.0061 U	0.0061 U	0.0062 UJ	0.0061 U	0.0063 U	0.0062 U
Pyrene	ug/L	120	0.35 U	0.35 U	0.36 U	0.36 U	0.35 U	0.36 U	0.0042 U	0.0040 U	0.0040 U	0.0041 U	0.0041 U	0.0041 U	0.0041 UJ	0.0041 U	**0.0054 J**	0.0041 U
Metals																		
Aluminum, Dissolved	ug/L	20,000	**62 J**	48 U	48 U	48 U	**56 J**	48 U	25 U	**25 J**	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Arsenic, Dissolved	ug/L	10	12 U	12 U	12 U	12 U	12 U	12 U	**2.5 J**	**2.7 J**	1.0 U	1.0 U	1.0 U	**1.1 J**	**1.9 J**	1.0 U	**1.0 J**	**5.2**
Barium, Dissolved	ug/L	2,000	**200**	**140**	**160**	**95**	**160**	**170**	**190**	**190**	**220 J**	**120**	**120**	**290**	**99**	**150**	**170**	**420**
Calcium, Dissolved	ug/L	NA	**190,000**	**160,000**	**210,000**	**150,000**	**170,000**	**160,000**	**190,000**	**180,000**	**150,000 J**	**170,000**	**130,000**	**150,000 J**	**160,000**	**150,000**	**140,000**	**170,000**
Chromium, Dissolved	ug/L	100	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.5 U	**1.6 J**	1.5 U	1.5 U	**4.9 J**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt, Dissolved	ug/L	6	3.0 U	**18**	3.0 U	**3.1 J**	3.0 U	3.0 U	**2.8 J**	**3.3**	1.0 U	**11**	1.0 U	1.0 U	**1.0 J**	**1.3 J**	1.0 U	**3.3**
Copper, Dissolved	ug/L	800	2.1 U	2.1 U	2.1 U	2.1 U	**2.2 J**	2.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Iron, Dissolved	ug/L	14,000	20 U	95 JU	20 JU	20 U	670 U	840 U	25 U	**35 J**	25 U	**120**	25 U	**260**	25 U	25 U	25 U	**430**
Magnesium, Dissolved	ug/L	NA	**38,000**	**33,000**	**43,000**	**30,000**	**35,000**	**33,000**	**37,000**	**38,000**	**32,000 J**	**34,000**	**27,000**	**31,000 J**	**32,000**	**33,000**	**29,000**	**33,000**
Manganese, Dissolved	ug/L	430	**64**	**230**	**86**	**230**	**430**	**490**	**37**	**41**	**55 J**	**100**	**160**	**310**	**72**	**300**	**21**	**140**
Methyl Mercury	ug/L	2	**0.00153**	**0.000127**	**0.00016**	**0.000079 J**	0.000039 U	0.000040 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel, Dissolved	ug/L	390	**4.2 J**	**6.7 J**	**9.0 J**	**6.2 J**	**12**	**13**	**3.2**	**3.6**	**3.5 J**	**8.2**	**8.1**	**2.9 J**	**5.4**	**8.9**	**3.8**	**4.3**
Potassium, Dissolved	ug/L	NA	**2,700**	**2,700**	**2,900**	**2,600**	**3,400**	**3,200**	**2,300**	**2,400**	**2,400 J**	**2,900**	**2,400**	**3,000**	**3,400**	**2,600**	**2,700**	**4,200**
Selenium, Dissolved	ug/L	50	13 U	13 U	13 U	13 U	13 U	13 U	**2.3 J**	**2.6 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sodium, Dissolved	ug/L	NA	**58,000**	**52,000**	**59,000**	**46,000**	**44,000**	**42,000**	**30,000**	**31,000**	**46,000 J**	**53,000**	**44,000**	**38,000 J**	**45,000**	**45,000**	**45,000**	**32,000**
Vanadium, Dissolved	ug/L	86	**2.6 J**	**2.8 J**	**4.6 J**	**2.9 J**	**8.7 J**	**5.4 J**	**10 J**	**10 J**	6.0 U	6.0 U	6.0 U	6.0 U	**7.7 J**	6.0 U	6.0 U	6.0 U
Zinc, Dissolved	ug/L	6,000	3.0 U	3.0 U	**63**	**3.1 J**	**62**	**49**	4.0 U	**8.7 J**	**6.9 J**	**19 J**	4.0 U	**9.6 J**	**5.4 J**	**6.6 J**	4.0 U	**5.0 J**

Table 4-18
Direct-Push Groundwater Samples, Detected Analytes (BTEX, SVOCs, and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	DP34	DP35	DP36	DP36	DP37
		Sample Designator:	GW01	GW01	GW01	GW11	GW01
		Sample Location:	KRFP	KRFP	KRFP	KRFP	KRFP
		Sample Date:	11/24/2014	11/24/2014	11/24/2014	11/24/2014	11/24/2014
		Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II
		Notes:	-	-	-	Duplicate	-
Parameter	**Units**	**Screening Levels[1]**					
Volatile Organic Compounds							
Ethylbenzene	ug/L	700	NS	NS	NS	NS	NS
Toluene	ug/L	1,000	NS	NS	NS	NS	NS
Semivolatile Organic Compounds							
Acenaphthylene	ug/L	NA	0.0049 U	0.0049 U	0.0048 U	0.0049 U	0.0049 UJ
Fluoranthene	ug/L	800	0.0042 U	0.0042 U	0.0041 U	0.0042 U	**0.0064 J**
Naphthalene	ug/L	0.17	0.0049 U	0.0049 U	0.0048 U	0.0049 U	0.0049 UJ
Phenanthrene	ug/L	NA	0.0061 U	0.0061 U	0.0060 U	0.0062 U	0.0061 UJ
Pyrene	ug/L	120	0.0041 U	**0.0140 J**	0.0040 U	0.0041 U	**0.0049 J**
Metals							
Aluminum, Dissolved	ug/L	20,000	25 U	25 U	25 U	25 U	25 U
Arsenic, Dissolved	ug/L	10	**1.0 J**	1.0 U	1.0 U	1.0 U	**5.5**
Barium, Dissolved	ug/L	2,000	**140**	**150**	**230**	**230**	**220**
Calcium, Dissolved	ug/L	NA	**140,000**	**140,000**	**140,000**	**140,000**	**170,000**
Chromium, Dissolved	ug/L	100	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt, Dissolved	ug/L	6	**9.4**	**2.2 J**	**5.8**	**5.9**	1.0 U
Copper, Dissolved	ug/L	800	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Iron, Dissolved	ug/L	14,000	**180**	25 U	25 U	25 U	**4,500**
Magnesium, Dissolved	ug/L	NA	**27,000**	**29,000**	**30,000**	**30,000**	**36,000**
Manganese, Dissolved	ug/L	430	**410**	**150**	**110**	**130**	**750**
Methyl Mercury	ug/L	2	NA	NA	NA	NA	NA
Nickel, Dissolved	ug/L	390	**8.5**	**4.6**	**7.6**	**8.4**	**3.8**
Potassium, Dissolved	ug/L	NA	**2,900**	**2,600**	**2,800**	**2,800**	**4,000**
Selenium, Dissolved	ug/L	50	1.0 U	1.0 U	**3.1**	**2.7 J**	1.0 U
Sodium, Dissolved	ug/L	NA	**44,000**	**49,000**	**41,000**	**43,000**	**35,000**
Vanadium, Dissolved	ug/L	86	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
Zinc, Dissolved	ug/L	6,000	**5.6 J**	4.0 U	**7.4 J**	**5.5 J**	**6.8 J**

Notes:
[1] For source of screening levels, see Table 4-1.
Bold - compound was detected
Highlighted - concentration exceeds screening level
FPS - floodplain slope
J - estimated value
KRFP - Kansas River Floodplain
NA - not available
NS - not sampled
U - compound was not detected
ug/L - micrograms per liter
UT - upland terrace

Table 4-19
Direct-Push Groundwater Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP08	DP09	DP10	DP11	DP12	DP12	DP25	DP25	DP26	DP27	DP28	DP29	DP30	DP31
			Sample Designator:	GW01	GW01	GW01	GW01	GW01	GW11	GW01	GW11	GW01	GW01	GW01	GW01	GW01	GW01
			Sample Location:	UT	TOS	KRFP	KRFP	KRFP	KRFP	UT	UT	KRFP	KRFP	TOS	KRFP	KRFP	KRFP
			Date Sampled:	1/15/2014	1/15/2014	1/15/2014	1/15/2014	1/15/2014	1/15/2014	11/21/2014	11/21/2014	11/25/2014	11/25/2014	11/21/2014	11/21/2014	11/24/2014	11/21/2014
			Investigation Phase:	Phase I	Phase I	Phase I	Phase I	Phase I	Phase I	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
			Notes:	-	-	-	-	-	Duplicate	-	Duplicate	-	-	-	-	-	-
Parameter	**Units**	**TEF**	**Screening Level[1]**														
Dioxins and Furans																	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	**12 J**	1.3 JU	0.49 U	0.62 JU	0.73 JU	0.39 U	2.0 JU	1.9 JU	0.72 U	2.3 JU	1.9 JU	1.9 JU	2.6 JU	1.6 JU
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	**180**	1.4 JU	0.36 U	1.3 JU	1.1 JU	0.98 JU	5.1 JU	3.0 JU	2.8 JU	4.3 JU	5.9 JU	4.4 JU	4.6 JU	4.6 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	7.8 JU	3.6 JU	1.5 JU	1.2 JU	1.7 JU	0.83 JU	0.35 U	0.39 U	**1.3 J**	0.59 U	0.34 U	0.42 U	**0.77 J**	0.26 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	**11 J**	0.27 U	0.31 U	0.30 U	0.19 U	0.28 JU	1.2 U	0.71 U	0.68 U	0.62 U	**1.4 J**	0.63 U	0.63 U	0.57 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	**1.4 J**	0.24 U	0.27 U	0.22 U	0.22 U	0.26 U	0.42 U	0.47 U	0.66 U	0.71 U	0.41 U	0.50 U	0.41 U	0.31 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	4.0 U	0.19 U	0.24 U	**0.64 J**	0.23 U	0.23 U	0.36 U	0.49 U	0.94 U	1.0 U	0.35 U	0.48 U	0.45 U	0.40 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	3.7 U	**0.41 J**	0.17 U	0.17 U	0.16 U	0.14 U	0.26 U	0.30 U	0.74 U	**1.2 J**	0.22 U	0.33 U	0.28 U	0.17 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	3.9 U	0.41 U	0.17 U	**0.66 J**	0.16 U	0.16 U	0.30 U	0.41 U	0.80 U	0.84 U	0.29 U	0.39 U	0.37 U	0.33 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	2.2 U	0.32 U	0.36 U	**0.57 J**	0.29 U	0.28 U	0.51 U	0.64 U	1.5 U	1.6 U	0.60 U	0.69 U	0.46 U	0.59 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	4.0 U	0.20 U	0.20 U	**0.69 J**	0.19 U	0.17 U	0.30 U	0.34 U	0.84 U	0.70 U	0.25 U	0.37 U	0.32 U	0.20 U
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	**13 J**	3.6 JU	1.5 JU	1.2 JU	1.7 JU	0.83 JU	0.42 U	0.47 U	**1.3 J**	0.71 U	0.41 U	0.50 U	**0.77 J**	0.31 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	**21 J**	0.75 JU	0.67 JU	0.68 JU	0.59 JU	1.2 JU	1.2 U	0.71 U	0.68 U	0.62 U	**1.4 J**	0.63 U	0.63 U	0.57 U
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	4.3 U	1.9 JU	0.23 U	1.7 JU	0.59 JU	0.19 U	0.33 U	0.37 U	0.91 U	**1.2 J**	0.28 U	0.42 U	0.36 U	0.22 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	4.0 U	0.41 U	0.24 U	**1.3 J**	0.23 U	0.23 U	0.36 U	0.49 U	0.94 U	2.8 U	0.35 U	0.48 U	0.45 U	0.40 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	2.2 U	0.32 U	0.36 U	**0.57 J**	0.29 U	0.28 U	0.51 U	0.64 U	1.5 U	1.6 U	0.60 U	0.69 U	**0.89 J**	0.59 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	NA	NA	0.99 U	0.23 U	0.24 U	0.27 U	0.24 U	0.22 U	0.30 U	0.34 U	0.82 U	0.70 U	0.31 U	0.40 U	0.25 U	0.30 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**0.1816**	**0.0410**	0	**0.7690**	0	0	0	0	**0.0130**	**0.1200**	**0.0140**	0	**0.0077**	0

Table 4-19
Direct-Push Groundwater Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	DP32	DP33	DP34	DP35	DP36	DP36	DP37
			Sample Designator:	GW01	GW01	GW01	GW01	GW01	GW11	GW01
			Sample Location:	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP	KRFP
			Date Sampled:	11/24/2014	11/25/2014	11/24/2014	11/24/2014	11/24/2014	11/24/2014	11/24/2014
			Investigation Phase:	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II	Phase II
			Notes:	-	-	-	-	-	Duplicate	-
Parameter	**Units**	**TEF**	**Screening Level[1]**							
Dioxins and Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	3.2 JU	0.78 U	0.36 U	0.34 U	2.2 JU	2.3 JU	0.39 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	5.4 JU	2.8 JU	3.5 JU	3.8 JU	5.2 JU	3.7 JU	3.8 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.41 U	0.75 U	0.54 U	0.27 U	0.38 U	0.30 U	0.33 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	**1.5 J**	0.56 U	**1.3 J**	0.58 U	0.65 U	0.47 U	0.58 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.49 U	0.91 U	0.33 U	0.33 U	0.45 U	0.37 U	0.39 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.50 U	0.97 U	0.40 U	0.36 U	0.49 U	0.31 U	0.40 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.41 U	0.73 U	0.24 U	0.21 U	0.33 U	0.25 U	0.24 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.41 U	0.82 U	0.33 U	0.29 U	0.40 U	1.1 U	0.33 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	0.57 U	1.3 U	0.38 U	0.52 U	0.55 U	0.50 U	0.53 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.46 U	0.83 U	0.27 U	0.23 U	0.38 U	0.29 U	0.27 U
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	0.49 U	0.91 U	0.54 U	0.33 U	0.45 U	0.37 U	0.39 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	**1.5 J**	**0.72 J**	**1.3 J**	0.58 U	0.65 U	0.47 U	0.58 U
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	0.52 U	0.90 U	0.30 U	0.26 U	0.42 U	0.32 U	0.30 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	0.50 U	0.97 U	0.40 U	0.36 U	0.49 U	1.1 U	0.40 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	0.57 U	1.8 U	**0.61 J**	0.52 U	0.55 U	0.50 U	0.53 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	NA	NA	0.32 U	1.0 U	0.24 U	0.26 U	**0.95 J**	**0.59 J**	0.31 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**0.0150**	0	**0.0130**	0	0	0	0

Notes:

TEQ values are calculated using only positive detections.
[1] For source of screening levels, see Table 4-1
Bold - compound was detected
Highlighted - concentration exceeds screening level
KPS - floodplain slope
J - estimated value
KRFP - Kansas River Floodplain
NA - not available
NS - not sampled
pg/L - picograms per liter
TEF - Toxicity Equivalence Factor
TEQ - Toxicity Equivalence
TOS - toe of slope
U - compound was not detected
ug/L - micrograms per liter
UT - upland terrace

Table 4-20
Monitoring Well Groundwater Samples, Detected Analytes (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-01
		Sample Designator:	GW01	GW02	GW03	GW04
		Sample Date:	5/6/2015	8/11/2015	11/10/2015	2/12/2016
		Investigation Phase:	Phase III	Phase III	Phase III	Phase III
		Quarterly Event:	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		Notes:	-	-	-	-
Parameter	**Units**	**Screening Levels[1]**				
Semivolatile Organic Compounds						
Naphthalene	ug/L	0.17	**0.019 J**	0.0047 U	0.0048 U	0.0048 U
Metals						
Aluminum	ug/L	20,000	**130**	25 U	25 U	25 U
Arsenic	ug/L	10	**1.1 J**	**1.6 J**	**1.3 J**	**1.7 J**
Barium	ug/L	2,000	**210**	**190**	**210**	**220**
Beryllium	ug/L	4	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	ug/L	NA	**180,000**	**180,000**	**170,000**	**190,000**
Chromium	ug/L	100	1.5 U	1.5 U	**1.5 J**	1.5 U
Cobalt	ug/L	6	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	1,300	**1.1 J**	1.0 U	1.0 U	1.0 U
Iron	ug/L	14,000	**130**	25 U	25.0 U	25.0 U
Lead	ug/L	15	0.60 U	0.60 U	0.60 U	0.60 U
Magnesium	ug/L	NA	**35,000**	**35,000**	**32,000**	**36,000**
Manganese	ug/L	430	**5.2 J**	2.0 U	2.0 U	2.0 U
Nickel	ug/L	390	**2.2 J**	**1.4 J**	**1.6 J**	**1.5 J**
Potassium	ng/L	NA	**2,400**	**3,100**	**2,700**	**3,100**
Selenium	ug/L	50	**1.2 J**	**3.8**	**2.4 J**	**2.6 J**
Sodium	ug/L	NA	**54,000**	**39,000**	**39,000**	**41,000**
Vanadium	ug/L	86	6.0 U	6.0 U	6.0 U	6.0 U
Zinc	ug/L	6,000	4.0 U	4.0 U	4.0 U	4.0 U

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

mg/L - milligrams per liter

NS - not sampled

U - compound was not detected

ug/L - micrograms per liter

Table 4-20
Monitoring Well Groundwater Samples,
Detected Analytes (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
		Sample Point:	**CFIMW15-02**	**CFIMW15-02**	**CFIMW15-02**	**CFIMW15-02**
		Sample Designator:	**GW01**	**GW02**	**GW03**	**GW04**
		Sample Date:	**5/5/2015**	**8/11/2015**	**11/10/2015**	**2/11/2016**
		Investigation Phase:	**Phase III**	**Phase III**	**Phase III**	**Phase III**
		Quarterly Event:	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**
		Notes:	**-**	**-**	**-**	**-**
Parameter	**Units**	**Screening Levels[1]**				
Semivolatile Organic Compounds						
Naphthalene	ug/L	0.17	0.0049 U	0.0047 U	0.0048 U	0.0047 U
Metals						
Aluminum	ug/L	20,000	**570**	**100 J**	25 U	25 U
Arsenic	ug/L	10	**2.5 J**	**3.7 J**	**3.5 J**	**3.5 J**
Barium	ug/L	2,000	**100**	**110**	**140**	**120**
Beryllium	ug/L	4	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	ug/L	NA	**170,000 J**	**180,000 J**	**280,000 J**	**260,000 J**
Chromium	ug/L	100	**1.6 J**	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	6	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	1,300	1.0 U	1.0 U	1.0 U	1.0 U
Iron	ug/L	14,000	**430**	87 JU	25.0 U	25.0 U
Lead	ug/L	15	0.60 U	0.60 U	0.60 U	0.60 U
Magnesium	ug/L	NA	**38,000 J**	**42,000 J**	**51,000 J**	**55,000 J**
Manganese	ug/L	430	**6.5 J**	2.0 U	2.0 U	2.0 U
Nickel	ug/L	390	**2.5 J**	**1.7 J**	**1.7 J**	**1.7 J**
Potassium	ng/L	NA	**2,800 J**	**3,200**	**3,200**	**3,500 J**
Selenium	ug/L	50	**3.0**	**4.7**	**13**	**12**
Sodium	ug/L	NA	**46,000 J**	**41,000 J**	**45,000 J**	**50,000 J**
Vanadium	ug/L	86	**9.2 J**	**9.3 J**	**10 J**	**10 J**
Zinc	ug/L	6,000	4.0 U	4.0 U	4.0 U	4.0 U

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

mg/L - milligrams per liter

NS - not sampled

U - compound was not detected

ug/L - micrograms per liter

Table 4-20
Monitoring Well Groundwater Samples, Detected Analytes (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
		Sample Point:	**CFIMW15-03**	**CFIMW15-03**	**CFIMW15-03**	**CFIMW15-03**
		Sample Designator:	**GW01**	**GW02**	**GW03**	**GW04**
		Sample Date:	**5/6/2015**	**8/11/2015**	**11/10/2015**	**2/12/2016**
		Investigation Phase:	**Phase III**	**Phase III**	**Phase III**	**Phase III**
		Quarterly Event:	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**
		Notes:	-	-	-	-
Parameter	**Units**	**Screening Levels[1]**				
Semivolatile Organic Compounds						
Naphthalene	ug/L	0.17	0.0048 U	0.0047 U	0.0048 U	0.0047 U
Metals						
Aluminum	ug/L	20,000	**69 J**	58 JU	25 U	**46 J**
Arsenic	ug/L	10	**2.3 J**	**2.6 J**	**2.8 J**	**2.7 J**
Barium	ug/L	2,000	**110 J**	**110**	**110**	**110**
Beryllium	ug/L	4	0.20 UJ	0.20 U	0.20 U	0.20 U
Calcium	ug/L	NA	**170,000 J**	**150,000**	**150,000**	**150,000**
Chromium	ug/L	100	1.5 UJ	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	6	1.0 UJ	1.0 U	1.0 U	1.0 U
Copper	ug/L	1,300	1.0 UJ	1.0 U	1.0 U	1.0 U
Iron	ug/L	14,000	**50 J**	43 JU	25.0 U	**35.0 J**
Lead	ug/L	15	0.60 UJ	0.60 U	0.60 U	0.60 U
Magnesium	ug/L	NA	**33,000 J**	**31,000**	**30,000**	**32,000**
Manganese	ug/L	430	**34 J**	**3.1 J**	2.0 U	2.0 U
Nickel	ug/L	390	**3.6 J**	**2.9 J**	**2.5 J**	**2.7 J**
Potassium	ng/L	NA	**2,600 J**	**2,600**	**2,400**	**2,500**
Selenium	ug/L	50	**1.4 J**	1.0 U	**1.0 J**	1.0 U
Sodium	ug/L	NA	**54,000 J**	**47,000**	**45,000**	**48,000**
Vanadium	ug/L	86	6.0 UJ	6.0 U	6.0 U	6.0 U
Zinc	ug/L	6,000	4.0 UJ	4.0 U	4.0 U	4.0 U

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

mg/L - milligrams per liter

NS - not sampled

U - compound was not detected

ug/L - micrograms per liter

Table 4-20
Monitoring Well Groundwater Samples, Detected Analytes (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFIMW15-04	CFIMW15-04	CFIMW15-04	CFIMW15-04
		Sample Designator:	GW01	GW11	GW02	GW22
		Sample Date:	5/5/2015	5/5/2015	8/11/2015	8/11/2015
		Investigation Phase:	Phase III	Phase III	Phase III	Phase III
		Quarterly Event:	1st Quarter	1st Quarter	2nd Quarter	2nd Quarter
		Notes:	-	Duplicate	-	Duplicate
Parameter	**Units**	**Screening Levels[1]**				
Semivolatile Organic Compounds						
Naphthalene	ug/L	0.17	**0.0077 J**	**0.0068 J**	0.0047 U	0.0047 U
Metals						
Aluminum	ug/L	20,000	**570**	**360**	25 U	25 U
Arsenic	ug/L	10	**6.5**	**7.1**	**6.3**	**6.5**
Barium	ug/L	2,000	**96**	**100**	**110**	**110**
Beryllium	ug/L	4	**0.76 J**	**0.48 J**	0.20 U	0.20 U
Calcium	ug/L	NA	**160,000**	**160,000**	**150,000**	**150,000**
Chromium	ug/L	100	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	6	**1.2 J**	1.0 U	1.0 U	1.0 U
Copper	ug/L	1,300	**2.6 J**	1.0 U	1.0 U	1.0 U
Iron	ug/L	14,000	**590**	**380**	39 JU	39 JU
Lead	ug/L	15	**1.3 J**	**0.66 J**	0.60 U	0.60 U
Magnesium	ug/L	NA	**28,000**	**32,000**	**32,000**	**32,000**
Manganese	ug/L	430	**210**	**240**	**280**	**280**
Nickel	ug/L	390	**4.7**	**4.8**	**3.8**	**3.8**
Potassium	ng/L	NA	**2,900**	**3,400**	**3,500**	**3,500**
Selenium	ug/L	50	**1.2 J**	1.0 U	1.0 U	1.0 U
Sodium	ug/L	NA	**41,000**	**42,000**	**39,000**	**39,000**
Vanadium	ug/L	86	6.0 U	6.0 U	6.0 U	6.0 U
Zinc	ug/L	6,000	**5.3 J**	**4.2 J**	4.0 U	4.0 U

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

mg/L - milligrams per liter

NS - not sampled

U - compound was not detected

ug/L - micrograms per liter

Table 4-20
Monitoring Well Groundwater Samples, Detected Analytes (SVOCs and Metals)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
		Sample Point:	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**
		Sample Designator:	**GW03**	**GW33**	**GW04**	**GW44**
		Sample Date:	**11/10/2015**	**11/10/2015**	**2/12/2016**	**2/12/2016**
		Investigation Phase:	**Phase III**	**Phase III**	**Phase III**	**Phase III**
		Quarterly Event:	**3rd Quarter**	**3rd Quarter**	**4th Quarter**	**4th Quarter**
		Notes:	**-**	**Duplicate**	**-**	**Duplicate**
Parameter	**Units**	**Screening Levels[1]**				
Semivolatile Organic Compounds						
Naphthalene	ug/L	0.17	0.0048 U	0.0048 U	0.0047 U	0.0047 U
Metals						
Aluminum	ug/L	20,000	25 U	25 U	25 U	25 U
Arsenic	ug/L	10	**7.3**	**7.6**	**7.1**	**7.1**
Barium	ug/L	2,000	**100**	**100**	**100**	**110**
Beryllium	ug/L	4	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	ug/L	NA	**140,000**	**140,000**	**140,000**	**150,000**
Chromium	ug/L	100	1.5 U	1.5 U	1.5 U	1.5 U
Cobalt	ug/L	6	1.0 U	1.0 U	**1.0 J**	**1.0 J**
Copper	ug/L	1,300	1.0 U	1.0 U	1.0 U	1.0 U
Iron	ug/L	14,000	**36 J**	**38 J**	**100**	**110**
Lead	ug/L	15	0.60 U	0.60 U	0.60 U	0.60 U
Magnesium	ug/L	NA	**27,000**	**28,000**	**31,000**	**31,000**
Manganese	ug/L	430	**230**	**280**	**260**	**260**
Nickel	ug/L	390	**3.6**	**3.7**	**3.7**	**4.2**
Potassium	ng/L	NA	**3,100**	**3,300**	**3,300**	**3,400**
Selenium	ug/L	50	1.0 U	1.0 U	1.0 U	1.0 U
Sodium	ug/L	NA	**38,000**	**39,000**	**40,000**	**41,000**
Vanadium	ug/L	86	6.0 U	6.0 U	6.0 U	6.0 U
Zinc	ug/L	6,000	4.0 U	4.0 U	4.0 U	4.0 U

Notes:

[1] For source of screening levels, see Table 4-1.

Bold - compound was detected

Highlighted - concentration exceeds screening level

mg/L - milligrams per liter

NS - not sampled

U - compound was not detected

ug/L - micrograms per liter

Table 4-21
Monitoring Well Groundwater Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
			Sample Point:	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-02	CFIMW15-02	CFIMW15-02	CFIMW15-02	CFIMW15-03	CFIMW15-03	CFIMW15-03	CFIMW15-03
			Sample Designator:	GW01	GW02	GW03	GW04	GW01	GW02	GW03	GW04	GW01	GW02	GW03	GW04
			Sample Date:	5/6/2015	8/11/2015	11/10/2015	2/12/2016	5/5/2015	8/11/2015	11/10/2015	2/11/2016	5/6/2015	8/11/2015	11/10/2015	2/12/2016
			Investigation Phase:	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III	Phase III
			Quarterly Event:	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
			Notes:	-	-	-	-	-	-	-	-	-	-	-	-
Parameter	**Units**	**TEF**	**Screening Levels[1]**												
Dioxins-Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	2.9 JU	**2.7 J**	4.6 JU	3.4 JU	9.0 JU	3.3 JU	1.2 JU	2.5 JU	8.6 JU	**2.1 J**	**300**	4.9 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	**0.97 J**	0.53 U	5.8 JU	3.2 JU	**5.0 J**	1.3 JU	11.0 JU	2.4 JU	**3.4 J**	**0.81 J**	**89 J**	4.7 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	0.73 U	**0.53 J**	1.2 JU	0.86 JU	2.3 JU	0.69 JU	0.84 JU	0.74 JU	1.8 JU	**0.24 J**	**13 J**	2.1 JU
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.31 U	**0.24 J**	2.1 JU	0.96 JU	1.5 JU	0.38 JU	2.2 JU	0.46 JU	1.5 JU	**0.19 J**	**19 J**	1.6 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.38 U	0.14 U	**1.0 J**	0.35 U	**2.3 J**	0.55 JU	**1.1 J**	0.30 U	**2.2 J**	0.15 U	**2.7 J**	1.3 JU
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.46 U	0.25 U	0.15 U	0.29 U	**0.76 J**	0.25 U	0.16 U	0.26 U	**0.62 J**	0.23 U	0.11 U	0.36 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.35 U	0.27 U	0.26 U	0.30 U	**1.2 J**	0.31 U	0.50 U	0.23 U	**0.83 J**	0.22 U	2.3 JU	1.0 JU
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.41 U	0.22 U	0.12 U	0.28 U	**1.7 J**	0.43 JU	0.13 U	0.25 U	**1.4 J**	0.20 U	0.086 U	0.35 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.31 U	0.24 U	**0.59 J**	0.28 U	**1.2 J**	0.27 U	0.40 U	0.21 U	**0.75 J**	0.19 U	**0.71 J**	1.0 JU
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.38 U	0.21 U	0.77 JU	0.25 U	**1.3 J**	0.21 U	0.12 U	0.22 U	**1.6 J**	0.19 U	0.36 JU	1.8 JU
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.36 U	0.28 U	0.90 JU	0.31 U	**1.2 J**	0.32 U	0.49 U	0.24 U	**1.9 J**	0.23 U	0.49 JU	1.8 JU
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	0.78 U	0.33 U	0.17 U	0.38 U	1.1 U	0.41 U	0.15 U	0.48 U	1.1 U	0.27 U	0.13 U	0.48 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.03	NA	0.41 U	0.25 U	0.44 JU	0.25 U	0.61 U	0.26 U	0.23 U	0.28 U	0.57 U	0.21 U	0.21 JU	0.38 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.34 U	0.26 U	0.94 JU	0.29 U	**1.3 J**	0.35 JU	0.47 U	0.23 U	**1.0 J**	0.21 U	0.41 U	1.4 JU
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	0.43 U	0.26 U	0.33 JU	0.25 U	0.64 U	0.27 U	0.24 U	0.28 U	0.59 U	0.22 U	0.15 U	0.78 JU
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	0.43 U	0.25 U	**0.18 J**	0.22 U	0.39 U	0.29 U	0.16 U	0.25 U	0.44 U	0.21 U	0.080 U	0.28 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	1.5 U	**1.1 J**	1.9 JU	1.7 JU	2.3 JU	1.4 JU	2.0 JU	1.8 JU	1.8 JU	**1.0 J**	**22 J**	2.9 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	0.38 U	**0.24 J**	3.1 JU	0.96 JU	**3.9 J**	0.93 JU	3.3 JU	0.46 JU	**3.7 J**	**0.19 J**	**44 J**	2.9 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	0.46 U	0.25 U	0.77 JU	0.29 U	**3.8 J**	0.43 JU	0.16 U	0.26 U	**3.6 J**	0.23 U	0.60 JU	1.8 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	0.36 U	0.28 U	2.4 JU	0.31 U	**4.9 J**	0.35 JU	0.50 U	0.24 U	**4.6 J**	0.23 U	4.70 JU	5.2 JU
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	0.78 U	0.33 U	0.17 U	0.38 U	1.1 U	0.41 U	0.15 U	0.48 U	1.1 U	0.27 U	0.13 U	0.48 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	0.43 U	0.26 U	0.77 JU	0.25 U	0.64 U	0.27 U	0.24 U	0.28 U	0.59 U	0.22 U	0.21 JU	0.78 JU
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	0.43 U	0.25 U	**0.18 J**	0.22 U	0.39 U	0.29 U	0.16 U	0.25 U	0.44 U	0.21 U	0.080 U	0.280 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**0.000291**	**0.0085**	**0.0280**	0	**0.8905**	0	**0.0110**	0	**0.8422**	**0.0052**	**0.5347**	0

Table 4-21
Monitoring Well Groundwater Samples, Detected Analytes (Dioxins/Furans)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

			Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
			Sample Point:	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**
			Sample Designator:	**GW01**	**GW11**	**GW02**	**GW22**	**GW03**	**GW33**	**GW04**	**GW44**
			Sample Date:	**5/5/2015**	**5/5/2015**	**8/11/2015**	**8/11/2015**	**11/10/2015**	**11/10/2015**	**2/12/2016**	**2/12/2016**
			Investigation Phase:	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase III**	**Phase III**
			Quarterly Event:	**1st Quarter**	**1st Quarter**	**2nd Quarter**	**2nd Quarter**	**3rd Quarter**	**3rd Quarter**	**4th Quarter**	**4th Quarter**
			Notes:	**-**	**Duplicate**	**-**	**Duplicate**	**-**	**Duplicate**	**-**	**Duplicate**
Parameter	**Units**	**TEF**	**Screening Levels[1]**								
Dioxins-Furans											
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	0.0003	NA	**4.6 J**	**4.4 J**	**4.8 J**	4.2 JU	4.5 JU	1.8 JU	33 JU	3.2 JU
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	0.0003	NA	0.41 U	**1.0 J**	3.4 JU	2.5 JU	9.6 JU	7.0 JU	5.9 JU	2.1 JU
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	0.01	NA	**0.98 J**	0.32 U	**2.3 J**	1.3 JU	1.3 JU	0.38 JU	4.1 JU	0.26 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.35 U	0.32 U	**1.5 J**	0.95 JU	2.5 JU	1.6 JU	2.2 JU	0.53 JU
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	0.01	NA	0.44 U	0.39 U	**1.2 J**	0.65 JU	**1.2 J**	**0.49 J**	1.9 JU	0.35 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.31 U	0.38 U	**1.2 J**	0.25 U	0.14	0.13 U	1.6 JU	0.26 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.22 U	0.22 U	**1.2 J**	0.28 U	0.48 JU	0.33 U	1.1 JU	0.51 JU
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.25 U	0.30 U	**0.99 J**	0.46 U	0.11	0.11 U	1.8 JU	0.25 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.17 U	0.17 U	**1.7 J**	0.25 U	0.33	0.26 U	1.1 JU	0.58 JU
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	0.1	NA	0.24 U	0.29 U	**0.93 J**	0.40 JU	0.63 JU	0.10 U	1.9 JU	0.45 JU
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.21 U	0.22 U	**0.96 J**	0.29 U	0.84 JU	0.32 U	**1.3 J**	0.69 JU
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	1	NA	0.45 U	0.44 U	**1.6 J**	0.32 U	0.24 JU	0.17 U	**2.1 J**	0.37 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.03	NA	0.31 U	0.26 U	**1.4 J**	0.25 U	0.19	0.17 U	**1.6**	0.31 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	0.1	NA	0.19 U	0.20 U	**1.5 J**	0.28 JU	0.56 JU	0.31 U	1.2 JU	0.49 JU
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	0.3	NA	0.31 U	0.26 U	**1.1 J**	0.26 U	0.20	0.18 U	**1.2 J**	0.31 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	0.1	NA	0.22 U	0.25 U	0.24 U	0.23 U	0.11	0.10 U	0.31 U	0.19 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	NA	NA	**1.8 J**	**1.1 J**	**2.8 J**	2.0 JU	2.1 JU	1.0 JU	6.1 JU	0.78 JU
Total Heptachlorodibenzofuran (HpCDF)	pg/L	NA	NA	0.44 U	0.39 U	**2.7 J**	1.6 JU	3.7 JU	2.1 JU	4.1 JU	0.53 JU
Total Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	NA	NA	0.31 U	0.38 U	**3.1 J**	0.40 JU	0.63 JU	0.13 U	5.2 JU	0.45 JU
Total Hexachlorodibenzofuran (HxCDF)	pg/L	NA	NA	0.22 U	0.22 U	**5.4 J**	0.28 JU	1.9 JU	0.33 U	4.7 JU	2.3 JU
Total Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	NA	NA	0.45 U	0.44 U	**1.6 J**	0.32 U	0.24 JU	0.17 U	**2.1 J**	0.37 U
Total Pentachlorodibenzofuran (PeCDF)	pg/L	NA	NA	0.31 U	0.26 U	**2.5 J**	0.26 U	0.20	0.18 U	**2.8 J**	0.31 U
Total Tetrachlorodibenzofuran (TCDF)	pg/L	NA	NA	0.22 U	0.25 U	0.24 U	0.23 U	0.11 U	0.10 U	0.31 U	0.19 U
Total 2,3,7,8-TCDD Equivalent / TEQ	**pg/L**	**NA**	**30**	**0.0112**	**0.0016**	**2.8714**	0	**0.0120**	**0.0049**	**2.6380**	0

Notes:

TEQ values are calculated using only positive detections.
[1] For source of screening levels, see Table 2.
Bold - compound was detected
Highlighted - concentration exceeds screening level
J - estimated value
NA - not available
pg/L - picograms per liter
TEF - Toxicity Equivalence Factor
TEQ - Toxicity Equivalence
U - compound was not detected

Table 4-22
Groundwater Quality Parameters
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFIMW15-01	CFIMW15-01	CFIMW15-01	CFIMW15-01
		Sample Designator:	GW01	GW02	GW03	GW04
		Sample Date:	05/06/2015	8/11/2015	11/10/2015	02/12/2016
		Quarterly Event:	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		Notes:				
Parameter	**Units**	**Screening Levels[1]**				
Laboratory Measured						
Alkalinity, Total (as CaCO3)	mg/L	--	**400**	NS	NS	NS
Chloride	mg/L	250	**160 J**	NS	NS	NS
Nitrate as Nitrogen	mg/L	10	**3.5**	NS	NS	NS
Nitrite as Nitrogen	mg/L	1	0.032 U	NS	NS	NS
Sulfate	mg/L	--	**93**	NS	NS	NS
Sulfide	mg/L	250	0.79 U	NS	NS	NS
Total Organic Carbon	mg/L	--	0.90 JU	NS	NS	NS
Field Measurements						
Temperature	°C	--	12.62	13.61	12.04	13.26
pH	SU	--	6.73	6.71	6.68	6.60
Specific Conductivity	mS/cm	--	1.076	1.157	0.992	1.148
Turbidity	NTU	--	4.73	2.52	0.27	0.53
Dissolved Oxygen	mg/L	--	0.85	0.52	0.63	0.70
Oxidation/Reduction Potential	mV	--	142.1	-147.6	252.9	53.3
Iron (II), Ferrous	mg/L	--	0.04	0.05	0.06	0.02

Notes:
[1] For Source of screening levels, see Table 4-1.
Bold = compound was detected
Highlighted - concentration exceeds screening level
°C - degrees Celsius
J - estimated value
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NS - Not sampled
NTU - nephelometric turbidity unit
SU - standard unit
U - compound was not detected

Table 4-22
Groundwater Quality Parameters
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFIMW15-02	CFIMW15-02	CFIMW15-02	CFIMW15-02
		Sample Designator:	GW01	GW02	GW03	GW04
		Sample Date:	05/05/2015	8/11/2015	11/10/2015	02/11/2016
		Quarterly Event:	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		Notes:				
Parameter	**Units**	**Screening Levels[1]**				
Laboratory Measured						
Alkalinity, Total (as CaCO3)	mg/L	--	**400**	NS	NS	NS
Chloride	mg/L	250	**78**	NS	NS	NS
Nitrate as Nitrogen	mg/L	10	**5.1 J**	NS	NS	NS
Nitrite as Nitrogen	mg/L	1	0.016 U	NS	NS	NS
Sulfate	mg/L	--	**140**	NS	NS	NS
Sulfide	mg/L	250	0.79 U	NS	NS	NS
Total Organic Carbon	mg/L	--	**1.1**	NS	NS	NS
Field Measurements						
Temperature	°C	--	11.59	12.99	12.43	13.69
pH	SU	--	6.74	6.70	6.69	6.81
Specific Conductivity	mS/cm	--	1.076	1.184	1.346	1.581
Turbidity	NTU	--	4.18	2.51	1.08	0.47
Dissolved Oxygen	mg/L	--	0.52	0.50	0.64	0.42
Oxidation/Reduction Potential	mV	--	157.9	-105.2	251.4	61.5
Iron (II), Ferrous	mg/L	--	0.06	0.05	0.02	0.01

Notes:
[1] For Source of screening levels, see Table 4-1.
Bold = compound was detected
Highlighted - concentration exceeds screening level
°C - degrees Celsius
J - estimated value
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NS - Not sampled
NTU - nephelometric turbidity unit
SU - standard unit
U - compound was not detected

Table 4-22
Groundwater Quality Parameters
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	CFIMW15-03	CFIMW15-03	CFIMW15-03	CFIMW15-03
		Sample Designator:	GW01	GW02	GW03	GW04
		Sample Date:	05/06/2015	8/11/2015	11/10/2015	02/12/2016
		Quarterly Event:	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		Notes:				
Parameter	**Units**	**Screening Levels[1]**				
Laboratory Measured						
Alkalinity, Total (as CaCO3)	mg/L	--	**430**	NS	NS	NS
Chloride	mg/L	250	**120**	NS	NS	NS
Nitrate as Nitrogen	mg/L	10	**1.6**	NS	NS	NS
Nitrite as Nitrogen	mg/L	1	0.032 U	NS	NS	NS
Sulfate	mg/L	--	**85**	NS	NS	NS
Sulfide	mg/L	250	0.79 U	NS	NS	NS
Total Organic Carbon	mg/L	--	**0.98 J**	NS	NS	NS
Field Measurements						
Temperature	°C	--	10.80	12.29	11.67	12.98
pH	SU	--	6.72	6.66	6.68	6.65
Specific Conductivity	mS/cm	--	1.014	1.057	0.962	1.041
Turbidity	NTU	--	2.50	5.82	2.27	2.64
Dissolved Oxygen	mg/L	--	0.54	0.50	0.60	0.69
Oxidation/Reduction Potential	mV	--	160.8	-108.8	233.2	82.1
Iron (II), Ferrous	mg/L	--	0.02	0.05	0.00	0.01

Notes:
[1] For Source of screening levels, see Table 4-1.
Bold = compound was detected
Highlighted - concentration exceeds screening level
°C - degrees Celsius
J - estimated value
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NS - Not sampled
NTU - nephelometric turbidity unit
SU - standard unit
U - compound was not detected

Table 4-22
Groundwater Quality Parameters
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**	**CFI OU 007**
		Sample Point:	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**
		Sample Designator:	**GW01**	**GW11**	**GW02**	**GW22**
		Sample Date:	**05/05/2015**	**05/05/2015**	**8/11/2015**	**8/11/2015**
		Quarterly Event:	**1st Quarter**	**1st Quarter**	**2nd Quarter**	**2nd Quarter**
		Notes:		**Duplicate**		**Duplicate**
Parameter	**Units**	**Screening Levels[1]**				
Laboratory Measured						
Alkalinity, Total (as CaCO3)	mg/L	--	**400**	**400**	NS	
Chloride	mg/L	250	**77**	**79**	NS	
Nitrate as Nitrogen	mg/L	10	0.022 U	0.022 U	NS	
Nitrite as Nitrogen	mg/L	1	0.016 U	0.016 U	NS	
Sulfate	mg/L	--	**120**	**120**	NS	
Sulfide	mg/L	250	0.79	**0.8 J**	NS	
Total Organic Carbon	mg/L	--	**1.1**	**1.1**	NS	
Field Measurements						
Temperature	°C	--	10.97		11.88	
pH	SU	--	6.79		6.33	
Specific Conductivity	mS/cm	--	0.995		1.052	
Turbidity	NTU	--	3.46		1.20	
Dissolved Oxygen	mg/L	--	0.60		0.52	
Oxidation/Reduction Potential	mV	--	117.4		-152.4	
Iron (II), Ferrous	mg/L	--	0.10		0.10	

Notes:
[1] For Source of screening levels, see Table 4-1.
Bold = compound was detected
Highlighted - concentration exceeds screening level
°C - degrees Celsius
J - estimated value
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NS - Not sampled
NTU - nephelometric turbidity unit
SU - standard unit
U - compound was not detected

Table 4-22
Groundwater Quality Parameters
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

		Group Name:	CFI OU 007	CFI OU 007	CFI OU 007	CFI OU 007
		Sample Point:	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**	**CFIMW15-04**
		Sample Designator:	**GW03**	**GW33**	**GW04**	**GW44**
		Sample Date:	**11/10/2015**	**8/11/2015**	**12/18/2012**	**12/18/2012**
		Quarterly Event:	**3rd Quarter**	**3rd Quarter**	**4th Quarter**	**4th Quarter**
		Notes:		**Duplicate**		**Duplicate**
Parameter	**Units**	**Screening Levels[1]**				
Laboratory Measured						
Alkalinity, Total (as CaCO3)	mg/L	--	NS		NS	
Chloride	mg/L	250	NS		NS	
Nitrate as Nitrogen	mg/L	10	NS		NS	
Nitrite as Nitrogen	mg/L	1	NS		NS	
Sulfate	mg/L	--	NS		NS	
Sulfide	mg/L	250	NS		NS	
Total Organic Carbon	mg/L	--	NS		NS	
Field Measurements						
Temperature	°C	--	11.54		12.63	
pH	SU	--	6.82		6.71	
Specific Conductivity	mS/cm	--	0.847		0.957	
Turbidity	NTU	--	0.89		1.20	
Dissolved Oxygen	mg/L	--	0.60		0.73	
Oxidation/Reduction Potential	mV	--	217.4		46.4	
Iron (II), Ferrous	mg/L	--	0.01		0.00	

Notes:
[1] For Source of screening levels, see Table 4-1.
Bold = compound was detected
Highlighted - concentration exceeds screening level
°C - degrees Celsius
J - estimated value
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NS - Not sampled
NTU - nephelometric turbidity unit
SU - standard unit
U - compound was not detected

Table 4-23
Exceedances by Medium
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Contaminant	Background Soil	Surface Soil[1]	Subsurface Soil	Stream Sediment	Surface Water	Groundwater	
						Direct-Push	Monitoring Well
Semivolatile Organic Compounds							
Benzo(a)anthracene		X	X				
Benzo(a)pyrene	X	X	X		X		
Benzo(b)fluoranthene	X	X	X				
Benzo(k)fluoranthene					X		
Chrysene					X		
Dibenzo(a,h)anthracene		X	X				
Metals							
Arsenic	X	X	X	X			
Cobalt						X	
Iron		X	X				
Lead		X[1]					
Manganese						X	
Mercury		X[1]					
Thallium		X	X				
Dioxins/Furans							
2,3,7,8-TCDD		X	X		X		

Notes:
[1]Only observed in histoical surface soil samples.
2,3,7,8-TCDD - 2,3,7,8-tetrachlorodibenzo-p-dioxin

Table 5-1
Physical and Chemical Properties of Organic Constituents
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Contaminant	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Density (g/cm^3)	Melting Point (°C)	K_{oc} (L/kg)	Water Solubility (mg/L)
Semivolatile Organic Compounds						
Benzo(a)anthracene	230	1.2E-05	1.3	84	180,000	0.0094
Benzo(a)pyrene	250	4.6E-07	NP	180	590,000	0.0016
Benzo(b)fluoranthene	250	6.6E-07	NP	170	600,000	0.0015
Benzo(k)fluoranthene	250	5.8E-07	NP	220	590,000	0.0008
Chrysene	230	5.2E-06	1.3	260	180,000	0.0020
Dibenzo(a,h)anthracene	280	1.4E-07	NP	270	1,900,000	0.0025
Dioxins/Furans						
2,3,7,8-TCDD	320	5.0E-05	1.8	310	250,000	0.0002

Notes:

Source of data is *USEPA Regional Screening Level (RSL) Chemical-Specific Parameters Supporting Table November 2015*.

atm-m^3/mol - atmospheres-cubic meters per mole

°C - degrees Celsius

g/cm^3 - grams per cubic centimeter

g/mol - grams per mole

K_{oc} = organic carbon partition coefficient (propensity for organic compounds to be absorbed by organic carbon in soil and sediment)

L/kg - liters per kilogram

mg/L - milligrams per liter

NP - not published

2,3,7,8-TCDD - 2,3,7,8-tetrachlorodibenzo-p-dioxin

Table 5-2
Physical and Chemical Properties of Inorganic Constituents
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Contaminant	Molecular Weight (g/mol)	Water Solubility (mg/L)	K_d (L/kg)	Density (g/cm^3)	Melting Point (°C)	Boiling Point (°C)
Metals						
Arsenic	78	NP	29	4.9	270	615
Cobalt	59	NP	45	8.9	1,500	2,927
Iron	56	NP	25	7.9	1,500	3,000
Lead	210	NP	900	11	330	1,740
Manganese	55	NP	65	7.3	1,200	2,061
Mercury	200	NP	52	14	-39	357
Thallium	210	NP	71	12	300	2,061

Notes:

Source of data is *USEPA Regional Screening Level (RSL) Chemical-Specific Parameters Supporting Table November 2015* .

°C - degrees Celsius

g/cm^3 - grams per cubic centimeter

g/mol - grams per mole

K_d = soil water distribution coefficient (how readily the species is sorbed to the surface)

L/kg - liters per kilogram

NP - not published

Table 6-1
Data Sets Used for Risk Assessment Calculations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Site-Wide Surface Soil Data Set (0-2' bgs)											
DP01 SB01	0 - 0.5	DP24 SB01	0 - 0.5	INC240612-L	0.5 - 1	CFI06-12	1 - 2	CFI06-23	1 - 2	CFI06-31	0 - 0.5
DP02 SB01	0 - 0.5	UT01 SB01	0 - 0.5	INC260612-L	0.5 - 1	CFI06-13	0.5 - 1	CFI06-24	0.5 - 1	CFI06-31	0.5 - 1
DP03 SB01	0 - 0.5	UT02 SB01	0 - 0.5	INC280006-L	0 - 0.5	CFI06-13	1 - 2	CFI06-24	1 - 2	CFI06-31	1 - 2
DP04 SB01	0 - 0.5	UT03 SB01	0 - 0.5	CFI06-03	0.5 - 1	CFI06-14	0.5 - 1	CFI06-25	0 - 0.5	CFI06-32	0 - 0.5
DP04 SB02	1 - 3	UT04 SB01	0 - 0.5	CFI06-03	1 - 2	CFI06-14	1 - 2	CFI06-25	0.5 - 1	CFI06-32	0.5 - 1
DP05 SB01	0 - 0.5	UT05 SB01	0 - 0.5	CFI06-04	0.5 - 1	CFI06-15	0.5 - 1	CFI06-25	1 - 2	CFI06-32	1 - 2
DP05 SB02	1.5 - 2.5	UT06 SB01	0 - 0.5	CFI06-04	1 - 2	CFI06-16	0.5 - 1	CFI06-26	0 - 0.5	CFI06-33	0 - 0.5
DP06 SB01	0 - 0.5	UT07 SB01	0 - 0.5	CFI06-05	0.5 - 1	CFI06-16	1 - 2	CFI06-26	0.5 - 1	CFI06-33	0.5 - 1
DP07 SB01	0 - 0.5	SS01 SS01	0 - 0.5	CFI06-05	1 - 2	CFI06-17	0.5 - 1	CFI06-26	1 - 2	CFI06-33	1 - 2
DP13 SB01	0 - 0.5	SS02 SS01	0 - 0.5	CFI06-06	0.5 - 1	CFI06-17	1 - 2	CFI06-27	0 - 0.5	CFI06-34	0 - 0.5
DP14 SB01	0 - 0.5	SS03 SS01	0 - 0.5	CFI06-06	1 - 2	CFI06-18	0.5 - 1	CFI06-27	0.5 - 1	CFI06-34	0.5 - 1
DP14 SB02	1.5 - 2.5	SS04 SS01	0 - 0.5	CFI06-07	0.5 - 1	CFI06-18	1 - 2	CFI06-27	1 - 2	CFI06-34	1 - 2
DP15 SB01	0 - 0.5	SS05 SS01	0 - 0.5	CFI06-08	0.5 - 1	CFI06-19	0.5 - 1	CFI06-28	0 - 0.5	CFI06-35	0 - 0.5
DP16 SB01	0 - 0.5	SS06 SS01	0 - 0.5	CFI06-08	1 - 2	CFI06-19	1 - 2	CFI06-28	0.5 - 1	CFI06-35	0.5 - 1
DP17 SB01	0 - 0.5	SS07 SS01	0 - 0.5	CFI06-09	0.5 - 1	CFI06-20	0.5 - 1	CFI06-28	1 - 2	CFI06-35	1 - 2
DP18 SB01	0 - 0.5	SS08 SS01	0 - 0.5	CFI06-09	1 - 2	CFI06-20	1 - 2	CFI06-29	0 - 0.5	CFI06-36	0 - 0.5
DP19 SB01	0 - 0.5	INC110612-L	0.5 - 1	CFI06-10	0.5 - 1	CFI06-21	0.5 - 1	CFI06-29	0.5 - 1	CFI06-36	0.5 - 1
DP20 SB01	0 - 0.5	INC141224-L	1 - 2	CFI06-10	1 - 2	CFI06-21	1 - 2	CFI06-29	1 - 2	CFI06-36	1 - 2
DP21 SB01	0 - 0.5	INC150006-L	0 - 0.5	CFI06-11	0.5 - 1	CFI06-22	0.5 - 1	CFI06-30	0 - 0.5		
DP22 SB01	0 - 0.5	INC190612-L	0.5 - 1	CFI06-11	1 - 2	CFI06-22	1 - 2	CFI06-30	0.5 - 1		
DP23 SB01	0 - 0.5	INC220612-L	0.5 - 1	CFI06-12	0.5 - 1	CFI06-23	0.5 - 1	CFI06-30	1 - 2		

Upland Terrace Surface Soil Data Set (0-2' bgs)											
DP01 SB01	0 - 0.5	UT07 SB01	0 - 0.5	CFI06-05	1 - 2	CFI06-11	0.5 - 1	CFI06-16	1 - 2	CFI06-21	1 - 2
DP13 SB01	0 - 0.5	INC110612-L	0.5 - 1	CFI06-06	0.5 - 1	CFI06-11	1 - 2	CFI06-17	0.5 - 1	CFI06-22	0.5 - 1
DP14 SB01	0 - 0.5	INC141224-L	1 - 2	CFI06-06	1 - 2	CFI06-12	0.5 - 1	CFI06-17	1 - 2	CFI06-22	1 - 2
DP14 SB02	1.5 - 2.5	INC260612-L	0.5 - 1	CFI06-07	0.5 - 1	CFI06-12	1 - 2	CFI06-18	0.5 - 1	CFI06-23	0.5 - 1
UT01 SB01	0 - 0.5	INC280006-L	0 - 0.5	CFI06-08	0.5 - 1	CFI06-13	0.5 - 1	CFI06-18	1 - 2	CFI06-23	1 - 2
UT02 SB01	0 - 0.5	CFI06-03	0.5 - 1	CFI06-08	1 - 2	CFI06-13	1 - 2	CFI06-19	0.5 - 1	CFI06-24	0.5 - 1
UT03 SB01	0 - 0.5	CFI06-03	1 - 2	CFI06-09	0.5 - 1	CFI06-14	0.5 - 1	CFI06-19	1 - 2	CFI06-24	1 - 2
UT04 SB01	0 - 0.5	CFI06-04	0.5 - 1	CFI06-09	1 - 2	CFI06-14	1 - 2	CFI06-20	0.5 - 1		
UT05 SB01	0 - 0.5	CFI06-04	1 - 2	CFI06-10	0.5 - 1	CFI06-15	0.5 - 1	CFI06-20	1 - 2		
UT06 SB01	0 - 0.5	CFI06-05	0.5 - 1	CFI06-10	1 - 2	CFI06-16	0.5 - 1	CFI06-21	0.5 - 1		

Table 6-1
Data Sets Used for Risk Assessment Calculations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Floodplain Slope Surface Soil Data Set (0-2' bgs)											
DP02 SB01	0 - 0.5	DP05 SB02	1.5 - 2.5	INC150006-L	0 - 0.5	CFI06-26	0.5 - 1	CFI06-28	0 - 0.5	CFI06-29	1 - 2
DP03 SB01	0 - 0.5	DP15 SB01	0 - 0.5	CFI06-25	0 - 0.5	CFI06-26	1 - 2	CFI06-28	0.5 - 1	CFI06-30	0 - 0.5
DP04 SB01	0 - 0.5	DP16 SB01	0 - 0.5	CFI06-25	0.5 - 1	CFI06-27	0 - 0.5	CFI06-28	1 - 2	CFI06-30	0.5 - 1
DP04 SB02	1 - 3	DP17 SB01	0 - 0.5	CFI06-25	1 - 2	CFI06-27	0.5 - 1	CFI06-29	0 - 0.5	CFI06-30	1 - 2
DP05 SB01	0 - 0.5	DP18 SB01	0 - 0.5	CFI06-26	0 - 0.5	CFI06-27	1 - 2	CFI06-29	0.5 - 1		

Kansas River Floodplain Surface Soil Data Set (0-2' bgs)											
DP06 SB01	0 - 0.5	DP24 SB01	0 - 0.5	SS04 SS01	0 - 0.5	CFI06-31	1 - 2	CFI06-34	0 - 0.5	CFI06-36	0.5 - 1
DP07 SB01	0 - 0.5	INC190612-L	0.5 - 1	SS05 SS01	0 - 0.5	CFI06-32	0 - 0.5	CFI06-34	0.5 - 1	CFI06-36	1 - 2
DP19 SB01	0 - 0.5	INC220612-L	0.5 - 1	SS06 SS01	0 - 0.5	CFI06-32	0.5 - 1	CFI06-34	1 - 2		
DP20 SB01	0 - 0.5	INC240612-L	0.5 - 1	SS07 SS01	0 - 0.5	CFI06-32	1 - 2	CFI06-35	0 - 0.5		
DP21 SB01	0 - 0.5	SS01 SS01	0 - 0.5	SS08 SS01	0 - 0.5	CFI06-33	0 - 0.5	CFI06-35	0.5 - 1		
DP22 SB01	0 - 0.5	SS02 SS01	0 - 0.5	CFI06-31	0 - 0.5	CFI06-33	0.5 - 1	CFI06-35	1 - 2		
DP23 SB01	0 - 0.5	SS03 SS01	0 - 0.5	CFI06-31	0.5 - 1	CFI06-33	1 - 2	CFI06-36	0 - 0.5		

Kansas River Floodplain Subsurface Soil Data Set (0-12' bgs)											
DP06 SB02	3 - 4.5	DP21 SB03	6 - 7	DP07 SB01	0 - 0.5	INC240612-L	0.5 - 1	CFI06-31	0 - 0.5	CFI06-34	0 - 0.5
DP06 SB03	6 - 7.5	DP21 SB04	11 - 12	DP19 SB01	0 - 0.5	SS01 SS01	0 - 0.5	CFI06-31	0.5 - 1	CFI06-34	0.5 - 1
DP07 SB02	3 - 4.5	DP22 SB02	3 - 4	DP20 SB01	0 - 0.5	SS02 SS01	0 - 0.5	CFI06-31	1 - 2	CFI06-34	1 - 2
DP07 SB03	6 - 7.5	DP22 SB03	6 - 7	DP21 SB01	0 - 0.5	SS03 SS01	0 - 0.5	CFI06-32	0 - 0.5	CFI06-35	0 - 0.5
DP19 SB02	3 - 4	DP23 SB02	3 - 4	DP22 SB01	0 - 0.5	SS04 SS01	0 - 0.5	CFI06-32	0.5 - 1	CFI06-35	0.5 - 1
DP19 SB03	6 - 7	DP23 SB03	6 - 7	DP23 SB01	0 - 0.5	SS05 SS01	0 - 0.5	CFI06-32	1 - 2	CFI06-35	1 - 2
DP20 SB02	3 - 4	DP24 SB02	3 - 4	DP24 SB01	0 - 0.5	SS06 SS01	0 - 0.5	CFI06-33	0 - 0.5	CFI06-36	0 - 0.5
DP20 SB03	6 - 7	DP24 SB03	6 - 7	INC190612-L	0.5 - 1	SS07 SS01	0 - 0.5	CFI06-33	0.5 - 1	CFI06-36	0.5 - 1
DP21 SB02	3 - 4	DP06 SB01	0 - 0.5	INC220612-L	0.5 - 1	SS08 SS01	0 - 0.5	CFI06-33	1 - 2	CFI06-36	1 - 2

Table 6-1
Data Sets Used for Risk Assessment Calculations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Site-Wide Comprehensive Soil Data Set (0' bgs -TD)											
DP01 SB02	3 - 4.5	DP18 SB02	3 - 4	DP05 SB02	1.5 - 2.5	INC190612-L	0.5 - 1	CFI06-18	1 - 2	CFI06-32	0 - 0.5
DP01 SB03	6 - 7.5	DP18 SB03	6 - 7	DP06 SB01	0 - 0.5	INC220612-L	0.5 - 1	CFI06-19	0.5 - 1	CFI06-32	0.5 - 1
DP01 SB04	18 - 20	DP18 SB04	14 - 15	DP07 SB01	0 - 0.5	INC240612-L	0.5 - 1	CFI06-19	1 - 2	CFI06-32	1 - 2
DP01 SB05	30 - 32	DP19 SB02	3 - 4	DP13 SB01	0 - 0.5	INC260612-L	0.5 - 1	CFI06-20	0.5 - 1	CFI06-33	0 - 0.5
DP02 SB02	3 - 6	DP19 SB03	6 - 7	DP14 SB01	0 - 0.5	INC280006-L	0 - 0.5	CFI06-20	1 - 2	CFI06-33	0.5 - 1
DP02 SB03	7 - 8	DP19 SB04	15 - 16	DP14 SB02	1.5 - 2.5	CFI06-03	0.5 - 1	CFI06-21	0.5 - 1	CFI06-33	1 - 2
DP02 SB04	16 - 17	DP20 SB02	3 - 4	DP15 SB01	0 - 0.5	CFI06-03	1 - 2	CFI06-21	1 - 2	CFI06-34	0 - 0.5
DP03 SB02	3 - 5	DP20 SB03	6 - 7	DP16 SB01	0 - 0.5	CFI06-04	0.5 - 1	CFI06-22	0.5 - 1	CFI06-34	0.5 - 1
DP03 SB03	5.5 - 6.5	DP20 SB04	14 - 15	DP17 SB01	0 - 0.5	CFI06-04	1 - 2	CFI06-22	1 - 2	CFI06-34	1 - 2
DP03 SB04	14 - 15.5	DP21 SB02	3 - 4	DP18 SB01	0 - 0.5	CFI06-05	0.5 - 1	CFI06-23	0.5 - 1	CFI06-35	0 - 0.5
DP04 SB03	3 - 4	DP21 SB03	6 - 7	DP19 SB01	0 - 0.5	CFI06-05	1 - 2	CFI06-23	1 - 2	CFI06-35	0.5 - 1
DP04 SB04	10 - 12	DP21 SB04	11 - 12	DP20 SB01	0 - 0.5	CFI06-06	0.5 - 1	CFI06-24	0.5 - 1	CFI06-35	1 - 2
DP05 SB03	2.5 - 3.5	DP22 SB02	3 - 4	DP21 SB01	0 - 0.5	CFI06-06	1 - 2	CFI06-24	1 - 2	CFI06-36	0 - 0.5
DP05 SB04	10 - 12	DP22 SB03	6 - 7	DP22 SB01	0 - 0.5	CFI06-07	0.5 - 1	CFI06-25	0 - 0.5	CFI06-36	0.5 - 1
DP06 SB02	3 - 4.5	DP22 SB04	14 -15	DP23 SB01	0 - 0.5	CFI06-08	0.5 - 1	CFI06-25	0.5 - 1	CFI06-36	1 - 2
DP06 SB03	6 - 7.5	DP23 SB02	3 - 4	DP24 SB01	0 - 0.5	CFI06-08	1 - 2	CFI06-25	1 - 2	CFI TP-1 30'	3'
DP06 SB04	16.5 - 18.5	DP23 SB03	6 - 7	UT01 SB01	0 - 0.5	CFI06-09	0.5 - 1	CFI06-26	0 - 0.5	CFI TP-1 55'	2'
DP07 SB02	3 - 4.5	DP23 SB04	15 - 16	UT02 SB01	0 - 0.5	CFI06-09	1 - 2	CFI06-26	0.5 - 1	CFI TP-1 65'	3.5
DP07 SB03	6 - 7.5	DP24 SB02	3 - 4	UT03 SB01	0 - 0.5	CFI06-10	0.5 - 1	CFI06-26	1 - 2	CFI TP-2 20'	3'
DP07 SB04	18 - 20	DP24 SB03	6 - 7	UT04 SB01	0 - 0.5	CFI06-10	1 - 2	CFI06-27	0 - 0.5	CFI TP-2 55'	2'
DP13 SB02	3 - 4	DP24 SB04	15 -16	UT05 SB01	0 - 0.5	CFI06-11	0.5 - 1	CFI06-27	0.5 - 1	CFI TP-3 25'	3'
DP13 SB03	6 - 7	UT01 SB02	3 - 4	UT06 SB01	0 - 0.5	CFI06-11	1 - 2	CFI06-27	1 - 2	CFI TP-3 60'	3'
DP13 SB04	20 - 21	UT02 SB02	3 - 4	UT07 SB01	0 - 0.5	CFI06-12	0.5 - 1	CFI06-28	0 - 0.5	CFI TP-3 60'	3.5'
DP14 SB03	4.5 - 5.5	UT03 SB02	3 - 4	SS01 SS01	0 - 0.5	CFI06-12	1 - 2	CFI06-28	0.5 - 1	CFI TP-4 65'	5'
DP14 SB04	9.5 - 10.5	UT04 SB02	3 - 4	SS02 SS01	0 - 0.5	CFI06-13	0.5 - 1	CFI06-28	1 - 2	CFI TP-4 65'	2.5'
DP15 SB02	3 - 4	UT05 SB02	3 - 4	SS03 SS01	0 - 0.5	CFI06-13	1 - 2	CFI06-29	0 - 0.5	CFI TP-5 70'	4.5'
DP15 SB03	10.5 - 11.5	UT06 SB02	3 - 4	SS04 SS01	0 - 0.5	CFI06-14	0.5 - 1	CFI06-29	0.5 - 1	CFI TP-5 80'	2'
DP15 SB04	16 - 17	UT07 SB02	3 - 4	SS05 SS01	0 - 0.5	CFI06-14	1 - 2	CFI06-29	1 - 2	CFI TP-6 15'	6'
DP16 SB02	3 - 4	DP01 SB01	0 - 0.5	SS06 SS01	0 - 0.5	CFI06-15	0.5 - 1	CFI06-30	0 - 0.5	CFI TP-6 60'	2'
DP16 SB03	6 - 7	DP02 SB01	0 - 0.5	SS07 SS01	0 - 0.5	CFI06-16	0.5 - 1	CFI06-30	0.5 - 1	CFI TP-6 60'	4'
DP16 SB04	14 - 15	DP03 SB01	0 - 0.5	SS08 SS01	0 - 0.5	CFI06-16	1 - 2	CFI06-30	1 - 2		
DP17 SB02	3 - 4	DP04 SB01	0 - 0.5	INC110612-L	0.5 - 1	CFI06-17	0.5 - 1	CFI06-31	0 - 0.5		
DP17 SB03	6 - 7	DP04 SB02	1 - 3	INC141224-L	1 - 2	CFI06-17	1 - 2	CFI06-31	0.5 - 1		
DP17 SB04	14.5 - 15.5	DP05 SB01	0 - 0.5	INC150006-L	0 - 0.5	CFI06-18	0.5 - 1	CFI06-31	1 - 2		

Table 6-1

Data Sets Used for Risk Assessment Calculations

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Upland Terrace Comprehensive Soil Data Set (0' bgs -TD)											
DP01 SB02	3 - 4.5	UT05 SB02	3 - 4	UT07 SB01	0 - 0.5	CFI06-07	0.5 - 1	CFI06-14	0.5 - 1	CFI06-21	0.5 - 1
DP01 SB03	6 - 7.5	UT06 SB02	3 - 4	INC110612-L	0.5 - 1	CFI06-08	0.5 - 1	CFI06-14	1 - 2	CFI06-21	1 - 2
DP01 SB04	18 - 20	UT07 SB02	3 - 4	INC141224-L	1 - 2	CFI06-08	1 - 2	CFI06-15	0.5 - 1	CFI06-22	0.5 - 1
DP01 SB05	30 - 32	DP01 SB01	0 - 0.5	INC260612-L	0.5 - 1	CFI06-09	0.5 - 1	CFI06-16	0.5 - 1	CFI06-22	1 - 2
DP13 SB02	3 - 4	DP13 SB01	0 - 0.5	INC280006-L	0 - 0.5	CFI06-09	1 - 2	CFI06-16	1 - 2	CFI06-23	0.5 - 1
DP13 SB03	6 - 7	DP14 SB01	0 - 0.5	CFI06-03	0.5 - 1	CFI06-10	0.5 - 1	CFI06-17	0.5 - 1	CFI06-23	1 - 2
DP13 SB04	20 - 21	DP14 SB02	1.5 - 2.5	CFI06-03	1 - 2	CFI06-10	1 - 2	CFI06-17	1 - 2	CFI06-24	0.5 - 1
DP14 SB03	4.5 - 5.5	UT01 SB01	0 - 0.5	CFI06-04	0.5 - 1	CFI06-11	0.5 - 1	CFI06-18	0.5 - 1	CFI06-24	1 - 2
DP14 SB04	9.5 - 10.5	UT02 SB01	0 - 0.5	CFI06-04	1 - 2	CFI06-11	1 - 2	CFI06-18	1 - 2		
UT01 SB02	3 - 4	UT03 SB01	0 - 0.5	CFI06-05	0.5 - 1	CFI06-12	0.5 - 1	CFI06-19	0.5 - 1		
UT02 SB02	3 - 4	UT04 SB01	0 - 0.5	CFI06-05	1 - 2	CFI06-12	1 - 2	CFI06-19	1 - 2		
UT03 SB02	3 - 4	UT05 SB01	0 - 0.5	CFI06-06	0.5 - 1	CFI06-13	0.5 - 1	CFI06-20	0.5 - 1		
UT04 SB02	3 - 4	UT06 SB01	0 - 0.5	CFI06-06	1 - 2	CFI06-13	1 - 2	CFI06-20	1 - 2		

Floodplain Slope Comprehensive Soil Data Set (0' bgs -TD)											
DP02 SB02	3 - 6	DP15 SB04	16 - 17	DP04 SB01	0 - 0.5	CFI06-26	0 - 0.5	CFI06-30	0 - 0.5	CFI TP-4 65'	2.5'
DP02 SB03	7 - 8	DP16 SB02	3 - 4	DP04 SB02	1 - 3	CFI06-26	0.5 - 1	CFI06-30	0.5 - 1	CFI TP-5 70'	4.5'
DP02 SB04	16 - 17	DP16 SB03	6 - 7	DP05 SB01	0 - 0.5	CFI06-26	1 - 2	CFI06-30	1 - 2	CFI TP-5 80'	2'
DP03 SB02	3 - 5	DP16 SB04	14 - 15	DP05 SB02	1.5 - 2.5	CFI06-27	0 - 0.5	CFI TP-1 30'	3'	CFI TP-6 15'	6'
DP03 SB03	5.5 - 6.5	DP17 SB02	3 - 4	DP15 SB01	0 - 0.5	CFI06-27	0.5 - 1	CFI TP-1 55'	2'	CFI TP-6 60'	2'
DP03 SB04	14 - 15.5	DP17 SB03	6 - 7	DP16 SB01	0 - 0.5	CFI06-27	1 - 2	CFI TP-1 65'	3.5	CFI TP-6 60'	4'
DP04 SB03	3 - 4	DP17 SB04	14.5 - 15.5	DP17 SB01	0 - 0.5	CFI06-28	0 - 0.5	CFI TP-2 20'	3'		
DP04 SB04	10 - 12	DP18 SB02	3 - 4	DP18 SB01	0 - 0.5	CFI06-28	0.5 - 1	CFI TP-2 55'	2'		
DP05 SB03	2.5 - 3.5	DP18 SB03	6 - 7	INC150006-L	0 - 0.5	CFI06-28	1 - 2	CFI TP-3 25'	3'		
DP05 SB04	10 - 12	DP18 SB04	14 - 15	CFI06-25	0 - 0.5	CFI06-29	0 - 0.5	CFI TP-3 60'	3'		
DP15 SB02	3 - 4	DP02 SB01	0 - 0.5	CFI06-25	0.5 - 1	CFI06-29	0.5 - 1	CFI TP-3 60'	3.5'		
DP15 SB03	10.5 - 11.5	DP03 SB01	0 - 0.5	CFI06-25	1 - 2	CFI06-29	1 - 2	CFI TP-4 65'	5'		

Table 6-1
Data Sets Used for Risk Assessment Calculations
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Kansas River Floodplain Comprehensive Soil Data Set (0' bgs -TD)											
DP06 SB02	3 - 4.5	DP20 SB04	14 - 15	DP24 SB03	6 - 7	INC220612-L	0.5 - 1	CFI06-31	0.5 - 1	CFI06-35	0 - 0.5
DP06 SB03	6 - 7.5	DP21 SB02	3 - 4	DP24 SB04	15 -16	INC240612-L	0.5 - 1	CFI06-31	1 - 2	CFI06-35	0.5 - 1
DP06 SB04	16.5 - 18.5	DP21 SB03	6 - 7	DP06 SB01	0 - 0.5	SS01 SS01	0 - 0.5	CFI06-32	0 - 0.5	CFI06-35	1 - 2
DP07 SB02	3 - 4.5	DP21 SB04	11 - 12	DP07 SB01	0 - 0.5	SS02 SS01	0 - 0.5	CFI06-32	0.5 - 1	CFI06-36	0 - 0.5
DP07 SB03	6 - 7.5	DP22 SB02	3 - 4	DP19 SB01	0 - 0.5	SS03 SS01	0 - 0.5	CFI06-32	1 - 2	CFI06-36	0.5 - 1
DP07 SB04	18 - 20	DP22 SB03	6 - 7	DP20 SB01	0 - 0.5	SS04 SS01	0 - 0.5	CFI06-33	0 - 0.5	CFI06-36	1 - 2
DP19 SB02	3 - 4	DP22 SB04	14 -15	DP21 SB01	0 - 0.5	SS05 SS01	0 - 0.5	CFI06-33	0.5 - 1		
DP19 SB03	6 - 7	DP23 SB02	3 - 4	DP22 SB01	0 - 0.5	SS06 SS01	0 - 0.5	CFI06-33	1 - 2		
DP19 SB04	15 - 16	DP23 SB03	6 - 7	DP23 SB01	0 - 0.5	SS07 SS01	0 - 0.5	CFI06-34	0 - 0.5		
DP20 SB02	3 - 4	DP23 SB04	15 - 16	DP24 SB01	0 - 0.5	SS08 SS01	0 - 0.5	CFI06-34	0.5 - 1		
DP20 SB03	6 - 7	DP24 SB02	3 - 4	INC190612-L	0.5 - 1	CFI06-31	0 - 0.5	CFI06-34	1 - 2		

Surface Water Data Set		
SW01 SW01	SW02 SW01	SW03 SW01
SW01 SW02	SW02 SW02	SW03 SW02
SW01 SW03	SW02 SW03	SW03 SW03
SW01 SW04	SW02 SW04	SW03 SW04
SW01 SW05	SW02 SW05	SW03 SW05

Sediment Data Set	
SD01 SD01	SD03 SD01
SD02 SD01	

Notes:
bgs - below ground surface
TD - total depth

Table 6-2
Human Health Screening Summary for Site-Wide Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	37 / 37	0.0278 - 14.9180	0.0278	14.918	DP02/SB01 (soil/ash)	4.8	3 / 37	**Yes**	Exceeded Screening Level	2.3	3.3
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	14 / 14	3.6 - 290	3.6	290	DP02/SB01 (soil/ash)	2,000	0 / 14	No	Did Not Excees Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.37 - 0.59	4 / 14	2 - 11	2	11	DP04/SB02 (ash)	220	0 / 5	No	Did Not Excees Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00051 - 0.016	11 / 37	0.00085 - 0.025	0.00085	0.025	DP15/SB01 (soil/ash)	3,600	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.0071	0.0053
Acenaphthylene	0.00036 - 0.027	14 / 37	0.00039 - 0.019	0.00039	0.019	UT04/SB01 (soil)	Not Applicable	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.0041	0.0039
Anthracene	0.00043 - 0.027	19 / 37	0.0006 - 0.045	0.0006	0.045	DP15/SB01 (soil/ash)	18,000	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.011	0.011
Benzo(a)anthracene	0.022 - 0.031	25 / 37	0.0012 - 0.21	0.0012	0.21	DP15/SB01 (soil/ash)	0.16	1 / 37	**Yes**	Exceeded Screening Level	0.037	0.044
Benzo(a)pyrene	0.022 - 0.031	24 / 37	0.0015 - 0.14	0.0015	0.14	DP15/SB01 (soil/ash)	0.016	15 / 37	**Yes**	Exceeded Screening Level	0.030	0.034
Benzo(b)fluoranthene	0.029 - 0.041	24 / 37	0.0017 - 0.16	0.0017	0.16	DP15/SB01 (soil/ash)	0.16	1 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.038	0.042
Benzo(g,h,i)perylene	0.0011 - 0.025	24 / 37	0.0013 - 0.11	0.0013	0.11	DP15/SB01 (soil/ash)	Not Applicable	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.026	0.025
Benzo(k)fluoranthene	0.045 - 0.063	23 / 37	0.0017 - 0.13	0.0017	0.13	DP15/SB01 (soil/ash)	1.6	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.026	0.032
Chrysene	0.03 - 0.042	25 / 37	0.0019 - 0.35	0.0019	0.35	DP15/SB01 (soil/ash)	16	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.064	0.075
Dibenzo(a,h)anthracene	0.0013 - 0.03	10 / 37	0.0025 - 0.032	0.0025	0.032	DP15/SB01 (soil/ash)	0.016	2 / 37	**Yes**	Exceeded Screening Level	0.010	0.0078
Dibenzofuran	0.023 - 0.031	3 / 14	0.044 - 0.13	0.044	0.13	DP02/SB01 (soil/ash)	73	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Dimethyl phthalate	0.026 - 0.028	10 / 14	0.071 - 0.56	0.071	0.56	DP07/SB01 (soil)	Not Applicable	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.04 - 0.057	25 / 29	0.0021 - 0.26	0.0021	0.26	DP15/SB01 (soil/ash)	2,400	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.051	0.061
Fluorene	0.00053 - 0.028	11 / 37	0.0012 - 0.026	0.0012	0.026	DP15/SB01 (soil/ash)	2,400	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.0085	0.0062
Indeno(1,2,3-cd)pyrene	0.00052 - 0.035	22 / 37	0.0012 - 0.057	0.0012	0.057	DP15/SB01 (soil/ash)	0.16	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.015	0.016
2-Methylnaphthalene	0.022 - 0.03	3 / 14	0.054 - 0.23	0.054	0.23	DP02/SB01 (soil/ash)	240	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.145	0.083
Naphthalene	0.00038 - 0.049	24 / 37	0.00041 - 1.4	0.00041	1.4	DP15/SB01 (soil/ash)	3.8	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.17	0.25
Phenanthrene	0.02 - 0.027	28 / 37	0.0012 - 1.5	0.0012	1.5	DP15/SB01 (soil/ash)	Not Applicable	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.23	0.31
Pyrene	0.014 - 0.019	27 / 37	0.002 - 0.26	0.002	0.26	DP15/SB01 (soil/ash)	1,800	0 / 37	**Yes**	Other PAHs Exceeded Screening Levels	0.048	0.059

Table 6-2
Human Health Screening Summary for Site-Wide Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	37 / 37	8,900 - 23,000	8,900	23,000	DP05/SB02 (soil/ash)	77,000	0 / 37	No	Did Not Excees Screening Level	Not Applicable	Not Applicable
Antimony	0.21 - 2	15 / 45	0.25 - 1.7	0.25	1.7	DP17/SB01 (soil/ash)	31	0 / 45	No	Did Not Excees Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	123 / 123	2.50 - 52.4	2.5	52.4	CFI06-07 0.5-1'	0.68	123 / 123	**Yes**	Exceeded Screening Level	9.3	13
Barium	Not Applicable	115 / 115	83.6 - 1,300	83.6	1,300	DP03/SB01 (soil/ash)	15,000	0 / 115	No	Exceeded Screening Level Did	Not Applicable	Not Applicable
Beryllium	Not Applicable	37 / 37	0.50 - 2.7	0.5	2.7	DP03/SB01 (soil/ash)	160	0 / 37	No	Not Exceed Screening Level Did	Not Applicable	Not Applicable
Cadmium	0.0815 - 0.11	101 / 115	0.0468 - 11.7	0.31	11.7	CFI06-26 0.5-1'	71	0 / 115	No	Not Exceed Screening Level Did	Not Applicable	Not Applicable
Calcium	Not Applicable	37 / 37	7,400 - 51,000	7,400	51,000	DP01/SB01 (soil/ash)	Not Applicable	0 / 37	No	Not Exceed Screening Level Did	Not Applicable	Not Applicable
Chromium	Not Applicable	115 / 115	5.54 - 23	5.54	23	SS06/SS01 (soil)	33.6	0 / 115	No	Not Exceed Screening Level Did	Not Applicable	Not Applicable
Cobalt	Not Applicable	37 / 37	4.9 - 16	4.9	16	DP02/SB01 (soil/ash)	23	0 / 37	No	Not Exceed Screening Level Did	Not Applicable	Not Applicable
Copper	Not Applicable	45 / 45	7.6 - 200	7.6	200	DP04/SB02 (ash)	3,100	0 / 45	No	Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	37 / 37	11,000 - 76,000	11,000	76,000	DP04/SB02 (ash)	55,000	2 / 37	**Yes**	Exceeded Screening Level	23,000	27,000
Lead*	Not Applicable	115 / 115	10 - 844	10	844	CFI06-27 0-0.5'	400	4 / 115	**Yes**	Exceeded Screening Level	78	Not Applicable
Magnesium	Not Applicable	37 / 37	790 - 5,300	790	5,300	DP21/SB01 (soil)	Not Applicable	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	37 / 37	260 - 450	260	450	DP21/SB01 (soil)	1,800	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.018 - 0.1	114 / 123	0.011 - 16.5	0.011	16.5	CFI06-26 0.5-1'	11	1 / 123	**Yes**	Exceeded Screening Level	0.22	0.79
Methyl Mercury	Not Applicable	14 / 14	0.000028 - 0.000265	0.000028	0.000265	DP04/SB01 (soil/ash)	7.8	0 / 14	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	37 / 37	12 - 87	12	87	DP02/SB01 (soil/ash)	1,500	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	37 / 37	1,300 - 4,700	1,300	4,700	DP21/SB01 (soil)	Not Applicable	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.12 - 2.3	72 / 115	0.14 - 2.4	0.14	2.4	DP02/SB01 (soil/ash)	390	0 / 115	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.11 - 0.16	25 / 115	0.037 - 0.97	0.037	0.97	DP16/SB01 (soil/ash)	390	0 / 115	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	37 / 37	56 - 620	56	620	DP03/SB01 (soil/ash)	Not Applicable	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	1 - 1.2	27 / 37	0.16 - 2	0.16	2	DP04/SB02 (ash)	0.78	4 / 37	**Yes**	Exceeded Screening Level	0.48	0.76
Vanadium	Not Applicable	37 / 37	18 - 43	18	43	DP20/SB01 (soil)	390	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	45 / 45	37.6 - 1,380	37.6	1,380	INC150006-L	23,000	0 / 45	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels,
as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.
bgs - below ground surface
pg/kg - picograms per kilogram
ug/kg - micrograms per kilogram

Table 6-3
Human Health Screening Summary for Upland Terrace Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	11 / 11	0.0278 - 7.3780	0.0278	7.378	UT01/SB01 (soil)	4.8	2 / 11	**Yes**	Exceeded Screening Level	5.4	2.5
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	1 / 1	39 - 39	39	39	DP01/SB01 (soil/ash)	2,000	0 / 1	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.37 - 0.37	0 / 1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	220	0 / 1	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00051 - 0.012	5 / 11	0.0039 - 0.0080	0.0039	0.0080	UT03/SB01 (soil)	3,600	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.0057	0.0056
Acenaphthylene	0.00036 - 0.02	7 / 11	0.0010 - 0.019	0.0010	0.019	UT04/SB01 (soil)	Not Applicable	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.0075	0.0088
Anthracene	0.02 - 0.02	10 / 11	0.0011 - 0.017	0.0011	0.017	UT04/SB01 (soil)	18,000	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.010	0.013
Benzo(a)anthracene	0.024 - 0.024	10 / 11	0.0035 - 0.074	0.0035	0.074	UT04/SB01 (soil)	0.16	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.034	0.044
Benzo(a)pyrene	0.024 - 0.024	10 / 11	0.0026 - 0.075	0.0026	0.075	UT04/SB01 (soil)	0.016	9 / 11	**Yes**	Exceeded Screening Level	0.033	0.043
Benzo(b)fluoranthene	0.031 - 0.031	10 / 11	0.0024 - 0.087	0.0024	0.087	UT04/SB01 (soil)	0.16	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.042	0.054
Benzo(g,h,i)perylene	0.0011 - 0.0011	10 / 11	0.017 - 0.054	0.017	0.054	UT01/SB01	Not Applicable	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.032	0.043
Benzo(k)fluoranthene	0.048 - 0.048	10 / 11	0.017 - 0.069	0.017	0.069	UT04/SB01 (soil)	1.6	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.029	0.038
Chrysene	0.032 - 0.032	10 / 11	0.0042 - 0.09	0.0042	0.09	UT01/SB01 (soil) / UT04/SB01 (soil)	16	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.057	0.071
Dibenzo(a,h)anthracene	0.0013 - 0.023	4 / 11	0.0052 - 0.015	0.0052	0.015	UT04/SB01 (soil)	0.016	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.0073	0.0090
Dibenzofuran	0.024 - 0.024	0 / 1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	73	0 / 1	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Dimethyl phthalate	Not Applicable	1 / 1	0.15 - 0.15	0.15	0.15	DP01/SB01 (soil/ash)	Not Applicable	0 / 1	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.043 - 0.043	10 / 11	0.0027 - 0.12	0.0027	0.12	UT04/SB01 (soil)	2,400	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.050	0.065
Fluorene	0.0029 - 0.022	5 / 11	0.0043 - 0.0090	0.0043	0.0090	UT03/SB01 (soil)	2,400	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.0064	0.0062
Indeno(1,2,3-cd)pyrene	0.00052 - 0.026	9 / 11	0.0087 - 0.049	0.0087	0.049	UT04/SB01 (soil)	0.16	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.022	0.024
2-Methylnaphthalene	0.023 - 0.023	0 / 1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	240	0 / 1	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Naphthalene	0.037 - 0.037	10 / 11	0.0031 - 0.073	0.0031	0.073	UT05/SB01 (soil)	3.8	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.069	0.14
Phenanthrene	Not Applicable	11 / 11	0.013 - 0.36	0.013	0.036	UT07/SB01 (soil)	Not Applicable	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.16	0.23
Pyrene	Not Applicable	11 / 11	0.0029 - 0.11	0.0029	0.11	UT04/SB01 (soil)	1,800	0 / 11	**Yes**	Other PAHs Exceeded Screening Levels	0.046	0.062

Table 6-3
Human Health Screening Summary for Upland Terrace Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	11 / 11	8,900 - 12,000	8,900	12,000	DP13/SB01(soil ash) / DP14/SB01 (soil/ash)/ DP14/SB02 (soil)/ UT01/SB01 (soil) / UT02/SB01(soil) / UT06/SB01 (soil)	77,000	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.21 - 2	8 / 15	0.25 - 0.94	0.25	0.94	UT06/SB01 (soil)	31	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	57 / 57	2.50 - 52.4	2.50	52.4	CFI06-07 0.5-1'	0.68	57 / 57	**Yes**	Exceeded Screening Level	6.5	11
Barium	Not Applicable	53 / 53	83.6 - 1,100	83.6	1,100	CFI06-22 1-2'	15,000	0 / 53	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	11 / 11	0.50 - 1.2	0.50	1.2	DP14/SB01 (soil/ash)	160	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.0815 - 0.11	42 / 53	0.0468 - 4.08	0.0468	4.08	CFI06-20 0.5-1'	71	0 / 53	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	11 / 11	7,400 - 51,000	7,400	51,000	DP01/SB01 (soil/ash)	Not Applicable	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	53 / 53	5.54 - 19.3	5.54	19.3	CFI06-21 1-2'	33.6	0 / 53	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	11 / 11	4.9 - 9.5	4.9	9.5	DP14/SB01 (soil/ash)	23	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	15 / 15	7.6 - 130	7.6	130	UT04/SB01 (soil) / UT05/SB01 (soil)	3,100	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	11 / 11	13,000 - 31,000	13,000	31,000	DP14/SB01 (soil/ash)	55,000	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Lead	Not Applicable	57 / 57	10 - 270	10	270	CFI06-22 1-2'	400	0 / 57	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Magnesium	Not Applicable	11 / 11	2,300 - 3,000	2,300	3,000	UT02/SB01 (soil)	Not Applicable	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	11 / 11	270 - 340	270	340	DP14/SB01 (soil/ash)	1,800	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.018 - 0.1	51 / 57	0.011 - 0.78	0.011	0.078	UT05/SB01 (soil)	11	0 / 57	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	Not Applicable	1 / 1	0.00012 - 0.00012	0.00012	0.00012	DP01/SB01 (soil/ash)	7.8	0 / 1	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	11 / 11	12 - 45	12	45	DP14/SB01 (soil/ash)	1,500	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	11 / 11	2,000 - 2,700	2,000	2,700	UT04/SB01 (soil)	Not Applicable	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.12 - 1.7	25 / 53	0.14 - 1.07	0.14	1.07	CFI06-22 0.5-1'	390	0 / 53	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.11 - 0.278	11 / 53	0.037 - 0.775	0.037	0.775	CFI06-17 0.5-1'	390	0 / 53	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	11 / 11	56 - 230	56	230	DP14/SB01 (soil/ash)	Not Applicable	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	1 - 1	10 / 11	0.16 - 0.26	0.16	0.26	DP14/SB01 (soil/ash)	0.78	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Vanadium	Not Applicable	11 / 11	18 - 28	18	28	DP14/SB01 (soil/ash)	390	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	15 / 15	37.6 - 390	37.6	390	DP14/SB01 (soil/ash)	23,000	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
bgs - below ground surface
pg/kg - picograms per kilogram
ug/kg - micrograms per kilogram

Table 6-4
Human Health Screening Summary for Floodplain Slope Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	10 / 10	0.0519 - 14.9180	0.0519	14.9180	DP02/SB01 (soil/ash)	4.8	1 / 10	**Yes**	Exceeded Screening Level	4.2	9.5
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	6 / 6	5.7 - 290	5.7	290	DP02/SB01 (soil/ash)	2,000	0 / 6	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.39 - 0.42	4 / 6	2 - 11	2	11	DP04/SB02 (ash)	220	0 / 6	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.012 - 0.012	4 / 10	0.0044 - 0.025	0.0044	0.025	DP15/SB01 (soil/ash)	3,600	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.011	0.013
Acenaphthylene	0.0018 - 0.02	1 / 10	0.00079 - 0.00079	0.00079	0.00079	DP18/SB01 (soil/ash)	Not Applicable	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.00079	Not Applicable
Anthracene	0.02 - 0.02	4 / 10	0.0095 - 0.045	0.0095	0.045	DP15/SB01 (soil/ash)	18,000	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.026	0.024
Benzo(a)anthracene	0.023 - 0.024	6 / 10	0.036 - 0.21	0.036	0.021	DP15/SB01 (soil/ash)	0.16	1 / 10	**Yes**	Exceeded Screening Level	0.089	0.099
Benzo(a)pyrene	0.023 - 0.024	5 / 10	0.028 - 0.14	0.028	0.14	DP15/SB01 (soil/ash)	0.016	5 / 10	**Yes**	Exceeded Screening Level	0.067	0.068
Benzo(b)fluoranthene	0.029 - 0.031	5 / 10	0.036 - 0.16	0.036	0.16	DP15/SB01 (soil/ash)	0.16	1 / 10	**Yes**	Exceeded Screening Level	0.086	0.085
Benzo(g,h,i)perylene	0.018 - 0.019	5 / 10	0.016 - 0.11	0.016	0.11	DP15/SB01 (soil/ash)	Not Applicable	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.051	0.052
Benzo(k)fluoranthene	0.045 - 0.048	4 / 10	0.022 - 0.13	0.022	0.13	DP15/SB01 (soil/ash)	1.6	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.065	0.068
Chrysene	0.031 - 0.031	6 / 10	0.049 - 0.35	0.049	0.35	DP15/SB01 (soil/ash)	16	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.153	0.168
Dibenzo(a,h)anthracene	0.021 - 0.023	4 / 10	0.0052 - 0.032	0.0052	0.032	DP15/SB01 (soil/ash)	0.016	2 / 10	**Yes**	Exceeded Screening Level	0.017	0.022
Dibenzofuran	0.023 - 0.024	3 / 6	0.044 - 0.13	0.044	0.13	DP02/SB01 (soil/ash)	73	0 / 6	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Dimethyl phthalate	0.026 - 0.028	3 / 6	0.071 - 0.49	0.071	0.49	DP05/SB02 (soil/ash)	Not Applicable	0 / 6	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.04 - 0.043	4 / 10	0.046 - 0.26	0.046	0.26	DP15/SB01 (soil/ash)	2,400	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.12	0.13
Fluorene	0.02 - 0.022	4 / 10	0.0059 - 0.026	0.0059	0.026	DP15/SB01 (soil/ash)	2,400	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.014	0.016
Indeno(1,2,3-cd)pyrene	0.025 - 0.026	4 / 10	0.0085 - 0.057	0.0085	0.057	DP15/SB01 (soil/ash)	0.16	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.029	0.030
2-Methylnaphthalene	0.022 - 0.023	3 / 6	0.054 - 0.23	0.054	0.23	DP02/SB01 (soil/ash)	240	0 / 6	**Yes**	Other PAHs Exceeded Screening Levels	0.15	0.16
Naphthalene	0.035 - 0.037	6 / 10	0.068 - 1.4	0.068	1.4	DP15/SB01 (soil/ash)	3.8	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.50	0.59
Phenanthrene	0.02 - 0.02	8 / 10	0.027 - 1.5	0.027	1.5	DP15/SB01 (soil/ash)	Not Applicable	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.52	0.70
Pyrene	0.014 - 0.014	7 / 10	0.019 - 0.26	0.019	0.26	DP15/SB01 (soil/ash)	1,800	0 / 10	**Yes**	Other PAHs Exceeded Screening Levels	0.10	0.13

Table 6-4
Human Health Screening Summary for Floodplain Slope Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	10 / 10	8,900 - 23,000	8,900	23,000	DP05/SB02 (soil/ash)	77,000	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	1.1 - 2	4 / 11	0.77 - 1.3	0.77	1.3	DP15/SB01 (soil/ash)	31	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	29 / 29	2.98 - 47.4	2.98	47.4	CFI06-27 0-0.5'	0.68	29 / 29	**Yes**	Exceeded Screening Level	19	22
Barium	Not Applicable	28 / 28	123 - 1,300	123	1,300	DP03/SB01 (soil/ash)	15,000	0 / 28	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	10 / 10	0.81 - 2.7	0.81	2.7	DP03/SB01 (soil/ash)	160	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.087 - 0.0941	26 / 28	0.12 - 11.7	0.12	11.7	CFI06-26 0.5-1'	71	0 / 28	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	10 / 10	7,800 - 27,000	7,800	27,000	DP03/SB01 (soil/ash)	Not Applicable	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	28 / 28	6.53 - 21	6.53	21	DP05/SB02 (soil/ash)	33.6	0 / 28	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	10 / 10	5.9 - 16	5.9	16	DP02/SB01 (soil/ash)	23	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	11 / 11	14 - 200	14	200	DP04/SB02 (ash)	3,100	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	10 / 10	14,000 - 76,000	14,000	76,000	DP04/SB02 (ash)	55,000	2 / 10	**Yes**	Exceeded Screening Level	40,000	Not Applicable
Lead*	Not Applicable	29 / 29	15.6 - 844	15.6	844	CFI06-27 0-0.5'	400	2 / 29	**Yes**	Exceeded Screening Level	190	270
Magnesium	Not Applicable	10 / 10	790 - 4,700	790	4,700	DP05/SB02 (soil/ash)	Not Applicable	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	10 / 10	290 - 440	290	440	DP02/SB01 (soil/ash)	1,800	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	Not Applicable	29 / 29	0.014 - 16.5	0.014	16.5	CFI06-26 0.5-1'	11	1 / 29	**Yes**	Exceeded Screening Level	0.64	3.1
Methyl Mercury	Not Applicable	6 / 6	0.000028 - 0.000265	0.000028	0.000265	DP04/SB01 (soil/ash)	7.8	0 / 6	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	10 / 10	20 - 87	20	87	DP02/SB01 (soil/ash)	1,500	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	10 / 10	1,900 - 3,900	1,900	3,900	DP05/SB02 (soil/ash)	Not Applicable	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.19 - 1.7	21 / 28	0.517 - 2.4	0.517	2.4	DP02/SB01 (soil/ash)	390	0 / 28	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.11 - 0.278	7 / 28	0.42 - 0.97	0.42	0.97	DP16/SB01 (soil/ash)	390	0 / 28	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	10 / 10	71 - 620	71	620	DP03/SB01 (soil/ash)	Not Applicable	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	1 - 1	7 / 10	0.33 - 2	0.33	2	DP04/SB02 (ash)	0.78	3 / 10	**Yes**	Exceeded Screening Level	0.98	1.8
Vanadium	Not Applicable	10 / 10	19 - 36	19	36	DP16/SB01 (soil/ash)	390	0 / 10	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	11 / 11	59 - 1,380	59	1,380	INC150006-L	23,000	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.
bgs - below ground surface
pg/kg - picograms per kilogram
ug/kg - micrograms per kilogram

Table 6-5
Human Health Screening Summary for Kansas River Floodplain Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	16 / 16	0.0313 - 3.7299	0.0313	3.7299	DP22/SB01 (soil)	4.8	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	7 / 7	3.6 - 32	3.6	32	SS01/SS01 (soil)	2,000	0 / 7	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.38 - 0.59	0 / 7	Not Applicable	Not Applicable	Not Applicable	Not Applicable	220	0 / 7	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Semivolatile Organic Compounds (mg/kg)												
Acenaphthene	0.00051 - 0.016	2 / 16	0.00085 - 0.0038	0.00085	0.0038	DP22/SB01 (soil)	3,600	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0023	0.0030
Acenaphthylene	0.00041 - 0.027	6 / 16	0.00039 - 0.0010	0.00039	0.0010	DP22/SB01 (soil)	Not Applicable	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.00065	0.00071
Anthracene	0.00043 - 0.027	5 / 16	0.00060 - 0.0077	0.00060	0.0077	DP22/SB01 (soil)	18,000	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0025	0.0031
Benzo(a)anthracene	0.024 - 0.031	9 / 16	0.0012 - 0.030	0.0012	0.030	DP22/SB01 (soil)	0.16	1 / 16	**Yes**	Exceeded Screening Level	0.0063	0.012
Benzo(a)pyrene	0.024 - 0.031	9 / 16	0.0015 - 0.022	0.0015	0.022	DP22/SB01 (soil)	0.016	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0061	0.011
Benzo(b)fluoranthene	0.032 - 0.041	9 / 16	0.0017 - 0.030	0.0017	0.030	DP22/SB01 (soil)	0.16	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0076	0.015
Benzo(g,h,i)perylene	0.019 - 0.025	9 / 16	0.0013 - 0.011	0.0013	0.011	DP19/SB01 (soil) / DP22/SB01 (soil	Not Applicable	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0042	0.0069
Benzo(k)fluoranthene	0.048 - 0.063	9 / 16	0.0017 - 0.017	0.0017	0.017	DP22/SB01 (soil)	1.6	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0049	0.0085
Chrysene	0.032 - 0.042	9 / 16	0.0019 - 0.062	0.0019	0.062	DP22/SB01 (soil)	16	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.012	0.026
Dibenzo(a,h)anthracene	0.0013 - 0.030	2 / 16	0.0025 - 0.0045	0.0025	0.0045	DP22/SB01 (soil)	0.016	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0035	0.0022
Dibenzofuran	0.024 - 0.031	0 / 7	Not Applicable	Not Applicable	Not Applicable	Not Applicable	73	0 / 7	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Dimethyl phthalate	0.028 - 0.028	6 / 7	0.076 - 0.56	0.076	0.56	DP07/SB01 (soil)	Not Applicable	0 / 7	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.043 - 0.057	9 / 16	0.021 - 0.042	0.0021	0.042	DP22/SB01 (soil)	2,400	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0090	0.015
Fluorene	0.00054 - 0.028	2 / 16	0.0012 - 0.0044	0.0012	0.0044	DP22/SB01 (soil)	2,400	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0028	0.0035
Indeno(1,2,3-cd)pyrene	0.026 - 0.035	9 / 16	0.0012 - 0.0081	0.0012	0.0081	DP22/SB01 (soil)	0.16	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0033	0.0048
2-Methylnaphthalene	0.023 - 0.030	0 / 7	Not Applicable	Not Applicable	Not Applicable	Not Applicable	240	0 / 7	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Naphthalene	0.00038 - 0.049	8 /16	0.00041 - 0.24	0.00041	0.24	DP22/SB01 (soil)	3.8	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.036	0.18
Phenanthrene	0.020 - 0.027	9 /16	0.0012 - 0.33	0.0012	0.33	DP22/SB01 (soil)	Not Applicable	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.047	0.24
Pyrene	0.015 - 0.019	9 / 16	0.0020 - 0.042	0.0020	0.042	DP22/SB01 (soil)	1,800	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.0089	0.010

Table 6-5
Human Health Screening Summary for Kansas River Floodplain Surface Soil (0-2' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	16 /16	12,000 - 22,000	12,000	22,000	DP20/SB01 (soil)	77,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.24 - 2.0	3 / 20	0.28 - 0.46	0.28	0.46	DP22/SB01 (soil)	31	0 / 20	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	37 / 37	3.3 - 22.3	3.3	22.3	CFI06-32	0.68	37 / 37	**Yes**	Exceeded Screening Level	6.2	7.3
Barium	Not Applicable	34 / 34	140 - 311	140	311	CFI06-32	15,000	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	16 / 16	0.56 - 1.0	0.56	1.0	SS05/SS01 (soil)	160	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.0959 - 0.0959	33 / 34	0.0583 - 6.81	0.0583	6.81	CFI06-32	71	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	16 / 16	9,300 - 18,000	9,300	18,000	DP21/SB01 (soil) / SS08/SS01 (soil)	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	34 / 34	8.4 - 23	8.4	23	SS06/SS01 (soil)	33.6	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	16 / 16	5.6 - 8.3	5.6	8.3	SS05/SS01 (soil)	23	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	19 / 19	9.8 - 19	9.8	19	SS05/SS01 (soil)	3,100	0 / 19	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	16 / 16	11,000 - 23,000	11,000	23,000	DP21/SB01 (soil)	55,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Lead*	Not Applicable	37 / 37	10.9 - 450	10.9	439	CFI06-32	400	2 / 16	**Yes**	Exceeded Screening Level	50	Not Applicable
Magnesium	Not Applicable	16 / 16	3,200 - 5,200	3,200	5,300	DP21/SB01 (soil) / SS05/SS01 (soil) / SS08/SS01 (soil)	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	16 / 16	270 - 450	270	450	DP21/SB01 (soil)	1,800	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.10 - 0.10	34 / 37	0.019 - 0.224	0.019	0.224	CFI06-33	11	0 / 37	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	Not Applicable	7 / 7	0.000039 - 0.000112	0.000039	0.000112	SS04/SS01 (soil)	7.8	0 / 7	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	16 / 16	12 - 22	12	22	DP19/SB01 (soil)	1,500	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	16 / 16	2,600 - 4,700	2,600	4,700	DP21/SB01 (soil)	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.959 - 2.3	26 / 34	0.16 - 1.07	0.16	1.07	CFI06-33	390	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.12 - 0.271	9 / 34	0.043 - 0.12	0.043	0.12	DP22/SB01 (soil)	390	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	16 / 16	59 - 110	59.0	110.0	DP19/SB01 (soil)	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	1.1 - 1.2	10 / 16	0.22 - 1.5	0.22	1.5	SS05/SS01 (soil)	0.78	1 / 16	**Yes**	Exceeded Screening Level	0.42	0.72
Vanadium	Not Applicable	16 / 16	22 - 43	22	43	DP20/SB01 (soil)	390	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	19 / 19	43 - 150	43	150	DP22/SB01 (soil)	23,000	0 / 19	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.
bgs - below ground surface
pg/kg - picograms per kilogram
ug/kg - micrograms per kilogram

Table 6-6
Human Health Screening Summary for Kansas River Floodplain Subsurface Soil (0-12' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	32 / 33	0.0028 - 8.1965	0.0028	8.1965	DP22/SB02 (ash)	4.8	1 / 33	**Yes**	Exceeded Screening Level	0.72	1.6
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	11 / 11	3 - 32	3	32	SS01/SS01 (soil)	2,000	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.38 - 0.58	0 / 11	Not Applicable	Not Applicable	Not Applicable	Not Applicable	220	0 / 11	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00047 - 0.016	3 / 33	0.00085 - 0.010	0.00085	0.010	DP22/SB02 (ash)	3,600	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0049	0.0020
Acenaphthylene	0.00033 - 0.027	7 / 33	0.00039 - 0.001	0.00039	0.001	DP22/SB01 (soil)	Not Applicable	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.00064	0.00051
Anthracene	0.0004 - 0.027	6 / 33	0.0006 - 0.025	0.0006	0.025	DP22/SB02 (ash)	18,000	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0025	0.0016
Benzo(a)anthracene	0.00031 - 0.031	15 / 33	0.001 - 0.093	0.001	0.093	DP22/SB02 (ash)	0.16	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.011	0.019
Benzo(a)pyrene	0.0004 - 0.031	15 / 33	0.0013 - 0.059	0.0013	0.059	DP22/SB02 (ash)	0.016	2 / 33	**Yes**	Exceeded Screening Level	0.0082	0.014
Benzo(b)fluoranthene	0.00051 - 0.041	15 / 33	0.0015 - 0.061	0.0015	0.061	DP22/SB02 (ash)	0.16	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0093	0.015
Benzo(g,h,i)perylene	0.001 - 0.025	12 / 33	0.0013 - 0.036	0.0013	0.036	DP22/SB02 (ash)	Not Applicable	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0064	0.0039
Benzo(k)fluoranthene	0.00077 - 0.063	13 / 33	0.0015 - 0.051	0.0015	0.051	DP22/SB02 (ash)	1.6	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0078	0.0052
Chrysene	0.00035 - 0.042	15 / 33	0.0014 - 0.17	0.0014	0.17	DP22/SB02 (ash)	16	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.019	0.034
Dibenzo(a,h)anthracene	0.0012 - 0.03	3 / 33	0.0013 - 0.012	0.0013	0.012	DP22/SB02 (ash)	0.016	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0063	0.0029
Dibenzofuran	0.021 - 0.031	0 / 11	Not Applicable	Not Applicable	Not Applicable	Not Applicable	73	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Dimethyl phthalate	0.028 - 0.028	10 / 11	0.076 - 0.56	0.076	0.56	DP07/SB01 (soil)	Not Applicable	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.0003 - 0.057	15 / 33	0.0017 - 0.13	0.0017	0.13	DP22/SB02 (ash)	2,400	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.018	0.027
Fluorene	0.00049 - 0.028	3 / 33	0.0012 - 0.012	0.0012	0.012	DP22/SB02 (ash)	2,400	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0059	0.0023
Indeno(1,2,3-cd)pyrene	0.00048 - 0.035	14 / 33	0.00087 - 0.017	0.00087	0.017	DP22/SB02 (ash)	0.16	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.0037	0.0043
2-Methylnaphthalene	0.02 - 0.03	0 / 11	Not Applicable	Not Applicable	Not Applicable	Not Applicable	240	0 / 11	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Naphthalene	0.00031 - 0.049	12 / 33	0.00041 - 0.28	0.00041	0.28	DP22/SB02 (ash)	3.8	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.049	0.089
Phenanthrene	0.00039 - 0.0027	17 / 33	0.00043 - 0.81	0.00043	0.81	DP22/SB02 (ash)	Not Applicable	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.074	0.21
Pyrene	0.00035 - 0.019	15 / 33	0.0017 - 0.13	0.0017	0.13	DP22/SB02 (ash)	1,800	0 / 33	**Yes**	Other PAHs Exceeded Screening Levels	0.015	0.026

Table 6-6
Human Health Screening Summary for Kansas River Floodplain Subsurface Soil (0-12' bgs)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	33 / 33	12,000 - 35,000	12,000	35,000	DP20/SB02 (soil) / DP24/SB02 (soil)	77,000	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.22 - 2	12 / 33	0.23 - 1.8	0.23	1.8	DP22/SB02 (ash)	31	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	54 / 54	2.7 - 41	2.7	41	DP22/SB02 (ash)	0.68	54 / 54	**Yes**	Exceeded Screening Level	6.7	8.0
Barium	Not Applicable	50 / 51	130 - 360	130	360	DP19/SB02 (soil)	15,000	0 / 51	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	33 / 33	0.56 - 2.1	0.56	2.1	DP22/SB02 (ash)	160	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.0959 - 0.0959	33 / 51	0.0583 - 24	0.0583	24	DP22/SB02 (ash)	71	0 / 51	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	33 / 33	6,600 - 46,000	6,600	46,000	DP21/SB04 (soil)	Not Applicable	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	51 / 51	8.4 - 31	8.4	31	DP24/SB02 (soil)	33.6	0 / 51	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	33 / 33	5.3 - 15	5.3	15	DP22/SB02 (ash)	23	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	36 / 36	8.4 - 56	8.4	56	DP22/SB02 (ash)	3,100	0 / 36	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	33 / 33	11,000 - 85,000	11,000	85,000	DP22/SB02 (ash)	55,000	1 / 33	**Yes**	Exceeded Screening Level	20,000	24,000
Lead*	Not Applicable	54 / 54	8.8 - 439	8.8	439	CFI06-32 0.5-1'	400	2 / 54	**Yes**	Exceeded Screening Level	42	Not Applicable
Magnesium	Not Applicable	33 / 33	2,500 - 8,900	2,500	8,900	DP20/SB02 (soil)	Not Applicable	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	33 / 33	180 - 640	180	640	DP24/SB02 (soil)	1,800	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.0091 - 0.1	50 / 54	0.011 - 1.2	0.011	1.2	DP22/SB02 (ash)	11	0 / 54	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	0.00003 - 0.000031	8 / 11	0.000024 - 0.000112	0.000024	0.000112	SS04/SS01 (soil)	7.8	0 / 11	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	33 / 33	12 - 74	12	74	DP22/SB02 (ash)	1,500	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	33 / 33	2,200 - 7,100	2,200	7,100	DP20/SB02 (soil)	Not Applicable	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.11 - 2.3	34 / 51	0.13 - 1.07	0.13	1.07	CFI06-33 0-0.5'	390	0 / 51	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.032 - 0.271	21 / 51	0.04 - 0.64	0.04	0.64	DP22/SB02 (ash)	390	0 / 51	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	33 / 33	59 - 550	59	550	DP22/SB02 (ash)	Not Applicable	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	0.98 - 1.2	23 / 33	0.18 - 1.5	0.18	1.5	SS05/SS01 (soil)	0.78	1 / 33	**Yes**	Exceeded Screening Level	0.38	1.6
Vanadium	Not Applicable	33 / 33	21 - 64	21	64	DP21/SB04 (soil) / DP24/SB02 (soil)	390	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	36 / 36	43 - 6,500	43	6,500	DP22/SB02 (ash)	23,000	0 / 36	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:

*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.

bgs - below ground surface

pg/kg - picograms per kilogram

ug/kg - micrograms per kilogram

Table 6-7
Human Health Screening Summary for Site-Wide Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	94 / 99	0.0018 - 14.9180	0.0018	14.918	DP02/SB01 (soil/ash)	4.8	6 / 99	**Yes**	Exceeded Screening Level	1.2	3.7
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	0.83 - 0.83	33 / 34	0.84 - 290	0.84	290	DP02/SB01 (soil/ash)	2,000	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.35 - 0.59	6 / 34	2.0 - 11	2.0	11	DP04/SB02 (ash) / DP03/SB02 (ash)	220	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/L)												
Acenaphthene	0.00047 - 0.016	16 / 99	0.00085 - 0.031	0.00085	0.031	DP18/SB02 (ash)	3,600	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.0070	0.0033
Acenaphthylene	0.00033 - 0.027	17 / 99	0.00039 - 0.019	0.00039	0.019	UT04/SB01 (soil)	NA	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.0038	0.0027
Anthracene	0.00039 - 0.027	28 / 99	0.00051 - 0.045	0.00051	0.045	DP15/SB01 (soil/ash)	18,000	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.012	0.0061
Benzo(a)anthracene	0.0003 - 0.031	44 / 99	0.00046 - 0.21	0.00046	0.21	DP15/SB01 (soil/ash)	0.16	2 / 99	**Yes**	Exceeded Screening Level	0.033	0.031
Benzo(a)pyrene	0.0004 - 0.031	40 / 99	0.00046 - 0.14	0.00046	0.14	DP15/SB02 (ash)	0.016	21 / 99	**Yes**	Exceeded Screening Level	0.027	0.023
Benzo(b)fluoranthene	0.0005 - 0.041	40 / 99	0.00097 - 0.16	0.00097	0.16	DP15/SB03 (soil)	0.16	1 / 99	**Yes**	Exceeded Screening Level	0.035	0.029
Benzo(g,h,i)perylene	0.00099 - 0.025	35 / 99	0.0012 - 0.11	0.0012	0.11	DP15/SB01 (soil/ash)	NA	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.023	0.017
Benzo(k)fluoranthene	0.00075 - 0.063	35 / 99	0.0011 - 0.13	0.0011	0.13	DP15/SB01 (soil/ash)	1.6	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.025	0.021
Chrysene	0.00034 - 0.042	44 / 99	0.00072 - 0.35	0.00072	0.35	DP15/SB01 (soil ash) / DP18/SB02 (ash)	16	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.058	0.055
Dibenzo(a,h)anthracene	0.0012 - 0.030	15 / 99	0.0025 - 0.032	0.0025	0.032	DP15/SB01 (soil/ash)	0.016	4 / 99	**Yes**	Exceeded Screening Level	0.0118	0.0048
Dibenzofuran	0.021 - 0.031	5 / 34	0.025 - 0.13	0.025	0.13	DP02/SB01 (soil/ash)	73	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Dimethyl phthalate	0.025 - 0.028	23 / 34	0.025 - 1.1	0.025	1.1	DP07/SB04 (soil)	NA	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.00029 - 0.057	47 / 99	0.00034 - 0.26	0.00034	0.26	DP15/SB01 (soil/ash)	2,400	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.042	0.043
Fluorene	0.00049 - 0.028	15 / 99	0.0012 - 0.044	0.0012	0.044	DP18/SB02 (ash)	2,400	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.011	0.0040
Indeno(1,2,3-cd)pyrene	0.00048 - 0.035	35 / 99	0.00068 - 0.057	0.00068	0.057	DP15/SB01 (soil/ash)	0.16	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.013	0.0084
2-Methylnaphthalene	0.020 - 0.030	5 / 34	0.023 - 0.23	0.023	0.23	DP02/SB01 (soil/ash)	240	0 / 34	**Yes**	Other PAHs Exceeded Screening Levels	0.10	0.046
Naphthalene	0.0003 - 0.052	47 / 99	0.00040 - 1.7	0.0004	1.7	DP15/SB02 (ash)	3.8	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.16	0.19
Phenanthrene	0.00035 - 0.046	58 / 99	0.00041 - 2.0	0.00041	2.0	DP18/SB02 (ash)	NA	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.19	0.26
Pyrene	0.00035 - 0.019	50 / 99	0.00050 - 0.26	0.00050	0.26	DP15/SB01 (soil/ash)	1,800	0 / 99	**Yes**	Other PAHs Exceeded Screening Levels	0.041	0.043

Table 6-7
Human Health Screening Summary for Site-Wide Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/L)												
Aluminum	Not Applicable	99 / 99	630 - 35,000	630	35,000	DP20/SB02 (soil) / DB24/SB02 (soil)	77,000	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.21 - 2.0	37 / 107	0.23 - 1.8	0.23	1.8	DP22/SB02 (ash)	31	0 / 107	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	200 / 200	1.5 - 86.9	1.5	86.9	CFI TP-4 65'	0.68	200 / 200	**Yes**	Exceeded Screening Level	8.9	12
Barium	Not Applicable	192 / 192	19 - 1,900	19	1,900	DP03/SB02 (ash)	15,000	0 / 192	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	99 / 99	0.052 - 3.0	0.052	3.0	DP03/SB02 (ash)	160	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.048 - 0.11	171 / 192	0.0468 - 24	0.0468	24	DP22/SB02 (ash)	71	0 / 192	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	99 / 99	2,600 - 69,000	2,600	69,000	DP03/SB04 (soil)	NA	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	192 / 192	1.3 - 31	1.3	31	DP24/SB02 (soil)	33.6	0 / 192	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	99 / 99	0.77 - 16	0.77	16	DP02/SB01 (soil/ash) / DP03/SB02 (ash)	23	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	107 / 107	0.63 - 200	0.63	200	DP02/SB04 (soil)	3,100	0 / 107	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	99 / 99	2,200 - 100,000	2,200	100,000	DP15/SB02 (ash)	55,000	5 / 99	**Yes**	Exceeded Screening Level	21,000	28,000
Lead*	Not Applicable	200 / 200	1.4 - 844	1.4	844	CFI06-27	400	4 / 200	**Yes**	Exceeded Screening Level	61	Not Applicable
Magnesium	Not Applicable	99 / 99	200 - 8,900	200	8,900	DP19/SB02 (soil) DP20/SB02 (soil)	NA	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	99 / 99	26 - 670	26	670	DP03/SB04 (soil)	1,800	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.0076 - 0.10	178 / 200	0.0091 - 16.5	0.0091	16.5	CFI06-26	11	1 / 200	**Yes**	Exceeded Screening Level	0.16	0.51
Methyl Mercury	0.000029 - 0.000038	22 / 34	0.000011 - 0.000265	0.000011	0.000265	DP04/SB01 (ash)	7.8	0 / 34	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	99 / 99	1.4 - 87	1.4	87	DP02/SB01 (soil/ash)	1,500	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	99 / 99	170 - 7,100	170	7,100	DP20/SB02 (soil) / DB24/SB02 (soil)	NA	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.10 - 2.3	106 / 192	0.11 - 2.4	0.11	2.4	DP02/SB01 (soil/ash)	390	0 / 192	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.031 - 0.278	66 / 192	0.034 - 1.5	0.034	1.5	DP02/SB02 (ash)	390	0 / 192	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	26 - 26	98 / 99	49 - 1100	49	1100	DP03/SB02 (ash)	NA	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	0.052 - 1.2	70 / 99	0.15 - 2	0.15	2.0	DP04/SB02 (ash)	0.78	6 / 99	**Yes**	Exceeded Screening Level	0.41	0.53
Vanadium	Not Applicable	99 / 99	5.8 - 85	5.8	85	DP24/SB04 (soil)	390	0 / 99	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	107 / 107	3.9 - 6,500	3.9	6,500	DP22/SB02 (ash)	23,000	0 / 107	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:

*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.

bgs - below ground surface

pg/kg - picograms per kilogram

TD - total depth

ug/kg - micrograms per kilogram

Table 6-8
Human Health Screening Summary for Upland Terrace Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	26 / 27	0.0018 - 7.3780	0.0018	7.3780	UT01/SB01 (soil)	4.8	1 / 27	**Yes**	Exceeded Screening Level	1.2	2.2
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	5 / 5	1 - 39.9	1	39.9	DP01/SB01 (soil/ash)	2,000	0 / 5	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.35 - 0.45	0 / 5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	220	0 / 5	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00051 - 0.013	1 / 27	0.005 - 0.005	0.005	0.005	UT07/SB01 (soil)	3,600	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.0037	0.0032
Acenaphthylene	0.00036 - 0.021	0 / 27	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.0065	0.0045
Anthracene	0.00043 - 0.021	2 / 27	0.00051 - 0.015	0.00051	0.015	UT07/SB01 (soil)	18,000	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.0097	0.0087
Benzo(a)anthracene	0.00033 - 0.025	2 / 27	0.0011 - 0.049	0.0011	0.049	UT07/SB01 (soil)	0.16	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.026	0.030
Benzo(a)pyrene	0.00043 - 0.025	13 / 27	0.001 - 0.075	0.001	0.075	UT04/SB01 (soil)	0.016	12 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.028	0.024
Benzo(b)fluoranthene	0.00054 - 0.033	2 / 27	0.0017 - 0.042	0.0017	0.042	UT07/SB01 (soil)	0.16	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.040	0.031
Benzo(g,h,i)perylene	0.0011 - 0.020	2 / 27	0.0023 - 0.017	0.0023	0.017	UT07/SB01 (soil)	Not Applicable	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.03	0.022
Benzo(k)fluoranthene	0.00082 - 0.050	1 / 27	0.028 - 0.028	0.028	0.028	UT07/SB01 (soil)	1.6	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.027	0.022
Chrysene	0.00038 - 0.034	2 / 27	0.0025 - 0.082	0.0025	0.082	UT07/SB01 (soil)	16	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.043	0.040
Dibenzo(a,h)anthracene	0.0013 - 0.024	1 / 27	0.021 - 0.021	0.021	0.021	UT06/SB02 (soil)	0.016	1 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.0095	0.0063
Dibenzofuran	0.023 - 0.025	0 / 5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	73	0 / 5	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Dimethyl phthalate	Not Applicable	5 / 5	0.13 - 0.38	0.13	0.38	DP01/SB05 (soil)	Not Applicable	0 / 5	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.00032 - 0.045	3 / 27	0.00034 - 0.059	0.00034	0.059	UT07/SB01 (soil)	2,400	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.035	0.036
Fluorene	0.00053 - 0.023	1 / 27	0.0047 - 0.0047	0.0047	0.0047	UT07/SB01 (soil)	2,400	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.0064	0.0031
Indeno(1,2,3-cd)pyrene	0.00052 - 0.028	2 / 27	0.001 - 0.0087	0.001	0.0087	UT07/SB01 (soil)	0.16	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.019	0.015
2-Methylnaphthalene	0.021 - 0.024	0 / 5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	240	0 / 5	No	Was Not Detected In Data Set	Not Applicable	Not Applicable
Naphthalene	0.00033 - 0.039	2 / 27	0.0025 - 0.21	0.0025	0.21	UT07/SB01 (soil)	3.8	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.046	0.062
Phenanthrene	0.00039 - 0.021	3 / 27	0.00057 - 0.36	0.00057	0.36	UT07/SB01 (soil)	Not Applicable	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.11	0.15
Pyrene	0.00038 - 0.015	2 / 27	0.0017 - 0.061	0.0017	0.061	UT07/SB01 (soil)	1,800	0 / 27	**Yes**	Other PAHs Exceeded Screening Levels	0.036	0.034

Table 6-8
Human Health Screening Summary for Upland Terrace Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	27 / 27	8,900 - 22,000	8,900	22,000	DP13/SB02 (soil)	77,000	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.21 - 2	1 / 27	0.56 - 0.56	0.56	0.56	UT07/SB01 (soil)	31	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	73 / 73	2.5 - 52.4	2.5	52.4	CFI06-07 0.5-1'	0.68	73 / 73	**Yes**	Exceeded Screening Level	6.0	9.4
Barium	Not Applicable	69 / 69	83.6 - 1,100	83.6	1,100	CFI06-22 1 -2'	15,000	0 / 69	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	27 / 27	0.45 - 1.2	0.45	1.2	DP14/SB01 (soil/ash)	160	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.0815 - 0.11	8 / 69	0.158 - 2.51	0.158	2.51	CFI06-21 0.5-1'	71	0 / 69	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	27 / 27	3,200 - 51,000	3,200	51,000	DP01/SB01 (soil/ash)	Not Applicable	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	69 / 69	5.54 - 20	5.7	20	DP13/SB02 (soil)	33.6	0 / 69	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	27 / 27	4.4 - 9.5	4.4	9.5	DP14/SB01 (soil/ash)	23	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	31 / 31	6.8 - 130	6.8	130	UT04/SB01 (soil) / UT05/SB01 (soil)	3,100	0 / 31	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	27 / 27	11,000 - 31,000	11,000	31,000	DP14/SB01 (soil/ash)	55,000	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Lead	Not Applicable	73 / 73	7.5 - 270	7.5	270	CFI06-22 1 -2'	400	0 / 31	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Magnesium	Not Applicable	27 / 27	2,300 - 4,600	2,300	4,600	DP01/SB01 (soil/ash)	Not Applicable	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	27 / 27	200 - 540	200	540	DP01/SB05 (soil)	1,800	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.0092 - 0.10	8 / 73	0.012 - 0.165	0.012	0.165	CFI06-08 0.5-1'	11	0 / 73	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	0.000029 - 0.00003	2 / 5	0.000120 - 0.000126	0.000120	0.000126	DP01/SB01 (soil/ash)	7.8	0 / 5	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	27 / 27	10 - 45	10	45	DP14/SB01 (soil/ash)	1,500	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	27 / 27	2,000 - 3,700	2,000	3,700	DP13/SB02 (soil) / UT01/SB02 (soil) / UT02/SB02 (soil)	Not Applicable	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.11 - 1.8	5 / 69	0.2 - 0.872	0.2	0.872	CFI06-21 0.5-1'	390	0 / 69	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.034 - 0.278	2 / 69	0.03 - 0.28	0.03	0.28	UT07/SB01 (soil)	390	0 / 69	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	27 / 27	49 - 450	49	450	DP01/SB04 (soil)	Not Applicable	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	0.91 - 1.1	3 / 27	0.15 - 0.21	0.15	0.21	UT07/SB01 (soil)	0.78	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Vanadium	Not Applicable	27 / 27	18 - 38	18	38	DP13/SB02 (soil)	390	0 / 27	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	31 / 31	28 - 390	28	390	DP14/SB01 (soil/ash)	23,000	0 / 31	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
bgs - below ground surface
pg/kg - picograms per kilogram
TD - total depth
ug/kg - micrograms per kilogram

Table 6-9
Human Health Screening Summary for Upland Terrace Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	31 / 32	0.0016 - 14.9180	0.0016	14.9180	DP02/SB01 (soil/ash)	4.8	2 / 32	**Yes**	Exceeded Screening Level	2.0	8.2
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	0.83 - 0.83	15 / 16	1.7 - 290	1.7	290	DP03/SB01 (soil/ash) / DP02/SB02 (ash)	2,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.35 - 0.42	6 / 16	2 - 11	2	11	DP04/SB01 (soil/ash) / DP03/SB02 (ash)	220	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00047 - 0.013	7 / 32	0.001 - 0.031	0.001	0.031	DP18/SB02 (ash)	3,600	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.013	0.0064
Acenaphthylene	0.00033 - 0.021	1 / 32	0.00079 - 0.00079	0.00079	0.00079	DP18/SB01 (soil/ash)	Not Applicable	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.0008	Not Applicable
Anthracene	0.00039 - 0.021	8 / 32	0.0071 - 0.045	0.00071	0.045	DP15/SB01 (soil/ash)	18,000	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.021	0.010
Benzo(a)anthracene	0.0003 - 0.025	11 / 32	0.002 - 0.21	0.002	0.21	DP15/SB01 (soil/ash)	0.16	2 / 32	**Yes**	Exceeded Screening Level	0.076	0.043
Benzo(a)pyrene	0.0004 - 0.025	10 / 32	0.0019 - 0.14	0.0019	0.14	DP15/SB01 (soil/ash)	0.016	7 / 32	**Yes**	Exceeded Screening Level	0.055	0.029
Benzo(b)fluoranthene	0.0005 - 0.032	10 / 32	0.0023 - 0.16	0.0023	0.16	DP15/SB01 (soil/ash)	0.16	1 / 32	**Yes**	Exceeded Screening Level	0.070	0.037
Benzo(g,h,i)perylene	0.00099 - 0.02	9 / 32	0.0012 - 0.11	0.0012	0.11	DP15/SB01 (soil/ash)	Not Applicable	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.037	0.019
Benzo(k)fluoranthene	0.00075 - 0.049	9 / 32	0.0011 - 0.13	0.0011	0.13	DP15/SB01 (soil/ash)	1.6	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.046	0.026
Chrysene	0.00034 - 0.033	11 / 32	0.0032 - 0.35	0.0032	0.35	DP15/SB01 (soil/ash)	16	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.14	0.079
Dibenzo(a,h)anthracene	0.0012 - 0.023	6 / 32	0.0052 - 0.032	0.0052	0.032	DP15/SB01 (soil/ash)	0.016	3 / 32	**Yes**	Exceeded Screening Level	0.017	0.0092
Dibenzofuran	0.021 - 0.024	5 / 16	0.025 - 0.13	0.025	0.13	DP02/SB01 (soil/ash)	73	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Dimethyl phthalate	0.025 - 0.028	6 / 16	0.025 - 0.49	0.025	0.49	DP05/SB02 (soil/ash)	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.00029 - 0.044	11 / 32	0.0028 - 0.26	0.0028	0.26	DP15/SB01 (soil/ash)	2,400	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.103	0.059
Fluorene	0.00049 - 0.022	7 / 32	0.002 - 0.044	0.002	0.044	DP18/SB02 (ash)	2,400	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.017	0.0092
Indeno(1,2,3-cd)pyrene	0.00048 - 0.027	8 / 32	0.00068 - 0.057	0.00068	0.057	DP15/SB01 (soil/ash)	0.16	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.019	0.012
2-Methylnaphthalene	0.02 - 0.023	5 / 16	0.023 - 0.23	0.023	0.23	DP02/SB01 (soil/ash)	240	0 / 16	**Yes**	Other PAHs Exceeded Screening Levels	0.10	0.074
Naphthalene	0.0003 - 0.052	13 / 32	0.00045 - 1.7	0.00045	1.7	DP15/SB02 (ash)	3.8	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.45	0.45
Phenanthrene	0.00035 - 0.046	17 / 32	0.00059 - 2	0.00059	2	DP18/SB02 (ash)	Not Applicable	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.46	0.52
Pyrene	0.00035 - 0.015	14 / 32	0.0031 - 0.26	0.0031	0.26	DP15/SB01 (soil/ash)	1,800	0 / 32	**Yes**	Other PAHs Exceeded Screening Levels	0.086	0.077

Table 6-9
Human Health Screening Summary for Upland Terrace Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	32 / 32	630 - 28,000	630	28,000	DP17/SB02 (soil)	77,000	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.21 - 2	10 / 32	0.24 - 1.7	0.24	1.7	DP17/SB01 (soil/ash)	31	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	66 / 66	1.5 - 86.9	1.5	86.9	CFI TP-4 65' 5'	0.68	66 / 66	**Yes**	Exceeded Screening Level	14	22
Barium	Not Applicable	65 / 65	19 - 1,900	19	1,900	DP03/SB02 (ash)	15,000	0 / 65	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	32 / 32	0.052 - 3	0.052	3	DP03/SB02 (ash)	160	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.048 - 0.0941	57 / 65	0.077 - 15.6	0.077	15.6	CFI TP-5 80' 2'	71	0 / 65	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	32 / 32	2,600 - 69,000	2,600	69,000	DP03/SB04 (soil)	Not Applicable	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	65 / 65	1.3 - 27	1.3	27	DP17/SB02 (soil)	33.6	0 / 65	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	32 / 32	0.77 - 16	0.77	16	DP02/SB01 (soil/ash) / DP03/SB02 (ash)	23	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	33 / 33	0.63 - 200	0.63	200	DP04/SB02 (ash)	3,100	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	32 / 32	2,200 - 100,000	2,200	100,000	DP15/SB02 (ash)	55,000	4 / 32	**Yes**	Exceeded Screening Level	28,000	38,000
Lead*	Not Applicable	66 / 66	1.4 - 844	1.4	844	CFI06-27 0-0.5'	400	2 / 66	**Yes**	Exceeded Screening Level	110	Not Applicable
Magnesium	Not Applicable	32 / 32	200 - 6,300	200	6,300	DP17/SB02 (soil)	Not Applicable	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	32 / 32	26 - 670	26	670	DP03/SB04 (soil)	1,800	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.0076 - 0.049	58 / 66	0.01 - 16.5	0.01	16.5	CFI06-26 0.5-1'	11	1 / 66	**Yes**	Exceeded Screening Level	0.36	0.12
Methyl Mercury	0.000029 - 0.000035	10 / 16	0.000011 - 0.000265	0.000011	0.000265	DP04/SB01 (soil/ash)	7.8	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	32 / 32	1.4 - 87	1.4	87	DP02/SB01 (soil/ash)	1,500	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	32 / 32	170 - 5,400	170	5,400	DP17/SB02 (soil)	Not Applicable	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.1 - 1.8	31 / 65	0.12 - 2.4	0.12	2.4	DP02/SB01 (soil/ash)	390	0 / 65	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.031 - 0.278	21 / 65	0.04 - 1.5	0.04	1.5	DP02/SB02 (ash)	390	0 / 65	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	26 - 26	31 / 32	67 - 1,100	67	1,100	DP03/SB02 (ash)	Not Applicable	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	0.052 - 1.11	20 / 32	0.19 - 2	0.19	2	DP04/SB02 (ash)	0.78	5 / 32	**Yes**	Exceeded Screening Level	0.63	0.91
Vanadium	Not Applicable	32 / 32	5.8 - 50	5.8	50	DP17/SB02 (soil)	390	0 / 32	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	33 / 33	3.9 - 1,380	3.9	1,380	INC150006-L	23,000	0 / 33	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.
bgs - below ground surface
pg/kg - picograms per kilogram
TD - total depth
ug/kg - micrograms per kilogram

Table 6-10
Human Health Screening Summary for Kansas River Floodplain Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/kg)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	37 / 40	0.0022 - 8.1965	0.0022	8.1965	DP22/SB02 (ash)	4.8	1 / 40	**Yes**	Exceeded Screening Level	0.63	2.9
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	13 / 13	1.3 - 32	1.3	32	SS01/SS01 (soil)	2,000	0 / 13	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Gasoline Range Organics	0.38 - 0.59	0 / 13	Not Applicable	Not Applicable	Not Applicable	Not Applicable	220	0 / 13	No	Was Not Detected in Data Set	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/kg)												
Acenaphthene	0.00047 - 0.016	3 / 40	0.00085 - 0.010	0.00085	0.010	DP22/SB02 (ash)	3,600	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0049	0.0017
Acenaphthylene	0.00033 - 0.027	7 / 40	0.00039 - 0.001	0.00039	0.001	DP22/SB01 (soil)	Not Applicable	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.00064	0.00048
Anthracene	0.0004 - 0.027	6 / 40	0.00043 - 0.025	0.00043	0.025	DP19/SB01 (soil) / DP22/SB02 (ash)	18,000	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0025	0.0013
Benzo(a)anthracene	0.00031 - 0.031	16 / 40	0.00093 - 0.093	0.00093	0.093	DP22/SB02 (ash)	0.16	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0099	0.015
Benzo(a)pyrene	0.0004 - 0.031	15 / 40	0.0013 - 0.059	0.0013	0.059	DP22/SB02 (ash)	0.016	2 / 40	**Yes**	Exceeded Screening Level	0.0082	0.011
Benzo(b)fluoranthene	0.00051 - 0.041	16 / 40	0.00097 - 0.061	0.00097	0.061	DP22/SB01 (soil)	0.16	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0088	0.012
Benzo(g,h,i)perylene	0.001 - 0.025	12 / 40	0.0013 - 0.036	0.0013	0.036	DP22/SB01 (soil)	Not Applicable	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0064	0.0032
Benzo(k)fluoranthene	0.00077 - 0.063	13 / 40	0.0015 - 0.051	0.0015	0.051	DP22/SB01 (soil)	1.6	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0078	0.0040
Chrysene	0.00035 - 0.042	16 / 40	0.0014 - 0.17	0.0014	0.17	DP22/SB01 (soil)	16	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.018	0.028
Dibenzo(a,h)anthracene	0.0012 - 0.03	3 / 40	0.0025 - 0.012	0.0025	0.012	DP22/SB01 (soil)	0.016	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0063	0.0026
Dibenzofuran	0.021 - 0.031	0 / 13	Not Applicable	Not Applicable	Not Applicable	Not Applicable	73	0 / 13	No	Was Not Detected in Data Set	Not Applicable	Not Applicable
Dimethyl phthalate	0.028 - 0.028	12 / 13	0.076 - 1.1	0.076	1.1	DP07/SB04 (soil)	Not Applicable	0 / 13	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.0003 - 0.057	18 / 40	0.00041 - 0.13	0.00041	0.13	DP22/SB01 (soil)	2,400	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.013	0.022
Fluorene	0.00049 - 0.028	3 / 40	0.0012 - 0.012	0.0012	0.012	DP22/SB01 (soil)	2,400	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0059	0.0020
Indeno(1,2,3-cd)pyrene	0.00048 - 0.035	14 / 40	0.00087 - 0.017	0.00087	0.017	DP22/SB01 (soil)	0.16	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.0037	0.0036
2-Methylnaphthalene	0.02 - 0.03	0 / 13	Not Applicable	Not Applicable	Not Applicable	Not Applicable	240	0 / 13	No	Was Not Detected in Data Set	Not Applicable	Not Applicable
Naphthalene	0.00031 - 0.049	16 / 40	0.00031 - 0.28	0.00031	0.28	DP22/SB01 (soil)	3.8	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.037	0.074
Phenanthrene	0.00039 - 0.027	21 / 40	0.00043 - 0.81	0.00043	0.81	DP22/SB01 (soil)	Not Applicable	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.058	0.17
Pyrene	0.00035 - 0.019	18 / 40	0.0005 - 0.13	0.0005	0.13	DP22/SB01 (soil)	1,800	0 / 40	**Yes**	Other PAHs Exceeded Screening Levels	0.013	0.021

Table 6-10
Human Health Screening Summary for Kansas River Floodplain Comprehensive Soil (0' bgs - TD)
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Metals (ug/kg)												
Aluminum	Not Applicable	40 / 40	12,000 - 35,000	12,000	35,000	DP20/SB02 (soil) / DP24/SB02 (soil)	77,000	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Antimony	0.22 - 2	17 / 43	0.23 - 1.8	0.23	1.8	DP22/SB02 (ash)	31	0 / 43	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	61 / 61	2.7 - 41	2.7	41	DP22/SB02 (ash)	0.68	61 / 61	**Yes**	Exceeded Screening Level	7.8	6.6
Barium	Not Applicable	58 / 58	130 - 360	130	360	DP19/SB02 (soil)	15,000	0 / 61	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	40 / 40	0.56 - 2.1	0.56	2.1	DP22/SB02 (ash)	160	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	0.0959 - 0.0959	57 / 58	0.0583 - 24	0.0583	24	DP22/SB02 (ash)	71	0 / 58	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	40 / 40	6,600 - 52,000	6,600	52,000	DP24/SB04 (soil)	Not Applicable	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	58 / 58	8.4 - 31	8.4	31	DP24/SB03 (soil)	33.6	0 / 58	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	40 / 40	5.3 - 15	5.3	15	DP22/SB02 (ash)	23	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	43 / 43	8.4 - 56	8.4	56	DP22/SB02 (ash)	3,100	0 / 43	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	40 / 40	11,000 - 85,000	11,000	85,000	DP22/SB02 (ash)	55,000	1 / 61	**Yes**	Exceeded Screening Level	20,000	23,000
Lead*	Not Applicable	61 / 61	8.8 - 439	8.8	439	CFI06-32 0.5-1'	400	2 / 61	**Yes**	Exceeded Screening Level	37	Not Applicable
Magnesium	Not Applicable	40 / 40	2,500 - 8,900	2,500	8,900	DP19/SB02 (soil) / DP20/SB02 (ash)	Not Applicable	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	40 / 40	180 - 640	180	640	DP24/SB02 (soil)	1,800	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.0091 - 0.1	56 / 61	0.011 - 1.2	0.011	1.2	DP22/SB02 (ash)	11	0 / 61	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	0.00003 - 0.00004	9 / 13	0.000022 - 0.000112	0.000022	0.000112	SS04/SS01 (soil)	7.8	0 / 13	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	40 / 40	12 - 74	12	74	DP22/SB02 (ash)	1,500	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	40 / 40	2,200 - 7,100	2,200	7,100	DP20/SB02 (soil)	Not Applicable	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	0.11 - 2.3	39 / 58	0.13 - 1.6	0.13	1.6	DP23/SB02 (soil)	390	0 / 58	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Silver	0.032 - 0.271	26 / 58	0.04 - 0.64	0.04	0.64	DP22/SB02 (ash)	390	0 / 58	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	40 / 40	59 - 550	59	550	DP22/SB02 (ash)	Not Applicable	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Thallium	0.98 - 1.2	28 / 40	0.18 - 1.5	0.18	1.5	SS05/SS01 (soil)	0.78	1 / 61	**Yes**	Exceeded Screening Level	0.41	0.41
Vanadium	Not Applicable	40 / 40	21 - 85	21	85	DP24/SB04 (soil)	390	0 / 40	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	43 / 43	43 - 6,500	43	6,500	DP22/SB02 (ash)	23,000	0 / 43	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
*95% UCL for lead is not used to determined risk associated for the analyte. Instead the arithmetic mean is used to compare to the elemental lead screening levels, as recommended by the Estimating the Soil Lead Concentration Term for the Integrated Exposure Uptake Biokinetic (IEUBK) Model.
bgs - below ground surface
pg/kg - picograms per kilogram
TD - total depth
ug/kg - micrograms per kilogram

Table 6-11
Human Health Summary for Stream Sediment
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins/Furans (pg/g)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	3 / 3	0.0052 - 0.0480	0.0052	0.0480	SD01/SD01	4.8	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	Not Applicable	3 / 3	2.4 - 5.4	2.4	5.4	SD01/SD01	2000	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Metals (mg/kg)												
Aluminum	Not Applicable	3 / 3	3,200 - 8,000	3,200	8,000	SD01/SD01	77,000	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	3 / 3	2.2 - 7.3	2.2	7.3	SD03/SD01	0.68	3 / 3	**Yes**	Exceeded Screening Level	4.1	8.8
Barium	Not Applicable	3 / 3	140 - 280	140	280	SD03/SD01	15,000	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	Not Applicable	3 / 3	0.080 - 0.36	0.080	0.36	SD01/SD01	160	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cadmium	Not Applicable	3 / 3	0.59 - 1.1	0.59	1.1	SD03/SD01	71	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	3 / 3	130,000 - 240,000	130,000	240,000	SD03/SD01	NA	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	Not Applicable	3 / 3	4.4 - 8.1	4.4	8.1	SD01/SD01	33.6	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	Not Applicable	3 / 3	4.6 - 7.3	4.6	7.3	SD03/SD01	23	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	Not Applicable	3 / 3	3.9 - 6.6	3.9	6.6	SD01/SD01	3,100	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	Not Applicable	3 / 3	4,300 - 10,000	4,300	10,000	SD01/SD01	55,000	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Lead	Not Applicable	3 / 3	5.1 - 8.0	5.1	8.0	SD01/SD01	400	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Magnesium	Not Applicable	3 / 3	2,000 - 5,200	2,000	5,200	SD03/SD01	NA	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	Not Applicable	3 / 3	470 - 990	470	990	SD03/SD01	1,800	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury	0.011 - 0.011	2 / 3	0.010 - 0.013	0.010	0.013	SD01/SD01	11	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	Not Applicable	3 / 3	0.000014 - 0.000038	0.000014	0.000038	SD03/SD01	7.8	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	3 / 3	7.6 - 14	7.6	14	SD02/SD01	1,500	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	3 / 3	680 - 1,600	680	1,600	SD01/SD01	NA	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	3 / 3	110 - 200	110	200	SD03/SD01	NA	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Vanadium	Not Applicable	3 / 3	4.9 - 14	4.9	14	SD03/SD01	390	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	Not Applicable	3 / 3	14 - 37	14	37	SD03/SD01	23,000	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
pg/g - picograms per gram
mg/kg - milligrams per kilogram

Table 6-12
Human Health Screening Summary for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/L)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	10 / 15	0.0007 - 3.1960	0.0007	3.1960	SW01/SW05	0.013	9 / 15	**Yes**	Exceeded Screening Level	0.56	1.4
Total Petroleum Hydrocarbons (ug/L)												
Diesel Range Organics	31 - 31	1 / 3	72 - 72	72	72	SW02/SW01	Not Applicable	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/L)												
Benzo(a)pyrene	0.0042 - 0.29	1 / 15	0.0049 - 0.0049	0.0049	0.0049	SW03/SW03	0.0028	1 / 15	**Yes**	Exceeded Screening Level	0.0049	Not Applicable
Benzo(k)fluoranthene	0.0074 - 0.44	1 / 15	0.0088 - 0.0088	0.0088	0.0088	SW03/SW03	0.0038	1 / 15	**Yes**	Exceeded Screening Level	0.0088	Not Applicable
Chrysene	0.0038 - 0.51	1 / 15	0.012 - 0.012	0.012	0.012	SW03/SW03	0.0038	1 / 15	**Yes**	Exceeded Screening Level	0.012	Not Applicable
Pyrene	0.004 - 0.35	1 / 15	0.004 - 0.004	0.004	0.004	SW03/SW03	960	0 / 15	**Yes**	Other PAHs Exceeded Screening Level	0.004	Not Applicable
Metals (ug/L)												
Aluminum, Dissolved	25 - 48	1 / 15	48 - 48	48	48	SW02/SW01	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic, Dissolved	12 - 12	12 / 15	1.4 - 3.4	1.4	3.4	SW03/SW02	10	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Barium, Dissolved	Not Applicable	15 / 15	130 - 180	130	180	SW03/SW05	2,000	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium, Dissolved	Not Applicable	15 / 15	84,000 - 100,000	84,000	100,000	SW02/SW01	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper, Dissolved	1.0 - 1.0	13 / 15	1.1 - 3.2	1.1	3.2	SW02/SW01	1,000	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Magnesium, Dissolved	Not Applicable	15 / 15	20,000 - 22,000	20,000	22,000	SW03/SW05	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese, Dissolved	Not Applicable	15 / 15	6.6 - 60	6.6	60	SW03/SW02	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Mercury, Dissolved	0.10 - 0.10	1 / 15	0.17 - 0.17	0.17	0.17	SW01/SW03	2	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Methyl Mercury	Not Applicable	3 / 3	0.000041 - 0.000094	0.000041	0.000094	SW03/SW01	Not Applicable	0 / 3	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel, Dissolved	2. 4 - 2.4	14 / 15	1.4 - 3.5	1.4	3.5	SW02/SW01	610	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium, Dissolved	6,200 - 6,200	14 / 15	4,600 - 7,500	4,600	7,500	SW01/SW04	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium, Dissolved	Not Applicable	15 / 15	35,000 - 53,000	35,000	53,000	SW02/SW01	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Vanadium, Dissolved	6.0 - 6.0	3 / 15	2.6 - 2.9	2.6	2.9	SW02/SW01	Not Applicable	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc, Dissolved	4.0 - 4.0	13 / 15	4.0 - 37	4.0	37	SW02/SW02	5,000	0 / 15	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
pg/L - picograms per liter
ug/L - micrograms per liter

Table 6-13
Human Health Screening Summary for Direct-Push Groundwater
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/L)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	9 / 18	0.0077 - 0.7690	0.0077	0.769	DP11/GW01	30	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Volatile Organic Compounds (ug/L)												
Ethylbenzene	0.16 - 0.16	4 / 5	0.19 - 0.39	0.19	0.39	DP08/GW01	700	0 / 5	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Toluene	Not Applicable	5 / 5	0.28 - 0.52	0.28	0.52	DP08/GW01 / DP10/GW01	1,000	0 / 5	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/L)												
Acenaphthylene	0.0048 - 0.48	2 / 18	0.0063 - 0.0094	0.0063	0.0094	DP27/GW01	Not Applicable	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Fluoranthene	0.0041 - 0.20	1 / 18	0.0064 - 0.0064	0.0064	0.0064	DP37/GW01	800	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Naphthalene	0.0048 - 0.28	2 / 18	0.0140 - 0.0210	0.0140	0.0210	DP27/GW01	0.17	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Phenanthrene	0.0060 - 0.26	1 / 18	0.0083 - 0.0083	0.0083	0.0083	DP27/GW01	Not Applicable	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Pyrene	0.0040 - 0.36	3 / 18	0.0049 - 0.0140	0.0049	0.0140	DP35/GW01	120	0 / 18	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
pg/L - picograms per liter
ug/L - micrograms per liter

Table 6-14
Human Health Screening Summary for Monitoring Well Groundwater
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Minimum Concentration Detected	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Human Health Screening Level	Frequency of Screening Level Exceedence	Chemical of Potential Concern (COPC)	Rational	Mean	95% Upper Confidence Level (UCL)
Dioxins-Furans (pg/L)												
Total 2,3,7,8-TCDD Equivalent	Not Applicable	12 / 16	0.00029 - 2.8714	0.00029	2.8714	CFIMW15-04/GW02	30	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Semivolatile Organic Compounds (ug/L)												
Naphthalene	0.0047 - 0.0049	2 / 16	0.0077 - 0.019	0.0077	0.019	CFIMW15-01/GW01	0.17	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Metals (ug/L)												
Aluminum	25 - 58	6 / 16	69 - 570	69	570	CFIMW15-02/GW01 / CFIMW15-04/GW01	20,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Arsenic	Not Applicable	16 / 16	1.1 - 7.6	1.1	7.6	CFIMW15-04/GW03	10	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Barium	Not Applicable	16 / 16	96 - 220	96	220	CFIMW15-01/GW04	2,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Beryllium	0.20 - 0.20	1 / 16	0.76 - 0.76	0.76	0.76	CFIMW15-04/GW01	4	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Calcium	Not Applicable	16 / 16	140,000 - 280,000	140,000	280,000	CFIMW15-02/GW03	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Chromium	1.5 - 1.5	2 / 16	1.5 -1.6	1.5	1.6	CFIMW15-02/GW01	100	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Cobalt	1 - 1	2 / 16	1 - 1.2	1	1.2	CFIMW15-04/GW01	6	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Copper	1 - 1	2 / 16	1.1 - 2.6	1.1	2.6	CFIMW15-04/GW01	1,300	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Iron	25 - 87	7 / 16	35 - 590	35	590	CFIMW15-04/GW01	14,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Lead	0.60 - 0.60	1 / 16	1.3 - 1.3	1.3	1.3	CFIMW15-04/GW01	15	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Magnesium	Not Applicable	16 / 16	28,000 - 55,000	28,000	55,000	CFIMW15-02/GW04	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Manganese	2 - 2	8 / 16	3.1 - 280	3.1	280	CFIMW15-04/GW03 / CFIMW15-04/GW02	430	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Nickel	Not Applicable	16 / 16	1.4 - 4.8	1.4	4.8	CFIMW15-04/GW01	390	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Potassium	Not Applicable	16 / 16	2,400 - 3,500	2,400	3,500	CFIMW15-02/GW04 / CFIMW15-04/GW02	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Selenium	1 - 1	11 / 16	1 - 13	1	13	CFIMW15-02/GW03	50	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Sodium	Not Applicable	16 / 16	39,000 - 54,000	39,000	54,000	CFIMW15-01/GW01 / CFIMW15-03/GW01	Not Applicable	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Vanadium	6 - 6	4 / 16	9.2 - 10	9.2	10	CFIMW15-02/GW03 / CFIMW15-02/GW04	86	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable
Zinc	4 - 4	1 / 16	5.3 - 5.3	5.3	5.3	CFIMW15-04/GW01	6,000	0 / 16	No	Did Not Exceed Screening Level	Not Applicable	Not Applicable

Notes:
pg/L - picograms per liter
ug/L - micrograms per liter

Table 6-15
Summary of Chemicals of Potential Concern
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

	Site-Wide Surface Soil	Upland Terrace Surface Soil	Floodplain Slope Surface Soil	Kansas River Floodplain Surface Soil	Kansas River Floodplain Subsurface Soil	Site-Wide Comprehensive Soil	Upland Terrace Comprehensive Soil	Floodplain Slope Comprehensive Soil	Kansas River Floodplain Comprehensive Soil	Sediment	Surface Water	Groundwater
Semivolatile Organic Compounds												
Acenaphthene	X	X	X	X	X	X	X	X	X			
Acenaphthylene	X	X	X	X	X	X	X	X	X			
Anthracene	X	X	X	X	X	X	X	X	X			
Benzo(a)anthracene	X	X	X	X	X	X	X	X	X			
Benzo(a)pyrene	X	X	X	X	X	X	X	X	X		X	
Benzo(b)fluoranthene	X	X	X	X	X	X	X	X	X			
Benzo(g,h,i)perylene	X	X	X	X	X	X	X	X	X			
Benzo(k)fluoranthene	X	X	X	X	X	X	X	X	X		X	
Chrysene	X	X	X	X	X	X	X	X	X		X	
Dibenzo(a,h)anthracene	X	X	X	X	X	X	X	X	X			
Fluoranthene	X	X	X	X	X	X	X	X	X			
Fluorene	X	X	X	X	X	X	X	X	X			
Indeno(1,2,3-cd)pyrene	X	X	X	X	X	X	X	X	X			
2-Methylnaphthalene	X		X			X		X				
Naphthalene	X	X	X	X	X	X	X	X	X			
Phenanthrene	X	X	X	X	X	X	X	X	X			
Pyrene	X	X	X	X	X	X	X	X	X		X	
Dioxins-Furans												
Total 2,3,7,8-TCDD Equivalent	X	X	X		X	X	X	X	X		X	
Inorganic Compounds												
Arsenic	X	X	X	X	X	X	X	X	X	X		
Iron	X		X		X	X		X	X			
Lead	X		X	X	X	X		X	X			
Mercury	X		X			X		X				
Thallium	X		X	X	X	X		X	X			

Note:
COPC - Chemical of Potential Concern

Table 6-16
Noncancer Toxicity Information
for Chemicals of Potential Concern
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Oral RfD / Subchronic RfD (mg/kg/day)	Source	Toxic Effect of Concern	Inhalation RfC (mg/m³)	Source	Toxic Effect of Concern
Semivolatile Organic Compounds						
Acenaphthene	6E-02 / 2E-01	IRIS / PPRTV	Hepatotoxicity			
Acenaphthylene						
Anthracene	3E-01 / 1E+00	IRIS / PPRTV	No observed effects			
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
Chrysene						
Dibenzo(a,h)anthracene						
Fluoranthene	4E-02 / 1E-01	IRIS / PPRTV	Nephropathy, increased liver weights, hematological alterations, and clinical effects			
Fluorene	4E-02	IRIS	Decreased RBC, packed cell volume and hemoglobin			
Indeno(1,2,3-cd)pyrene						
2-Methylnaphthalene	4E-03 / 4E-03	IRIS / PPRTV	Pulmonary alveolar proteinosis			
Naphthalene	2E-02	IRIS	Decreased mean terminal body weights in males	3E-03	IRIS	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively
Phenanthrene						
Pyrene	3E-02 / 3E-01	IRIS / PPRTV	Decreased mean terminal body weight in males			
Dioxins/Furans						
2,3,7,8-TCDD	7E-10	IRIS	Decreased sperm count and motility in men exposed to TCDD as boys / Increased TSH in neonates	4E-08	CalEPA	Decreased sperm count and motility in men exposed to TCDD as boys / Increased TSH in neonates

Table 6-16
Noncancer Toxicity Information
for Chemicals of Potential Concern
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Oral RfD / Subchronic RfD (mg/kg/day)	Source	Toxic Effect of Concern	Inhalation RfC (mg/m^3)	Source	Toxic Effect of Concern
Inorganic Compounds						
Arsenic	3E-04	IRIS	Hyperpigmentation, keratosis, and possible vascular complications	2E-05	CalEPA	
Iron	7E-01 / 7E-01	PPRTV / PPRTV				
Lead						
Mercury[1]				3E-04	IRIS	Hand tremor; increases in memory disturbances; slight subjective and objective evidence of autonomic dysfunction
Thallium[2]	1E-05	PPRTV				

Notes:

1 - Values for mercury represent elemental mercury.
2 - Values for thallium represent thallium (I), soluble salts.
CalEPA - California Environmental Protection Agency
IRIS - Integrated Risk Information System (USEPA, 2016)
Initial source collumn represents RfD source followed by the subchronic RfD source.
Blanks indicate that information is not available.
RfD - Reference Dose
RfC - Reference Concentration
mg/kg/day - milligrams per kilogram per day
mg/m^3 - milligrams per cubic meter
PPRTV - Provisional Peer Reviewed Toxicity Values

Table 6-17
Adjusted Oral Toxicity Values for Dermal Exposure
for Chemicals of Potential Concern
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Oral RfD (mg/kg/day)	Oral Slope Factor 1/(mg/kg/day)	Gastrointestinal Absorption Efficiency[1]	Adjustment Needed[2]	RfD for Dermal Exposure (mg/kg/day)	Slope Factor for Dermal Exposure 1/(mg/kg/day)
emivolatile Organic Compounds						
Acenaphthene	6E-02 / 2E-01		> 50%	No	6E-02 / 2E-01	
Acenaphthylene			> 50%	No		
Anthracene	3E-01 / 1E+00		> 50%	No	3E-01 / 1E+00	
Benzo(a)anthracene		7.3E-01	> 50%	No		7.3E-01
Benzo(a)pyrene		7.3E+00	> 50%	No		7.3E+00
Benzo(b)fluoranthene		7.3E-01	> 50%	No		7.3E-01
Benzo(g,h,i)perylene			> 50%	No		
Benzo(k)fluoranthene		7.3E-02	> 50%	No		7.3E-02
Chrysene		7.3E-03	> 50%	No		7.3E-03
Dibenzo(a,h)anthracene		7.3E+00	> 50%	No		7.3E+00
Fluoranthene	4E-02 / 1E-01		> 50%	No	4E-02 / 1E-01	
Fluorene	4E-02		> 50%	No	4E-02	
Indeno(1,2,3-cd)pyrene		7.3E-01	> 50%	No		7.3E-01
2-Methylnaphthalene	4E-03 / 4E-03		> 50%	No	4E-03 / 4E-03	
Naphthalene	2E-02		> 50%	No	2E-02	
Phenanthrene			> 50%	No		
Pyrene	3E-02 / 3E-01		> 50%	No	3E-02 / 3E-01	
Dioxins/Furans						
2,3,7,8-TCDD	7E-10	1.3E+05	> 50%	No	7E-10	1.3E+05
Inorganic Compounds						
Arsenic	3E-04	1.5E+00	95%	No	3E-04	1.5E+00
Iron						
Lead						
Mercury[3]						
Thallium	1E-05		100%	No	1E-05	

Notes:

1 - Source: USEPA, 2004

2 - Current guidance recommends that oral toxicity values be adjusted to reflect gastrointestinal absorption efficiency only when the absorptio efficiency is less than 50 percent (USEPA, 2004).

3 - Values for mercury represent elemental mercury.

4 - Values for thallium represent thallium (I), soluble salts.

mg/kg/day - milligrams per kilogram per day

Table 6-18
Cancer Toxicity Information
for Chemicals of Potential Concern
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Weight-of-Evidence Classification[1]	Source	Oral Slope Factor 1/(mg/kg/day)	Source	Inhalation Unit Risk 1/(mg/m³)	Source	Site of Tumor
Semivolatile Organic Compounds							
Acenaphthene	I	PPRTV					
Acenaphthylene	D	IRIS					
Anthracene	I	PPRTV					
Benzo(a)anthracene	L	PPRTV	7.3E-01	PAH	1.1E-01	CalEPA	
Benzo(a)pyrene	B2	IRIS	7.3E+00	IRIS	1.1E+00	CalEPA	Portal of Entry
Benzo(b)fluoranthene	B2	IRIS	7.3E-01	PAH	1.1E-01	CalEPA	
Benzo(g,h,i)perylene	B2	IRIS					
Benzo(k)fluoranthene	B2	IRIS	7.3E-02	PAH	1.1E-01	CalEPA	
Chrysene	B2	IRIS	7.3E-03	PAH	1.1E-02	CalEPA	
Dibenzo(a,h)anthracene	B2	IRIS	7.3E+00	PAH	1.2E+00	CalEPA	
Fluoranthene	I	PPRTV					
Fluorene	D	IRIS					
Indeno(1,2,3-cd)pyrene	B2	IRIS	7.3E-01	PAH	1.1E-01	CalEPA	
2-Methylnaphthalene	I	PPRTV					
Naphthalene	S	PPRTV			3.4E-02	CalEPA	
Phenanthrene	I	PPRTV					
Pyrene	I	PPRTV					
Dioxins/Furans							
2,3,7,8-TCDD			1.3E+05	CalEPA	3.8E+04	CalEPA	
Inorganic Compounds							
Arsenic	C	PPRTV	1.5E+00	IRIS	4.3E+00	IRIS	Lungs
Iron	I	PPRTV					
Lead	L	PPRTV					
Mercury	I	PPRTV					
Thallium	I	PPRTV					

Notes:
[1] - Weight of evidence classifications obtained from IRIS or PPRTV.
B2 - Probably human carcinogen
C - Carcinogenic to humans
CalEPA - California Environmental Protection Agency
D - Not classifiable as to human carcinogenicity
EPA - United States Environmental Protection Agency
I - Inadequate information to assess carcinogenic potential
IRIS - Integrated Risk Information System (USEPA, 2016)
L - Likely to be carcinogenic to humans
mg/kg/day - milligrams per kilogram per day
ug/m³ - micrograms per cubic meter
N - Not likely to be carcinogenic to humans
PAH - Polycyclic Aromatic Hydrocarbons
PPRTV - Provisional Peer Reviewed Toxicity Values
S - Suggestive evidence of carcinogenic potential
Blanks indicate that information is not available.

Table 6-19
Formula for Incidental Ingestion of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:
IN = CS x IR x CF x FI x EF x ED / (BW x AT)

Cancer effects for Residents:
IN = CS x CF x FI x IFSadj x EF / AT

where:

IFSadj = (EDc x IRc) / BWc + (EDa x IRa) / BWa

Mutagenic mode of action for Residents:
IN = CS x CF x FI x IFSMadj / AT

where:

$$IFSMadj = (EF_{0-2} \times ED_{0-2} \times IR_{0-2} \times 10) / BW_{0-2} + (EF_{2-6} \times ED_{2-6} \times IR_{2-6} \times 3) / BW_{2-6} + (EF_{6-16} \times ED_{6-16} \times IR_{6-16} \times 3) / BW_{6-16} + (EF_{16-26} \times ED_{16-26} \times IR_{16-26} \times 1) / BW_{16-26}$$

Where:

IN	=	Intake (milligram per kilogram per day [mg/kg/day])
CS	=	Chemical concentration in soil (milligram per kilogram [mg/kg])
IR	=	Ingestion rate (milligram of soil per day [mg-soil/day])
IRc	=	Child ingestion rate (mg-soil/day)
IRa	=	Adult ingestion rate (mg-soil/day)
IR_{0-2}	=	Ingestion rate (ages 0-2) (mg-soil/day)
IR_{2-6}	=	Ingestion rate (ages 2-6) (mg-soil/day)
IR_{6-16}	=	Ingestion rate (ages 6-16) (mg-soil/day)
IR_{16-26}	=	Ingestion rate (ages 16-26) (mg-soil/day)
CF	=	Conversion factor (10^{-6} kilogram per milligram [kg/mg])
FI	=	Fraction ingested from contaminated source (unitless)
EF	=	Exposure frequency (days/year)
EF_{0-2}	=	Exposure frequency (ages 0-2) (days/year)
EF_{2-6}	=	Exposure frequency (ages 2-6) (days/year)
EF_{6-16}	=	Exposure frequency (ages 6-16) (days/year)
EF_{16-26}	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
ED_{0-2}	=	Exposure duration (ages 0-2) (years)
ED_{2-6}	=	Exposure duration (ages 2-6) (years)
ED_{6-16}	=	Exposure duration (ages 6-16) (years)
ED_{16-26}	=	Exposure duration (ages 16-26) (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)
BW_{0-2}	=	Body weight (ages 0-2) (kg)
BW_{2-6}	=	Body weight (ages 2-6) (kg)
BW_{6-16}	=	Body weight (ages 6-16) (kg)
BW_{16-26}	=	Body weight (ages 16-26) (kg)
AT	=	Averaging time (days)
IFSadj	=	Age-adjusted soil ingestion factor (mg-year/kg-day)
IFSMadj	=	Age-adjusted soil ingestion factor (mutagenic) (mg/kg)

Table 6-19 (continued)
Formula for Incidental Ingestion of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Upland Terrace Rail Worker Variable Values:

CS	=	See Tables 6-28
IR	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:

CS	=	See Tables 6-29
IR	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Worker Variable Values:

CS	=	See Tables 6-30
IR	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:

CS	=	See Tables 6-31
IR	=	330 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	120 days/year (Assumed 6 months of construction)
ED	=	1 year
BW	=	80 kg (USEPA, 2014)
AT	=	180 days for noncancer effects (30 days/month x 6 months) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Child Visitor Variable Values:

CS	=	See Tables 6-27
IR	=	200 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-19 (continued)
Formula for Incidental Ingestion of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Youth Visitor Variable Values:

CS	=	See Tables 6-27
IR	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) average body weight of 6-11 and 11-16 year olds (USEPA, 2011)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Adult Visitor Variable Values:

CS	=	See Tables 6-27
IR	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Child Resident Variable Values:

CS	=	See Tables 6-30
IRc	=	200 mg/day (USEPA, 2014)
IR_{0-2}	=	200 mg/day (USEPA, 2014)
IR_{2-6}	=	200 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	350 days/year (USEPA, 2014)
EF_{0-2}	=	350 days/year (USEPA, 2014)
EF_{2-6}	=	350 days/year (USEPA, 2014)
EDc	=	6 years (USEPA, 2014)
ED_{0-2}	=	2 years (USEPA, 2014)
ED_{2-6}	=	4 years (USEPA, 2014)
BWc	=	15 kg (USEPA, 2014)
BW_{0-2}	=	15 kg (USEPA, 2014)
BW_{2-6}	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-19 (continued)
Formula for Incidental Ingestion of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

<u>Future Kansas River Floodplain Adult Resident Variable Values</u>:

CS	=	See Tables 6-30
IRa	=	100 mg/day (USEPA, 2014)
IR_{6-16}	=	100 mg/day (USEPA, 2014)
IR_{16-26}	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	350 days/year (USEPA, 2014)
EF_{6-16}	=	350 days/year (USEPA, 2014)
EF_{16-26}	=	350 days/year (USEPA, 2014)
EDa	=	20 years (USEPA, 2014)
ED_{6-16}	=	10 years (USEPA, 2014)
ED_{16-26}	=	10 years (USEPA, 2014)
BWa	=	80 kg (USEPA, 2014)
BW_{6-16}	=	80 kg (USEPA, 2014)
BW_{16-26}	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-20
Formula for Dermal Absorption of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:
AD = CS x CF x SA x AF x ABS x EF x ED / (BW x AT)

Cancer effects for Residents:
AD = CS x CF x ABS x EF x SFSadj / AT

where:

SFSadj = (SAc x AFc x EDc / BWc) + (SAa x AFa x EDa / BWa)

Mutagenic mode of action for Residents:
AD = CS x CF x ABS x DFSMadj / AT

where:

DFSMadj = $(EF_{0-2}$ x ED_{0-2} x AF_{0-2} x SA_{0-2} x 10) / BW_{0-2} + $(EF_{2-6}$ x ED_{2-6} x AF_{2-6} x SA_{0-2} x 3) / BW_{2-6} + $(EF_{6-16}$ x ED_{6-16} x AF_{6-16} x SA_{6-16} x 3) / BW_{6-16} + $(EF_{16-26}$ x ED_{16-26} x AF_{16-26} x SA_{16-26} x 1) / BW_{16-26}

Where:

AD	=	Absorbed dose (milligram per kilogram per day [mg/kg/day])
CS	=	Chemical concentration in soil (milligram per kilogram [mg/kg])
CF	=	Conversion factor (10^{-6} kilogram per milligram [kg/mg])
SA	=	Skin surface area available for contact (squared centimeters per day [cm^2/day])
SAc	=	Child skin surface area available for contact (cm^2/day)
SAa	=	Adult skin surface area available for contact (cm^2/day)
SA_{0-2}	=	Skin surface area available for contact (ages 0-2) (cm^2/day)
SA_{2-6}	=	Skin surface area available for contact (ages 2-6) (cm^2/day)
SA_{6-16}	=	Skin surface area available for contact (ages 6-16) (cm^2/day)
SA_{16-26}	=	Skin surface area available for contact (ages 16-26) (cm^2/day)
AF	=	Soil to skin adherence factor (milligram per squared centimeter [mg/cm^2])
AFc	=	Child soil to skin adherence factor (mg/cm^2)
AFa	=	Adult soil to skin adherence factor (mg/cm^2)
AF_{0-2}	=	Soil to skin adherence factor (ages 0-2) (mg/cm^2)
AF_{2-6}	=	Soil to skin adherence factor (ages 2-6) (mg/cm^2)
AF_{6-16}	=	Soil to skin adherence factor (ages 6-16) (mg/cm^2)
AF_{16-26}	=	Soil to skin adherence factor (ages 16-26) (mg/cm^2)
ABS	=	Absorption factor (unitless)
EF	=	Exposure frequency (days/year)
EF_{0-2}	=	Exposure frequency (ages 0-2) (days/year)
EF_{2-6}	=	Exposure frequency (ages 2-6) (days/year)
EF_{6-16}	=	Exposure frequency (ages 6-16) (days/year)
EF_{16-26}	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
ED_{0-2}	=	Exposure duration (ages 0-2) (years)
ED_{2-6}	=	Exposure duration (ages 2-6) (years)
ED_{6-16}	=	Exposure duration (ages 6-16) (years)
ED_{16-26}	=	Exposure duration (ages 16-26) (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)

Table 6-20 (continued)
Formula for Dermal Absorption of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Where:
BW_{0-2} = Body weight (ages 0-2) (kg)
BW_{2-6} = Body weight (ages 2-6) (kg)
BW_{6-16} = Body weight (ages 6-16) (kg)
BW_{16-26} = Body weight (ages 16-26) (kg)
AT = Averaging time (days)
SFSadj = Age-adjusted dermal absorption factor (mg-year/kg-day)
DFSMadj = Age-adjusted dermal absorption factor (mutagenic) (mg/kg)

Current/Future Upland Terrace Rail Worker Variable Values:
CS = See Tables 6-28
SA = 3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF = 0.12 mg/cm^2 (USEPA, 2014)
ABS = 0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF = 250 days/year (USEPA, 2014)
ED = 25 years (USEPA, 2014)
BW = 80 kg (USEPA, 2014)
AT = 9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989)
25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:
CS = See Tables 6-29
SA = 3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF = 0.12 mg/cm^2 (USEPA, 2014)
ABS = 0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF = 250 days/year (USEPA, 2014)
ED = 25 years (USEPA, 2014)
BW = 80 kg (USEPA, 2014)
AT = 9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989)
25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Worker Variable Values:
CS = See Tables 6-30
SA = 3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF = 0.12 mg/cm^2 (USEPA, 2014)
ABS = 0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF = 250 days/year (USEPA, 2014)
ED = 25 years (USEPA, 2014)
BW = 80 kg (USEPA, 2014)
AT = 9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989)
25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:
CS = See Tables 6-31
SA = 3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF = 0.3 mg/cm^2 (USEPA, 2002)
ABS = 0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF = 120 days/year (Assumed 6 months of construction)
ED = 1 year
BW = 80 kg (USEPA, 2014)
AT = 180 days for noncancer effects (30 days/month x 6 months)
25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-20 (continued)
Formula for Dermal Absorption of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Child Visitor Variable Values:

CS	=	See Tables 6-27
SA	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AF	=	0.2 mg/cm^2 (USEPA, 2014)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Youth Visitor Variable Values:

CS	=	See Tables 6-27
SA	=	5,437 cm^2 (Mean surface area of hands, forearms, lower legs, and feet) (USEPA, 2011)
AF	=	0.2 mg/cm^2 (USEPA, 2014)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) average body weight of 6-11 and 11-16 year olds (USEPA, 2011)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Adult Visitor Variable Values:

CS	=	See Tables 6-27
SA	=	6,032 cm^2 (Mean surface area of head, hands, forearms, and lower legs) (USEPA, 2014)
AF	=	0.07 mg/cm^2 (USEPA, 2014)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-20 (continued)
Formula for Dermal Absorption of Chemicals in Soil*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Child Resident Variable Values:

CS	=	See Tables 6-30
SAc	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
$SA_{0\text{-}2}$	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
$SA_{2\text{-}6}$	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AFc	=	0.2 mg/cm^2 (USEPA, 2014)
$AF_{0\text{-}2}$	=	0.2 mg/cm^2 (USEPA, 2014)
$AF_{2\text{-}6}$	=	0.2 mg/cm^2 (USEPA, 2014)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	350 days/year (USEPA, 1991)
$EF_{0\text{-}2}$	=	350 days/year (USEPA, 1991)
$EF_{2\text{-}6}$	=	350 days/year (USEPA, 1991)
EDc	=	6 years (USEPA, 1991)
$ED_{0\text{-}2}$	=	2 years (USEPA, 1991)
$ED_{2\text{-}6}$	=	4 years (USEPA, 1991)
BWc	=	15 kg (USEPA, 2014)
$BW_{0\text{-}2}$	=	15 kg (USEPA, 2014)
$BW_{2\text{-}6}$	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Adult Resident Variable Values:

CS	=	See Tables 6-30
SAa	=	6,032 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
$SA_{6\text{-}16}$	=	6,032 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
$SA_{16\text{-}26}$	=	6,032 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AFa	=	0.07 mg/cm^2 (USEPA, 2014)
$AF_{6\text{-}16}$	=	0.07 mg/cm^2 (USEPA, 2014)
$AF_{16\text{-}26}$	=	0.07 mg/cm^2 (USEPA, 2014)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	350 days/year (USEPA, 1991)
$EF_{6\text{-}16}$	=	350 days/year (USEPA, 1991)
$EF_{16\text{-}26}$	=	350 days/year (USEPA, 1991)
EDa	=	20 years (USEPA, 2014)
$ED_{6\text{-}16}$	=	10 years (USEPA, 1991)
$ED_{16\text{-}26}$	=	10 years (USEPA, 1991)
BWa	=	80 kg (USEPA, 2014)
$BW_{6\text{-}16}$	=	80 kg (USEPA, 2014)
$BW_{16\text{-}26}$	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-21
Formula for Inhalation of Chemicals in Fugitive Dust*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:
IN = CS x ET x EF x ED / (PEF x AT)

Cancer effects for Residents:
IN = CS x ET x EF x INHadj / (PEF x AT)

where:

INHadj = (EDc + EDa)

Mutagenic mode of action for Residents:
IN = CS x DFSMadj / (PEF x AT)

where:

$DFSMadj = (ET_{0-2} \times EF_{0-2} \times ED_{0-2} \times 10) + (ET_{2-6} \times EF_{2-6} \times ED_{2-6} \times 3) + (ET_{6-16} \times EF_{6-16} \times ED_{6-16} \times 3) + (ET_{16-26} \times EF_{16-26} \times ED_{16-26} \times 1)$

Where:

IN	=	Intake (milligrams per cubic meter [mg/m^3])
CS	=	Chemical concentration in soil (milligram per kilogram [mg/kg])
ET	=	Exposure time (hours/day)
ET_{0-2}	=	Exposure time (ages 0-2) (hours/day)
ET_{2-6}	=	Exposure time (ages 2-6) (hours/day)
ET_{6-16}	=	Exposure time (ages 6-16) (hours/day)
ET_{16-26}	=	Exposure time (ages 16-26) (hours/day)
EF	=	Exposure frequency (days/year)
EF_{0-2}	=	Exposure frequency (ages 0-2) (days/year)
EF_{2-6}	=	Exposure frequency (ages 2-6) (days/year)
EF_{6-16}	=	Exposure frequency (ages 6-16) (days/year)
EF_{16-26}	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
ED_{0-2}	=	Exposure duration (ages 0-2) (years)
ED_{2-6}	=	Exposure duration (ages 2-6) (years)
ED_{6-16}	=	Exposure duration (ages 6-16) (years)
ED_{16-26}	=	Exposure duration (ages 16-26) (years)
PEF	=	Particulate emission factor (cubic meters per kilogram [m^3/kg])
AT	=	Averaging time (hours)
INHadj	=	Ade-adjusted inhalation factor (years)
DFSMadj	=	Age-adjusted inhalation factor (mutagenic) (hours)

Current/Future Upland Terrace Rail Worker Variable Values:

CS	=	See Tables 6-28
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Table 6-21 (continued)
Formula for Inhalation of Chemicals in Fugitive Dust*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Floodplain Slope Worker Variable Values:

CS	=	See Tables 6-29
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Worker Variable Values:

CS	=	See Tables 6-30
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Construction Worker Variable Values:

CS	=	See Tables 6-31
ET	=	8 hrs/day (Standard working day)
EF	=	120 days/year (Assumed 6 months of construction)
ED	=	1 year
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	4,320 hours for noncancer effects [180 days x 24 hours/day] 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Current/Future Site-Wide Child Visitor Variable Values:

CS	=	See Tables 6-27
ET	=	4.8 hrs/day (Assumed exposure time of parent/guardian)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Current/Future Site-Wide Youth Visitor Variable Values:

CS	=	See Tables 6-27
ET	=	2 hrs/day (Mean amount of time spent outdoors for the ages of 9 to 15) average exposure time of 6-11 and 11-16 year olds (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Table 6-21 (continued)
Formula for Inhalation of Chemicals in Fugitive Dust*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Adult Visitor Variable Values:

CS	=	See Tables 6-27
ET	=	4.8 hrs/day (Mean amount of time spent outdoors for the ages of 18 to 70) (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	175,200 hours for noncancer effects [20 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Child Resident Variable Values:

CS	=	See Tables 6-30
ET	=	24 hrs/day (Assumed worst case scenario)
ET_{0-2}	=	24 hrs/day (Assumed worst case scenario)
ET_{2-6}	=	24 hrs/day (Assumed worst case scenario)
EF	=	350 days/year (USEPA, 2014)
EF_{0-2}	=	350 days/year (USEPA, 2014)
EF_{2-6}	=	350 days/year (USEPA, 2014)
EDc	=	6 years (USEPA, 2014)
ED_{0-2}	=	2 years (USEPA, 2014)
ED_{2-6}	=	4 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Adult Resident Variable Values:

CS	=	See Tables 6-30
ET	=	24 hrs/day (Assumed worst case scenario)
ET_{6-16}	=	24 hrs/day (Assumed worst case scenario)
ET_{16-26}	=	24 hrs/day (Assumed worst case scenario)
EF	=	350 days/year (USEPA, 2014)
EF_{6-16}	=	350 days/year (USEPA, 2014)
EF_{16-26}	=	350 days/year (USEPA, 2014)
EDa	=	20 years (USEPA, 2014)
ED_{6-16}	=	10 years (USEPA, 2014)
ED_{16-26}	=	10 years (USEPA, 2014)
PEF	=	1.316E+09 m^3/kg (USEPA, 2002)
AT	=	175,200 hours for noncancer effects [20 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

* USEPA, 2009a, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment) Final.* Office of Superfund Remediation and Technology Innovation. EPA-540-R-070-002. January 2009.

Table 6-22
Formula for Inhalation of Vapor Phase Chemicals*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:
IN = CA x ET x EF x ED / AT

Cancer effects for Residents:
IN = CA x ET x EF x INHadj / AT

where:

INHadj = (EDc + EDa)

Mutagenic mode of action for Residents:
IN = CA x DFSMadj / AT

where:

DFSMadj = (ET_{0-2} x EF_{0-2} x ED_{0-2} x 10) + (ET_{2-6} x EF_{2-6} x ED_{2-6} x 3) + (ET_{6-16} x EF_{6-16} x ED_{6-16} x 3) + (ET_{16-26} x EF_{16-26} x ED_{16-26} x 1)

Where:

IN	=	Intake (milligrams per cubic meter [mg/m^3])
CA	=	Chemical concentrations in air (mg/m^3)
ET	=	Exposure time (hours/day)
ET_{0-2}	=	Exposure time (ages 0-2) (hours/day)
ET_{2-6}	=	Exposure time (ages 2-6) (hours/day)
ET_{6-16}	=	Exposure time (ages 6-16) (hours/day)
ET_{16-26}	=	Exposure time (ages 16-26) (hours/day)
EF	=	Exposure frequency (days/year)
EF_{0-2}	=	Exposure frequency (ages 0-2) (days/year)
EF_{2-6}	=	Exposure frequency (ages 2-6) (days/year)
EF_{6-16}	=	Exposure frequency (ages 6-16) (days/year)
EF_{16-26}	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
ED_{0-2}	=	Exposure duration (ages 0-2) (years)
ED_{2-6}	=	Exposure duration (ages 2-6) (years)
ED_{6-16}	=	Exposure duration (ages 6-16) (years)
ED_{16-26}	=	Exposure duration (ages 16-26) (years)
AT	=	Averaging time (hours)
INHadj	=	Ade-adjusted inhalation factor (years)
DFSMadj	=	Age-adjusted inhalation factor (mutagenic) (hours)

Current/Future Upland Terrace Rail Worker Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-50)
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Table 6-22 (continued)
Formula for Inhalation of Vapor Phase Chemicals*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Floodplain Slope Worker Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-51)
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Worker Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-52)
ET	=	8 hrs/day (Standard working day)
EF	=	250 days/year (USEPA, 2014)
ED	=	25 years (USEPA, 2014)
AT	=	219,000 hours for noncancer effects [25 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Construction Worker Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-53)
ET	=	8 hrs/day (Standard working day)
EF	=	120 days/year (Assumed 6 months of construction)
ED	=	1 year
AT	=	4,320 hours for noncancer effects [180 days x 24 hours/day] 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Current/Future Site-Wide Child Visitor Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-54)
ET	=	4.8 hrs/day (Assumed exposure time of parent/guardian)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Current/Future Site-Wide Youth Visitor Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-55)
ET	=	2 hrs/day (Mean amount of time spent outdoors for the ages of 9 to 15) average exposure time of 6-11 and 11-16 year olds (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 2009) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Table 6-22 (continued)
Formula for Inhalation of Vapor Phase Chemicals*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Adult Visitor Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-56)
ET	=	4.8 hrs/day (Mean amount of time spent outdoors for the ages of 18 to 70) (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
AT	=	175,200 hours for noncancer effects [20 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Child Resident Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-57)
ET	=	24 hrs/day (Assumed worst case scenario)
ET_{0-2}	=	24 hrs/day (Assumed worst case scenario)
ET_{2-6}	=	24 hrs/day (Assumed worst case scenario)
EF	=	350 days/year (USEPA, 2014)
EF_{0-2}	=	350 days/year (USEPA, 2014)
EF_{2-6}	=	350 days/year (USEPA, 2014)
EDc	=	6 years (USEPA, 2014)
ED_{0-2}	=	2 years (USEPA, 2014)
ED_{2-6}	=	4 years (USEPA, 2014)
AT	=	52,560 hours for noncancer effects [6 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

Future Kansas River Floodplain Adult Resident Variable Values:

CA	=	Modeled from soil concentrations (See Table 6-58)
ET	=	24 hrs/day (Assumed worst case scenario)
ET_{6-16}	=	24 hrs/day (Assumed worst case scenario)
ET_{16-26}	=	24 hrs/day (Assumed worst case scenario)
EF	=	350 days/year (USEPA, 2014)
EF_{6-16}	=	350 days/year (USEPA, 2014)
EF_{16-26}	=	350 days/year (USEPA, 2014)
EDa	=	20 years (USEPA, 2014)
ED_{6-16}	=	10 years (USEPA, 2014)
ED_{16-26}	=	10 years (USEPA, 2014)
AT	=	175,200 hours for noncancer effects [20 years (ED) x 365 days/year x 24 hours/day] (USEPA, 1989) 613,200 hours for cancer effects [70 years (Lifetime) x 365 days/year x 24 hours/day] (USEPA, 2009)

* USEPA, 2009a, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment) Final.* Office of Superfund Remediation and Technology Innovation. EPA-540-R-070-002. January 2009.

Table 6-23
Formula for Incidental Ingestion of Chemicals in Stream Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:
IN = CS x IR x CF x FI x EF x ED / (BW x AT)

Cancer effects for Residents:
IN = CS x CF x FI x IFSadj x EF / AT

where:

IFSadj = (EDc x IRc) / BWc + (EDa x IRa) / BWa

Where:

IN	=	Intake (milligram per kilogram per day [mg/kg/day])
CS	=	Chemical concentration in sediment (milligram per kilogram [mg/kg])
IR	=	Ingestion rate (milligram of soil per day [mg-soil/day])
IRc	=	Child ingestion rate (mg-soil/day)
IRa	=	Adult ingestion rate (mg-soil/day)
CF	=	Conversion factor (10^{-6} kilogram per milligram [kg/mg])
FI	=	Fraction ingested from contaminated source (unitless)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)
AT	=	Averaging time (days)
IFSadj	=	Age-adjusted soil ingestion factor (mg-year/kg-day)
IFSMadj	=	Age-adjusted soil ingestion factor (mutagenic) (mg/kg)

Current/Future Upland Terrace Rail Worker Variable Values:

CS	=	See Tables 6-36
IR	=	100 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:

CS	=	See Tables 6-36
IR	=	100 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-23 (continued)
Formula for Incidental Ingestion of Chemicals in Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Worker Variable Values:

CS	=	See Tables 6-36
IR	=	100 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:

CS	=	See Tables 6-36
IR	=	330 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	26 days/year (Assumed 1 day per week during 6 months of construction)
ED	=	1 year
BW	=	80 kg (USEPA, 2014)
AT	=	180 days for noncancer effects (30 days/month x 6 months) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Child Visitor Variable Values:

CS	=	See Tables 6-36
IR	=	200 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Youth Visitor Variable Values:

CS	=	See Tables 6-36
IR	=	100 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) average body weight of 6-11 and 11-16 year olds (USEPA, 2011)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Adult Visitor Variable Values:

CS	=	See Tables 6-36
IR	=	100 mg/day (USEPA, 2002)
FI	=	1.0 (Assumed worst case value)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-23 (continued)
Formula for Incidental Ingestion of Chemicals in Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Child Resident Variable Values:

CS	=	See Tables 6-36
IRc	=	200 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	72 days/year (See text)
EDc	=	6 years (USEPA, 2014)
BWc	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Adult Resident Variable Values:

CS	=	See Tables 6-36
IRa	=	100 mg/day (USEPA, 2014)
FI	=	1.0 (Assumed worst case value)
EF	=	72 days/year (See text)
EDa	=	20 years (USEPA, 2014)
BWa	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-24
Formula for Dermal Absorption of Chemicals in Stream Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

AD = CS x CF x SA x AF x ABS x EF x ED / (BW x AT)

Cancer effects for Residents:
AD = CS x CF x ABS x EF x SFSadj / AT

where:

SFSadj = (SAc x AFc x EDc / BWc) + (SAa x AFa x EDa / BWa)

Where:

AD	=	Absorbed dose (milligram per kilogram per day [mg/kg/day])
CS	=	Chemical concentration in sediment (milligram per kilogram [mg/kg])
CF	=	Conversion factor (10^{-6} kilogram per milligram [kg/mg])
SA	=	Skin surface area available for contact (squared centimeters per day [cm^2/day])
SAc	=	Child skin surface area available for contact (cm^2/day)
SAa	=	Adult skin surface area available for contact (cm^2/day)
AF	=	Soil to skin adherence factor (milligram per squared centimeter [mg/cm^2])
AFc	=	Child sediment to skin adherence factor (mg/cm^2)
AFa	=	Adult sediment to skin adherence factor (mg/cm^2)
ABS	=	Absorption factor (unitless)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)
AT	=	Averaging time (days)
SFSadj	=	Age-adjusted dermal absorption factor (mg-year/kg-day)

Current/Future Upland Terrace Rail Worker Variable Values:

CS	=	See Table 6-36
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF	=	0.20 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:

CS	=	See Table 6-36
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF	=	0.20 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-24 (continued)
Formula for Dermal Absorption of Chemicals in Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Worker Variable Values:

CS	=	See Table 6-36
SA	=	3,572 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
AF	=	0.20 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:

CS	=	See Table 6-36
SA	=	3,527 cm^2 (Mean surface area of hands, arms, and feet) (USEPA, 2014)
AF	=	0.20 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	26 days/year (Assumed 1 day per week during 6 months of construction)
ED	=	1 year
BW	=	80 kg (USEPA, 2014)
AT	=	180 days for noncancer effects (30 days/month x 6 months) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Child Visitor Variable Values:

CS	=	See Table 6-36
SA	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AF	=	3.6 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Youth Visitor Variable Values:

CS	=	See Table 6-36
SA	=	5,440 cm^2 (Mean surface area of hands, forearms, lower legs, and feet) (USEPA, 2011)
AF	=	4.0 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-24 (continued)
Formula for Dermal Absorption of Chemicals in Sediment*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Adult Visitor Variable Values:

CS	=	See Table 6-36
SA	=	12,680 cm^2 (Mean surface area of hands, forearms, lower legs, and feet) (USEPA, 2011)
AF	=	0.26 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Child Resident Variable Values:

CS	=	See Table 6-36
SAc	=	2,373 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AF	=	3.6 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	72 days/year (See text)
EDc	=	6 years (USEPA, 1991)
BWc	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Adult Resident Variable Values:

CS	=	See Table 6-36
SAa	=	12,680 cm^2 (Mean surface area of head, hands, forearms, lower legs, and feet) (USEPA, 2014)
AF	=	0.26 mg/cm^2 (USEPA, 2011)
ABS	=	0.13 for polycyclic aromatic hydrocarbons (Based on benzo(a)pyrene), 0.03 for arsenic and 2,3,7,8-TCDD, and 0 for inorganics (USEPA, 2004)
EF	=	72 days/year (See text)
EDa	=	20 years (USEPA, 2014)
BWa	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-25
Formula for Ingestion of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

IN = CW x IR x EF x ED / (BW x AT)

<u>Cancer effects for Residents:</u>
IN = CW x IFWadj x EF / AT

where:

IFWadj = (EDc x IRc) / BWc + (EDa x IRa) / BWa

<u>Mutagenic mode of action for Residents:</u>
IN = CW x IFWMadj / AT

where:

$$IFWMadj = (EF_{0\text{-}2} \times ED_{0\text{-}2} \times IR_{0\text{-}2} \times 10) / BW_{0\text{-}2} + (EF_{2\text{-}6} \times ED_{2\text{-}6} \times IR_{2\text{-}6} \times 3) / BW_{2\text{-}6} + (EF_{6\text{-}16} \times ED_{6\text{-}16} \times IR_{6\text{-}16} \times 3) / BW_{6\text{-}16} + (EF_{16\text{-}26} \times ED_{16\text{-}26} \times IR_{16\text{-}26} \times 1) / BW_{16\text{-}26}$$

<u>Where</u>:

IN	=	Intake (milligram per kilogram per day [mg/kg/day])
CW	=	Chemical concentration in water (milligram per liter [mg/L])
IR	=	Ingestion rate (liters per day [L/day])
IRc	=	Child ingestion rate (L/day)
IRa	=	Adult ingestion rate (L/day)
$IR_{0\text{-}2}$	=	Ingestion rate (ages 0-2) (L-water/day)
$IR_{2\text{-}6}$	=	Ingestion rate (ages 2-6) (L-water/day)
$IR_{6\text{-}16}$	=	Ingestion rate (ages 6-16) (L-water/day)
$IR_{16\text{-}26}$	=	Ingestion rate (ages 16-26) (L-water/day)
EF	=	Exposure frequency (days/year)
$EF_{0\text{-}2}$	=	Exposure frequency (ages 0-2) (days/year)
$EF_{2\text{-}6}$	=	Exposure frequency (ages 2-6) (days/year)
$EF_{6\text{-}16}$	=	Exposure frequency (ages 6-16) (days/year)
$EF_{16\text{-}26}$	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
$ED_{0\text{-}2}$	=	Exposure duration (ages 0-2) (years)
$ED_{2\text{-}6}$	=	Exposure duration (ages 2-6) (years)
$ED_{6\text{-}16}$	=	Exposure duration (ages 6-16) (years)
$ED_{16\text{-}26}$	=	Exposure duration (ages 16-26) (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)
$BW_{0\text{-}2}$	=	Body weight (ages 0-2) (kg)
$BW_{2\text{-}6}$	=	Body weight (ages 2-6) (kg)
$BW_{6\text{-}16}$	=	Body weight (ages 6-16) (kg)
$BW_{16\text{-}26}$	=	Body weight (ages 16-26) (kg)
AT	=	Averaging time (days)
IFWadj	=	Age-adjusted water ingestion factor (L-year/kg-day)
IFWMadj	=	Age-adjusted water ingestion factor (mutagenic) (L/kg)

Table 6-25 (continued)
Formula for Ingestion of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Upland Terrace Rail Worker Variable Values:

CW	=	See Table 6-37
IR	=	0.568 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:

CW	=	See Table 6-37
IR	=	0.568 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Worker Variable Values:

CW	=	See Table 6-37
IR	=	0.568 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:

CW	=	See Table 6-37
IR	=	0.568 L/day (USEPA, 2011)
EF	=	26 days/year (Assumed 1 day per week during 6 months of construction)
ED	=	1 year
BW	=	80 kg (USEPA, 2014)
AT	=	180 days for noncancer effects (30 days/month x 6 months) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Child Visitor Variable Values:

CW	=	See Table 6-37
IR	=	0.54 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-25 (continued)
Formula for Ingestion of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Youth Visitor Variable Values:

CW	=	See Table 6-37
IR	=	0.24 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) average body weight of 6-11 and 11-16 year olds (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Adult Visitor Variable Values:

CW	=	See Table 6-37
IR	=	0.341 L/day (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Child Resident Variable Values:

CW	=	See Table 6-37
IRc	=	0.54 L/day (USEPA, 2011)
$IR_{0\text{-}2}$	=	0.54 L/day (USEPA, 2011)
$IR_{2\text{-}6}$	=	0.54 L/day (USEPA, 2011)
FI	=	1.0 (Assumed worst case value)
EF	=	72 days/year (See text)
$EF_{0\text{-}2}$	=	72 days/year (See text)
$EF_{2\text{-}6}$	=	72 days/year (See text)
EDc	=	6 years (USEPA, 2014)
$ED_{0\text{-}2}$	=	2 years (USEPA, 2014)
$ED_{2\text{-}6}$	=	4 years (USEPA, 2014)
BWc	=	15 kg (USEPA, 2014)
$BW_{0\text{-}2}$	=	15 kg (USEPA, 2014)
$BW_{2\text{-}6}$	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-25 (continued)
Formula for Ingestion of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Adult Resident Variable Values:

CW	=	See Table 6-37
IRa	=	0.249 L/day (USEPA, 2011)
IR_{6-16}	=	0.249 L/day (USEPA, 2011)
IR_{16-26}	=	0.249 L/day (USEPA, 2011)
FI	=	1.0 (Assumed worst case value)
EF	=	72 days/year (See text)
EF_{6-16}	=	72 days/year (See text)
EF_{16-26}	=	72 days/year (See text)
EDa	=	20 years (USEPA, 2014)
ED_{6-16}	=	10 years (USEPA, 2014)
ED_{16-26}	=	10 years (USEPA, 2014)
BWa	=	80 kg (USEPA, 2014)
BW_{6-16}	=	80 kg (USEPA, 2014)
BW_{16-26}	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-26
Formula for Dermal Absorption of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

$DAD = DA_{event} \times EV \times SA \times EF \times ED / (BW \times AT)$

Cancer effects for Residents:
$DAD = DA_{event} \times EV \times DFWadj \times EF / AT$

where:

$DFWadj = (SAc \times EDc / BWc) + (SAa \times EDa / BWa)$

Mutagenic mode of action for Residents:
$DAD = DA_{event} \times EV \times IFWMadj / AT$

where:

$$IFWMadj = (EF_{0\text{-}2} \times ED_{0\text{-}2} \times SA_{0\text{-}2} \times 10) / BW_{0\text{-}2} + (EF_{2\text{-}6} \times ED_{2\text{-}6} \times SA_{2\text{-}6} \times 3) / BW_{2\text{-}6} + (EF_{6\text{-}16} \times ED_{6\text{-}16} \times SA_{6\text{-}16} \times 3) / BW_{6\text{-}16} + (EF_{16\text{-}26} \times ED_{16\text{-}26} \times SA_{16\text{-}26} \times 1) / BW_{16\text{-}26}$$

Where:

DAD	=	Dermally absorbed dose (milligram per kilogram per day [mg/kg/day])
DA_{event}	=	Absorbed dose per event (milligrams per square centimeter event [mg/cm^2-event])
EV	=	Event frequency (events/day)
SA	=	Skin surface area available for contact (cm^2)
SAc	=	Child skin surface area available for contact (cm^2/day)
SAa	=	Adult skin surface area available for contact (cm^2/day)
$SA_{0\text{-}2}$	=	Skin surface area available for contact (ages 0-2) (cm^2/day)
$SA_{2\text{-}6}$	=	Skin surface area available for contact (ages 2-6) (cm^2/day)
$SA_{6\text{-}16}$	=	Skin surface area available for contact (ages 6-16) (cm^2/day)
$SA_{16\text{-}26}$	=	Skin surface area available for contact (ages 16-26) (cm^2/day)
EF	=	Exposure frequency (days/year)
$EF_{0\text{-}2}$	=	Exposure frequency (ages 0-2) (days/year)
$EF_{2\text{-}6}$	=	Exposure frequency (ages 2-6) (days/year)
$EF_{6\text{-}16}$	=	Exposure frequency (ages 6-16) (days/year)
$EF_{16\text{-}26}$	=	Exposure frequency (ages 16-26) (days/year)
ED	=	Exposure duration (years)
EDc	=	Child exposure duration (years)
EDa	=	Adult exposure duration (years)
$ED_{0\text{-}2}$	=	Exposure duration (ages 0-2) (years)
$ED_{2\text{-}6}$	=	Exposure duration (ages 2-6) (years)
$ED_{6\text{-}16}$	=	Exposure duration (ages 6-16) (years)
$ED_{16\text{-}26}$	=	Exposure duration (ages 16-26) (years)
BW	=	Body weight (kilogram [kg])
BWc	=	Child body weight (kg)
BWa	=	Adult body weight (kg)
$BW_{0\text{-}2}$	=	Body weight (ages 0-2) (kg)
$BW_{2\text{-}6}$	=	Body weight (ages 2-6) (kg)
$BW_{6\text{-}16}$	=	Body weight (ages 6-16) (kg)
$BW_{16\text{-}26}$	=	Body weight (ages 16-26) (kg)
AT	=	Averaging time (days)
DFWadj	=	Age-adjusted dermal absorption factor (cm^2-year/kg-day)
IFWMadj	=	Age-adjusted dermal absorption factor (mutagenic) (cm^2/kg)

Table 6-26 (continued)
Formula for Dermal Absorption of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Upland Terrace Rail Worker Variable Values:

DA_{event}	=	Calculated (See Table 6-39)
EV	=	1 event/day (USEPA, 2004)
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Floodplain Slope Worker Variable Values:

DA_{event}	=	Calculated (See Table 6-39)
EV	=	1 event/day (USEPA, 2004)
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Worker Variable Values:

DA_{event}	=	Calculated (See Table 6-39)
EV	=	1 event/day (USEPA, 2004)
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	25 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	9,125 days for noncancer effects [25 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Construction Worker Variable Values:

DA_{event}	=	Calculated (See Table 6-39)
EV	=	1 event/day (USEPA, 2004)
SA	=	3,527 cm^2 (Mean surface area of head, hands, and forearms) (USEPA, 2014)
EF	=	26 days/year (Assumed 1 day per week during 6 months of construction)
ED	=	1 year
BW	=	80 kg (USEPA, 2014)
AT	=	180 days for noncancer effects (30 days/month x 6 months) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Child Visitor Variable Values:

DA_{event}	=	Calculated (See Table 6-40)
EV	=	1 event/day (USEPA, 2004)
SA	=	2,373 (Weighted average of mean values for male and female children <6) (USEPA, 2014)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 0-6)
BW	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-26 (continued)
Formula for Dermal Absorption of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Current/Future Site-Wide Youth Visitor Variable Values:

DA_{event}	=	Calculated (See Table 6-40)
EV	=	1 event/day (USEPA, 2004)
SA	=	5,440 cm^2 (Mean surface area of hands, forearms, lower legs, and feet) (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	6 years (Site-specific value) (Assumed age range of 9-15)
BW	=	44.3 kg (Average body weight for youths 9-15 years old) average body weight of 6-11 and 11-16 year olds (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Current/Future Site-Wide Adult Visitor Variable Values:

DA_{event}	=	Calculated (See Table 40)
EV	=	1 event/day (USEPA, 2004)
SA	=	12,680 cm^2 (Weighted average of mean values for male and female adults 21+) (USEPA, 2011)
EF	=	52 days/year (Site-specific value) (Assumed 1 day per week)
ED	=	20 years (USEPA, 2014)
BW	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Future Kansas River Floodplain Child Resident Variable Values:

DA_{event}	=	Calculated (See Table 41)
SAa	=	2,373 (Weighted average of mean values for male and female children <6) (USEPA, 2014)
SA_{0-2}	=	2,373 (Weighted average of mean values for male and female children <6) (USEPA, 2014)
SA_{2-4}	=	2,373 (Weighted average of mean values for male and female children <6) (USEPA, 2014)
EF	=	72 days/year (See text)
EF_{0-2}	=	72 days/year (See text)
EF_{2-6}	=	72 days/year (See text)
EDc	=	6 years (USEPA, 2014)
ED_{0-2}	=	2 years (USEPA, 2014)
ED_{2-6}	=	4 years (USEPA, 2014)
BWc	=	15 kg (USEPA, 2014)
BW_{0-2}	=	15 kg (USEPA, 2014)
BW_{2-6}	=	15 kg (USEPA, 2014)
AT	=	2,190 days for noncancer effects [6 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

Table 6-26 (continued)
Formula for Dermal Absorption of Chemicals in Surface Water*
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Future Kansas River Floodplain Adult Resident Variable Values:

DA_{event}	=	Calculated (See Table 41)
SAa	=	12,680 cm^2 (Weighted average of mean values for male and female adults 21+) (USEPA, 2011)
SA_{6-16}	=	12,680 cm^2 (Weighted average of mean values for male and female adults 21+) (USEPA, 2011)
SA_{16-26}	=	12,680 cm^2 (Weighted average of mean values for male and female adults 21+) (USEPA, 2011)
EF	=	72 days/year (See text)
EF_{6-16}	=	72 days/year (See text)
EF_{16-26}	=	72 days/year (See text)
EDa	=	20 years (USEPA, 2014)
ED_{6-16}	=	10 years (USEPA, 2014)
ED_{16-26}	=	10 years (USEPA, 2014)
BWa	=	80 kg (USEPA, 2014)
BW_{6-16}	=	80 kg (USEPA, 2014)
BW_{16-26}	=	80 kg (USEPA, 2014)
AT	=	7,300 days for noncancer effects [20 years (ED) x 365 days/year] (USEPA, 1989) 25,550 days for cancer effects [70 years (Lifetime) x 365 days/year] (USEPA, 1989)

* USEPA, 1989, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual (Part A)*. EPA/540/1-89/002.

Table 6-27
Exposure Point Concentrations
Site-Wide Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.025	0.010	0.010
Acenaphthylene	0.019	0.0039	0.0039
Anthracene	0.045	0.011	0.011
Benzo(a)anthracene	0.21	0.044	0.044
Benzo(a)pyrene	0.14	0.034	0.034
Benzo(b)fluoranthene	0.16	0.042	0.042
Benzo(g,h,i)perylene	0.11	0.025	0.025
Benzo(k)fluoranthene	0.13	0.032	0.032
Chrysene	0.35	0.075	0.075
Dibenzo(a,h)anthracene	0.032	0.0078	0.0078
Fluoranthene	0.26	0.061	0.061
Fluorene	0.026	0.011	0.011
Indeno(1,2,3-cd)pyrene	0.057	0.0163	0.016
2-Methylnaphthalene	0.23	0.0833	0.083
Naphthalene	1.4	0.249	0.25
Phenanthrene	1.5	0.307	0.31
Pyrene	0.26	0.0591	0.059
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.0000149	0.00000325	0.00000325
Inorganic Compounds			
Arsenic	52.4	13	12.95
Iron	76,000	27,000	27,000
Lead	844	130	78
Mercury	16.5	0.789	0.79
Thallium	2.00	0.762	0.76

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-28
Exposure Point Concentrations
Upland Terrace Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.0080	0.0056	0.0056
Acenaphthylene	0.019	0.0088	0.0088
Anthracene	0.017	0.013	0.013
Benzo(a)anthracene	0.074	0.044	0.044
Benzo(a)pyrene	0.075	0.043	0.043
Benzo(b)fluoranthene	0.087	0.054	0.054
Benzo(g,h,i)perylene	0.054	0.043	0.043
Benzo(k)fluoranthene	0.069	0.038	0.038
Chrysene	0.0042	0.071	0.0042
Dibenzo(a,h)anthracene	0.015	0.0090	0.0090
Fluoranthene	0.12	0.065	0.065
Fluorene	0.0090	0.0062	0.0062
Indeno(1,2,3-cd)pyrene	0.0490	0.026	0.026
Naphthalene	0.21	0.16	0.16
Phenanthrene	0.36	0.23	0.23
Pyrene	0.11	0.062	0.062
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.00000738	0.00000538	0.00000538
Inorganic Compounds			
Arsenic	52.4	11	11

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-29
Exposure Point Concentrations
Floodplain Slope Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.025	0.013	0.013
Acenaphthylene	0.00079	NC	0.00079
Anthracene	0.045	0.024	0.024
Benzo(a)anthracene	0.21	0.099	0.099
Benzo(a)pyrene	0.14	0.068	0.068
Benzo(b)fluoranthene	0.16	0.085	0.085
Benzo(g,h,i)perylene	0.11	0.052	0.052
Benzo(k)fluoranthene	0.13	0.068	0.068
Chrysene	0.35	0.168	0.168
Dibenzo(a,h)anthracene	0.032	0.022	0.022
Fluoranthene	0.260	0.131	0.131
Fluorene	0.026	0.016	0.016
Indeno(1,2,3-cd)pyrene	0.057	0.030	0.030
2-Methylnaphthalene	0.23	0.16	0.16
Naphthalene	1.4	0.59	0.59
Phenanthrene	1.5	0.70	0.70
Pyrene	0.26	0.13	0.13
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.0000149	0.00000947	0.00000947
Inorganic Compounds			
Arsenic	47.4	22	22
Iron	76,000	50,000	50,000
Lead	844	270	190
Mercury	16.5	3.1	3.1
Thallium	2.00	1.8	1.8

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

NC - not calculated due to a lack of detections

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-30
Exposure Point Concentrations
Kansas River Floodplain Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.0038	0.0030	0.0030
Acenaphthylene	0.0010	0.00071	0.00071
Anthracene	0.0077	0.0031	0.0031
Benzo(a)anthracene	0.030	0.012	0.012
Benzo(a)pyrene	0.022	0.011	0.011
Benzo(b)fluoranthene	0.030	0.015	0.015
Benzo(g,h,i)perylene	0.011	0.010	0.010
Benzo(k)fluoranthene	0.017	0.010	0.010
Chrysene	0.062	0.026	0.026
Dibenzo(a,h)anthracene	0.0045	0.0035	0.0035
Fluoranthene	0.042	0.015	0.015
Fluorene	0.0044	0.0035	0.0035
Indeno(1,2,3-cd)pyrene	0.0081	0.0048	0.0048
Naphthalene	0.24	0.18	0.18
Phenanthrene	0.33	0.24	0.24
Pyrene	0.042	0.010	0.010
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.0000149	0.00000325	0.00000325
Inorganic Compounds			
Arsenic	22.3	7.3	7.3
Lead	439	116	50
Thallium	1.50	0.72	0.72

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

NC - not calculated due to a lack of detections

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-31
Exposure Point Concentrations
Kansas River Floodplain Subsurface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.0100	0.0020	0.0020
Acenaphthylene	0.0010	0.00051	0.00051
Anthracene	0.0077	0.0016	0.0016
Benzo(a)anthracene	0.093	0.019	0.019
Benzo(a)pyrene	0.059	0.014	0.014
Benzo(b)fluoranthene	0.061	0.015	0.015
Benzo(g,h,i)perylene	0.036	0.0039	0.0039
Benzo(k)fluoranthene	0.051	0.0052	0.0052
Chrysene	0.17	0.034	0.034
Dibenzo(a,h)anthracene	0.012	0.0029	0.0029
Fluoranthene	0.13	0.027	0.027
Fluorene	0.012	0.0023	0.0023
Indeno(1,2,3-cd)pyrene	0.017	0.0094	0.0094
Naphthalene	0.28	0.089	0.089
Phenanthrene	0.81	0.21	0.21
Pyrene	0.13	0.026	0.026
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.00000820	0.00000159	0.00000159
Inorganic Compounds			
Arsenic	41.0	8.0	8.0
Iron	85,000	24,000	24,000
Lead	439	90	42
Thallium	1.50	0.45	0.45

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-32
Exposure Point Concentrations
Site-Wide Comprehensive Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.031	0.0033	0.0033
Acenaphthylene	0.019	0.0027	0.0027
Anthracene	0.045	0.0061	0.0061
Benzo(a)anthracene	0.21	0.031	0.031
Benzo(a)pyrene	0.14	0.023	0.023
Benzo(b)fluoranthene	0.16	0.029	0.029
Benzo(g,h,i)perylene	0.11	0.017	0.017
Benzo(k)fluoranthene	0.13	0.021	0.021
Chrysene	0.35	0.055	0.055
Dibenzo(a,h)anthracene	0.032	0.0048	0.0048
Fluoranthene	0.26	0.043	0.043
Fluorene	0.044	0.011	0.011
Indeno(1,2,3-cd)pyrene	0.057	0.0084	0.0084
2-Methylnaphthalene	0.23	0.046	0.046
Naphthalene	1.7	0.19	0.19
Phenanthrene	2.0	0.26	0.26
Pyrene	0.26	0.043	0.043
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.0000149	0.00000366	0.00000366
Inorganic Compounds			
Arsenic	86.9	12	12
Iron	100,000	28,000	28,000
Lead	844	94	61
Mercury	16.5	0.51	0.51
Thallium	2.00	0.53	0.53

Notes:
2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin
mg/kg - milligrams per kilogram
UCL values calculated using ProUCL Version 5.0 (See Appendix P).
Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-33
Exposure Point Concentrations
Upland Terrace Comprehensive Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.0080	0.0032	0.0032
Acenaphthylene	0.019	0.0045	0.0045
Anthracene	0.025	0.0087	0.0087
Benzo(a)anthracene	0.078	0.030	0.030
Benzo(a)pyrene	0.075	0.024	0.024
Benzo(b)fluoranthene	0.087	0.031	0.031
Benzo(g,h,i)perylene	0.054	0.022	0.022
Benzo(k)fluoranthene	0.069	0.022	0.022
Chrysene	0.110	0.040	0.040
Dibenzo(a,h)anthracene	0.021	0.0063	0.0063
Fluoranthene	0.12	0.036	0.036
Fluorene	0.0090	0.0031	0.0031
Indeno(1,2,3-cd)pyrene	0.049	0.015	0.015
Naphthalene	0.21	0.062	0.062
Phenanthrene	0.36	0.15	0.15
Pyrene	0.11	0.034	0.034
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.00000738	0.00000270	0.00000270
Inorganic Compounds			
Arsenic	52.4	9.4	9.4
Iron	31,000	17,000	17,000
Lead	270	59	34
Mercury	0.780	0.14	0.14
Thallium	0.270	0.21	0.21

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-34
Exposure Point Concentrations
Floodplain Slope Comprehensive Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.031	0.0064	0.0064
Acenaphthylene	0.00079	NC	0.00079
Anthracene	0.045	0.010	0.010
Benzo(a)anthracene	0.21	0.043	0.043
Benzo(a)pyrene	0.14	0.030	0.030
Benzo(b)fluoranthene	0.16	0.037	0.037
Benzo(g,h,i)perylene	0.11	0.019	0.019
Benzo(k)fluoranthene	0.13	0.026	0.026
Chrysene	0.35	0.079	0.079
Dibenzo(a,h)anthracene	0.032	0.0092	0.0092
Fluoranthene	0.26	0.059	0.059
Fluorene	0.044	0.0092	0.0092
Indeno(1,2,3-cd)pyrene	0.057	0.012	0.012
2-Methylnaphthalene	0.23	0.074	0.074
Naphthalene	1.7	0.46	0.46
Phenanthrene	2.0	0.52	0.52
Pyrene	0.26	0.077	0.077
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.0000149	0.00000825	0.00000825
Inorganic Compounds			
Arsenic	86.9	21	21.4
Iron	100,000	44,000	44,000
Lead	844	190	110
Mercury	16.5	1.4	1.4
Thallium	2.00	0.67	0.67

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

NC - not calculated due to a lack of detections

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-35
Exposure Point Concentrations
Kansas River Floodplain Comprehensive Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Semivolatile Organic Compounds			
Acenaphthene	0.010	0.00171	0.00171
Acenaphthylene	0.0010	0.000495	0.000495
Anthracene	0.0077	0.0014	0.0014
Benzo(a)anthracene	0.093	0.0092	0.0092
Benzo(a)pyrene	0.059	0.0073	0.0073
Benzo(b)fluoranthene	0.061	0.0079	0.0079
Benzo(g,h,i)perylene	0.036	0.0051	0.0051
Benzo(k)fluoranthene	0.051	0.0067	0.0067
Chrysene	0.17	0.017	0.017
Dibenzo(a,h)anthracene	0.012	0.0026	0.0026
Fluoranthene	0.13	0.014	0.014
Fluorene	0.012	0.0020	0.0020
Indeno(1,2,3-cd)pyrene	0.017	0.0095	0.0095
Naphthalene	0.28	0.11	0.11
Phenanthrene	0.81	0.25	0.25
Pyrene	0.13	0.013	0.013
Dioxins-Furans			
Total 2,3,7,8-TCDD Equivalent	0.00000820	0.00000287	0.00000287
Inorganic Compounds			
Arsenic	41.0	8.1	8.1
Iron	85,000	23,377	23,377
Lead	439	85	39
Mercury	1.20	0.14	0.14
Thallium	1.50	0.46	0.46

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

mg/kg - milligrams per kilogram

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-36
Exposure Point Concentrations
Stream Sediment
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration (mg/kg)
Inorganic Compounds			
Arsenic	7.30	6.8	6.8

Notes:
mg/kg - milligrams per kilogram
UCL values calculated using ProUCL Version 5.0 (See Appendix P).
Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Table 6-37
Exposure Point Concentrations
Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Maximum Detected Concentration (ug/L)	Maximum Detected Concentration (mg/cm^3)	Upper Confidence Limit (ug/L)	Exposure Point Concentration (ug/L)
Semivolatile Organic Compounds				
Benzo(a)pyrene	0.0049	4.9E-09	NC	4.9E-09
Benzo(k)fluoranthene	0.0088	8.8E-09	NC	8.8E-09
Chrysene	0.012	1.2E-08	NC	1.2E-08
Pyrene	0.004	4.0E-09	NC	4.0E-09
Dioxins-Furans				
Total 2,3,7,8-TCDD Equivalent	0.00000320	3.20E-12	0.000001378	3.20E-12

Notes:

2,3,7,8-TCDD - Tetrachlorodibenzo-p-dioxin

NC - Not calculated, due to a lack of detections.

ug/L - micrograms per liter

mg/cm^3 - micrograms per cubic meter

UCL values calculated using ProUCL Version 5.0 (See Appendix P).

Exposure point concentration is lower of maximum detected concentration or upper confidence limit.

Maximum detected concentration expressed in mg/cm3 as presented
in the dermal absorption calculations (Tables 6-39 to 6-41).

mg/cm^3 calculated by multiplying ug/L by a factor of 1.0E-06.

Table 6-38
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Worker Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equations:

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$$

$$If\left(t_{event}\right) \le t^*, then: DA_{event} = 2 \times FA \times K_p \times C_w \sqrt{\frac{6 \times T_{event} \times t_{event}}{\pi}}$$

or

$$If\left(t_{event}\right) \ge t^*, then: DA_{event} = FA \times K_p \times C_w \left[\frac{t_{event}}{1+B} + 2 \times T_{event}\left(\frac{1+3 \times B + 3 \times B^2}{\left(1+B\right)^2}\right)\right]$$

Variables:

DAD = Dermally Absorbed Dose (milligrams per kilogram-day [mg/kg-day])
DAevent = Absorbed dose per event (milligrams per square centimeters-event [mg/cm²-event])
EV = Event frequency (events/day)
ED = Exposure duration (years)
EF = Exposure frequency (days/year)
SA = Skin surface area available for contact (square centimeter [cm²])
BW = Body weight [kilograms (kg)]
ATnc = Averaging time - noncancer (days)
ATc = Averaging time - cancer (days)
DAevent = Absorbed dose per event (mg/cm²-event)
FA = Fraction absorbed water (dimensionless)
Kp = Dermal permeability coefficient of compound in water (centimeters per hour [cm/hour])
Cw = Chemical concentration in water (milligrams per cubic centimeter [mg/cm³])
Tevent = Lag time per event (hours/event)
tevent = Event duration (hours/event)
t* = Time to reach steady-state (hours) = 2.4 x Tevent
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)

Table 6-38
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Worker Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Variable Values:

Future Site Worker			Future Construction Worker		
DAD =	Caculated		DAD =	Caculated	
DAevent =	Chemical-specific		DAevent =	Chemical-specific	
EV =	1	events/day	EV =	1	events/day
ED =	25	years	ED =	1	years
EF =	52	days/year	EF =	26	days/year
SA =	5030	cm^2	SA =	5030	cm^2
BW =	80	kg	BW =	80	kg
ATnc =	9125	days	ATnc =	168	days
ATc =	25550	days	ATc =	25550	days
DAevent =	Calculated		DAevent =	Calculated	
FA =	Chemical-specific (USEPA, 2004)		FA =	Chemical-specific (USEPA, 2004)	
Kp =	Chemical-specific (USEPA, 2004)		Kp =	Chemical-specific (USEPA, 2004)	
Cw =	Site-specific (See Table 6-37)		Cw =	Site-specific (See Table 6-37)	
Tevent =	Chemical-specific (USEPA, 2004)		Tevent =	Chemical-specific (USEPA, 2004)	
tevent =	8	hours/event (USEPA, 2004)	tevent =	8	hours/event (USEPA, 2004)
t* =	Calculated		t* =	Calculated	
B =	Chemical-specific (USEPA, 2004)		B =	Chemical-specific (USEPA, 2004)	

Noncancer

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm^3)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm^2-event)	DAD - Site Wkr (mg/kg-day)	DAD - Const Wkr (mg/kg-day)
Semivolatile Organic Compounds									
Benzo(a)pyrene	1.0	7.00E-01	4.90E-09	2.69	6.46	4.3	5.07E-08	4.55E-07	4.94E-07
Benzo(k)fluoranthene	NAv	NAv	8.80E-09	NAv	NC	NAv	NC	NC	NC
Chrysene	1.0	4.70E-01	1.20E-08	2.03	4.87	2.8	6.41E-08	5.74E-07	6.24E-07
Pyrene	NAv	NAv	4.00E-09	NAv	NC	NAv	NC	NC	NC
Dioxins-Furans									
2,3,7,8-TCDD	0.50	8.10E-01	8.29E-13	6.82	16.4	5.6	6.85E-12	6.14E-11	6.67E-11

Cancer

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm^3)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm^2-event)	DAD - Site Wkr (mg/kg-day)	DAD - Const Wkr (mg/kg-day)
Semivolatile Organic Compounds									
Benzo(a)pyrene	1.0	7.00E-01	4.90E-09	2.69	6.46	4.3	5.07E-08	1.62E-07	3.25E-09
Benzo(k)fluoranthene	NAv	NAv	8.80E-09	NAv	NC	NAv	NC	NC	NC
Chrysene	1.0	4.70E-01	1.20E-08	2.03	4.87	2.8	6.41E-08	2.05E-07	4.10E-09
Pyrene	NAv	NAv	4.00E-09	NAv	NC	NAv	NC	NC	NC
Dioxins-Furans									
2,3,7,8-TCDD	0.50	0.81	8.29E-13	6.82	16.4	5.6	6.85E-12	2.19E-11	4.39E-13

Table 6-39
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Visitor Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equations:

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$$

$$If\left(t_{event}\right) \leq t^*, then: DA_{event} = 2 \times FA \times K_p \times C_w \sqrt{\frac{6 \times T_{event} \times t_{event}}{\pi}}$$

or

$$If\left(t_{event}\right) \geq t^*, then: DA_{event} = FA \times K_p \times C_w \left[\frac{t_{event}}{1+B} + 2 \times T_{event}\left(\frac{1+3 \times B + 3 \times B^2}{\left(1+B\right)^2}\right)\right]$$

Variables:

DAD = Dermally Absorbed Dose (milligrams per kilogram-day [mg/kg-day])
DAevent = Absorbed dose per event (milligrams per square centimeters-event [mg/cm^2-event])
EV = Event frequency (events/day)
ED = Exposure duration (years)
EF = Exposure frequency (days/year)
SA = Skin surface area available for contact (square centimeter [cm^2])
BW = Body weight [kilograms (kg)]
ATnc = Averaging time - noncancer (days)
ATc = Averaging time - cancer (days)
DAevent = Absorbed dose per event (mg/cm^2-event)
FA = Fraction absorbed water (dimensionless)
Kp = Dermal permeability coefficient of compound in water (centimeters per hour [cm/hour])
Cw = Chemical concentration in water (milligrams per cubic centimeter [mg/cm^3])
Tevent = Lag time per event (hours/event)
tevent = Event duration (hours/event)
t* = Time to reach steady-state (hours) = 2.4 x Tevent
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)

Table 6-39
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Visitor Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Variable Values:

Current/Future Site-Wide Child Visitor

DAD =	Caculated	
DAevent =	Chemical-specific	
EV =	1	
ED =	6	
EF =	52	
SA =	2690	
BW =	15	
ATnc =	2190	
ATc =	25550	
DAevent =	Calculated	
FA =	Chemical-specific (USEPA, 2004)	
Kp =	Chemical-specific (USEPA, 2004)	
Cw =	Site-specific (See Table 6-37)	
Tevent =	Chemical-specific (USEPA, 2004)	
tevent =	4.5	hours/event
t* =	Calculated	
B =	Chemical-specific (USEPA, 2004)	

Current/Future Site-Wide Youth Visitor

DAD =	Caculated	
DAevent =	Chemical-specific	
EV =	1	events/day
ED =	6	years
EF =	52	days/year
SA =	7365	cm²
BW =	44.3	kg
ATnc =	2190	days
ATc =	25550	days
DAevent =	Calculated	
FA =	Chemical-specific (USEPA, 2004)	
Kp =	Chemical-specific (USEPA, 2004)	
Cw =	Site-specific (See Table 6-37)	
Tevent =	Chemical-specific (USEPA, 2004)	
tevent =	2	hours/event
t* =	Calculated	
B =	Chemical-specific (USEPA, 2004)	

Current/Future Site-Wide Adult Visitor

DAD =	Caculated	
DAevent =	Chemical-specific	
EV =	1	events/day
ED =	20	years
EF =	52	days/year
SA =	11430	cm²
BW =	80	kg
ATnc =	7300	days
ATc =	25550	days
DAevent =	Calculated	
FA =	Chemical-specific (USEPA, 2004)	
Kp =	Chemical-specific (USEPA, 2004)	
Cw =	Site-specific (See Table 6-37)	
Tevent =	Chemical-specific (USEPA, 2004)	
tevent =	4.8	hours/event
t* =	Calculated	
B =	Chemical-specific (USEPA, 2004)	

Noncancer

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm³)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm²-event)	DAD - Child (mg/kg-day)	DAD - Youth (mg/kg-day)	DAD - Adult (mg/kg-day)
Semivolatile Organic Compounds										
Benzo(a)pyrene	1.0	7.00E-01	4.90E-09	2.69	6.46	4.3	2.20E-08	5.62E-07	5.21E-07	4.48E-07
Benzo(k)fluoranthene	NAv	NAv	8.8E-09	NAv	NC	NAv	NC	NC	NC	NC
Chrysene	1	0.47	1.2E-08	2.03	4.872	2.8	3.14104E-08	8.02499E-07	7.43965E-07	6.39351E-07
Pyrene	NAv	NAv	4E-09	NAv	NC	NAv	NC	NC	NC	NC
Dioxins-Furans										
2,3,7,8-TCDD	0.5	0.81	8.29E-13	6.82	16.368	5.6	3.43E-12	8.76E-11	8.12E-11	6.98E-11

Cancer

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm³)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm²-event)	DAD - Child (mg/kg-day)	DAD - Youth (mg/kg-day)	DAD - Adult (mg/kg-day)
Semivolatile Organic Compounds										
Benzo(a)pyrene	1.0	0.7	4.9E-09	2.69	6.456	4.3	2.19895E-08	4.82E-08	4.46E-08	1.28E-07
Benzo(k)fluoranthene	NAv	NAv	8.8E-09	NAv	NC	NAv	NC	NC	NC	NC
Chrysene	1	0.47	1.2E-08	2.03	4.872	2.8	3.14104E-08	6.87856E-08	6.37684E-08	1.82672E-07
Pyrene	NAv	NAv	4E-09	NAv	NC	NAv	NC	NC	NC	NC
Dioxins-Furans										
2,3,7,8-TCDD	0.5	0.81	8.29E-13	6.82	16.4	5.6	3.42726E-12	7.51E-12	6.96E-12	1.99E-11

Table 6-40
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Resident Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equations:

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$$

$$If\left(t_{event}\right) \leq t^*, then: DA_{event} = 2 \times FA \times K_p \times C_w \sqrt{\frac{6 \times T_{event} \times t_{event}}{\pi}}$$

or

$$If\left(t_{event}\right) \geq t^*, then: DA_{event} = FA \times K_p \times C_w \left[\frac{t_{event}}{1+B} + 2 \times T_{event}\left(\frac{1+3 \times B+3 \times B^2}{(1+B)^2}\right)\right]$$

Variables:

DAD = Dermally Absorbed Dose (milligrams per kilogram-day [mg/kg-day])
DAevent = Absorbed dose per event (milligrams per square centimeters-event [mg/cm²-event])
EV = Event frequency (events/day)
ED = Exposure duration (years)
EF = Exposure frequency (days/year)
SA = Skin surface area available for contact (square centimeter [cm²])
BW = Body weight [kilograms (kg)]
ATnc = Averaging time - noncancer (days)
ATc = Averaging time - cancer (days)
DAevent = Absorbed dose per event (mg/cm²-event)
FA = Fraction absorbed water (dimensionless)
Kp = Dermal permeability coefficient of compound in water (centimeters per hour [cm/hour])
Cw = Chemical concentration in water (milligrams per cubic centimeter [mg/cm³])
Tevent = Lag time per event (hours/event)
tevent = Event duration (hours/event)
t* = Time to reach steady-state (hours) = 2.4 x Tevent
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve) (dimensionless)

Table 6-40
Dermal Absorbed Dose per Event for Organic Compounds in Surface Water
Resident Scenarios
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Variable Values:

Future Floodplain Child Resident

DAD =	Caculated	
DAevent =	Chemical-specific	
EV =	1	events/day
ED =	6	years
	2	0-2 years
	4	2-6 years
EF =	72	days/year
SA =	2690	cm²
BW =	15	kg
ATnc =	2190	days
ATc =	25550	days
DAevent =	Calculated	
FA =	Chemical-specific	(USEPA, 2004)
Kp =	Chemical-specific	(USEPA, 2004)
Cw =	Site-specific	(See Table 6-24)
Tevent =	Chemical-specific	(USEPA, 2004)
tevent =	4.5	hours/event (USEPA, 2011)
t* =	Calculated	
B =	Chemical-specific	(USEPA, 2004)

Future Floodplain Adult Resident

DAD =	Caculated	
DAevent =	Chemical-specific	
EV =	1	events/day
ED =	20	years
	10	6-16 years
	10	16-26 years
EF =	72	days/year
SA =	6032	cm²
BW =	80	kg
ATnc =	7300	days
ATc =	25550	days
DAevent =	Calculated	
FA =	Chemical-specific	(USEPA, 2004)
Kp =	Chemical-specific	(USEPA, 2004)
Cw =	Site-specific	(See Table 6-24)
Tevent =	Chemical-specific	(USEPA, 2004)
tevent =	3.5	hours/event (USEPA, 2011)
t* =	Calculated	
B =	Chemical-specific	(USEPA, 2004)

Noncancer

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm³)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm²-event)	DAD - Child (mg/kg-day)	DAD - Adult (mg/kg-day)
Semivolatile Organic Compounds									
Benzo(a)pyrene	1.0	7.00E-01	4.90E-09	2.69	6.46	4.3	3.30E-08	1.17E-06	4.91E-07
Benzo(k)fluoranthene	NAv	NAv	8.80E-09	NAv	NC	NAv	NC	NC	NC
Chrysene	1.0	4.70E-01	1.20E-08	2.03	4.87	2.8	4.71E-08	1.67E-06	7.01E-07
Pyrene	NAv	NAv	4.00E-09	NAv	NC	NAv	NC	NC	NC
Dioxins-Furans									
2,3,7,8-TCDD	0.50	8.10E-01	8.29E-13	6.82	16.4	5.6	3.43E-12	1.21E-10	5.10E-11

Cancer/Mutagen

Chemical	FA (dimensionless)	Kp (cm/hour)	CW (mg/cm³)	Tevent (hours/event)	t* (hours)	B (dimensionless)	DAevent (mg/cm²-event)	DAD - Cancer (mg/kg-day)	DAD - Mutagen (mg/kg-day)
Semivolatile Organic Compounds									
Benzo(a)pyrene	1	0.7	4.9E-09	2.69	6.456	4.3	3.29843E-08	2.40E-07	8.14E-07
Benzo(k)fluoranthene	NAv	NAv	8.80E-09	NAv	NC	NAv	NC	NC	NC
Chrysene	1.0	4.70E-01	1.20E-08	2.03	4.87	2.8	4.71E-08	3.43E-07	1.16E-06
Pyrene	NAv	NAv	4.00E-09	NAv	NC	NAv	NC	NC	NC
Dioxins-Furans									
2,3,7,8-TCDD	0.5	0.81	8.29E-13	6.82	16.368	5.6	3.42726E-12	2.50E-11	8.46E-11

Table 6-41
Volatilization Factor to Outdoor Air from Soil *
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$VFout = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

$$D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$$ and $$\frac{Q}{C}\left(g/m^2\text{ - s per kg/m}^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Where:

VFout = Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C = Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da = Apparent diffusivity (squared centimeters per second [cm²/s])
T = Exposure interval (seconds [s])
UC = Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb = Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas = Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di = Diffusion coefficient in air (cm²/s)
H' = Henry's law constant (unitless)
Ows = Water-filled porosity in vadose zone soil (L/L)
Dw = Diffusion coefficient in water (cm²/s)
Ot = Total soil porosity (L/L)
Kd = Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc = Carbon-water sorption coefficient (cm³/g)
foc = Fraction organic carbon (unitless)
A = Constant based on air dispersion modeling for specific climate zones [unitless]
Asite = Extent of the site or contamination [acres]
B = Constant based on air dispersion modeling for specific climate zones [unitless]
C = Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	8.26E+01	g/m²-sec per kg/m³ (Calculated)
T =	8E+08	s (represents 25-year exposure duration)
UC =	1E-04	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	0.5	acres (total acreage of Upland Terrace)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-41
Volatilization Factor to Outdoor Air from Soil *
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	7.50E-03	5.00E+03	1.00E+01	5.10E-02	8.30E-06	1.43E-06	1.24E+05
Anthracene	2.30E-03	1.60E+04	3.20E+01	3.90E-02	7.90E-06	1.10E-07	4.50E+05
Benzo(a)anthracene	4.90E-04	1.80E+05	3.60E+02	2.60E-02	6.70E-06	1.68E-09	3.63E+06
Fluorene	3.90E-03	9.20E+03	1.84E+01	4.40E-02	7.90E-06	3.56E-07	2.50E+05
Naphthalene	1.80E-02	1.50E+03	3.00E+00	6.00E-02	8.40E-06	1.29E-05	4.14E+04
Pyrene	4.90E-04	5.40E+04	1.08E+02	2.80E-02	7.20E-06	6.04E-09	1.92E+06
Dioxins-Furans							
2,3,7,8-TCDD	2.00E-03	2.50E+05	5.00E+02	4.70E-02	6.80E-06	7.33E-09	1.74E+06

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-42
Volatilization Factor to Outdoor Air from Soil *
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$\text{VFout} = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

$$D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$$

and

$$\frac{Q}{C}\left(g/m^2 \text{ - s per } kg/m^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Where:

VFout = Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C = Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da = Apparent diffusivity (squared centimeters per second [cm²/s])
T = Exposure interval (seconds [s])
UC = Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb = Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas = Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di = Diffusion coefficient in air (cm²/s)
H' = Henry's law constant (unitless)
Ows = Water-filled porosity in vadose zone soil (L/L)
Dw = Diffusion coefficient in water (cm²/s)
Ot = Total soil porosity (L/L)
Kd = Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc = Carbon-water sorption coefficient (cm³/g)
foc = Fraction organic carbon (unitless)
A = Constant based on air dispersion modeling for specific climate zones [unitless]
Asite = Extent of the site or contamination [acres]
B = Constant based on air dispersion modeling for specific climate zones [unitless]
C = Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	8.26E+01	g/m²-sec per kg/m³ (Calculated)
T =	8E+08	s (represents 25-year exposure duration)
UC =	1E-04	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	0.5	acres (total acreage of Floodplain Slope)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-42
Volatilization Factor to Outdoor Air from Soil *
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	124439.041
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	449791.6129
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	3627847.687
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	249595.8306
2-Methylnaphthalene	0.021	2500	5	0.052	0.0000078	7.98607E-06	52685.9
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	41449.39407
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	1916173.873
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	1739486.061

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-43
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$VFout = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

Where $D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$ and $\frac{Q}{C}\left(g/m^2 - s \text{ per } kg/m^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	72.92122939	g/m²-sec per kg/m³ (Calculated)
T =	788400000	s (represents 25-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	1	acres (total acreage of Floodplain)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-43
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	109869.8814
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	397130.6012
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	3203104.041
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	220373.4783
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	36596.55342
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	1691830.751
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	1535829.316

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-44
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$\mathrm{VFout} = \frac{\mathrm{Q/C} \times (3.14 \times \mathrm{D_a} \times \mathrm{T})^{1/2} \times \mathrm{UC}}{(2 \times \mathrm{P_b} \times \mathrm{D_a})}$$

Where
$$\mathrm{D_a} = \frac{\left[\left(\Theta_{as}^{3.33} \times \mathrm{D^i} \times \mathrm{H'} + \Theta_{ws}^{3.33} \times \mathrm{D_w}\right) / \Theta_t^2\right]}{\mathrm{P_b} \times \mathrm{K_d} + \Theta_{ws} + \Theta_{as} \times \mathrm{H'}}$$
and
$$\frac{\mathrm{Q}}{\mathrm{C}}\left(\mathrm{g/m^2\text{-}s\ per\ kg/m^2}\right) = \mathrm{A} \times \exp\left[\frac{(\ln \mathrm{A_{site}} - \mathrm{B})^2}{\mathrm{C}}\right]$$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	72.92122939	g/m²-sec per kg/m³ (Calculated)
T =	31536000	s (represents 1-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	1	acres (total acreage of Floodplain Slope)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-44
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	21973.97628
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	79426.12025
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	640620.8083
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	44074.69567
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	7319.310683
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	338366.1503
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	307165.8632

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m¹/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-45
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$VFout = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

$$D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$$

and

$$\frac{Q}{C}\left(g/m^2 - s \text{ per } kg/m^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Where:

VFout = Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C = Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da = Apparent diffusivity (squared centimeters per second [cm²/s])
T = Exposure interval (seconds [s])
UC = Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb = Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas = Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di = Diffusion coefficient in air (cm²/s)
H' = Henry's law constant (unitless)
Ows = Water-filled porosity in vadose zone soil (L/L)
Dw = Diffusion coefficient in water (cm²/s)
Ot = Total soil porosity (L/L)
Kd = Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc = Carbon-water sorption coefficient (cm³/g)
foc = Fraction organic carbon (unitless)
A = Constant based on air dispersion modeling for specific climate zones [unitless]
Asite = Extent of the site or contamination [acres]
B = Constant based on air dispersion modeling for specific climate zones [unitless]
C = Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	6.47E+01	g/m²-sec per kg/m³ (Calculated)
T =	2E+08	s (represents 6-year exposure duration)
UC =	1E-04	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	2	acres (total acreage of CFI)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-45
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm³/g)	Kd (cm³/g)	Di (cm²/s)	Dw (cm²/s)	Da (cm²/s)	VF (m³/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	47738.65174
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	172553.9268
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	1391754.195
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	95752.65398
2-Methylnaphthalene	0.021	2500	5	0.052	0.0000078	7.98607E-06	20211.93519
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	15901.26517
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	735103.3606
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	667320.4695

Notes:
*USEPA, 2002
NC - Not calculated
*USEPA, 2002

Table 6-46
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$\mathrm{VFout} = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

Where

$$D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$$

and

$$\frac{Q}{C}\left(g/m^2\text{-}s \text{ per } kg/m^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	64.67824353	g/m²-sec per kg/m³ (Calculated)
T =	189200000	s (represents 6-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	2	acres (total acreage of CFI)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-46
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	47738.65174
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	172553.9268
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	1391754.195
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	95752.65398
2-Methylnaphthalene	0.021	2500	5	0.052	0.0000078	7.98607E-06	20211.93519
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	15901.26517
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	735103.3606
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	667320.4695

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-47
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$VFout = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

Where $D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$ and $\frac{Q}{C}\left(g/m^2 - s \text{ per } kg/m^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	64.67824353	g/m²-sec per kg/m³ (Calculated)
T =	631152000	s (represents 20-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	2	acres (total acreage of CFI)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-47
Volatilization Factor to Outdoor Air from Soil *
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	87191.98496
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	315160.1237
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	2541961.417
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	174886.8822
2-Methylnaphthalene	0.021	2500	5	0.052	0.0000078	7.98607E-06	36915.97238
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	29042.774
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	1342625.29
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	1218823.62

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-48
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Child Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$VFout = \frac{Q/C \times (3.14 \times D_a \times T)^{1/2} \times UC}{(2 \times P_b \times D_a)}$$

Where $$D_a = \frac{\left[\left(\Theta_{as}^{3.33} \times D^i \times H' + \Theta_{ws}^{3.33} \times D_w\right) / \Theta_t^2\right]}{P_b \times K_d + \Theta_{ws} + \Theta_{as} \times H'}$$ and $$\frac{Q}{C}\left(g/m^2\text{ - s per kg/m}^2\right) = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	72.92122939	g/m²-sec per kg/m³ (Calculated)
T =	189200000	s (represents 6-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	1	acres (total acreage of Floodplain)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-48
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Child Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	53822.75375
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	194545.241
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	1569127.752
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	107955.9503
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	17927.81841
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	828789.3712
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	752367.8192

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-49
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Adult Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Equation:

$$\text{VFout} = \frac{\text{Q/C} \times (3.14 \times \text{D}_a \times \text{T})^{1/2} \times \text{UC}}{(2 \times \text{P}_b \times \text{D}_a)}$$

Where $$\text{D}_a = \frac{\left[\left(\Theta_{as}^{3.33} \times \text{D}^i \times \text{H}' + \Theta_{ws}^{3.33} \times \text{D}_w\right) / \Theta_t^2\right]}{\text{P}_b \times \text{K}_d + \Theta_{ws} + \Theta_{as} \times \text{H}'}$$ and $$\frac{\text{Q}}{\text{C}}(\text{g/m}^2\text{-s per kg/m}^2) = \text{A} \times \exp\left[\frac{(\ln \text{A}_{site} - \text{B})^2}{\text{C}}\right]$$

Where:

VFout =	Volatilization factor from soil to outdoor air (cubic meters per kilogram [m³/kg])
Q/C =	Inverse of the mean concentration at the center of a 55 acre square source (grams per squared meter-seconds per kilogram per cubic meter [g/m²-s per kg/m³])
Da =	Apparent diffusivity (squared centimeters per second [cm²/s])
T =	Exposure interval (seconds [s])
UC =	Unit conversion (squared meters per squared centimeter [m²/cm²])
Pb =	Dry soil bulk density (grams per cubic centimeter [g/cm³])
Oas =	Air-filled porosity in vadose zone soil (liters per liter [L/L])
Di =	Diffusion coefficient in air (cm²/s)
H' =	Henry's law constant (unitless)
Ows =	Water-filled porosity in vadose zone soil (L/L)
Dw =	Diffusion coefficient in water (cm²/s)
Ot =	Total soil porosity (L/L)
Kd =	Soil-water sorption coefficient (cubic centimeters per gram [cm³/g]) (Koc x foc)
Koc =	Carbon-water sorption coefficient (cm³/g)
foc =	Fraction organic carbon (unitless)
A =	Constant based on air dispersion modeling for specific climate zones [unitless]
Asite =	Extent of the site or contamination [acres]
B =	Constant based on air dispersion modeling for specific climate zones [unitless]
C =	Constant based on air dispersion modeling for specific climate zones [unitless]

Variables:

VFout =	Calculated	
Da =	Calculated	
Q/C =	72.92122939	g/m²-sec per kg/m³ (Calculated)
T =	631152000	s (represents 20-year exposure duration)
UC =	0.0001	m²/cm²
Pb =	1.38	g/cm³ (USEPA, 2002)
Oas =	0.265	L/L (Ot - Ows)
Di =	Chemical-specific (USEPA, 1996)	
H' =	Chemical-specific (USEPA, 1996)	
Ows =	0.216	L/L (USEPA, 2002)
Dw =	Chemical-specific (USEPA, 1996)	
Ot =	0.481	L/L (USEPA, 2002)
Kd =	Chemical-specific (calculated)	
Koc =	Chemical-specific (USEPA, 1996)	
foc =	0.002	unitless (USEPA, 2002)
A =	14.1901	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
Asite =	1	acres (total acreage of Floodplain)
B =	18.5634	(represents Zone 5-Lincoln, NE) (USEPA, 2002)
C =	210.5281	(represents Zone 5-Lincoln, NE) (USEPA, 2002)

Table 6-49
Volatilization Factor to Outdoor Air from Soil *
Future Kansas River Floodplain Adult Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	H' (unitless)	Koc (cm^3/g)	Kd (cm^3/g)	Di (cm^2/s)	Dw (cm^2/s)	Da (cm^2/s)	VF (m^3/kg)
Semivolatile Organic Compounds							
Acenaphthene	0.0075	5000	10	0.051	0.0000083	1.43156E-06	98304.25796
Anthracene	0.0023	16000	32	0.039	0.0000079	1.09572E-07	355326.0327
Benzo(a)anthracene	0.00049	180000	360	0.026	0.0000067	1.68432E-09	2865924.327
Fluorene	0.0039	9200	18.4	0.044	0.0000079	3.55834E-07	197175.5224
Naphthalene	0.018	1500	3	0.06	0.0000084	1.29029E-05	32744.16047
Pyrene	0.00049	54000	108	0.028	0.0000072	6.03743E-09	1513737.564
Dioxins-Furans							
2,3,7,8-TCDD	0.002	250000	500	0.047	0.0000068	7.32622E-09	1374157.861

Notes:
*USEPA, 2002
In accordance with the USEPA RSL Users Guide (USEPA, 2015), VF is only calculated for chemicals with an H' greater than or equal to 1E-05 atm-m^1/mole, or a vapor pressure greater than or equal to 1 mm Hg.

Table 6-50
Chemical Concentrations in Outdoor Air
Current/Future Upland Terrace Rail Worker Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil: Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	Concentration Used in Risk Assessment (mg/m^3)
Semivolatile Organic Compounds				
Acenaphthene	3.23E-03	1.24E+05	2.60E-08	2.60E-08
Anthracene	8.68E-03	4.50E+05	1.93E-08	1.93E-08
Benzo(a)anthracene	2.95E-02	3.63E+06	8.13E-09	8.13E-09
Fluorene	3.07E-03	2.50E+05	1.23E-08	1.23E-08
Naphthalene	6.23E-02	4.14E+04	1.50E-06	1.50E-06
Pyrene	3.44E-02	1.92E+06	1.79E-08	1.79E-08
Dioxins-Furans				
2,3,7,8-TCDD	2.70E-06	1.74E+06	1.55E-12	1.55E-12

Notes:
Table includes all volatile COPCs in soil.
mg/kg - milligrams per kilogram
m^3/kg - cubic meters per kilogram
mg/m^3 - milligrams per cubic meter
Concentration in soil from EPC table 6-33.
Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-51
Chemical Concentrations in Outdoor Air
Future Floodplain Slope Worker Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil			Concentration Used in Risk Assessment (mg/m^3)
	Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	
Semivolatile Organic Compounds				
Acenaphthene	6.43E-03	1.24E+05	5.19E-08	5.19E-08
Anthracene	1.00E-02	4.50E+05	2.22E-08	2.22E-08
Benzo(a)anthracene	4.32E-02	3.63E+06	1.19E-08	1.19E-08
Fluorene	9.16E-03	2.50E+05	3.66E-08	3.66E-08
2-Methylnaphthalene	7.42E-02	5.27E+04	1.41E-06	1.41E-06
Naphthalene	4.56E-01	4.14E+04	1.10E-05	1.10E-05
Pyrene	7.65E-02	1.92E+06	3.98E-08	3.98E-08
Dioxins-Furans				
2,3,7,8-TCDD	8.25E-06	1.74E+06	4.74E-12	4.74E-12

Notes:

Table includes all volatile COPCs in soil.

mg/kg - milligrams per kilogram

m^3/kg - cubic meters per kilogram

mg/m^3 - milligrams per cubic meter

Concentration in soil from EPC table 6-34.

Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-52
Chemical Concentrations in Outdoor Air
Future Kansas River Floodplain Worker Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil: Concentration in Soil (mg/kg)	Calculated Chemical Concentration in Outdoor Air Based on Soil: Volatilization Factor (m^3/kg)	Calculated Chemical Concentration in Outdoor Air Based on Soil: Modeled Concentration (mg/m^3)	Concentration Used in Risk Assessment (mg/m^3)
Semivolatile Organic Compounds				
Acenaphthene	1.71E-03	1.10E+05	1.55E-08	1.55E-08
Anthracene	1.37E-03	3.97E+05	3.45E-09	3.45E-09
Benzo(a)anthracene	9.21E-03	3.20E+06	2.88E-09	2.88E-09
Fluorene	1.99E-03	2.20E+05	9.05E-09	9.05E-09
Naphthalene	1.08E-01	3.66E+04	2.95E-06	2.95E-06
Pyrene	1.29E-02	1.69E+06	7.63E-09	7.63E-09
Dioxins-Furans				
2,3,7,8-TCDD	2.87E-06	1.54E+06	1.86E-12	1.86E-12

Notes:
Table includes all volatile COPCs in soil.
mg/kg - milligrams per kilogram
m^3/kg - cubic meters per kilogram
mg/m^3 - milligrams per cubic meter
Concentration in soil from EPC table 6-35.
Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-53
Chemical Concentrations in Outdoor Air
Future Kansas River Floodplain Construction Worker Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil			Concentration Used in Risk Assessment (mg/m^3)
	Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	
Semivolatile Organic Compounds				
Acenaphthene	1.71E-03	2.20E+04	7.77E-08	7.77E-08
Anthracene	1.37E-03	7.94E+04	1.73E-08	1.73E-08
Benzo(a)anthracene	9.21E-03	6.41E+05	1.44E-08	1.44E-08
Fluorene	1.99E-03	4.41E+04	4.51E-08	4.51E-08
Naphthalene	1.08E-01	7.32E+03	1.48E-05	1.48E-05
Pyrene	1.29E-02	3.38E+05	3.82E-08	3.82E-08
Dioxins-Furans				
2,3,7,8-TCDD	2.87E-06	3.07E+05	9.35E-12	9.35E-12

Notes:

Table includes all volatile COPCs in soil.

mg/kg - milligrams per kilogram

m^3/kg - cubic meters per kilogram

mg/m^3 - milligrams per cubic meter

Concentration in soil from EPC table 6-35.

Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-54
Chemical Concentrations in Outdoor Air
Current/Future Site-Wide Child Visitor Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil: Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	Concentration Used in Risk Assessment (mg/m^3)
Semivolatile Organic Compounds				
Acenaphthene	3.30E-03	4.77E+04	6.92E-08	6.92E-08
Anthracene	6.10E-03	1.73E+05	3.53E-08	3.53E-08
Benzo(a)anthracene	3.11E-02	1.39E+06	2.24E-08	2.24E-08
Fluorene	1.08E-02	9.58E+04	1.13E-07	1.13E-07
2-Methylnaphthalene	4.58E-02	2.02E+04	2.27E-06	2.27E-06
Naphthalene	1.92E-01	1.59E+04	1.21E-05	1.21E-05
Pyrene	4.72E-02	7.35E+05	6.42E-08	6.42E-08
Dioxins-Furans				
2,3,7,8-TCDD	3.66E-06	6.67E+05	5.49E-12	5.49E-12

Notes:

Table includes all volatile COPCs in soil.

mg/kg - milligrams per kilogram

m^3/kg - cubic meters per kilogram

mg/m^3 - milligrams per cubic meter

Concentration in soil from EPC table 6-32.

Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-55
Chemical Concentrations in Outdoor Air
Current/Future Site-Wide Youth Visitor Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

	Calculated Chemical Concentration in Outdoor Air Based on Soil			
Chemical	**Concentration in Soil (mg/kg)**	**Volatilization Factor (m^3/kg)**	**Modeled Concentration (mg/m^3)**	**Concentration Used in Risk Assessment (mg/m^3)**
Semivolatile Organic Compounds				
Acenaphthene	3.30E-03	4.77E+04	6.92E-08	6.92E-08
Anthracene	6.10E-03	1.73E+05	3.53E-08	3.53E-08
Benzo(a)anthracene	3.11E-02	1.39E+06	2.24E-08	2.24E-08
Fluorene	1.08E-02	9.58E+04	1.13E-07	1.13E-07
2-Methylnaphthalene	4.58E-02	2.02E+04	2.27E-06	2.27E-06
Naphthalene	1.92E-01	1.59E+04	1.21E-05	1.21E-05
Pyrene	4.72E-02	7.35E+05	6.42E-08	6.42E-08
Dioxins-Furans				
2,3,7,8-TCDD	3.66E-06	6.67E+05	5.49E-12	5.49E-12

Notes:
Table includes all volatile COPCs in soil.
mg/kg - milligrams per kilogram
m^3/kg - cubic meters per kilogram
mg/m^3 - milligrams per cubic meter
Concentration in soil from EPC table 6-32.
Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-56
Chemical Concentrations in Outdoor Air
Current/Future Site-Wide Adult Visitor Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil: Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	Concentration Used in Risk Assessment (mg/m^3)
Semivolatile Organic Compounds				
Acenaphthene	3.30E-03	8.72E+04	3.78E-08	3.78E-08
Anthracene	6.10E-03	3.15E+05	1.94E-08	1.94E-08
Benzo(a)anthracene	3.11E-02	2.54E+06	1.22E-08	1.22E-08
Fluorene	1.08E-02	1.75E+05	6.17E-08	6.17E-08
2-Methylnaphthalene	4.58E-02	3.69E+04	1.24E-06	1.24E-06
Naphthalene	1.92E-01	2.90E+04	6.62E-06	6.62E-06
Pyrene	4.72E-02	1.34E+06	3.52E-08	3.52E-08
Dioxins-Furans				
2,3,7,8-TCDD	3.66E-06	1.22E+06	3.00E-12	3.00E-12

Notes:
Table includes all volatile COPCs in soil.
mg/kg - milligrams per kilogram
m^3/kg - cubic meters per kilogram
mg/m^3 - milligrams per cubic meter
Concentration in soil from EPC table 6-32.
Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-57
Chemical Concentrations in Outdoor Air
Future Kansas River Floodplain Child Resident Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil: Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	Concentration Used in Risk Assessment (mg/m^3)
Semivolatile Organic Compounds				
Acenaphthene	1.71E-03	5.38E+04	3.18E-08	3.18E-08
Anthracene	1.37E-03	1.95E+05	7.03E-09	7.03E-09
Benzo(a)anthracene	9.21E-03	1.57E+06	5.87E-09	5.87E-09
Fluorene	1.99E-03	1.08E+05	1.84E-08	1.84E-08
Naphthalene	1.08E-01	1.79E+04	6.03E-06	6.03E-06
Pyrene	1.29E-02	8.29E+05	1.56E-08	1.56E-08
Dioxins-Furans				
2,3,7,8-TCDD	2.87E-06	7.52E+05	3.82E-12	3.82E-12

Notes:

Table includes all volatile COPCs in soil.

mg/kg - milligrams per kilogram

m^3/kg - cubic meters per kilogram

mg/m^3 - milligrams per cubic meter

Concentration in soil from EPC table 6-35.

Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-58
Chemical Concentrations in Outdoor Air
Future Kansas River Floodplain Adult Resident Scenario
WWI Inicnerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Calculated Chemical Concentration in Outdoor Air Based on Soil			Concentration Used in Risk Assessment (mg/m^3)
	Concentration in Soil (mg/kg)	Volatilization Factor (m^3/kg)	Modeled Concentration (mg/m^3)	
Semivolatile Organic Compounds				
Acenaphthene	1.71E-03	9.83E+04	1.74E-08	1.74E-08
Anthracene	1.37E-03	3.55E+05	3.86E-09	3.86E-09
Benzo(a)anthracene	9.21E-03	2.87E+06	3.21E-09	3.21E-09
Fluorene	1.99E-03	1.97E+05	1.01E-08	1.01E-08
Naphthalene	1.08E-01	3.27E+04	3.30E-06	3.30E-06
Pyrene	1.29E-02	1.51E+06	8.54E-09	8.54E-09
Dioxins-Furans				
2,3,7,8-TCDD	2.87E-06	1.37E+06	2.09E-12	2.09E-12

Notes:

Table includes all volatile COPCs in soil.

mg/kg - milligrams per kilogram

m^3/kg - cubic meters per kilogram

mg/m^3 - milligrams per cubic meter

Concentration in soil from EPC table 6-35.

Modeled concentration calculated by dividing the concentration in soil by the volatilization factor.

Table 6-59
Hazard Index Estimates for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	4.80E-09	6E-02	8E-08		
Acenaphthylene	7.49E-09	NAv	NAp		
Anthracene	1.10E-08	3E-01	4E-08		
Benzo(a)anthracene	3.72E-08	NAv	NAp		
Benzo(a)pyrene	3.66E-08	NAv	NAp		
Benzo(b)fluoranthene	4.60E-08	NAv	NAp		
Benzo(g,h,i)perylene	3.64E-08	NAv	NAp		
Benzo(k)fluoranthene	3.27E-08	NAv	NAp		
Chrysene	3.60E-09	NAv	NAp		
Dibenzo(a,h)anthracene	7.70E-09	NAv	NAp		
Fluoranthene	5.56E-08	4E-02	1E-06		
Fluorene	5.30E-09	4E-02	1E-07		
Indeno(1,2,3-cd)pyrene	2.25E-08	NAv	NAp		
Naphthalene	1.34E-07	2E-02	7E-06		
Phenanthrene	1.95E-07	NAv	NAp		
Pyrene	5.27E-08	3E-02	2E-06		
Dioxins-Furans					
2,3,7,8-TCDD	4.61E-12	7E-10	7E-03		
Inorganic Compounds					
Arsenic	9.25E-06	3E-04	3E-02		
				4E-02	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	2.64E-09	6E-02	4E-08		
Acenaphthylene	4.12E-09	NAv	NAp		
Anthracene	6.08E-09	3E-01	2E-08		
Benzo(a)anthracene	2.05E-08	NAv	NAp		
Benzo(a)pyrene	2.01E-08	NAv	NAp		
Benzo(b)fluoranthene	2.53E-08	NAv	NAp		
Benzo(g,h,i)perylene	2.00E-08	NAv	NAp		
Benzo(k)fluoranthene	1.80E-08	NAv	NAp		
Chrysene	1.98E-09	NAv	NAp		
Dibenzo(a,h)anthracene	4.23E-09	NAv	NAp		
Fluoranthene	3.06E-08	4E-02	8E-07		
Fluorene	2.92E-09	4E-02	7E-08		
Indeno(1,2,3-cd)pyrene	1.24E-08	NAv	NAp		
Naphthalene	7.35E-08	2E-02	4E-06		
Phenanthrene	1.07E-07	NAv	NAp		
Pyrene	2.90E-08	3E-02	1E-06		
Dioxins-Furans					
2,3,7,8-TCDD	5.85E-13	7E-10	8E-04		
Inorganic Compounds					
Arsenic	1.17E-06	3E-04	4E-03		
				5E-03	

Table 6-59
Hazard Index Estimates for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	9.73E-13	NAv	NAp		
Acenaphthylene	1.52E-12	NAv	NAp		
Anthracene	2.24E-12	NAv	NAp		
Benzo(a)anthracene	7.55E-12	NAv	NAp		
Benzo(a)pyrene	7.41E-12	NAv	NAp		
Benzo(b)fluoranthene	9.32E-12	NAv	NAp		
Benzo(g,h,i)perylene	7.37E-12	NAv	NAp		
Benzo(k)fluoranthene	6.63E-12	NAv	NAp		
Chrysene	7.29E-13	NAv	NAp		
Dibenzo(a,h)anthracene	1.56E-12	NAv	NAp		
Fluoranthene	1.13E-11	NAv	NAp		
Fluorene	1.07E-12	NAv	NAp		
Indeno(1,2,3-cd)pyrene	4.56E-12	NAv	NAp		
Naphthalene	2.71E-11	3E-03	9E-09		
Phenanthrene	3.96E-11	NAv	NAp		
Pyrene	1.07E-11	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	9.33E-16	4E-08	2E-08		
Inorganic Compounds					
Arsenic	1.87E-09	2E-05	9E-05		
				9E-05	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	5.94E-09	NAv	NAp		
Anthracene	4.41E-09	NAv	NAp		
Benzo(a)anthracene	1.86E-09	NAv	NAp		
Fluorene	2.81E-09	NAv	NAp		
Naphthalene	3.42E-07	3E-03	1E-04		
Pyrene	4.09E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3.54E-13	4E-08	9E-06		
				1E-04	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1.30E-06	3E-04	4E-03		
				4E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2.75E-07	3E-04	9E-04		
				9E-04	

Table 6-59
Hazard Index Estimates for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4.96E-09	NAv	NAp		
Benzo(k)fluoranthene	8.90E-09	NAv	NAp		
Chrysene	1.21E-08	NAv	NAp		
Pyrene	4.05E-09	3E-02	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	8.39E-13	7E-10	1E-03		
				1E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	1.06E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	1.52E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.65E-11	7E-10	2E-02		
				2E-02	
					7E-02

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-60
Excess Lifetime Cancer Risk Estimate for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1.3E-08	7E-01	1E-08		
Benzo(a)pyrene	1.3E-08	7E+00	1E-07		
Benzo(b)fluoranthene	1.6E-08	7E-01	1E-08		
Benzo(k)fluoranthene	1.2E-08	7E-02	9E-10		
Chrysene	1.3E-09	7E-03	9E-12		
Dibenzo(a,h)anthracene	2.7E-09	7E+00	2E-08		
Indeno(1,2,3-cd)pyrene	8.0E-09	7E-01	6E-09		
Naphthalene	4.8E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.6E-12	1E+05	2E-07		
Inorganic Compounds					
Arsenic	3.3E-06	2E+00	5E-06		
				5E-06	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	7.3E-09	7E-01	5E-09		
Benzo(a)pyrene	7.2E-09	7E+00	5E-08		
Benzo(b)fluoranthene	9.0E-09	7E-01	7E-09		
Benzo(k)fluoranthene	6.4E-09	7E-02	5E-10		
Chrysene	7.1E-10	7E-03	5E-12		
Dibenzo(a,h)anthracene	1.5E-09	7E+00	1E-08		
Indeno(1,2,3-cd)pyrene	4.4E-09	7E-01	3E-09		
Naphthalene	2.6E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2.1E-13	1E+05	3E-08		
Inorganic Compounds					
Arsenic	4.2E-07	2E+00	6E-07		
				7E-07	

Table 6-60
Excess Lifetime Cancer Risk Estimate for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.7E-12	1E-01	3E-13		
Benzo(a)pyrene	2.6E-12	1E+00	3E-12		
Benzo(b)fluoranthene	3.3E-12	1E-01	4E-13		
Benzo(k)fluoranthene	2.4E-12	1E-01	3E-13		
Chrysene	2.6E-13	1E-02	3E-15		
Dibenzo(a,h)anthracene	5.6E-13	1E+00	7E-13		
Indeno(1,2,3-cd)pyrene	1.6E-12	1E-01	2E-13		
Naphthalene	9.7E-12	3E-02	3E-13		
Dioxins-Furans					
2,3,7,8-TCDD	3.3E-16	4E+04	1E-11		
Inorganic Compounds					
Arsenic	6.7E-10	4E+00	3E-09		
				3E-09	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	7E-10	1E-01	7E-11		
Naphthalene	1E-07	3E-02	4E-09		
Dioxins-Furans					
2,3,7,8-TCDD	1E-13	4E+04	5E-09		
				9E-09	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	5E-07	2E+00	7E-07		
				7E-07	

Table 6-60
Excess Lifetime Cancer Risk Estimate for
Current/Future Upland Terrace Rail Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-07	2E+00	1E-07		
				1E-07	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-09	7E+00	1E-08		
Benzo(k)fluoranthene	3E-09	7E-02	2E-10		
Chrysene	4E-09	7E-03	3E-11		
Dioxins-Furans					
2,3,7,8-TCDD	3E-13	1E+05	4E-08		
				5E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-07	7E+00	1E-06		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	2E-07	7E-03	1E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-11	1E+05	3E-06		
				4E-06	
					1E-05

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-61
Hazard Index Estimates for
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	1.10E-08	6E-02	2E-07		
Acenaphthylene	6.76E-10	NAv	NAp		
Anthracene	2.01E-08	3E-01	7E-08		
Benzo(a)anthracene	8.45E-08	NAv	NAp		
Benzo(a)pyrene	5.86E-08	NAv	NAp		
Benzo(b)fluoranthene	7.27E-08	NAv	NAp		
Benzo(g,h,i)perylene	4.47E-08	NAv	NAp		
Benzo(k)fluoranthene	5.81E-08	NAv	NAp		
Chrysene	1.44E-07	NAv	NAp		
Dibenzo(a,h)anthracene	1.86E-08	NAv	NAp		
Fluoranthene	1.12E-07	4E-02	3E-06		
Fluorene	1.40E-08	4E-02	3E-07		
Indeno(1,2,3-cd)pyrene	2.58E-08	NAv	NAp		
2-Methylnaphthalene	1.40E-07	4E-03	4E-05		
Naphthalene	5.03E-07	2E-02	3E-05		
Phenanthrene	6.02E-07	NAv	NAp		
Pyrene	1.09E-07	3E-02	4E-06		
Dioxins-Furans					
2,3,7,8-TCDD	8.11E-12	7E-10	1E-02		
Inorganic Compounds					
Arsenic	1.91E-05	3E-04	6E-02		
Iron	4.30E-02	7E-01	6E-02		
Lead	1.61E-04	NAv	NAp		
Mercury	2.66E-06	NAv	NAp		
Thallium	1.61E-06	1E-05	2E-01		
				3E-01	

Table 6-61
Hazard Index Estimates for
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	6.08E-09	6E-02	1E-07		
Acenaphthylene	3.72E-10	NAv	NAp		
Anthracene	1.11E-08	3E-01	4E-08		
Benzo(a)anthracene	4.65E-08	NAv	NAp		
Benzo(a)pyrene	3.22E-08	NAv	NAp		
Benzo(b)fluoranthene	4.00E-08	NAv	NAp		
Benzo(g,h,i)perylene	2.46E-08	NAv	NAp		
Benzo(k)fluoranthene	3.20E-08	NAv	NAp		
Chrysene	7.91E-08	NAv	NAp		
Dibenzo(a,h)anthracene	1.02E-08	NAv	NAp		
Fluoranthene	6.17E-08	4E-02	2E-06		
Fluorene	7.68E-09	4E-02	2E-07		
Indeno(1,2,3-cd)pyrene	1.42E-08	NAv	NAp		
2-Methylnaphthalene	7.73E-08	4E-03	NAp		
Naphthalene	2.77E-07	2E-02	1E-05		
Phenanthrene	3.31E-07	NAv	NAp		
Pyrene	5.98E-08	3E-02	2E-06		
Dioxins-Furans					
2,3,7,8-TCDD	1.03E-12	7E-10	1E-03		
Inorganic Compounds					
Arsenic	2.42E-06	3E-04	8E-03		
Iron	0.00E+00	7E-01	0E+00		
Lead	0.00E+00	NAv	NAp		
Mercury	0.00E+00	NAv	NAp		
Thallium	0.00E+00	1E-05	0E+00		
				1E-02	

Table 6-61
Hazard Index Estimates for
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	2.24E-12	NAv	NAp		
Acenaphthylene	1.37E-13	NAv	NAp		
Anthracene	4.08E-12	NAv	NAp		
Benzo(a)anthracene	1.71E-11	NAv	NAp		
Benzo(a)pyrene	1.19E-11	NAv	NAp		
Benzo(b)fluoranthene	1.47E-11	NAv	NAp		
Benzo(g,h,i)perylene	9.06E-12	NAv	NAp		
Benzo(k)fluoranthene	1.18E-11	NAv	NAp		
Chrysene	2.91E-11	NAv	NAp		
Dibenzo(a,h)anthracene	3.76E-12	NAv	NAp		
Fluoranthene	2.27E-11	NAv	NAp		
Fluorene	2.83E-12	NAv	NAp		
Indeno(1,2,3-cd)pyrene	5.22E-12	NAv	NAp		
2-Methylnaphthalene	2.85E-11	NAv	NAp		
Naphthalene	1.02E-10	3E-03	3E-08		
Phenanthrene	1.22E-10	NAv	NAp		
Pyrene	2.20E-11	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.64E-15	4E-08	4E-08		
Inorganic Compounds					
Arsenic	3.87E-09	2E-05	2E-04		
Iron	8.72E-06	NAv	NAp		
Lead	3.26E-08	NAv	NAp		
Mercury	5.40E-10	3E-04	2E-06		
Thallium	3.26E-10	NAv	NAp		
				2E-04	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	1.18E-08	NAv	NAp		
Anthracene	5.07E-09	NAv	NAp		
Benzo(a)anthracene	2.72E-09	NAv	NAp		
Fluorene	8.36E-09	NAv	NAp		
2-Methylnaphthalene	3.22E-07	NAv	NAp		
Naphthalene	2.51E-06	3E-03	8E-04		
Pyrene	9.09E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.08E-12	4E-08	3E-05		
				9E-04	

Table 6-61
Hazard Index Estimates for
Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1.30E-06	3E-04	4E-03		
				4E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2.75E-07	3E-04	9E-04		
				9E-04	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4.96E-09	NAv	NAp		
Benzo(k)fluoranthene	8.90E-09	NAv	NAp		
Chrysene	1.21E-08	NAv	NAp		
Pyrene	4.05E-09	3E-02	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	8.39E-13	7E-10	1E-03		
Inorganic Compounds					
Manganese	3.25E-05	1E-01	3E-04		
Mercury	1.72E-07	NAv	NAp		
				2E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4.55E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	5.74E-07	NAv	NAp		
Pyrene	NC	3E-02	Nap		
Dioxins-Furans					
2,3,7,8-TCDD	6.14E-11	7E-10	9E-02		
				9E-02	
					4E-01

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-62
Excess Lifetime Cancer Risk Estimate for Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	3.0E-08	7E-01	2E-08		
Benzo(a)pyrene	2.1E-08	7E+00	2E-07		
Benzo(b)fluoranthene	2.6E-08	7E-01	2E-08		
Benzo(k)fluoranthene	2.1E-08	7E-02	2E-09		
Chrysene	5.1E-08	7E-03	4E-10		
Dibenzo(a,h)anthracene	6.6E-09	7E+00	5E-08		
Indeno(1,2,3-cd)pyrene	9.2E-09	7E-01	7E-09		
Naphthalene	1.8E-07	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2.9E-12	1E+05	4E-07		
Inorganic Compounds					
Arsenic	6.8E-06	2E+00	1E-05		
Lead	5.7E-05	NAv	NAp		
				1E-05	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1.7E-08	7E-01	1E-08		
Benzo(a)pyrene	1.2E-08	7E+00	8E-08		
Benzo(b)fluoranthene	1.4E-08	7E-01	1E-08		
Benzo(k)fluoranthene	1.1E-08	7E-02	8E-10		
Chrysene	2.8E-08	7E-03	2E-10		
Dibenzo(a,h)anthracene	3.7E-09	7E+00	3E-08		
Indeno(1,2,3-cd)pyrene	5.1E-09	7E-01	4E-09		
Naphthalene	9.9E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3.7E-13	1E+05	5E-08		
Inorganic Compounds					
Arsenic	8.7E-07	2E+00	1E-06		
Lead	0.0E+00	NAv	NAp		
				1E-06	
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	6.1E-12	1E-01	7E-13		
Benzo(a)pyrene	4.2E-12	1E+00	5E-12		
Benzo(b)fluoranthene	5.3E-12	1E-01	6E-13		
Benzo(k)fluoranthene	4.2E-12	1E-01	5E-13		
Chrysene	1.0E-11	1E-02	1E-13		
Dibenzo(a,h)anthracene	1.3E-12	1E+00	2E-12		
Indeno(1,2,3-cd)pyrene	1.9E-12	1E-01	2E-13		
Naphthalene	3.6E-11	3E-02	1E-12		
Dioxins-Furans					
2,3,7,8-TCDD	5.9E-16	4E+04	2E-11		
Inorganic Compounds					
Arsenic	1.4E-09	4E+00	6E-09		
Lead	1.2E-08	NAv	NAp		

Table 6-62
Excess Lifetime Cancer Risk Estimate for Future Floodplain Slope Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
				6E-09	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1E-09	1E-01	1E-10		
Naphthalene	9E-07	3E-02	3E-08		
Dioxins-Furans					
2,3,7,8-TCDD	4E-13	4E+04	1E-08		
				5E-08	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	5E-07	2E+00	7E-07		
				7E-07	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-07	2E+00	1E-07		
				1E-07	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-09	7E+00	1E-08		
Benzo(k)fluoranthene	3E-09	7E-02	2E-10		
Chrysene	4E-09	7E-03	3E-11		
Dioxins-Furans					
2,3,7,8-TCDD	3E-13	1E+05	4E-08		
				5E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-07	7E+00	1E-06		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	2E-07	7E-03	1E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-11	1E+05	3E-06		
				4E-06	
					2E-05

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-63
Hazard Index Estimates for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	2.59E-09	6E-02	4E-08		
Acenaphthylene	6.04E-10	NAv	NAp		
Anthracene	2.62E-09	3E-01	9E-09		
Benzo(a)anthracene	1.01E-08	NAv	NAp		
Benzo(a)pyrene	9.50E-09	NAv	NAp		
Benzo(b)fluoranthene	1.24E-08	NAv	NAp		
Benzo(g,h,i)perylene	8.56E-09	NAv	NAp		
Benzo(k)fluoranthene	8.90E-09	NAv	NAp		
Chrysene	2.24E-08	NAv	NAp		
Dibenzo(a,h)anthracene	3.01E-09	NAv	NAp		
Fluoranthene	1.24E-08	4E-02	3E-07		
Fluorene	3.01E-09	4E-02	8E-08		
Indeno(1,2,3-cd)pyrene	4.08E-09	NAv	NAp		
Naphthalene	1.51E-07	2E-02	8E-06		
Phenanthrene	2.04E-07	NAv	NAp		
Pyrene	8.82E-09	3E-02	3E-07		
Dioxins-Furans					
2,3,7,8-TCDD	2.78E-12	7E-10	4E-03		
Inorganic Compounds					
Arsenic	6.28E-06	3E-04	2E-02		
Lead	4.28E-05	NAv	NAp		
Thallium	6.12E-07	1E-05	6E-02		
				9E-02	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	1.42E-09	6E-02	2E-08		
Acenaphthylene	3.33E-10	NAv	NAp		
Anthracene	1.44E-09	3E-01	5E-09		
Benzo(a)anthracene	5.56E-09	NAv	NAp		
Benzo(a)pyrene	5.23E-09	NAv	NAp		
Benzo(b)fluoranthene	6.83E-09	NAv	NAp		
Benzo(g,h,i)perylene	4.71E-09	NAv	NAp		
Benzo(k)fluoranthene	4.90E-09	NAv	NAp		
Chrysene	1.23E-08	NAv	NAp		
Dibenzo(a,h)anthracene	1.66E-09	NAv	NAp		
Fluoranthene	6.83E-09	4E-02	2E-07		
Fluorene	1.66E-09	4E-02	4E-08		
Indeno(1,2,3-cd)pyrene	2.25E-09	NAv	NAp		
Naphthalene	8.29E-08	2E-02	4E-06		
Phenanthrene	1.12E-07	NAv	NAp		
Pyrene	4.85E-09	3E-02	2E-07		
Dioxins-Furans					
2,3,7,8-TCDD	3.53E-13	7E-10	5E-04		
Inorganic Compounds					
Arsenic	7.98E-07	3E-04	3E-03		
Lead	0.00E+00	NAv	NAp		
Thallium	0.00E+00	1E-05	0E+00		
				3E-03	

Table 6-63
Hazard Index Estimates for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	5.24E-13	NAv	NAp		
Acenaphthylene	1.22E-13	NAv	NAp		
Anthracene	5.31E-13	NAv	NAp		
Benzo(a)anthracene	2.05E-12	NAv	NAp		
Benzo(a)pyrene	1.93E-12	NAv	NAp		
Benzo(b)fluoranthene	2.52E-12	NAv	NAp		
Benzo(g,h,i)perylene	1.73E-12	NAv	NAp		
Benzo(k)fluoranthene	1.80E-12	NAv	NAp		
Chrysene	4.55E-12	NAv	NAp		
Dibenzo(a,h)anthracene	6.11E-13	NAv	NAp		
Fluoranthene	2.52E-12	NAv	NAp		
Fluorene	6.11E-13	NAv	NAp		
Indeno(1,2,3-cd)pyrene	8.28E-13	NAv	NAp		
Naphthalene	3.05E-11	3E-03	1E-08		
Phenanthrene	4.13E-11	NAv	NAp		
Pyrene	1.79E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	5.64E-16	4E-08	1E-08		
Inorganic Compounds					
Arsenic	1.27E-09	2E-05	6E-05		
Lead	8.67E-09	NAv	NAp		
Thallium	1.24E-10	NAv	NAp		
				6E-05	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	3.54E-09	NAv	NAp		
Anthracene	7.88E-10	NAv	NAp		
Benzo(a)anthracene	6.58E-10	NAv	NAp		
Fluorene	2.07E-09	NAv	NAp		
Naphthalene	6.74E-07	3E-03	2E-04		
Pyrene	1.74E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	4.25E-13	4E-08	1E-05		
				2E-04	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1.30E-06	3E-04	4E-03		
				4E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2.75E-07	3E-04	9E-04		
				9E-04	

Table 6-63
Hazard Index Estimates for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4.96E-09	NAv	NAp		
Benzo(k)fluoranthene	8.90E-09	NAv	NAp		
Chrysene	1.21E-08	NAv	NAp		
Pyrene	4.05E-09	3E-02	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	8.39E-13	7E-10	1E-03		
				1E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4.55E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	5.74E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	6.14E-11	7E-10	9E-02		
				9E-02	
					2E-01

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-64
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	3.6E-09	7E-01	3E-09		
Benzo(a)pyrene	3.4E-09	7E+00	2E-08		
Benzo(b)fluoranthene	4.4E-09	7E-01	3E-09		
Benzo(k)fluoranthene	3.2E-09	7E-02	2E-10		
Chrysene	8.0E-09	7E-03	6E-11		
Dibenzo(a,h)anthracene	1.1E-09	7E+00	8E-09		
Indeno(1,2,3-cd)pyrene	1.5E-09	7E-01	1E-09		
Naphthalene	5.4E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	9.9E-13	1E+05	1E-07		
Inorganic Compounds					
Arsenic	2.2E-06	2E+00	3E-06		
Lead	1.5E-05	NAv	NAp		
				4E-06	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.0E-09	7E-01	1E-09		
Benzo(a)pyrene	1.9E-09	7E+00	1E-08		
Benzo(b)fluoranthene	2.4E-09	7E-01	2E-09		
Benzo(k)fluoranthene	1.7E-09	7E-02	1E-10		
Chrysene	4.4E-09	7E-03	3E-11		
Dibenzo(a,h)anthracene	5.9E-10	7E+00	4E-09		
Indeno(1,2,3-cd)pyrene	8.0E-10	7E-01	6E-10		
Naphthalene	3.0E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.3E-13	1E+05	2E-08		
Inorganic Compounds					
Arsenic	2.8E-07	2E+00	4E-07		
Lead	0.0E+00	NAv	NAp		
				5E-07	

Table 6-64
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	7.3E-13	1E-01	8E-14		
Benzo(a)pyrene	6.9E-13	1E+00	8E-13		
Benzo(b)fluoranthene	9.0E-13	1E-01	1E-13		
Benzo(k)fluoranthene	6.4E-13	1E-01	7E-14		
Chrysene	1.6E-12	1E-02	2E-14		
Dibenzo(a,h)anthracene	2.2E-13	1E+00	3E-13		
Indeno(1,2,3-cd)pyrene	3.0E-13	1E-01	3E-14		
Naphthalene	1.1E-11	3E-02	4E-13		
Dioxins-Furans					
2,3,7,8-TCDD	2.0E-16	4E+04	8E-12		
Inorganic Compounds					
Arsenic	4.5E-10	4E+00	2E-09		
Lead	3.1E-09	NAv	NAp		
				2E-09	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2E-10	1E-01	3E-11		
Naphthalene	2E-07	3E-02	8E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-13	4E+04	6E-09		
				1E-08	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	5E-07	2E+00	7E-07		
				7E-07	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-07	2E+00	1E-07		
				1E-07	

Table 6-64
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-09	7E+00	1E-08		
Benzo(k)fluoranthene	3E-09	7E-02	2E-10		
Chrysene	4E-09	7E-03	3E-11		
Dioxins-Furans					
2,3,7,8-TCDD	3E-13	1E+05	4E-08		
				5E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-07	7E+00	1E-06		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	2E-07	7E-03	1E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-11	1E+05	3E-06		
				4E-06	
					9E-06

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-65
Hazard Index Estimates for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	6E-09	2E-01	3E-08		
Acenaphthylene	2E-09	NAv	NAp		
Anthracene	5E-09	1E+00	5E-09		
Benzo(a)anthracene	5E-08	NAv	NAp		
Benzo(a)pyrene	4E-08	NAv	NAp		
Benzo(b)fluoranthene	4E-08	NAv	NAp		
Benzo(g,h,i)perylene	1E-08	NAv	NAp		
Benzo(k)fluoranthene	2E-08	NAv	NAp		
Chrysene	1E-07	NAv	NAp		
Dibenzo(a,h)anthracene	9E-09	NAv	NAp		
Fluoranthene	8E-08	1E-01	8E-07		
Fluorene	7E-09	4E-01	2E-08		
Indeno(1,2,3-cd)pyrene	3E-08	NAv	NAp		
Naphthalene	3E-07	2E-02	1E-05		
Phenanthrene	6E-07	NAv	NAp		
Pyrene	8E-08	3E-01	3E-07		
Dioxins-Furans					
2,3,7,8-TCDD	5E-12	7E-10	7E-03		
Inorganic Compounds					
Arsenic	2E-05	3E-04	8E-02		
Iron	7E-02	7E-01	1E-01		
Lead	1E-04	NAv	NAp		
Thallium	1E-06	1E-05	1E-01		
				3E-01	

Table 6-65
Hazard Index Estimates for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	2E-09	2E-01	1E-08		
Acenaphthylene	6E-10	NAv	NAp		
Anthracene	2E-09	1E+00	2E-09		
Benzo(a)anthracene	2E-08	NAv	NAp		
Benzo(a)pyrene	2E-08	NAv	NAp		
Benzo(b)fluoranthene	2E-08	NAv	NAp		
Benzo(g,h,i)perylene	5E-09	NAv	NAp		
Benzo(k)fluoranthene	6E-09	NAv	NAp		
Chrysene	4E-08	NAv	NAp		
Dibenzo(a,h)anthracene	4E-09	NAv	NAp		
Fluoranthene	3E-08	1E-01	3E-07		
Fluorene	3E-09	4E-01	7E-09		
Indeno(1,2,3-cd)pyrene	1E-08	NAv	NAp		
Naphthalene	1E-07	2E-02	5E-06		
Phenanthrene	3E-07	NAv	NAp		
Pyrene	3E-08	3E-01	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	5E-13	7E-10	6E-04		
Inorganic Compounds					
Arsenic	2E-06	3E-04	8E-03		
Iron	0E+00	7E-01	0E+00		
Lead	0E+00	NAv	NAp		
Thallium	0E+00	1E-05	0E+00		
				8E-03	

Table 6-65
Hazard Index Estimates for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	4E-13	NAv	NAp		
Acenaphthylene	9E-14	NAv	NAp		
Anthracene	3E-13	NAv	NAp		
Benzo(a)anthracene	3E-12	NAv	NAp		
Benzo(a)pyrene	2E-12	NAv	NAp		
Benzo(b)fluoranthene	3E-12	NAv	NAp		
Benzo(g,h,i)perylene	7E-13	NAv	NAp		
Benzo(k)fluoranthene	9E-13	NAv	NAp		
Chrysene	6E-12	NAv	NAp		
Dibenzo(a,h)anthracene	5E-13	NAv	NAp		
Fluoranthene	5E-12	NAv	NAp		
Fluorene	4E-13	NAv	NAp		
Indeno(1,2,3-cd)pyrene	2E-12	NAv	NAp		
Naphthalene	2E-11	3E-03	5E-09		
Phenanthrene	4E-11	NAv	NAp		
Pyrene	5E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3E-16	4E-08	7E-09		
Inorganic Compounds					
Arsenic	1E-09	2E-05	7E-05		
Iron	4E-06	NAv	NAp		
Lead	8E-09	NAv	NAp		
Thallium	8E-11	NAv	NAp		
				7E-05	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	2E-08	NAv	NAp		
Anthracene	4E-09	NAv	NAp		
Benzo(a)anthracene	3E-09	NAv	NAp		
Fluorene	1E-08	NAv	NAp		
Naphthalene	4E-06	3E-03	1E-03		
Pyrene	9E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2E-12	4E-08	6E-05		
				1E-03	
Exposure Pathway: Ingestion of Sediment					
Semivolatile Organic Compounds					
Arsenic	5E-06	3E-04	2E-02		
				2E-02	
Exposure Pathway: Dermal Contact with Sediment					
Semivolatile Organic Compounds					
Arsenic	3E-07	3E-04	1E-03		
				1E-03	

Table 6-65
Hazard Index Estimates for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	5E-09	NAv	NAp		
Benzo(k)fluoranthene	1E-08	NAv	NAp		
Chrysene	1E-08	NAv	NAp		
Pyrene	4E-09	3E-02	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	9E-13	7E-10	1E-03		
				1E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	5E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	6E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
2,3,7,8-TCDD	7E-11	7E-10	1E-01		
				1E-01	
					4E-01

Notes:

NAp - Not Applicable

NAv - Not Available

RfC - Reference Concentration

RfD - Reference Dose

Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.

Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-66
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	4E-10	7E-01	3E-10		
Benzo(a)pyrene	3E-10	7E+00	2E-09		
Benzo(b)fluoranthene	3E-10	7E-01	2E-10		
Benzo(k)fluoranthene	1E-10	7E-02	7E-12		
Chrysene	7E-10	7E-03	5E-12		
Dibenzo(a,h)anthracene	6E-11	7E+00	4E-10		
Indeno(1,2,3-cd)pyrene	2E-10	7E-01	1E-10		
Naphthalene	2E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3E-14	1E+05	4E-09		
Inorganic Compounds					
Arsenic	2E-07	2E+00	2E-07		
Lead	8E-07	NAv	NAp		
				2E-07	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1E-10	7E-01	1E-10		
Benzo(a)pyrene	1E-10	7E+00	8E-10		
Benzo(b)fluoranthene	1E-10	7E-01	9E-11		
Benzo(k)fluoranthene	4E-11	7E-02	3E-12		
Chrysene	3E-10	7E-03	2E-12		
Dibenzo(a,h)anthracene	2E-11	7E+00	2E-10		
Indeno(1,2,3-cd)pyrene	8E-11	7E-01	6E-11		
Naphthalene	7E-10	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3E-15	1E+05	4E-10		
Inorganic Compounds					
Arsenic	1E-08	2E+00	2E-08		
Lead	0E+00	NAv	NAp		
				2E-08	

Table 6-66
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2E-14	1E-01	2E-15		
Benzo(a)pyrene	2E-14	1E+00	2E-14		
Benzo(b)fluoranthene	2E-14	1E-01	2E-15		
Benzo(k)fluoranthene	6E-15	1E-01	7E-16		
Chrysene	4E-14	1E-02	4E-16		
Dibenzo(a,h)anthracene	3E-15	1E+00	4E-15		
Indeno(1,2,3-cd)pyrene	1E-14	1E-01	1E-15		
Naphthalene	1E-13	3E-02	4E-15		
Dioxins-Furans					
2,3,7,8-TCDD	2E-18	4E+04	7E-14		
Inorganic Compounds					
Arsenic	1E-11	4E+00	4E-11		
Lead	5E-11	NAv	NAp		
				4E-11	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2E-11	1E-01	2E-12		
Naphthalene	2E-08	3E-02	8E-10		
Dioxins-Furans					
2,3,7,8-TCDD	1E-14	4E+04	6E-10		
				1E-09	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	3E-08	2E+00	5E-08		
				5E-08	

Table 6-66
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Construction Worker Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2E-09	2E+00	3E-09		
				3E-09	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4E-11	7E+00	3E-10		
Benzo(k)fluoranthene	6E-11	7E-02	5E-12		
Chrysene	9E-11	7E-03	6E-13		
Dioxins-Furans					
2,3,7,8-TCDD	6E-15	1E+05	8E-10		
				1E-09	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3E-09	7E+00	2E-08		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	4E-09	7E-03	3E-11		
Dioxins-Furans					
2,3,7,8-TCDD	4E-13	1E+05	6E-08		
				8E-08	
					4E-07

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-67
Hazard Index Estimates for
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	9E-09	6E-02	2E-07		
Acenaphthylene	8E-09	NAv	NAp		
Anthracene	2E-08	3E-01	7E-08		
Benzo(a)anthracene	8E-08	NAv	NAp		
Benzo(a)pyrene	6E-08	NAv	NAp		
Benzo(b)fluoranthene	7E-08	NAv	NAp		
Benzo(g,h,i)perylene	5E-08	NAv	NAp		
Benzo(k)fluoranthene	6E-08	NAv	NAp		
Chrysene	1E-07	NAv	NAp		
Dibenzo(a,h)anthracene	1E-08	NAv	NAp		
Fluoranthene	1E-07	4E-02	3E-06		
Fluorene	1E-08	4E-02	3E-07		
Indeno(1,2,3-cd)pyrene	3E-08	NAv	NAp		
2-Methylnaphthalene	2E-07	4E-03	4E-05		
Naphthalene	5E-07	2E-02	2E-05		
Phenanthrene	7E-07	NAv	NAp		
Pyrene	1E-07	3E-02	5E-06		
Dioxins-Furans					
2,3,7,8-TCDD	6E-12	7E-10	9E-03		
Inorganic Compounds					
Arsenic	2E-05	3E-04	8E-02		
Iron	5E-02	7E-01	7E-02		
Lead	2E-04	NAv	NAp		
Mercury	2E-06	NAv	NAp		
Thallium	1E-06	1E-05	1E-01		
				3E-01	

Table 6-67
Hazard Index Estimates for
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	3E-09	6E-02	5E-08		
Acenaphthylene	2E-09	NAv	NAp		
Anthracene	7E-09	3E-01	2E-08		
Benzo(a)anthracene	3E-08	NAv	NAp		
Benzo(a)pyrene	2E-08	NAv	NAp		
Benzo(b)fluoranthene	2E-08	NAv	NAp		
Benzo(g,h,i)perylene	1E-08	NAv	NAp		
Benzo(k)fluoranthene	2E-08	NAv	NAp		
Chrysene	4E-08	NAv	NAp		
Dibenzo(a,h)anthracene	5E-09	NAv	NAp		
Fluoranthene	4E-08	4E-02	9E-07		
Fluorene	3E-09	4E-02	9E-08		
Indeno(1,2,3-cd)pyrene	1E-08	NAv	NAp		
2-Methylnaphthalene	5E-08	4E-03	NAp		
Naphthalene	1E-07	2E-02	7E-06		
Phenanthrene	2E-07	NAv	NAp		
Pyrene	4E-08	3E-02	1E-06		
Dioxins-Furans					
2,3,7,8-TCDD	4E-13	7E-10	6E-04		
Inorganic Compounds					
Arsenic	2E-06	3E-04	6E-03		
Iron	0E+00	7E-01	0E+00		
Lead	0E+00	NAv	NAp		
Mercury	0E+00	NAv	NAp		
Thallium	0E+00	1E-05	0E+00		
				6E-03	

Table 6-67
Hazard Index Estimates for
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	1E-13	NAv	NAp		
Acenaphthylene	9E-14	NAv	NAp		
Anthracene	2E-13	NAv	NAp		
Benzo(a)anthracene	1E-12	NAv	NAp		
Benzo(a)pyrene	7E-13	NAv	NAp		
Benzo(b)fluoranthene	9E-13	NAv	NAp		
Benzo(g,h,i)perylene	6E-13	NAv	NAp		
Benzo(k)fluoranthene	7E-13	NAv	NAp		
Chrysene	2E-12	NAv	NAp		
Dibenzo(a,h)anthracene	2E-13	NAv	NAp		
Fluoranthene	1E-12	NAv	NAp		
Fluorene	1E-13	NAv	NAp		
Indeno(1,2,3-cd)pyrene	4E-13	NAv	NAp		
2-Methylnaphthalene	2E-12	NAv	NAp		
Naphthalene	5E-12	3E-03	2E-09		
Phenanthrene	8E-12	NAv	NAp		
Pyrene	2E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	7E-17	4E-08	2E-09		
Inorganic Compounds					
Arsenic	3E-10	2E-05	1E-05		
Iron	6E-07	NAv	NAp		
Lead	3E-09	NAv	NAp		
Mercury	2E-11	3E-04	6E-08		
Thallium	1E-11	NAv	NAp		
				1E-05	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	6E-09	NAv	NAp		
Anthracene	2E-09	NAv	NAp		
Benzo(a)anthracene	6E-10	NAv	NAp		
Fluorene	3E-09	NAv	NAp		
2-Methylnaphthalene	6E-08	NAv	NAp		
Naphthalene	3E-07	3E-03	1E-04		
Pyrene	2E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1E-13	4E-08	3E-06		
				1E-04	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1E-05	3E-04	5E-02		
				5E-02	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2E-05	3E-04	6E-02		
				6E-02	

Table 6-67
Hazard Index Estimates for
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3E-08	NAv	NAp		
Benzo(k)fluoranthene	5E-08	NAv	NAp		
Chrysene	6E-08	NAv	NAp		
Pyrene	2E-08	3E-02	7E-07		
Dioxins-Furans					
2,3,7,8-TCDD	4E-12	7E-10	6E-03		
				6E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	6E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	8E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	9E-11	7E-10	1E-01		
				1E-01	
					5E-01

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-68
Excess Lifetime Cancer Risk Estimate for
Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	7.1E-09	7E-01	5E-09		
Benzo(a)pyrene	5.4E-09	7E+00	4E-08		
Benzo(b)fluoranthene	6.4E-09	7E-01	5E-09		
Benzo(k)fluoranthene	5.1E-09	7E-02	4E-10		
Chrysene	1.2E-08	7E-03	9E-11		
Dibenzo(a,h)anthracene	1.3E-09	7E+00	9E-09		
Indeno(1,2,3-cd)pyrene	2.7E-09	7E-01	2E-09		
Naphthalene	4.1E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	5.3E-13	1E+05	7E-08		
Inorganic Compounds					
Arsenic	2.1E-06	2E+00	3E-06		
Lead	2.1E-05	NAv	NAp		
				3E-06	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.2E-09	7E-01	2E-09		
Benzo(a)pyrene	1.7E-09	7E+00	1E-08		
Benzo(b)fluoranthene	2.0E-09	7E-01	1E-09		
Benzo(k)fluoranthene	1.6E-09	7E-02	1E-10		
Chrysene	3.7E-09	7E-03	3E-11		
Dibenzo(a,h)anthracene	4.0E-10	7E+00	3E-09		
Indeno(1,2,3-cd)pyrene	8.2E-10	7E-01	6E-10		
Naphthalene	1.3E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3.8E-14	1E+05	5E-09		
Inorganic Compounds					
Arsenic	1.5E-07	2E+00	2E-07		
Lead	0.0E+00	NAv	NAp		
				2E-07	
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	8.1E-14	1E-01	9E-15		
Benzo(a)pyrene	6.2E-14	1E+00	7E-14		
Benzo(b)fluoranthene	7.3E-14	1E-01	8E-15		
Benzo(k)fluoranthene	5.8E-14	1E-01	6E-15		
Chrysene	1.4E-13	1E-02	2E-15		
Dibenzo(a,h)anthracene	1.5E-14	1E+00	2E-14		
Indeno(1,2,3-cd)pyrene	3.0E-14	1E-01	3E-15		
Naphthalene	4.7E-13	3E-02	2E-14		
Dioxins-Furans					
2,3,7,8-TCDD	6.0E-18	4E+04	2E-13		
Inorganic Compounds					
Arsenic	2.4E-11	4E+00	1E-10		
Lead	2.4E-10	NAv	NAp		
				1E-10	

Table 6-68
Excess Lifetime Cancer Risk Estimate for Current/Future Site-Wide Child Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	5E-11	1E-01	6E-12		
Naphthalene	3E-08	3E-02	1E-09		
Dioxins-Furans					
2,3,7,8-TCDD	1E-14	4E+04	4E-10		
				1E-09	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1E-06	2E+00	2E-06		
				2E-06	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2E-06	2E+00	2E-06		
				2E-06	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-09	7E+00	2E-08		
Benzo(k)fluoranthene	4E-09	7E-02	3E-10		
Chrysene	5E-09	7E-03	4E-11		
Dioxins-Furans					
2,3,7,8-TCDD	4E-13	1E+05	5E-08		
				6E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	5E-08	7E+00	4E-07		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	7E-08	7E-03	5E-10		
Dioxins-Furans					
2,3,7,8-TCDD	8E-12	1E+05	1E-06		
				1E-06	
					9E-06

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-69
Hazard Index Estimates for
Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	2E-09	6E-02	3E-08		
Acenaphthylene	1E-09	NAv	NAp		
Anthracene	4E-09	3E-01	1E-08		
Benzo(a)anthracene	1E-08	NAv	NAp		
Benzo(a)pyrene	1E-08	NAv	NAp		
Benzo(b)fluoranthene	1E-08	NAv	NAp		
Benzo(g,h,i)perylene	8E-09	NAv	NAp		
Benzo(k)fluoranthene	1E-08	NAv	NAp		
Chrysene	2E-08	NAv	NAp		
Dibenzo(a,h)anthracene	3E-09	NAv	NAp		
Fluoranthene	2E-08	4E-02	5E-07		
Fluorene	2E-09	4E-02	5E-08		
Indeno(1,2,3-cd)pyrene	5E-09	NAv	NAp		
2-Methylnaphthalene	3E-08	4E-03	7E-06		
Naphthalene	8E-08	2E-02	4E-06		
Phenanthrene	1E-07	NAv	NAp		
Pyrene	2E-08	3E-02	8E-07		
Dioxins-Furans					
2,3,7,8-TCDD	1E-12	7E-10	1E-03		
Inorganic Compounds					
Arsenic	4E-06	3E-04	1E-02		
Iron	9E-03	7E-01	1E-02		
Lead	4E-05	NAv	NAp		
Mercury	3E-07	NAv	NAp		
Thallium	2E-07	1E-05	2E-02		
				5E-02	

Table 6-69
Hazard Index Estimates for
Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	2E-09	6E-02	4E-08		
Acenaphthylene	2E-09	NAv	NAp		
Anthracene	5E-09	3E-01	2E-08		
Benzo(a)anthracene	2E-08	NAv	NAp		
Benzo(a)pyrene	2E-08	NAv	NAp		
Benzo(b)fluoranthene	2E-08	NAv	NAp		
Benzo(g,h,i)perylene	1E-08	NAv	NAp		
Benzo(k)fluoranthene	1E-08	NAv	NAp		
Chrysene	3E-08	NAv	NAp		
Dibenzo(a,h)anthracene	4E-09	NAv	NAp		
Fluoranthene	3E-08	4E-02	7E-07		
Fluorene	3E-09	4E-02	7E-08		
Indeno(1,2,3-cd)pyrene	7E-09	NAv	NAp		
2-Methylnaphthalene	4E-08	4E-03	NAp		
Naphthalene	1E-07	2E-02	6E-06		
Phenanthrene	2E-07	NAv	NAp		
Pyrene	3E-08	3E-02	1E-06		
Dioxins-Furans					
2,3,7,8-TCDD	3E-13	7E-10	5E-04		
Inorganic Compounds					
Arsenic	1E-06	3E-04	5E-03		
Iron	0E+00	7E-01	0E+00		
Lead	0E+00	NAv	NAp		
Mercury	0E+00	NAv	NAp		
Thallium	0E+00	1E-05	0E+00		
				5E-03	

Table 6-69
Hazard Index Estimates for
Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	4E-14	NAv	NAp		
Acenaphthylene	4E-14	NAv	NAp		
Anthracene	1E-13	NAv	NAp		
Benzo(a)anthracene	4E-13	NAv	NAp		
Benzo(a)pyrene	3E-13	NAv	NAp		
Benzo(b)fluoranthene	4E-13	NAv	NAp		
Benzo(g,h,i)perylene	2E-13	NAv	NAp		
Benzo(k)fluoranthene	3E-13	NAv	NAp		
Chrysene	7E-13	NAv	NAp		
Dibenzo(a,h)anthracene	7E-14	NAv	NAp		
Fluoranthene	5E-13	NAv	NAp		
Fluorene	5E-14	NAv	NAp		
Indeno(1,2,3-cd)pyrene	1E-13	NAv	NAp		
2-Methylnaphthalene	8E-13	NAv	NAp		
Naphthalene	2E-12	3E-03	8E-10		
Phenanthrene	4E-12	NAv	NAp		
Pyrene	7E-13	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3E-17	4E-08	7E-10		
Inorganic Compounds					
Arsenic	1E-10	2E-05	6E-06		
Iron	2E-07	NAv	NAp		
Lead	1E-09	NAv	NAp		
Mercury	7E-12	3E-04	2E-08		
Thallium	5E-12	NAv	NAp		
				6E-06	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	3E-09	NAv	NAp		
Anthracene	8E-10	NAv	NAp		
Benzo(a)anthracene	3E-10	NAv	NAp		
Fluorene	1E-09	NAv	NAp		
2-Methylnaphthalene	3E-08	NAv	NAp		
Naphthalene	1E-07	3E-03	5E-05		
Pyrene	8E-10	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	5E-14	4E-08	1E-06		
				5E-05	

Table 6-69
Hazard Index Estimates for
Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	2E-06	3E-04	8E-03		
				8E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2E-05	3E-04	5E-02		
				5E-02	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4E-09	NAv	NAp		
Benzo(k)fluoranthene	7E-09	NAv	NAp		
Chrysene	9E-09	NAv	NAp		
Pyrene	3E-09	3E-02	1E-07		
Dioxins-Furans					
2,3,7,8-TCDD	6E-13	7E-10	9E-04		
Inorganic Compounds					
Manganese	2E-05	1E-01	2E-04		
Mercury	1E-07	NAv	NAp		
				1E-03	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	5E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	7E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	8E-11	7E-10	1E-01		
				1E-01	2E-01

Notes:

NAp - Not Applicable

NAv - Not Available

RfC - Reference Concentration

RfD - Reference Dose

Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.

Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-70
Excess Lifetime Cancer Risk Estimate for
Current/Future Site Wide Youth Visitor Scenario

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1.2E-09	7E-01	9E-10		
Benzo(a)pyrene	9.2E-10	7E+00	7E-09		
Benzo(b)fluoranthene	1.1E-09	7E-01	8E-10		
Benzo(k)fluoranthene	8.6E-10	7E-02	6E-11		
Chrysene	2.0E-09	7E-03	1E-11		
Dibenzo(a,h)anthracene	2.2E-10	7E+00	2E-09		
Indeno(1,2,3-cd)pyrene	4.5E-10	7E-01	3E-10		
Naphthalene	6.9E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	9.0E-14	1E+05	1E-08		
Inorganic Compounds					
Arsenic	3.6E-07	2E+00	5E-07		
Lead	3.5E-06	NAv	NAp		
				6E-07	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1.7E-09	7E-01	1E-09		
Benzo(a)pyrene	1.3E-09	7E+00	1E-08		
Benzo(b)fluoranthene	1.5E-09	7E-01	1E-09		
Benzo(k)fluoranthene	1.2E-09	7E-02	9E-11		
Chrysene	2.9E-09	7E-03	2E-11		
Dibenzo(a,h)anthracene	3.1E-10	7E+00	2E-09		
Indeno(1,2,3-cd)pyrene	6.4E-10	7E-01	5E-10		
Naphthalene	9.8E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2.9E-14	1E+05	4E-09		
Inorganic Compounds					
Arsenic	1.2E-07	2E+00	2E-07		
Lead	0.0E+00	NAv	NAp		
				2E-07	

Table 6-70
Excess Lifetime Cancer Risk Estimate for Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	3.4E-14	1E-01	4E-15		
Benzo(a)pyrene	2.6E-14	1E+00	3E-14		
Benzo(b)fluoranthene	3.0E-14	1E-01	3E-15		
Benzo(k)fluoranthene	2.4E-14	1E-01	3E-15		
Chrysene	5.7E-14	1E-02	6E-16		
Dibenzo(a,h)anthracene	6.1E-15	1E+00	7E-15		
Indeno(1,2,3-cd)pyrene	1.3E-14	1E-01	1E-15		
Naphthalene	1.9E-13	3E-02	7E-15		
Dioxins-Furans					
2,3,7,8-TCDD	2.5E-18	4E+04	1E-13		
Inorganic Compounds					
Arsenic	1.0E-11	4E+00	4E-11		
Lead	9.8E-11	NAv	NAp		
				4E-11	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2E-11	1E-01	3E-12		
Naphthalene	1E-08	3E-02	4E-10		
Dioxins-Furans					
2,3,7,8-TCDD	4E-15	4E+04	2E-10		
				6E-10	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	2E-07	2E+00	3E-07		
				3E-07	

Table 6-70
Excess Lifetime Cancer Risk Estimate for
Current/Future Site Wide Youth Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-06	2E+00	2E-06		
				2E-06	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3E-10	7E+00	2E-09		
Benzo(k)fluoranthene	6E-10	7E-02	4E-11		
Chrysene	8E-10	7E-03	6E-12		
Dioxins-Furans					
2,3,7,8-TCDD	5E-14	1E+05	7E-09		
				1E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4E-08	7E+00	3E-07		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	6E-08	7E-03	5E-10		
Dioxins-Furans					
2,3,7,8-TCDD	7E-12	1E+05	9E-07		
				1E-06	
					4E-06

Notes:

IUR - Inhalation Unit Risk

NAp - Not Applicable

NAv - Not Available

Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.

Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-71
Hazard Index Estimates for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	9E-10	6E-02	1E-08		
Acenaphthylene	7E-10	NAv	NAp		
Anthracene	2E-09	3E-01	7E-09		
Benzo(a)anthracene	8E-09	NAv	NAp		
Benzo(a)pyrene	6E-09	NAv	NAp		
Benzo(b)fluoranthene	7E-09	NAv	NAp		
Benzo(g,h,i)perylene	5E-09	NAv	NAp		
Benzo(k)fluoranthene	6E-09	NAv	NAp		
Chrysene	1E-08	NAv	NAp		
Dibenzo(a,h)anthracene	1E-09	NAv	NAp		
Fluoranthene	1E-08	4E-02	3E-07		
Fluorene	1E-09	4E-02	3E-08		
Indeno(1,2,3-cd)pyrene	3E-09	NAv	NAp		
2-Methylnaphthalene	1E-08	4E-03	4E-06		
Naphthalene	4E-08	2E-02	2E-06		
Phenanthrene	7E-08	NAv	NAp		
Pyrene	1E-08	3E-02	4E-07		
Dioxins-Furans					
2,3,7,8-TCDD	6E-13	7E-10	8E-04		
Inorganic Compounds					
Arsenic	2E-06	3E-04	8E-03		
Iron	5E-03	7E-01	7E-03		
Lead	2E-05	NAv	NAp		
Mercury	1E-07	NAv	NAp		
Thallium	1E-07	1E-05	1E-02		
				3E-02	

Table 6-71
Hazard Index Estimates for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	5E-10	6E-02	8E-09		
Acenaphthylene	4E-10	NAv	NAp		
Anthracene	1E-09	3E-01	4E-09		
Benzo(a)anthracene	4E-09	NAv	NAp		
Benzo(a)pyrene	3E-09	NAv	NAp		
Benzo(b)fluoranthene	4E-09	NAv	NAp		
Benzo(g,h,i)perylene	2E-09	NAv	NAp		
Benzo(k)fluoranthene	3E-09	NAv	NAp		
Chrysene	7E-09	NAv	NAp		
Dibenzo(a,h)anthracene	8E-10	NAv	NAp		
Fluoranthene	6E-09	4E-02	1E-07		
Fluorene	6E-10	4E-02	1E-08		
Indeno(1,2,3-cd)pyrene	2E-09	NAv	NAp		
2-Methylnaphthalene	8E-09	4E-03	NAp		
Naphthalene	2E-08	2E-02	1E-06		
Phenanthrene	4E-08	NAv	NAp		
Pyrene	7E-09	3E-02	2E-07		
Dioxins-Furans					
2,3,7,8-TCDD	7E-14	7E-10	1E-04		
Inorganic Compounds					
Arsenic	3E-07	3E-04	1E-03		
Iron	0E+00	7E-01	0E+00		
Lead	0E+00	NAv	NAp		
Mercury	0E+00	NAv	NAp		
Thallium	0E+00	1E-05	0E+00		
				1E-03	

Table 6-71
Hazard Index Estimates for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	1E-13	NAv	NAp		
Acenaphthylene	9E-14	NAv	NAp		
Anthracene	2E-13	NAv	NAp		
Benzo(a)anthracene	1E-12	NAv	NAp		
Benzo(a)pyrene	7E-13	NAv	NAp		
Benzo(b)fluoranthene	9E-13	NAv	NAp		
Benzo(g,h,i)perylene	6E-13	NAv	NAp		
Benzo(k)fluoranthene	7E-13	NAv	NAp		
Chrysene	2E-12	NAv	NAp		
Dibenzo(a,h)anthracene	2E-13	NAv	NAp		
Fluoranthene	1E-12	NAv	NAp		
Fluorene	1E-13	NAv	NAp		
Indeno(1,2,3-cd)pyrene	4E-13	NAv	NAp		
2-Methylnaphthalene	2E-12	NAv	NAp		
Naphthalene	5E-12	3E-03	2E-09		
Phenanthrene	8E-12	NAv	NAp		
Pyrene	2E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	7E-17	4E-08	2E-09		
Inorganic Compounds					
Arsenic	3E-10	2E-05	1E-05		
Iron	6E-07	NAv	NAp		
Lead	3E-09	NAv	NAp		
Mercury	2E-11	3E-04	6E-08		
Thallium	1E-11	NAv	NAp		
				1E-05	

Table 6-71
Hazard Index Estimates for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	3E-09	NAv	NAp		
Anthracene	1E-09	NAv	NAp		
Benzo(a)anthracene	3E-10	NAv	NAp		
Fluorene	2E-09	NAv	NAp		
2-Methylnaphthalene	4E-08	NAv	NAp		
Naphthalene	2E-07	3E-03	6E-05		
Pyrene	1E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	6E-14	4E-08	2E-06		
				6E-05	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1E-06	3E-04	4E-03		
				4E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-06	3E-04	4E-03		
				4E-03	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3E-09	NAv	NAp		
Benzo(k)fluoranthene	5E-09	NAv	NAp		
Chrysene	7E-09	NAv	NAp		
Pyrene	2E-09	3E-02	8E-08		
Dioxins-Furans					
2,3,7,8-TCDD	5E-13	7E-10	7E-04		
Inorganic Compounds					
Manganese	2E-05	1E-01	2E-04		
Mercury	1E-07	NAv	NAp		
				9E-04	

Table 6-71
Hazard Index Estimates for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	4E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	6E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	7E-11	7E-10	1E-01		
				1E-01	
					1E-01

Notes:

NAp - Not Applicable

NAv - Not Available

RfC - Reference Concentration

RfD - Reference Dose

Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.

Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-72
Excess Lifetime Cancer Risk Estimate for
Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.2E-09	7E-01	2E-09		
Benzo(a)pyrene	1.7E-09	7E+00	1E-08		
Benzo(b)fluoranthene	2.0E-09	7E-01	1E-09		
Benzo(k)fluoranthene	1.6E-09	7E-02	1E-10		
Chrysene	3.8E-09	7E-03	3E-11		
Dibenzo(a,h)anthracene	4.0E-10	7E+00	3E-09		
Indeno(1,2,3-cd)pyrene	8.3E-10	7E-01	6E-10		
Naphthalene	1.3E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	1.7E-13	1E+05	2E-08		
Inorganic Compounds					
Arsenic	6.6E-07	2E+00	1E-06		
Lead	6.5E-06	NAv	NAp		
				1E-06	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1.2E-09	7E-01	9E-10		
Benzo(a)pyrene	9.3E-10	7E+00	7E-09		
Benzo(b)fluoranthene	1.1E-09	7E-01	8E-10		
Benzo(k)fluoranthene	8.7E-10	7E-02	6E-11		
Chrysene	2.1E-09	7E-03	2E-11		
Dibenzo(a,h)anthracene	2.2E-10	7E+00	2E-09		
Indeno(1,2,3-cd)pyrene	4.6E-10	7E-01	3E-10		
Naphthalene	7.0E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2.1E-14	1E+05	3E-09		
Inorganic Compounds					
Arsenic	8.4E-08	2E+00	1E-07		
Lead	0.0E+00	NAv	NAp		
				1E-07	

Table 6-72
Excess Lifetime Cancer Risk Estimate for Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.7E-13	1E-01	3E-14		
Benzo(a)pyrene	2.1E-13	1E+00	2E-13		
Benzo(b)fluoranthene	2.4E-13	1E-01	3E-14		
Benzo(k)fluoranthene	1.9E-13	1E-01	2E-14		
Chrysene	4.6E-13	1E-02	5E-15		
Dibenzo(a,h)anthracene	4.9E-14	1E+00	6E-14		
Indeno(1,2,3-cd)pyrene	1.0E-13	1E-01	1E-14		
Naphthalene	1.6E-12	3E-02	5E-14		
Dioxins-Furans					
2,3,7,8-TCDD	2.0E-17	4E+04	8E-13		
Inorganic Compounds					
Arsenic	8.0E-11	4E+00	3E-10		
Lead	7.9E-10	NAv	NAp		
				3E-10	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	1E-10	1E-01	1E-11		
Naphthalene	5E-08	3E-02	2E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-14	4E+04	7E-10		
				3E-09	

Table 6-72
Excess Lifetime Cancer Risk Estimate for Current/Future Site-Wide Adult Visitor Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	4E-07	2E+00	6E-07		
				6E-07	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	4E-07	2E+00	6E-07		
				6E-07	
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	9E-10	7E+00	6E-09		
Benzo(k)fluoranthene	2E-09	7E-02	1E-10		
Chrysene	2E-09	7E-03	2E-11		
Dioxins-Furans					
2,3,7,8-TCDD	1E-13	1E+05	2E-08		
				3E-08	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	1E-07	7E+00	9E-07		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	2E-07	7E-03	1E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-11	1E+05	3E-06		
				4E-06	
					6E-06

Notes:

IUR - Inhalation Unit Risk

NAp - Not Applicable

NAv - Not Available

Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.

Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m³.

Table 6-73
Hazard Index Estimates for
Future Kansas River Floodplain Child Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	3.86E-08	6E-02	6E-07		
Acenaphthylene	9.03E-09	NAv	NAp		
Anthracene	3.91E-08	3E-01	1E-07		
Benzo(a)anthracene	1.51E-07	NAv	NAp		
Benzo(a)pyrene	1.42E-07	NAv	NAp		
Benzo(b)fluoranthene	1.85E-07	NAv	NAp		
Benzo(g,h,i)perylene	1.28E-07	NAv	NAp		
Benzo(k)fluoranthene	1.33E-07	NAv	NAp		
Chrysene	3.35E-07	NAv	NAp		
Dibenzo(a,h)anthracene	4.50E-08	NAv	NAp		
Fluoranthene	1.85E-07	4E-02	5E-06		
Fluorene	4.50E-08	4E-02	1E-06		
Indeno(1,2,3-cd)pyrene	6.10E-08	NAv	NAp		
Naphthalene	2.25E-06	2E-02	1E-04		
Phenanthrene	3.04E-06	NAv	NAp		
Pyrene	1.32E-07	3E-02	4E-06		
Dioxins-Furans					
2,3,7,8-TCDD	4.16E-11	7E-10	6E-02		
Inorganic Compounds					
Arsenic	9.38E-05	3E-04	3E-01		
Lead	6.38E-04	NAv	NAp		
Thallium	9.14E-06	1E-05	9E-01		
				1E+00	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	1.19E-08	6E-02	2E-07		
Acenaphthylene	2.78E-09	NAv	NAp		
Anthracene	1.21E-08	3E-01	4E-08		
Benzo(a)anthracene	4.65E-08	NAv	NAp		
Benzo(a)pyrene	4.38E-08	NAv	NAp		
Benzo(b)fluoranthene	5.72E-08	NAv	NAp		
Benzo(g,h,i)perylene	3.94E-08	NAv	NAp		
Benzo(k)fluoranthene	4.10E-08	NAv	NAp		
Chrysene	1.03E-07	NAv	NAp		
Dibenzo(a,h)anthracene	1.39E-08	NAv	NAp		
Fluoranthene	5.72E-08	4E-02	1E-06		
Fluorene	1.39E-08	4E-02	3E-07		
Indeno(1,2,3-cd)pyrene	1.88E-08	NAv	NAp		
Naphthalene	6.94E-07	2E-02	3E-05		
Phenanthrene	9.39E-07	NAv	NAp		
Pyrene	4.06E-08	3E-02	1E-06		
Dioxins-Furans					
2,3,7,8-TCDD	2.96E-12	7E-10	4E-03		
Inorganic Compounds					
Arsenic	6.68E-06	3E-04	2E-02		
Lead	0.00E+00	NAv	NAp		
Thallium	0.00E+00	1E-05	0E+00		
				3E-02	

Table 6-73
Hazard Index Estimates for
Future Kansas River Floodplain Child Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	2.20E-12	NAv	NAp		
Acenaphthylene	5.14E-13	NAv	NAp		
Anthracene	2.23E-12	NAv	NAp		
Benzo(a)anthracene	8.60E-12	NAv	NAp		
Benzo(a)pyrene	8.09E-12	NAv	NAp		
Benzo(b)fluoranthene	1.06E-11	NAv	NAp		
Benzo(g,h,i)perylene	7.28E-12	NAv	NAp		
Benzo(k)fluoranthene	7.58E-12	NAv	NAp		
Chrysene	1.91E-11	NAv	NAp		
Dibenzo(a,h)anthracene	2.56E-12	NAv	NAp		
Fluoranthene	1.06E-11	NAv	NAp		
Fluorene	2.56E-12	NAv	NAp		
Indeno(1,2,3-cd)pyrene	3.48E-12	NAv	NAp		
Naphthalene	1.28E-10	3E-03	4E-08		
Phenanthrene	1.73E-10	NAv	NAp		
Pyrene	7.51E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2.37E-15	4E-08	6E-08		
Inorganic Compounds					
Arsenic	5.35E-09	2E-05	3E-04		
Lead	3.64E-08	NAv	NAp		
Thallium	5.21E-10	NAv	NAp		
				3E-04	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	3.05E-08	NAv	NAp		
Anthracene	6.74E-09	NAv	NAp		
Benzo(a)anthracene	5.63E-09	NAv	NAp		
Fluorene	1.76E-08	NAv	NAp		
Naphthalene	5.78E-06	3E-03	2E-03		
Pyrene	1.50E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3.66E-12	4E-08	9E-05		
				2E-03	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1.92E-05	3E-04	6E-02		
				6E-02	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	2.46E-05	3E-04	8E-02		
				8E-02	

Table 6-73
Hazard Index Estimates for
Future Kansas River Floodplain Child Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3.48E-08	NAv	NAp		
Benzo(k)fluoranthene	6.25E-08	NAv	NAp		
Chrysene	8.52E-08	NAv	NAp		
Pyrene	2.84E-08	3E-02	9E-07		
Dioxins-Furans					
2,3,7,8-TCDD	5.89E-12	7E-10	8E-03		
Inorganic Compounds					
Manganese	2.28E-04	1E-01	2E-03		
Mercury	1.21E-06	NAv	NAp		
				1E-02	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	1.17E-06	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	1.67E-06	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	8.57E-11	7E-10	1E-01		
				1E-01	
					2E+00

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-74
Hazard Index Estimates for
Future Kansas River Floodplain Adult Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Acenaphthene	4E-09	6E-02	6E-08		
Acenaphthylene	8E-10	NAv	NAp		
Anthracene	4E-09	3E-01	1E-08		
Benzo(a)anthracene	1E-08	NAv	NAp		
Benzo(a)pyrene	1E-08	NAv	NAp		
Benzo(b)fluoranthene	2E-08	NAv	NAp		
Benzo(g,h,i)perylene	1E-08	NAv	NAp		
Benzo(k)fluoranthene	1E-08	NAv	NAp		
Chrysene	3E-08	NAv	NAp		
Dibenzo(a,h)anthracene	4E-09	NAv	NAp		
Fluoranthene	2E-08	4E-02	4E-07		
Fluorene	4E-09	4E-02	1E-07		
Indeno(1,2,3-cd)pyrene	6E-09	NAv	NAp		
Naphthalene	2E-07	2E-02	1E-05		
Phenanthrene	3E-07	NAv	NAp		
Pyrene	1E-08	3E-02	4E-07		
Dioxins-Furans					
2,3,7,8-TCDD	4E-12	7E-10	6E-03		
Inorganic Compounds					
Arsenic	9E-06	3E-04	3E-02		
Lead	6E-05	NAv	NAp		
Thallium	9E-07	1E-05	9E-02		
				1E-01	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Acenaphthene	2E-09	6E-02	3E-08		
Acenaphthylene	5E-10	NAv	NAp		
Anthracene	2E-09	3E-01	7E-09		
Benzo(a)anthracene	8E-09	NAv	NAp		
Benzo(a)pyrene	7E-09	NAv	NAp		
Benzo(b)fluoranthene	1E-08	NAv	NAp		
Benzo(g,h,i)perylene	7E-09	NAv	NAp		
Benzo(k)fluoranthene	7E-09	NAv	NAp		
Chrysene	2E-08	NAv	NAp		
Dibenzo(a,h)anthracene	2E-09	NAv	NAp		
Fluoranthene	1E-08	4E-02	2E-07		
Fluorene	2E-09	4E-02	6E-08		
Indeno(1,2,3-cd)pyrene	3E-09	NAv	NAp		
Naphthalene	1E-07	2E-02	6E-06		
Phenanthrene	2E-07	NAv	NAp		
Pyrene	7E-09	3E-02	2E-07		
Dioxins-Furans					
2,3,7,8-TCDD	5E-13	7E-10	7E-04		
Inorganic Compounds					
Arsenic	1E-06	3E-04	4E-03		
Lead	0E+00	NAv	NAp		
Thallium	0E+00	1E-05	0E+00		
				4E-03	

Table 6-74
Hazard Index Estimates for
Future Kansas River Floodplain Adult Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Acenaphthene	2E-12	NAv	NAp		
Acenaphthylene	5E-13	NAv	NAp		
Anthracene	2E-12	NAv	NAp		
Benzo(a)anthracene	9E-12	NAv	NAp		
Benzo(a)pyrene	8E-12	NAv	NAp		
Benzo(b)fluoranthene	1E-11	NAv	NAp		
Benzo(g,h,i)perylene	7E-12	NAv	NAp		
Benzo(k)fluoranthene	8E-12	NAv	NAp		
Chrysene	2E-11	NAv	NAp		
Dibenzo(a,h)anthracene	3E-12	NAv	NAp		
Fluoranthene	1E-11	NAv	NAp		
Fluorene	3E-12	NAv	NAp		
Indeno(1,2,3-cd)pyrene	3E-12	NAv	NAp		
Naphthalene	1E-10	3E-03	4E-08		
Phenanthrene	2E-10	NAv	NAp		
Pyrene	8E-12	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2E-15	4E-08	6E-08		
Inorganic Compounds					
Arsenic	5E-09	2E-05	3E-04		
Lead	4E-08	NAv	NAp		
Thallium	5E-10	NAv	NAp		
				3E-04	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Acenaphthene	2E-08	NAv	NAp		
Anthracene	4E-09	NAv	NAp		
Benzo(a)anthracene	3E-09	NAv	NAp		
Fluorene	1E-08	NAv	NAp		
Naphthalene	3E-06	3E-03	1E-03		
Pyrene	8E-09	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	2E-12	4E-08	5E-05		
				1E-03	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	2E-06	3E-04	6E-03		
				6E-03	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	1E-06	3E-04	5E-03		
				5E-03	

Table 6-74
Hazard Index Estimates for
Future Kansas River Floodplain Adult Resident Scenario

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Chemical	Daily Intake	RfD/RfC	Hazard Quotient	Pathway Hazard Index	Total Hazard Index
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	3E-09	NAv	NAp		
Benzo(k)fluoranthene	5E-09	NAv	NAp		
Chrysene	7E-09	NAv	NAp		
Pyrene	2E-09	3E-02	8E-08		
Dioxins-Furans					
2,3,7,8-TCDD	5E-13	7E-10	7E-04		
Inorganic Compounds					
Manganese	2E-05	1E-01	2E-04		
Mercury	1E-07	NAv	NAp		
				9E-04	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	5E-07	NAv	NAp		
Benzo(k)fluoranthene	NC	NAv	NAp		
Chrysene	7E-07	NAv	NAp		
Pyrene	NC	3E-02	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	4E-11	7E-10	5E-02		
				5E-02	
					2E-01

Notes:
NAp - Not Applicable
NAv - Not Available
RfC - Reference Concentration
RfD - Reference Dose
Daily intakes and RfDs applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and RfDs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-75
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Incidental Ingestion of Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	7.7E-08	7E-01	6E-08		
Benzo(a)pyrene	7.2E-08	7E+00	5E-07		
Benzo(b)fluoranthene	9.5E-08	7E-01	7E-08		
Benzo(k)fluoranthene	6.8E-08	7E-02	5E-09		
Chrysene	1.7E-07	7E-03	1E-09		
Dibenzo(a,h)anthracene	2.3E-08	7E+00	2E-07		
Indeno(1,2,3-cd)pyrene	3.1E-08	7E-01	2E-08		
Naphthalene	2.5E-07	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	4.7E-12	1E+05	6E-07		
Inorganic Compounds					
Arsenic	1.1E-05	2E+00	2E-05		
Lead	7.2E-05	NAv	NAp		
				2E-05	
Exposure Pathway: Dermal Contact with Soil					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2.6E-08	7E-01	2E-08		
Benzo(a)pyrene	2.4E-08	7E+00	2E-07		
Benzo(b)fluoranthene	3.2E-08	7E-01	2E-08		
Benzo(k)fluoranthene	2.3E-08	7E-02	2E-09		
Chrysene	5.7E-08	7E-03	4E-10		
Dibenzo(a,h)anthracene	7.7E-09	7E+00	6E-08		
Indeno(1,2,3-cd)pyrene	1.0E-08	7E-01	8E-09		
Naphthalene	9.3E-08	NAv	NAp		
Dioxins-Furans					
2,3,7,8-TCDD	3.9E-13	1E+05	5E-08		
Inorganic Compounds					
Arsenic	8.9E-07	2E+00	1E-06		
Lead	0.0E+00	NAv	NAp		
				2E-06	

Table 6-75
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Inhalation of Fugitive Dust					
Semivolatile Organic Compounds					
Benzo(a)anthracene	3.2E-13	1E-01	4E-14		
Benzo(a)pyrene	3.0E-13	1E+00	3E-13		
Benzo(b)fluoranthene	4.0E-13	1E-01	4E-14		
Benzo(k)fluoranthene	2.9E-13	1E-01	3E-14		
Chrysene	7.2E-13	1E-02	8E-15		
Dibenzo(a,h)anthracene	9.6E-14	1E+00	1E-13		
Indeno(1,2,3-cd)pyrene	1.3E-13	1E-01	1E-14		
Naphthalene	4.8E-11	3E-02	2E-12		
Dioxins-Furans					
2,3,7,8-TCDD	8.8E-16	4E+04	3E-11		
Inorganic Compounds					
Arsenic	2.0E-09	4E+00	9E-09		
Lead	1.4E-08	NAv	NAp		
				9E-09	
Exposure Pathway: Inhalation of Outdoor Vapors					
Semivolatile Organic Compounds					
Benzo(a)anthracene	2E-09	1E-01	2E-10		
Naphthalene	2E-06	3E-02	7E-08		
Dioxins-Furans					
2,3,7,8-TCDD	1E-12	4E+04	5E-08		
				1E-07	
Exposure Pathway: Ingestion of Sediment					
Inorganic Compounds					
Arsenic	1E-05	2E+00	2E-05		
				2E-05	
Exposure Pathway: Dermal Contact with Sediment					
Inorganic Compounds					
Arsenic	9E-07	2E+00	1E-06		
				1E-06	

Table 6-75
Excess Lifetime Cancer Risk Estimate for
Future Kansas River Floodplain Resident Scenario
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Chemical	Daily Intake	Slope Factor/ IUR	Excess Cancer Risk	Pathway Cancer Risk	Total Cancer Risk
Exposure Pathway: Ingestion of Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	2E-08	7E+00	1E-07		
Benzo(k)fluoranthene	3E-08	7E-02	2E-09		
Chrysene	4E-08	7E-03	3E-10		
Dioxins-Furans					
2,3,7,8-TCDD	7E-13	1E+05	8E-08		
				2E-07	
Exposure Pathway: Dermal Contact with Surface Water					
Semivolatile Organic Compounds					
Benzo(a)pyrene	8E-07	7E+00	6E-06		
Benzo(k)fluoranthene	NC	7E-02	NAp		
Chrysene	1E-06	7E-03	8E-09		
Dioxins-Furans					
2,3,7,8-TCDD	2E-11	1E+05	2E-06		
				8E-06	
					4E-05

Notes:
IUR - Inhalation Unit Risk
NAp - Not Applicable
NAv - Not Available
Daily intakes and Slope Factors applicable to ingestion and dermal contact pathways are expressed in units of mg/kg/day.
Daily intakes and IURs applicable to inhalation pathways are expressed in units of mg/m^3.

Table 6-76
Summary of Risk Results
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Population	Noncancer	Cancer
Current/Future Upland Terrace Rail Worker		
Incidental Ingestion of Surface Soil	4E-02	5E-06
Dermal Contact with Surface Soil	5E-03	7E-07
Inhalation of Fugitive Dust	9E-05	3E-09
Inhalation of Outdoor Vapors	1E-04	9E-09
Ingestion of Sediment	4E-03	7E-07
Dermal Contact with Sediment	9E-04	1E-07
Ingestion of Surface Water	1E-03	5E-08
Dermal Contact with Surface Water	2E-02	4E-06
Total	8E-02	**1E-05**
Future Floodplain Slope Worker		
Incidental Ingestion of Surface Soil	3E-01	1E-05
Dermal Contact with Surface Soil	1E-02	1E-06
Inhalation of Fugitive Dust	2E-04	6E-09
Inhalation of Outdoor Vapors	9E-04	5E-08
Ingestion of Sediment	4E-03	7E-07
Dermal Contact with Sediment	9E-04	1E-07
Ingestion of Surface Water	2E-03	5E-08
Dermal Contact with Surface Water	9E-02	4E-06
Total	4E-01	**2E-05**
Future Kansas River Floodplain Worker		
Incidental Ingestion of Surface Soil	9E-02	4E-06
Dermal Contact with Surface Soil	3E-03	5E-07
Inhalation of Fugitive Dust	6E-05	2E-09
Inhalation of Outdoor Vapors	2E-04	1E-08
Ingestion of Sediment	4E-03	7E-07
Dermal Contact with Sediment	9E-04	1E-07
Ingestion of Surface Water	1E-03	5E-08
Dermal Contact with Surface Water	9E-02	4E-06
Total	2E-01	**9E-06**
Future Kansas River Floodplain Construction Worker		
Incidental Ingestion of Surface and Subsurface Soil	3E-01	2E-07
Dermal Contact with Surface and Subsurface Soil	8E-03	2E-08
Inhalation of Fugitive Dust	7E-05	4E-11
Inhalation of Outdoor Vapors	1E-03	1E-09
Ingestion of Sediment	2E-02	5E-08
Dermal Contact with Sediment	1E-03	3E-09
Ingestion of Surface Water	1E-03	1E-09
Dermal Contact with Surface Water	1E-01	8E-08
Total	4E-01	4E-07
Current/Future Site-Wide Child Visitor		
Incidental Ingestion of Surface Soil	3E-01	3E-06
Dermal Contact with Surface Soil	6E-03	2E-07
Inhalation of Fugitive Dust	1E-05	1E-10
Inhalation of Outdoor Vapors	1E-04	1E-09
Ingestion of Sediment	5E-02	2E-06
Dermal Contact with Sediment	6E-02	2E-06
Ingestion of Surface Water	6E-03	6E-08
Dermal Contact with Surface Water	1E-01	1E-06
Total	5E-01	**9E-06**

Table 6-76
Summary of Risk Results
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Population	Noncancer	Cancer
Current/Future Site-Wide Youth Visitor		
Incidental Ingestion of Surface Soil	5E-02	6E-07
Dermal Contact with Surface Soil	5E-03	2E-07
Inhalation of Fugitive Dust	6E-06	4E-11
Inhalation of Outdoor Vapors	5E-05	6E-10
Ingestion of Sediment	8E-03	3E-07
Dermal Contact with Sediment	5E-02	2E-06
Ingestion of Surface Water	1E-03	1E-08
Dermal Contact with Surface Water	1E-01	1E-06
Total	2E-01	**4E-06**
Current/Future Site-Wide Adult Visitor		
Incidental Ingestion of Surface Soil	3E-02	1E-06
Dermal Contact with Surface Soil	1E-03	1E-07
Inhalation of Fugitive Dust	1E-05	3E-10
Inhalation of Outdoor Vapors	6E-05	3E-09
Ingestion of Sediment	4E-03	6E-07
Dermal Contact with Sediment	4E-03	6E-07
Ingestion of Surface Water	9E-04	3E-08
Dermal Contact with Surface Water	1E-01	4E-06
Total	1E-01	**6E-06**
Future Kansas River Floodplain Child Resident		
Incidental Ingestion of Surface Soil	1E+00	
Dermal Contact with Surface Soil	3E-02	
Inhalation of Fugitive Dust	3E-04	
Inhalation of Outdoor Vapors	2E-03	
Ingestion of Sediment	6E-02	
Dermal Contact with Sediment	8E-02	
Ingestion of Surface Water	1E-02	
Dermal Contact with Surface Water	1E-01	
Total	**2E+00**	
Future Kansas River Floodplain Adult Resident		
Incidental Ingestion of Surface Soil	1E-01	
Dermal Contact with Surface Soil	4E-03	
Inhalation of Fugitive Dust	3E-04	
Inhalation of Outdoor Vapors	1E-03	
Ingestion of Sediment	6E-03	
Dermal Contact with Sediment	5E-03	
Ingestion of Surface Water	9E-04	
Dermal Contact with Surface Water	5E-02	
Total	2E-01	
Future Kansas River Floodplain Age-Adjusted Resident		
Incidental Ingestion of Surface Soil		2E-05
Dermal Contact with Surface Soil		2E-06
Inhalation of Fugitive Dust		9E-09
Inhalation of Outdoor Vapors		1E-07
Ingestion of Sediment		2E-05
Dermal Contact with Sediment		1E-06
Ingestion of Surface Water		2E-07
Dermal Contact with Surface Water		8E-06
Total		**4E-05**

Note:
Bold indicates a noncancer risk above the USEPA target of 1 and/or cumulative risk within the USEPA risk management range of 1E-04 to 1E-06.

Table 7-1
Ecological Screening Levels Used and Sources
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Soil							
Detected Parameter	**Units**	**Screening Level**	**Source[1]**	**Detected Parameter**	**Units**	**Screening Level**	**Source[1]**
Dioxins/Furans				**Metals[2]**			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/kg	0.000199	EPA R5	Aluminum[3]	µg/kg	50,000	SQuiRTs
Total Petroleum Hydrocarbons				Antimony	µg/kg	142	EPA R5
Diesel Range Organics	µg/kg	200,000	WAC	Arsenic	µg/kg	5,700	EPA R5
Gasoline Range Organics	µg/kg	100,000	WAC	Barium	µg/kg	1,040	EPA R5
Semivolatile Organic Compounds				Beryllium	µg/kg	1,060	EPA R5
Acenaphthene	µg/kg	682,000	EPA R5	Cadmium	µg/kg	2.22	EPA R5
Acenapthylene	µg/kg	682,000	EPA R5	Calcium	µg/kg	NA	NA
Anthracene	µg/kg	1,480,000	EPA R5	Chromium	µg/kg	400	EPA R5
Benzo(a)anthracene	µg/kg	5,210	EPA R5	Cobalt	µg/kg	140	EPA R5
Benzo(a)pyrene	µg/kg	1,520	EPA R5	Copper	µg/kg	5,400	EPA R5
Benzo(b)fluoranthene	µg/kg	59,800	EPA R5	Iron[4]	µg/kg	200,000	SQuiRTs
Benzo(g,h,i)perylene	µg/kg	119,000	EPA R5	Lead	µg/kg	53.7	EPA R5
Benzo(k)fluoranthracene	µg/kg	148,000	EPA R5	Magnesium	µg/kg	NA	NA
Chrysene	µg/kg	4,730	EPA R5	Manganese[4]	µg/kg	100,000	SQuiRTs
Dibenzo(a,h)anthracene	µg/kg	18,400	EPA R5	Mercury	µg/kg	100	EPA R5
Dibenzofuran	µg/kg	NA	EPA R5	Methyl Mercury	µg/kg	1.58	EPA R5
Dimethyl phthalate	µg/kg	734,000	EPA R5	Nickel	µg/kg	13,600	EPA R5
Fluoranthene	µg/kg	122,000	EPA R5	Potassium	µg/kg	NA	NA
Fluorene	µg/kg	122,000	EPA R5	Selenium	µg/kg	27.6	EPA R5
Indeno(1,2,3-cd)pyrene	µg/kg	109,000	EPA R5	Silver	µg/kg	4,040	EPA R5
1-Methylnaphthalene[6]	µg/kg	3,240	EPA R5	Sodium	µg/kg	NA	NA
2-Methylnaphthalene	µg/kg	3,240	EPA R5	Thallium	µg/kg	56.9	EPA R5
Naphthalene	µg/kg	99.4	EPA R5	Vanadium	µg/kg	1,590	EPA R5
Phenanthrene	µg/kg	45,700	EPA R5	Zinc	µg/kg	6,620	EPA R5
Pyrene	µg/kg	78,500	EPA R5				

Stream Sediment			
Detected Parameter	**Units**	**Screening Level**	**Source[1]**
Dioxins/Furans			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/kg	0.00012	EPA R5
Total Petroleum Hydrocarbons			
Diesel Range Organics	µg/kg	340,000	EPA R4
Metals[2]			
Aluminum	µg/kg	25,000,000	EPA R4
Antimony	µg/kg	2,000	SRNL
Arsenic	µg/kg	9,790	EPA R5
Barium	µg/kg	200,000	SRNL
Beryllium	µg/kg	1,100	SRNL
Cadmium	µg/kg	990	EPA R5
Calcium	µg/kg	NA	NA
Chromium	µg/kg	43,400	EPA R5
Cobalt	µg/kg	50,000	EPA R5
Copper	µg/kg	31,600	EPA R5
Iron	µg/kg	20,000,000	EPA R4
Lead	µg/kg	35,800	EPA R5
Magnesium	µg/kg	NA	NA
Manganese	µg/kg	460,000	EPA R4
Mercury	µg/kg	174	EPA R5
Methyl Mercury	µg/kg	0.01	EPA R5
Nickel	µg/kg	22,700	EPA R5
Potassium	µg/kg	NA	NA
Selenium	µg/kg	700	SRNL
Silver	µg/kg	500	EPA R5
Sodium	µg/kg	NA	NA
Thallium	µg/kg	1,000	SRNL
Vanadium	µg/kg	NA	EPA R5
Zinc	µg/kg	121,000	EPA R5

Notes:

[1] Sources are as follows:
- EPA R5 - USEPA, Region 5, RCRA Ecological Screening Levels, August 22, 2003. Access: https://archive.epa.gov/region5/waste/cars/web/pdf/ecological-screening-levels-200308.pdf (USEPA, 2003b).
- SQuiRTs - NOAA Screening Quick Reference Tables (SQuiRTs), 2008. Access: http://response.restoration.noaa.gov/sites/default/files/SQuiRTs.pdf. (NOAA, 2008).
- WAC - Terrestrial Ecological Screening Values: Site Specific Ecological Evaluation screening levels for protection of terrestrial plants and animals - from WAC 173-340-900; Washington State Department of Ecology, February 12, 2001. Access: https://fortress.wa.gov/ecy/clarc/FocusSheets/Tee%20Site%20Specific.pdf (WAC, 2001).
- SRNL - Savannah River National Laboratory Ecological Screening Values for Surface Water, Sediment, and Soil: 2005 Update, WSRC-TR-98-00110. Access: http://www.osti.gov/scitech/servlets/purl/4764 (SRNL, 2005).
- EPA R4 - USEPA, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft, RCRA Ecological Screening Levels, August 2015. Access: https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf (USEPA, 2015b).
- CAWB - San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Levels, February 2016. Access: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/ESL/Tier%201%20and%20Summary%20ESLs_22Feb16.pdf (CAWB, 2016)

[2] Value represents United States Environmental Protection Agency's total screening value, unless indicated otherwise.

[3] Value reported is Oak Ridge National Laboratory (ORNL) ORNL 1997, ES/ER/TM-126/R2

[4] Value repreported is from ORNL 1996, ES/ER/TM-85/R3.

[5] Screening level for ground water used as a surrogate for the screening level for surface water.

[6] 2-Methylnaphthalene screening level was used as a surrogate for 1-Methylnaphthalene

[7] The benzo[a]pyrene screening level of 0.014 ug/L was devided by the TEF of 0.01 to derive the corresponding ESL of 1.4 ug/L for benzo[k]fluoranthene.

NA = Not available

TCDD = 2,3,7,8-Tetra chlorodibenzo-p-dioxin

µg/kg = micrograms per kilogram

µg/L = micrograms per liter

Table 7-1
Ecological Screening Levels Used and Sources
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Surface Water

Detected Parameter	Units	Screening Level	Source[1]
Dioxins/Furans			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/L	0.000000003	EPA R5
Total Petroleum Hydrocarbons			
Diesel Range Organics[3]	µg/L	100	CAWB
Semivolatile Organic Compounds			
Benzo(a)pyrene	µg/L	0.014	EPA R5
Benzo(k)fluoranthene[4]	µg/L	1.4	EPA R5
Chrysene	µg/L	NA	EPA R5
Pyrene	µg/L	0.3	EPA R5
Metals[2]			
Aluminum	µg/L	87	SRNL
Arsenic	µg/L	148	EPA R5
Barium	µg/L	220	EPA R5
Calcium	µg/L	116,000	SRNL
Copper	µg/L	1.58	EPA R5
Magnesium	µg/L	82,000	SRNL
Manganese	µg/L	120	SRNL
Mercury	µg/L	0.0013	EPA R5
Methyl Mercury	µg/L	0.00246	EPA R5
Nickel	µg/L	28.9	EPA R5
Potassium	µg/L	53,000	SRNL
Sodium	µg/L	680,000	SRNL
Vanadium	µg/L	12.00	EPA R5
Zinc	µg/L	65.7	EPA R5

Groundwater

Detected Parameter	Units	Screening Level	Source[1]
Dioxins/Furans			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/L	0.000000003	EPA R5
Volatile Organic Compounds			
Ethylbenzene	µg/L	14	EPA R5
Toluene	µg/L	253	EPA R5
Semivolatile Organic Compounds			
Acenapthylene	µg/L	38	EPA R5
Fluoranthene	µg/L	1.9	EPA R5
Naphthalene	µg/L	13	EPA R5
Phenanthrene	µg/L	3.6	EPA R5
Pyrene	µg/L	0.3	EPA R5
Metals[2]			
Aluminum	µg/L	87	SRNL
Arsenic	µg/L	148	EPA R5
Barium	µg/L	220	EPA R5
Beryllium	µg/L	3.6	EPA R5
Calcium	µg/L	116,000	SRNL
Chromium	µg/L	42	EPA R5
Cobalt	µg/L	24	EPA R5
Copper	µg/L	1.58	EPA R5
Iron	µg/L	1,000	SRNL
Lead	µg/L	35,800	EPA R5
Magnesium	µg/L	82,000	SRNL
Manganese	µg/L	120	SRNL
Methyl Mercury	µg/L	0.00246	EPA R5
Nickel	µg/L	28.9	EPA R5
Potassium	µg/L	53,000	SRNL
Selenium	µg/L	5	EPA R5
Sodium	µg/L	680,000	SRNL
Vanadium	µg/L	12	EPA R5

Notes:

[1] Sources are as follows:
- EPA R5 - USEPA, Region 5, RCRA Ecological Screening Levels, August 22, 2003. Access: https://archive.epa.gov/region5/waste/cars/web/pdf/ecological-screening-levels-200308.pdf (USEPA, 2003b).
- SQuiRTs - NOAA Screening Quick Reference Tables (SQuiRTs), 2008. Access: http://response.restoration.noaa.gov/sites/default/files/SQuiRTs.pdf. (NOAA, 2008).
- WAC - Terrestrial Ecological Screening Values: Site Specific Ecological Evaluation screening levels for protection of terrestrial plants and animals - from WAC 173-340-900; Washington State Department of Ecology, February 12, 2001. Access: https://fortress.wa.gov/ecy/clarc/FocusSheets/Tee%20Site%20Specific.pdf (WAC, 2001).
- SRNL - Savannah River National Laboratory Ecological Screening Values for Surface Water, Sediment, and Soil: 2005 Update, WSRC-TR-98-00110. Access: http://www.osti.gov/scitech/servlets/purl/4764 (SRNL, 2005).
- EPA R4 - USEPA, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft, RCRA Ecological Screening Levels, August 2015. Access: https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf (USEPA, 2015c).
- CAWB - San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Levels, February 2016. Access: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/ESL/Tier%201%20and%20Summary%20ESLs_22Feb16.pdf (CAWB, 2016)

[2] Value represents United States Environmental Protection Agency's total screening value, unless indicated otherwise.

[3] Value reported is Oak Ridge National Laboratory (ORNL) ORNL 1997, ES/ER/TM-126/R2

[4] Value repreported is from ORNL 1996, ES/ER/TM-85/R3.

[5] Screening level for ground water used as a surrogate for the screening level for surface water.

NA = Not available

TCDD = 2,3,7,8-Tetra chlorodibenzo-p-dioxin

µg/kg = micrograms per kilogram

µg/L = micrograms per liter

Table 7-2
Ecological Screening Summary for Surface Soil
WWI Incenerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Dioxins/Furans (pg/g)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.92 - 16	27 / 37	4.2 - 160	160	UT01/SB01 (Soil)	663.3333333	0 / 43	2.41E-01	No	Does Not Exceed
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	0.26 - 8.3	35 / 37	13 - 1,500	1,500	UT01/SB01 (Soil)	663.3333333	3 / 37	2.26E+00	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.32 - 10	30 / 37	0.50 - 110	110	UT01/SB01 (Soil)	19.9	15 / 37	5.53E+00	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.15 - 1.7	33 / 37	5.1 - 220	220	UT01/SB01 (Soil)	19.9	21 / 37	1.11E+01	**Yes**	Exceeds Screening Level
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.036 -3.0	14 / 37	0.22 - 4.6	4.6	DP02/SB01 (Soil/Ash)	19.9	0 / 43	2.31E-01	No	Does Not Exceed
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.039 - 1.8	25 / 37	0.12 - 11	11	DP02/SB01 (Soil/Ash)	1.99	13 / 37	5.53E+00	**Yes**	Exceeds Screening Level
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.036 - 0.63	29 / 37	0.16 - 2.3	2.3	UT01/SB01 (Soil)	1.99	1 / 37	1.16E+00	**Yes**	Exceeds Screening Level
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.029 - 0.58	29 / 37	0.094 - 14	14	DP02/SB01 (Soil/Ash)	1.99	14 / 37	7.04E+00	**Yes**	Exceeds Screening Level
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.068 - 0.22	35 / 37	0.12 - 6.4	6.4	UT01/SB01 (Soil)	1.99	6 / 37	3.22E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.043 - 0.66	2 / 37	0.25 - 0.36	0.36	SS03/SS11 (Soil)	1.99	0 / 43	1.81E-01	No	Does Not Exceed
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.50 - 0.50	36 / 37	0.13 - 6.5	6.5	UT01/SB01 (Soil)	1.99	10 / 37	3.27E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.033 - 0.66	20 / 37	0.14 - 12	12	DP02/SB01 (Soil/Ash)	6.633333333	1 / 37	1.81E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.051 - 0.43	20 / 37	0.14 - 2.0	2	DP02/SB01 (Soil/Ash)	0.199	18 / 37	1.01E+01	**Yes**	Exceeds Screening Level
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.034 - 0.66	26 / 37	0.16 - 12	12	DP02/SB01 (Soil/Ash)	1.99	8 / 37	6.03E+00	**Yes**	Exceeds Screening Level
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.036 - 0.69	25 / 37	0.061 - 17	17	DP02/SB01 (Soil/Ash)	0.663333333	9 / 37	2.56E+01	**Yes**	Exceeds Screening Level
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.042 - 12	14 / 37	0.18 - 1.9	1.9	DP15/SB01 (Soil/Ash)	1.99	0 / 43	9.55E-01	No	Does Not Exceed
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.034 - 0.19	10 / 37	0.069 - 0.82	0.82	DP02/SB01 (Soil/Ash)	0.199	3 / 37	4.12E+00	**Yes**	Exceeds Screening Level
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Not Applicable	14 / 14	3.6 - 290	290	DP02/SB01 (Soil/Ash)	200	1 / 14	1.45E+00	**Yes**	Exceeds Screening Level
Gasoline Range Organics	0.37 - 0.59	4 / 14	2.0 - 11	11	DP04/SB02 (Ash)	100	0 / 14	1.10E-01	No	Does Not Exceed
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	0.00051 - 0.016	11 / 37	0.0034 - 0.025	0.025	DP15/SB01 (Soil/Ash)	682	0 / 37	3.67E-05	No	Does Not Exceed
Acenaphthylene	0.00036 - 0.027	14 / 37	0.00039 - 0.019	0.019	UT04/SB01 (Soil)	682	0 / 37	2.79E-05	No	Does Not Exceed
Anthracene	0.00043 - 0.027	19 / 37	0.00060 - 0.045	0.045	DP15/SB01 (Soil/Ash)	1480	0 / 37	3.04E-05	No	Does Not Exceed
Benzo(a)anthracene	0.0012 - 0.031	25 / 37	0.0012 - 0.21	0.21	DP15/SB01 (Soil/Ash)	5.21	0 / 37	4.03E-02	No	Does Not Exceed
Benzo(a)pyrene	0.0015 - 0.031	24 / 37	0.0015 - 0.14	0.14	DP15/SB01 (Soil/Ash)	1.52	0 / 37	9.21E-02	No	Does Not Exceed
Benzo(b)fluoranthene	0.0017 - 0.041	24 / 37	0.0017 - 0.16	0.16	DP15/SB01 (Soil/Ash)	59.8	0 / 37	2.68E-03	No	Does Not Exceed
Benzo(g,h,i)perylene	0.0011 - 0.025	24 / 37	0.0013 - 0.11	0.11	DP15/SB01 (Soil/Ash)	119	0 / 37	9.24E-04	No	Does Not Exceed
Benzo(k)fluoranthene	0.0017 - 0.063	23 / 37	0.0017 - 0.13	0.13	DP15/SB01 (Soil/Ash)	148	0 / 37	8.78E-04	No	Does Not Exceed
Chrysene	0.0019 - 0.042	25 / 37	0.0019 - 0.35	0.35	DP15/SB01 (Soil/Ash)	4.73	0 / 37	7.40E-02	No	Does Not Exceed
Dibenzo(a,h)anthracene	0.0013 - 0.03	10 / 37	0.0025 - 0.032	0.032	DP15/SB01 (Soil/Ash)	18.4	0 / 37	1.74E-03	No	Does Not Exceed
Dibenzofuran	0.023 - 0.031	3 / 14	0.044 - 0.13	0.13	DP02/SB01 (Soil/Ash)	None Reported	Not Applicable	Not Applicable	**Yes**	No Screening Level
Dimethyl phthalate	0.026 - 0.028	11 / 14	0.052 - 0.56	0.56	DP07/SB01 (Soil)	734	0 / 14	7.63E-04	No	Does Not Exceed
Fluoranthene	0.0021 - 0.057	25 / 37	0.0021 - 0.26	0.26	DP15/SB01 (Soil/Ash)	122	0 / 37	2.13E-03	No	Does Not Exceed
Fluorene	0.00053 - 0.028	11 / 37	0.0012 - 0.026	0.026	DP15/SB01 (Soil/Ash)	122	0 / 37	2.13E-04	No	Does Not Exceed
Semivolatile Organic Compounds (mg/kg) Continued										
Indeno(1,2,3-cd)pyrene	0.00052 - 0.035	22 / 37	0.0012 - 0.057	0.057	DP15/SB01 (Soil/Ash)	109	0 / 37	5.23E-04	No	Does Not Exceed
2-Methylnaphthalene	0.022 - 0.03	3 / 14	0.054 - 0.23	0.23	DP02/SB01 (Soil/Ash)	3.24	0 / 14	7.10E-02	No	Does Not Exceed
Naphthalene	0.00038 - 0.049	24 / 37	0.00041 - 1.4	1.4	DP15/SB01 (Soil/Ash)	0.0994	7 / 37	1.41E+01	**Yes**	Exceeds Screening Level
Phenanthrene	0.0012 - 0.027	28 / 37	0.0012 - 1.5	1.5	DP15/SB01 (Soil/Ash)	45.7	0 / 37	3.28E-02	No	Does Not Exceed
Pyrene	0.014 - 0.019	27 / 37	0.0020 - 0.26	0.26	DP15/SB01 (Soil/Ash)	78.5	0 / 37	3.31E-03	No	Does Not Exceed

Table 7-2
Ecological Screening Summary for Surface Soil
WWI Incenerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Metals (mg/kg)										
Aluminum	Not Applicable	37 / 37	8,900 - 23,000	23,000	DP05/SB02 (Soil/Ash)	50	37 / 37	4.60E+02	**Yes**	Exceeds Screening Level
Antimony	0.21 - 1.6	15 / 37	0.25 - 1.7	1.7	DP17/SB01 (Soil/Ash)	0.142	15 / 37	1.20E+01	**Yes**	Exceeds Screening Level
Arsenic	Not Applicable	37 / 37	3.4 - 35	35	DP03/SB01 (Soil/Ash)	5.7	19 / 37	6.14E+00	**Yes**	Exceeds Screening Level
Barium	Not Applicable	37 / 37	120 - 1,300	1,300	DP03/SB01 (Soil/Ash)	1.04	37 / 37	1.25E+03	**Yes**	Exceeds Screening Level
Beryllium	Not Applicable	37 / 37	0.50 - 2.7	2.7	DP03/SB01 (Soil/Ash)	1.06	10 / 37	2.55E+00	**Yes**	Exceeds Screening Level
Cadmium	Not Applicable	37 / 37	0.31 - 5.3	5.3	DP02/SB01 (Soil/Ash)	0.00222	37 / 37	2.39E+03	**Yes**	Exceeds Screening Level
Chromium	Not Applicable	37 / 37	11 - 23	23	SS06/SS01 (Soil)	0.4	37 / 37	5.75E+01	**Yes**	Exceeds Screening Level
Cobalt	Not Applicable	37 / 37	4.9 - 16	16	DP02/SB01 (Soil/Ash)	0.14	37 / 37	1.14E+02	**Yes**	Exceeds Screening Level
Copper	Not Applicable	37 / 37	10 - 200	200	DP04/SB02 (Ash)	5.4	37 / 37	3.70E+01	**Yes**	Exceeds Screening Level
Iron	Not Applicable	37 / 37	11,000 - 76,000	76,000	DP04/SB02 (Ash)	200	37 / 37	3.80E+02	**Yes**	Exceeds Screening Level
Lead	Not Applicable	37 / 37	10 - 370	370	DP02/SB01 (Soil/Ash)	0.0537	37 / 37	6.89E+03	**Yes**	Exceeds Screening Level
Manganese	Not Applicable	37 / 37	260 - 450	450	DP21/SB01 (Soil)	100	37 / 37	4.50E+00	**Yes**	Exceeds Screening Level
Mercury	Not Applicable	37 / 37	0.013 - 0.78	0.78	UT05/SB01 (Soil)	0.1	6 / 37	7.80E+00	**Yes**	Exceeds Screening Level
Methyl Mercury	Not Applicable	14 / 14	0.000028 - 0.000265	0.000265	DP04/SB01 (Soil/Ash)	0.00158	0 / 14	1.68E-01	**Yes**	Bioaccumulative
Nickel	Not Applicable	37 / 37	12 - 87	87	DP02/SB01 (Soil/Ash)	13.6	28 / 37	6.40E+00	**Yes**	Exceeds Screening Level
Selenium	0.12 - 2.3	23 / 37	0.14 - 2.4	2.4	DP02/SB01 (Soil/Ash)	0.0276	23 / 37	8.70E+01	**Yes**	Exceeds Screening Level
Silver	0.11 - 0.16	24 / 37	0.037 - 0.97	0.97	DP16/SB11 (Soil/Ash)	4.04	0 / 37	2.40E-01	No	Does Not Exceed
Thallium	1.0 - 1.2	27 / 37	0.16 - 2	2	DP04/SB02 (Ash)	0.0569	27 / 37	3.51E+01	**Yes**	Exceeds Screening Level
Vanadium	Not Applicable	37 / 37	18 - 43	43	DP20/SB01 (Soil)	1.59	37 / 37	2.70E+01	**Yes**	Exceeds Screening Level
Zinc	Not Applicable	37 / 37	43 - 980	980	DP02/SB01 (Soil/Ash)	6.62	37 / 37	1.48E+02	**Yes**	Exceeds Screening Level

Notes:
pg/g - picograms per gram
mg/kg - milligrams per kilogram
The ecological screening level for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the ecological screening level for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-3
Ecological Screening Summary for Historic Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Maximum Detection Exceeds Ecological Screening Level	Rational
Metals (mg/kg)										
Antimony	2.0 - 2.0	0 / 7	Not Applicable	Not Applicable	Not Applicable	0.142	0 / 7	Not Applicable	No	Does Not Exceed
Arsenic	Not Applicable	112 - 112	2.50 - 86.9	86.9	CFI TP-4 65' 5'	5.7	41 / 112	1.52E+01	**Yes**	Exceeds Screening Level
Barium	Not Applicable	105 / 105	78.5 - 1,380	1,380	CFI TP-3 Composite	1.04	105 / 105	1.33E+03	**Yes**	Exceeds Screening Level
Cadmium	0.048 - 0.11	71 / 105	0.0468 - 15.6	15.6	CFI TP-5 70'	0.00222	71 / 105	7.03E+03	**Yes**	Exceeds Screening Level
Chromium	Not Applicable	105 / 105	5.54 - 20.3	20.3	CFI TP-6 60' 2'	0.4	105 / 105	5.08E+01	**Yes**	Exceeds Screening Level
Copper	Not Applicable	7 / 7	7.6 - 60.0	60	INC150006-L	5.4	7 / 7	1.11E+01	**Yes**	Exceeds Screening Level
Lead	Not Applicable	112 / 112	6.9 - 844	844	CFI06-27 0 - 0.5	0.0537	112 / 112	1.57E+04	**Yes**	Exceeds Screening Level
Mercury	0.0085 - 0.1	100 / 112	0.01 - 16.5	16.5	CFI06-26 0.5 - 1	0.1	17 / 112	1.65E+02	**Yes**	Exceeds Screening Level
Selenium	0.22 - 1.15	61 / 105	0.22 - 1.63	1.63	CFI06-27 1 - 2	0.0276	61 / 105	5.91E+01	**Yes**	Exceeds Screening Level
Silver	0.059 - 0.278	16 / 105	0.12 - 0.94	0.94	CFI TP-4 65' 5'	4.04	0 / 105	2.33E-01	No	Does Not Exceed
Zinc	Not Applicable	7 / 7	37.6 - 1,380	1,380	INC150006-L	6.62	7 / 7	2.08E+02	**Yes**	Exceeds Screening Level

Notes:
mg/kg - milligrams per kilogram

Table 7-4
Ecological Screening Summary for Subsurface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Dioxins/Furans (pg/g)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.075 - 3.2	20 / 62	0.28 - 28	28	UT03/SB02 (Soil)	663.3333333	0 / 62	4.22E-02	No	Does Not Exceed
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.4 - 12	50 / 62	0.82 - 350	350	UT03/SB02 (Soil)	663.3333333	0 / 62	5.28E-01	No	Does Not Exceed
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.059 - 2.3	36 / 62	0.082 - 42	42	DP02/SB02 (Ash)	19.9	2 / 62	2.11E+00	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.087 - 1.9	19 / 62	0.45 - 40	40	UT03/SB02 (Soil)	19.9	1 / 62	2.01E+00	**Yes**	Exceeds Screening Level
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.028 - 0.33	3 / 62	0.25 - 3.3	3.3	DP02/SB02 (Ash)	19.9	0 / 62	1.66E-01	No	Does Not Exceed
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.033 - 0.78	19 / 62	0.071 - 12	12	DP02/SB02 (Ash)	1.99	3 / 62	6.03E+00	**Yes**	Exceeds Screening Level
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.015 - 0.53	12 / 62	0.074 - 1.5	1.5	DP22/SB02 (Ash)	1.99	0 / 62	7.54E-01	No	Does Not Exceed
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.025 - 0.64	19 / 62	0.062 - 14	14	DP02/SB02 (Ash)	1.99	2 / 62	7.04E+00	**Yes**	Exceeds Screening Level
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.019 - 0.53	17 / 62	0.05 - 2.0	2.0	DP22/SB02 (Ash)	1.99	1 / 62	1.01E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.029 - 0.79	1 / 62	1.5 - 1.5	1.5	DP02/SB02 (Ash)	1.99	0 / 62	7.54E-01	No	Does Not Exceed
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.034 - 0.67	32 / 62	0.083 - 3.4	3.4	DP22/SB02 (Ash)	1.99	2 / 62	1.71E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.021 - 1.9	13 / 62	0.062 - 14	14	DP02/SB02 (Ash)	6.633333333	1 / 62	2.11E+00	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.041 - 0.73	6 / 62	0.16 - 1.5	1.5	DP02/SB02 (Ash); DP22/SB02 (Ash)	0.199	5 / 62	7.54E+00	**Yes**	Exceeds Screening Level
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.026 - 0.73	15 / 62	0.059 - 8.3	8.3	DP02/SB02 (Ash)	1.99	2 / 62	4.17E+00	**Yes**	Exceeds Screening Level
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.026 - 0.84	11 / 62	0.062 - 16	16	DP02/SB02 (Ash)	0.663333333	5 / 62	2.41E+01	**Yes**	Exceeds Screening Level
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.020 - 0.50	6 / 62	0.18 - 13	13	DP02/SB02 (Ash)	1.99	2 / 62	6.53E+00	**Yes**	Exceeds Screening Level
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.026 - 0.31	6 / 62	0.05 - 0.76	0.76	DP02/SB02 (Ash); DP15/SB02 (Ash)	0.199	4 / 62	3.82E+00	**Yes**	Exceeds Screening Level
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	0.83 - 0.83	19 / 20	0.84 - 290	290	DP02/SB02 (Ash)	200	1 / 20	1.45E+00	**Yes**	Exceeds Screening Level
Gasoline Range Organics	0.35 - 0.58	2 / 20	7.2 - 11	11	DP03/SB02 (Ash)	100	0 / 20	1.10E-01	No	Does Not Exceed
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	0.00047 - 0.014	5 / 62	0.0010 - 0.031	0.031	DP18/SB02 (Ash)	682	0 / 62	4.55E-05	No	Does Not Exceed
Acenaphthylene	0.00033 - 0.022	3 / 62	0.00044 - 0.0060	0.006	UT03/SB02 (Soil)	682	0 / 62	8.80E-06	No	Does Not Exceed
Anthracene	0.00039 - 0.022	8 / 62	0.00051 - 0.038	0.038	DP18/SB02 (Ash)	1480	0 / 62	2.57E-05	No	Does Not Exceed
Benzo(a)anthracene	0.0003 - 0.026	19 / 62	0.00046 - 0.16	0.16	DP18/SB02 (Ash)	5.21	0 / 62	3.07E-02	No	Does Not Exceed
Benzo(a)pyrene	0.0004 - 0.026	16 / 62	0.00046 - 0.12	0.12	DP18/SB02 (Ash)	1.52	0 / 62	7.89E-02	No	Does Not Exceed
Benzo(b)fluoranthene	0.0005 - 0.034	16 / 62	0.00097 - 0.15	0.15	DP18/SB02 (Ash)	59.8	0 / 62	2.51E-03	No	Does Not Exceed
Benzo(g,h,i)perylene	0.00099 - 0.021	11 / 62	0.0012 - 0.049	0.049	DP18/SB02 (Ash)	119	0 / 62	4.12E-04	No	Does Not Exceed
Benzo(k)fluoranthene	0.00075 - 0.053	12 / 62	0.0011 - 0.074	0.074	DP18/SB02 (Ash)	148	0 / 62	5.00E-04	No	Does Not Exceed
Chrysene	0.00034 - 0.036	19 / 62	0.00072 - 0.35	0.35	DP18/SB02 (Ash)	4.73	0 / 62	7.40E-02	No	Does Not Exceed
Dibenzo(a,h)anthracene	0.0012 - 0.025	5 / 62	0.0085 - 0.022	0.022	DP18/SB02 (Ash)	18.4	0 / 62	1.20E-03	No	Does Not Exceed
Dibenzofuran	0.021 - 0.026	2 / 20	0.025 - 0.064	0.064	DP02/SB02 (Ash)	None Reported	Not Applicable	Not Applicable	**Yes**	No Screening Level
Dimethyl phthalate	0.025 - 0.028	13 / 20	0.025 - 1.1	1.1	DP07/SB04 (Soil)	734	0 / 20	1.50E-03	No	Does Not Exceed
Fluoranthene	0.00029 - 0.047	22 / 62	0.00034 - 0.24	0.24	DP18/SB02 (Ash)	122	0 / 62	1.97E-03	No	Does Not Exceed
Fluorene	0.00049 - 0.024	4 / 62	0.0020 - 0.044	0.044	DP18/SB02 (Ash)	122	0 / 62	3.61E-04	No	Does Not Exceed
Indeno(1,2,3-cd)pyrene	0.00048 - 0.029	13 / 62	0.00068 - 0.02	0.020	DP18/SB02 (Ash); UT03/SB02 (Soil)	109	2 / 62	1.83E-04	No	Does Not Exceed
2-Methylnaphthalene	0.02 - 0.025	2 / 20	0.023 - 0.06	0.06	DP02/SB02 (Ash)	3.24	0 / 20	1.85E-02	No	Does Not Exceed
Naphthalene	0.0003 - 0.041	23 / 62	0.00040 - 1.7	1.7	DP15/SB02 (Ash)	0.0994	4 / 62	1.71E+01	**Yes**	Exceeds Screening Level
Semivolatile Organic Compounds (mg/kg) Continued										
Phenanthrene	0.00035 - 0.022	30 / 62	0.00043 - 2	2	DP18/SB02 (Ash)	45.7	0 / 62	4.38E-02	No	Does Not Exceed
Pyrene	0.00035 - 0.016	23 / 62	0.00050 - 0.250	0.25	DP18/SB02 (Ash)	78.5	0 / 62	3.18E-03	No	Does Not Exceed

Table 7-4
Ecological Screening Summary for Subsurface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Metals (mg/kg)										
Aluminum	Not Applicable	62 / 62	630 - 35,000	35,000	DP20/SB02 (Soil); DP24/SB02 (Soil)	50	62 / 62	7.00E+02	**Yes**	Exceeds Screening Level
Antimony	0.21 - 1.2	22 / 62	0.23 - 1.8	1.8	DP22/SB02 (Ash)	0.142	22 / 62	1.27E+01	**Yes**	Exceeds Screening Level
Arsenic	Not Applicable	62 / 62	1.5 - 41	41	DP22/SB02 (Ash)	5.7	19 / 62	7.19E+00	**Yes**	Exceeds Screening Level
Barium	Not Applicable	62 / 62	19 - 1,900	1,900	DP03/SB02 (Ash)	1.04	62 / 62	1.83E+03	**Yes**	Exceeds Screening Level
Beryllium	Not Applicable	62 / 62	0.052 - 3	3	DP03/SB02 (Ash)	1.06	11 / 62	2.83E+00	**Yes**	Exceeds Screening Level
Cadmium	0.052 - 0.061	62 / 62	0.077 - 24	24	DP22/SB02 (Ash)	0.00222	60 / 62	1.08E+04	**Yes**	Exceeds Screening Level
Chromium	Not Applicable	62 / 62	1.3 - 31	31	DP24/SB02 (Soil)	0.4	62 / 62	7.75E+01	**Yes**	Exceeds Screening Level
Cobalt	Not Applicable	62 / 62	0.77 - 16	16	DP03/SB02 (Ash)	0.14	62 / 62	1.14E+02	**Yes**	Exceeds Screening Level
Copper	Not Applicable	62 / 62	0.63 - 120	120	DP02/SB02 (Ash)	5.4	60 / 62	2.22E+01	**Yes**	Exceeds Screening Level
Iron	Not Applicable	62 / 62	2,200 - 100,000	100,000	DP15/SB02 (Ash)	200	62 / 62	5.00E+02	**Yes**	Exceeds Screening Level
Lead	Not Applicable	62 / 62	1.4 - 340	340	DP02/SB02 (Ash)	0.0537	62 / 62	6.33E+03	**Yes**	Exceeds Screening Level
Manganese	Not Applicable	62 / 62	26 - 670	670	DP03/SB04 (Soil)	100	59 / 62	6.70E+00	**Yes**	Exceeds Screening Level
Mercury	0.0076 - 0.049	51 / 62	0.0091 - 1.2	1.2	DP22/SB02 (Ash)	0.1	4 / 62	1.20E+01	**Yes**	Exceeds Screening Level
Methyl Mercury	0.000029 - 0.000038	8 / 20	0.000011 - 0.000126	0.000126	DP01/SB03 (Soil)	0.00158	0 / 20	7.97E-02	**Yes**	Bioaccumulative
Nickel	Not Applicable	62 / 62	1.4 - 83	83	DP02/SB02 (Ash)	13.6	46 / 62	6.10E+00	**Yes**	Exceeds Screening Level
Selenium	0.1 - 1.8	30 / 62	0.11 - 1.7	1.7	DP15/SB02 (Ash); DP18/SB02 (Ash)	0.0276	30 / 62	6.16E+01	**Yes**	Exceeds Screening Level
Silver	0.031 - 1.5	36 / 62	0.034 - 1.5	1.5	DP02/SB02 (Ash)	4.04	0 / 62	3.71E-01	No	Does Not Exceed
Thallium	0.052 - 1.1	43 / 62	0.16 - 1.6	1.6	DP02/SB02 (Ash)	0.0569	43 / 62	2.81E+01	**Yes**	Exceeds Screening Level
Vanadium	Not Applicable	62 / 62	5.8 - 85	85	DP24/SB04 (Soil)	1.59	62 / 62	5.35E+01	**Yes**	Exceeds Screening Level
Zinc	Not Applicable	62 / 62	3.9 - 6,500	6,500	DP22/SB02 (Ash)	6.62	61 / 62	9.82E+02	**Yes**	Exceeds Screening Level

Notes:

pg/g - picograms per gram

mg/kg - milligrams per kilogram

The ecological screening level for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the ecological screening level for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-5
Ecological Screening Summary for Stream Sediment
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Dioxins/Furans (pg/g)										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Not Applicable	3 / 3	0.34 - 2.3	2.3	SD01	12	0 / 3	1.92E-01	No	Does Not Exceed
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	5.8 - 6.2	1 / 3	0.12 - 0.12	0.12	SD03	1.2	0 / 3	1.00E-01	No	Does Not Exceed
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	5.8 - 6.1	1 / 3	0.25 - 0.25	0.25	SD01	1.2	0 / 3	2.08E-01	No	Does Not Exceed
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	2.3 - 5.4	3 / 3	2.3 - 5.4	5.4	SD01	340	0 / 3	1.59E-02	No	Does Not Exceed
Metals (mg/kg)										
Aluminum	Not Applicable	3 / 3	1,100 - 8,000	8000	SD01	25000	0 / 3	3.20E-01	No	Does Not Exceed
Arsenic	Not Applicable	3 / 3	2.2 - 7.3	7.3	SD03	9.79	0 / 3	7.46E-01	No	Does Not Exceed
Barium	Not Applicable	3 / 3	14 - 280	280	SD03	200	1 / 3	1.40E+00	**Yes**	Exceeds Screening Level
Beryllium	Not Applicable	3 / 3	0.068 - 0.36	0.36	SD01	1.1	0 / 3	3.27E-01	No	Does Not Exceed
Cadmium	Not Applicable	3 / 3	0.027 - 1.1	1.1	SD03	0.99	1 / 3	1.11E+00	**Yes**	Exceeds Screening Level
Chromium	Not Applicable	3 / 3	1.3 - 8.1	8.1	SD01	43.4	0 / 3	1.87E-01	No	Does Not Exceed
Cobalt	Not Applicable	3 / 3	0.64 - 7.3	7.3	SD03	50	0 / 3	1.46E-01	No	Does Not Exceed
Copper	Not Applicable	3 / 3	1.2 - 6.6	6.6	SD01	31.6	0 / 3	2.09E-01	No	Does Not Exceed
Iron	Not Applicable	3 / 3	1,200 - 10,000	10000	SD01	20000	0 / 3	5.00E-01	No	Does Not Exceed
Lead	Not Applicable	3 / 3	1.4 - 8.0	8	SD01	35.8	0 / 3	2.23E-01	No	Does Not Exceed
Manganese	Not Applicable	3 / 3	32 - 990	990	SD03	460	3 / 3	2.15E+00	**Yes**	Exceeds Screening Level
Mercury	0.011 - 0.011	2 / 3	0.087 - 0.013	0.013	SD01	0.17	0 / 3	7.47E-02	No	Does Not Exceed
Methyl Mercury	Not Applicable	3 / 3	0.000014 - 0.000038	0.000038	SD03	0.00001	3 / 3	3.80E+00	**Yes**	Exceeds Screening Level
Nickel	Not Applicable	3 / 3	1.4 - 14	14	SD02	22.7	0 / 3	6.17E-01	No	Does Not Exceed
Vanadium	Not Applicable	3 / 3	2.1 - 14	14	SD03	None Reported	Not Applicable	Not Applicable	**Yes**	No Screening Level
Zinc	Not Applicable	3 / 3	4.4 - 37	37	SD03	121	0 / 3	3.06E-01	No	Does Not Exceed

Notes:

pg/g - picograms per gram

mg/kg - milligrams per kilogram

The ecological screening level for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a ecological screening value of 0.12 pg/g for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-6
Ecological Screening Summary for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Dioxins-Furans (pg/L)										
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.3 - 14	2 / 15	3.8 - 5.2	5.2	SW03/SW03	0.01	2 / 15	5.20E+02	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.31 - 9.2	6 / 15	1.2 - 5.6	5.6	SW02/SW02	0.01	6 / 15	5.60E+02	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	0.28 - 2.7	3 / 15	0.51 - 1.2	1.2	SW02/SW03; SW03/SW03	0.0003	3 / 15	4.00E+03	**Yes**	Exceeds Screening Level
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.22 - 2.4	1 / 15	0.70 - 0.70	0.7	SW01/SW03	0.0003	1 / 15	2.33E+03	**Yes**	Exceeds Screening Level
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.18 - 1.7	3 / 15	0.31 - 1.7	1.7	SW02/SW02	0.0003	3 / 15	5.67E+03	**Yes**	Exceeds Screening Level
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.092 - 1.5	2 / 15	0.31 - 0.74	0.74	SW01/SW02	0.00003	2 / 15	2.47E+04	**Yes**	Exceeds Screening Level
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.23 - 1.8	2 / 15	0.91 - 1.1	1.1	SW02/SW02	0.00003	2 / 15	3.67E+04	**Yes**	Exceeds Screening Level
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.075 - 1.4	2 / 15	0.61 - 0.81	0.81	SW01/SW02	0.00003	2 / 15	2.70E+04	**Yes**	Exceeds Screening Level
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.20 - 1.9	2 / 15	0.85 - 1.2	1.2	SW02/SW02	0.00003	2 / 15	4.00E+04	**Yes**	Exceeds Screening Level
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.071 - 2.1	2 / 15	1.2 - 1.9	1.9	SW02/SW02	0.00003	2 / 15	6.33E+04	**Yes**	Exceeds Screening Level
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.23 - 1.9	2 / 15	1.0 - 1.4	1.4	SW02/SW02	0.00003	2 / 15	4.67E+04	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.13 - 1.5	2 / 15	1.0 - 3.1	3.1	SW01/SW05	0.000003	2 / 15	1.03E+06	**Yes**	Exceeds Screening Level
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.18 - 2.5	0 / 15	Not Applicable	Not Applicable	Not Applicable	0.0001	Not Applicable	Not Applicable	No	Not Detected
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.22 - 1.8	2 / 15	1.0 - 1.4	1.4	SW02/SW02	0.00003	2 / 15	4.67E+04	**Yes**	Exceeds Screening Level
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.19 - 2.6	1 / 15	1.0 - 1.0	1.0	SW01/SW02	0.00001	1 / 15	1.00E+05	**Yes**	Exceeds Screening Level
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.10 - 0.55	0 / 15	Not Applicable	Not Applicable	Not Applicable	0.000003	Not Applicable	Not Applicable	No	Not Detected
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.11 - 0.42	2 / 15	0.15 - 0.96	0.96	SW01/SW05	0.00003	2 / 15	3.20E+04	**Yes**	Exceeds Screening Level
Total Petroleum Hydrocarbons (ug/L)										
Diesel Range Organics	31 - 31	1 / 3	72 - 72	72	SW02/SW01	100	1 / 3	7.20E-01	No	Does Not Exceed
Semivolatile Organic Compounds (ug/L)										
Benzo(a)pyrene	0.0042 - 0.29	1 / 15	0.0049 - 0.0049	0.0049	SW03/SW02	0.014	0 / 15	3.50E-01	No	Does Not Exceed
Benzo(k)fluoranthene	0.0074 - 0.44	1 / 15	0.0088 - 0.0088	0.0088	SW03/SW02	1.4	0 / 15	6.28E-03	No	Does Not Exceed
Chrysene	0.0038 - 0.51	1 / 15	0.012 - 0.012	0.012	SW03/SW02	None Reported	Not Applicable	Not Applicable	**Yes**	No Screening Level
Pyrene	0.0040 - 0.35	1 / 15	0.004 - 0.004	0.004	SW03/SW02	0.3	0 / 15	1.33E-02	No	Does Not Exceed

Table 7-6
Ecological Screening Summary for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Range of Non-Detect Values	Frequency of Detection	Range of Detection Concentrations	Maximum Concentration Detected	Sample Location of Maximum Detected Concentration	Ecological Screening Level	Frequency of Exceedence	Maximum Hazard Quotient	Preliminary Chemical of Potential Ecological Concern (COPEC)	Rational
Metals (ug/L)										
Aluminum, Dissolved	25 - 48	1 / 15	48 - 48	48	SW01/SW01	87	0 / 15	5.52E-01	No	Does Not Exceed
Arsenic, Dissolved	12 - 12	12 / 15	1.4 - 3.3	3.3	SW02/SW02	148	0 / 15	2.23E-02	No	Does Not Exceed
Barium, Dissolved	Not Applicable	15 / 15	130 - 180	180	SW03/SW05	220	0 / 15	8.18E-01	No	Does Not Exceed
Copper, Dissolved	1.0 - 1.0	13 / 15	1.1 - 3.2	3.2	SW02/SW01	1.58	7 / 15	2.03E+00	**Yes**	Exceeds Screening Level
Manganese, Dissolved	Not Applicable	15 / 15	6.6 - 60	60	SW03/SW02	120	0 / 15	5.00E-01	No	Does Not Exceed
Mercury, Dissolved	0.10 - 0.10	1 / 15	0.17 - 0.17	0.17	SW01/SW02	0.0013	1 / 15	1.31E+02	**Yes**	Exceeds Screening Level
Methyl Mercury	Not Applicable	3 / 3	0.000041 - 0.000094	0.000094	SW03/SW01	0.00246	0 / 3	3.82E-02	**Yes**	Bioaccumulative
Nickel, Dissolved	2. 4 - 2.4	14 / 15	1.4 - 3.5	3.5	SW02/SW01	28.9	0 / 15	1.21E-01	No	Does Not Exceed
Vanadium, Dissolved	6.0 - 6.0	3 / 15	2.6 - 2.9	2.9	SW02/SW01	12	0 / 15	2.42E-01	No	Does Not Exceed
Zinc, Dissolved	4.0 - 4.0	13 / 15	4.0 - 37	37	SW02/SW02	65.7	0 / 15	5.63E-01	No	Does Not Exceed

Notes:

pg/L - picograms per liter

ug/L - micrograms per liter

The ecological screening level for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a ecological screening value for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-7
Ecological Problem Formulation, Assessment Endpoints, Selected Receptor Species, and Measurement Endpoints
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Problem Formulation	Assessment Endpoint	Selected Receptor Species	Measurement Endpoint
Are COPEC concentrations in surface soils at the site adversely affecting soil invertebrate communities?	Continued survival, growth, and reproduction of terrestrial soil invertebrate communities	Earthworm	Comparison of COPEC concentrations in surface soils with soil screening values for earthworms
Are COPEC concentrations in surface soils and subsurface soils at the site adversely affecting terrestrial plant communities?	Continued survival, growth, and reproduction of terrestrial plant communities	Terrestrial Plants	Comparison of COPEC concentrations in surface soils and subsurface soils with soil screening values for terrestrial plants
Are COPEC concentrations in sediment in the perennial stream adjacent to the site adversely affecting aquatic and benthic invertebrate communities?	Continued survival, growth, and reproduction of benthic invertebrate communities	Benthic Invertebrates	Comparison of COPEC concentrations in sediment with medium-specific screening values for benthic invertebrates
Are COPEC concentrations in surface water in the perennial stream adjacent to the site adversely affecting aquatic plant communities?	Continued survival, growth, and reproduction of aquatic plant communities	Aquatic Plants	Comparison of COPEC concentrations in surface water with medium-specific screening values for aquatic plants
Are COPEC concentrations in surface water in the perennial stream adjacent to the site adversely affecting aquatic invertebrate communities?	Continued survival, growth, and reproduction of aquatic invertebrate communities	Aquatic Invertebrates	Comparison of COPEC concentrations in surface water with medium-specific screening values for aquatic invertebrates
Are COPEC concentrations in surface water in the perennial stream adjacent to the site adversely affecting fish communities?	Continued survival, growth, and reproduction of fish communities	Fish	Comparison of COPEC concentrations in surface water with medium-specific screening values for Fish
Are COPEC concentrations in surface soils and surface water adversly affecting mammalian receptor populations that consume soil invertebrates, surface water, and soils from the site?	Continued survival, growth, and reproduction of mammalian terrestrial insectivore populations	Short-tailed shrew	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the short-tailed shrew
Are COPEC concentrations in surface soils and surface water adversely affecting mammalian receptor populations that consume terrestrial plants, surface water, and soils from the site?	Continued survival, growth, and reproduction of mammalian terrestrial herbicvore populations	White-footed Mouse Eastern Cottontail Rabbit White-tailed Deer	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the white-footed mouse, eastern cottontail rabbit, and white-tailed deer.
Are COPEC concentrations in surface soils and surface water adversely affecting mammalian receptor populations that consume soil invertebrates, terrestrial plants, surface water, and soils from the site?	Continued survival, growth, and reproduction of mammalian terrestrial omnivore populations	Meadow Vole	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the meadow vole
Are COPEC concentrations in surface soils and surface water adversly affecting mammalian receptor populations that consume soil invertebrates, small birds, small mammals, surface water, and soil from the site?	Continued survival, growth, and reproduction of mammalian terrestrial carnivore populations	Red Fox	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the red fox
Are COPEC concentrations in sediment and surface water adversely affecting mammalian receptor populations that consume benthic invertebrates, fish, sediment, and surface water from the site?	Continued survival, growth, and reproduction of mammalian benthic invertivore populations	Raccoon	Comparison of modeled dietary intakes using sediment and surface water concentrations with NOAEL-based ingestion screening values for the raccoon
Are COPEC concentrations in surface soils and surface water adversly affecting avian receptor populations that consume soil invertebrates, terrestrial plants, surface water, and soil from the site?	Continued survival, growth, and reproduction of avian terrestrial insectivore/omnivore populations	American Robin	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the American robin
Are COPEC concentrations in surface soils and surface water adversely affecting avian receptor populations that consume small mammals, surface water, and soils from the site?	Continued survival, growth, and reproduction of avian terrestrial carnivore populations	Red-tailed Hawk	Comparison of modeled dietary intakes using surface soil and surface water concentrations with NOAEL-based ingestion screening values for the red-tailed hawk

Notes:
COPEC - Chemical of Potential Ecological Concern
NOAEL - No Observed Adverse Effect Level

Table 7-8
Body Mass and Food, Water, and Soil or Stream Sediment Consumption Rates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Representative Wildlife Species	Body Mass (kg)[a]	Food Intake (kg dw/day)[a]	Water Intake (L/day)[a]	Estimated Soil or Sediment Intake (kg dw/day)[b]
Short-tailed Shrew	1.50E-02	9.00E-03	3.30E-03	1.17E-03
White-footed Mouse	2.20E-02	3.40E-03	6.60E-03	6.80E-05
Meadow Vole	4.40E-02	5.00E-03	6.00E-03	1.20E-04[c]
Eastern Cottontail Rabbit	1.20E+00	2.37E-01	1.16E-01	1.49E-02[c]
Red Fox	4.50E+00	4.50E-01	3.80E-01	1.26E-02
Raccoon	5.20E+00[d]	2.37E-01[e]	3.83E-01[f]	2.22E-02[g]
White-tailed Deer	5.65E+01	1.74E+00	3.70E+00	3.50E-02
American Robin	7.70E-02	9.30E-02	1.06E-02	8.74E-03[h]
Red-tailed Hawk	1.13E+00	1.09E-01	6.40E-02	3.05E-03[i]

Notes:

[a] Based on reported body weights and food and water consumption rates for selected avian and mammalian wildlife species from ORNL (1996) unless noted otherwise

[b] Based on reported soil ingestion rates from Efroymson et al. (1997a) unless noted otherwise

[c] Estimated fraction of soil or sediment in diet as reported in USEPA (1993) -- The estimated soil intake in diet for the jackrabbit was used as a surrogate for the estimated soil intake for the cottontail rabbit

[d] Minimum adult body mass reported in Mammals of Kansas (http://kufs.ku.edu/libres/Mammals_of_Kansas/list.html#procy; accessed May 2, 2015)

[e] Based on Food Intake (Kg/day) = 0.0687(Body Mass in Kilograms)$^{0.822}$ (ORNL 1996 and USEPA 1993)

[f] Based on Water Intake (L/day) = 0.099(Body Mass in Kilograms)$^{0.90}$ (ORNL 1996 and USEPA 1993)

[g] Assumes 9.4% of diet is sediment or soil as reported in USEPA (1993).

[h] Food Ingestion Rate x Percent of Soil in Diet (9.4) as reported in Beyer et al. (1994)

[i] Percent of soils comprising diet (2.8%) is assumed to be the same as for the Red Fox.

kg - kilograms

kg dw/day - kilograms dry weight per day

L/day - liters per day

Table 7-9
Assumed Percent Composition of Diet for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Representative Wildlife Species	Benthic Invertebrates	Soil Invertebrates (Earthworms)	Terrestrial Plants	Fish	Small Mammal	Representing Cast
Short-tailed Shrew	0%	100%	0%	0%	0%	Insectivore
White-footed Mouse	0%	0%	100%	0%	0%	Herbivore
Meadow Vole	0%	50%	50%	0%	0%	Omnivore
Eastern Cottontail Rabbit	0%	0%	100%	0%	0%	Herbivore
Red Fox	0%	0%	0%	0%	100%	Carnivore
Raccoon	50%	0%	0%	50%	0%	Aquatic Carnivore
White-tailed Deer	0%	0%	100%	0%	0%	Herbivore
American Robin	0%	80%	20%	0%	0%	Omnivore
Red-tailed Hawk	0%	0%	0%	0%	100%	Carnivore

Table 7-10
Home Range and Percent of Home Range within Areas Evaluated for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Representative Wildlife Species	Home Range (acres)[a]	Percent of Home Range Within the 2-Acre CFI Site
Short-tailed Shrew	0.05	100
White-footed Mouse	0.05	100
Meadow Vole	0.05	100
Eastern Cottontail Rabbit	1	100
Red Fox	150	1.3
Raccoon	480	0.4
White-tailed Deer	320	0.6
American Robin	2	100
Red-tailed Hawk	940	0.2

Notes:

[a]Based on most conservative estimates of home range sizes as reported in Schwartz and Schwartz (1981) and USEPA (1993).

Table 7-11
Earthworm Evaluation Based on Maximum Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil	Soil Organism Benchmark	Hazard Quotient	COPECs for Soil Invertebrates
Dioxins/Furans (pg/g)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E+02	2.93E+07[a]	5.45E-06	HQ<1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E+03	2.93E+07[a]	5.11E-05	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E+02	8.80E+05[a]	1.25E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E+02	8.80E+05[a]	2.50E-04	HQ<1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E+00	8.80E+05[a]	5.23E-06	HQ<1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E+01	8.80E+04[a]	1.25E-04	HQ<1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E+00	8.80E+04[a]	2.61E-05	HQ<1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+01	8.80E+04[a]	1.59E-04	HQ<1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E+00	8.80E+04[a]	7.27E-05	HQ<1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-01	8.80E+04[a]	4.09E-06	HQ<1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E+00	8.80E+04[a]	7.39E-05	HQ<1
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E+01	2.93E+05[a]	4.09E-05	HQ<1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E+00	8.80E+03[a]	2.27E-04	HQ<1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+01	8.80E+04[a]	1.36E-04	HQ<1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E+01	2.93E+04[a]	5.80E-04	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E+00	8.80E+04[a]	2.16E-05	HQ<1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-01	8.80E+03[a]	9.32E-05	HQ<1
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	2.00E+02[b]	1.45E+00	**Yes**
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	6.82E+02[a]	3.67E-05	HQ<1
Acenaphthylene	1.90E-02	6.82E+02[a]	2.79E-05	HQ<1
Anthracene	4.50E-02	1.48E+03[a]	3.04E-05	HQ<1
Benzo(a)anthracene	2.10E-01	5.21E+00[a]	4.03E-02	HQ<1
Benzo(a)pyrene	1.40E-01	1.52E+00[a]	9.21E-02	HQ<1
Benzo(b)fluoranthene	1.60E-01	5.98E+01[a]	2.68E-03	HQ<1
Benzo(g,h,i)perylene	1.10E-01	1.19E+02[a]	9.24E-04	HQ<1
Benzo(k)fluoranthene	1.30E-01	1.48E+02[a]	8.78E-04	HQ<1
Chrysene	3.50E-01	4.73E+00[a]	7.40E-02	HQ<1
Dibenzo(a,h)anthracene	3.20E-02	1.84E+01[a]	1.74E-03	HQ<1
Dibenzofuran	1.30E-01	None Reported	NA	**Yes**
Dimethyl phthalate	5.60E-01	7.34E+02[a]	7.63E-04	HQ<1
Fluoranthene	2.60E-01	1.00E+01[c]	2.60E-02	HQ<1
Fluorene	2.60E-02	1.22E+02[a]	2.13E-04	HQ<1
Indeno(1,2,3-cd)pyrene	5.70E-02	1.09E+02[a]	5.23E-04	HQ<1
2-Methylnaphthalene	2.30E-01	3.24E+00[a]	7.10E-02	HQ<1
Naphthalene	1.40E+00	9.94E-02[a]	1.41E+01	**Yes**
Phenanthrene	1.50E+00	5.50E+00[c]	2.73E-01	HQ<1
Pyrene	2.60E-01	1.00E+01[c]	2.60E-02	HQ<1

Table 7-11
Earthworm Evaluation Based on Maximum Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil	Soil Organism Benchmark	Hazard Quotient	COPECs for Soil Invertebrates
Metals (mg/kg)				
Aluminum	2.30E+04	6.00E+02[d]	3.83E+01	**Yes**
Antimony	1.70E+00	7.80E+01[c]	2.18E-02	HQ<1
Arsenic	8.69E+01	6.00E+01[e]	1.45E+00	**Yes**
Barium	1.38E+03	3.00E+03[d]	4.60E-01	HQ<1
Beryllium	2.70E+00	4.00E+01[c]	6.75E-02	HQ<1
Cadmium	1.56E+01	2.00E+01[e]	7.80E-01	HQ<1
Chromium	2.30E+01	4.00E-01[e]	5.75E+01	**Yes**
Cobalt	1.60E+01	1.00E+03[d]	1.60E-02	HQ<1
Copper	2.00E+02	6.00E+01[e]	3.33E+00	**Yes**
Iron	7.60E+04	2.00E+02[d]	3.80E+02	**Yes**
Lead	8.44E+02	5.00E+02[e]	1.69E+00	**Yes**
Manganese	4.50E+02	1.00E+02[d]	4.50E+00	**Yes**
Mercury	1.65E+01	1.00E-01[e]	1.65E+02	**Yes**
Methyl Mercury	2.65E-04	1.00E-01[c]	2.65E-03	HQ<1
Nickel	8.70E+01	2.00E+02[e]	4.35E-01	HQ<1
Selenium	2.40E+00	7.00E+01[e]	3.43E-02	HQ<1
Silver	9.70E-01	5.00E+01[d]	1.94E-02	HQ<1
Thallium	2.00E+00	None Reported	NA	**Yes**
Vanadium	4.30E+01	2.00E+01[d]	2.15E+00	**Yes**
Zinc	1.38E+03	1.00E+02[e]	1.38E+01	**Yes**

Notes:

COPEC - Chemical of Potential Ecological Concern

EHI - Ecological Hazard Index

pg/g - picograms per gram

mg/kg - milligrams per kilogram

NA - Not Analyzed

[a] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft; The soil organism benchmarks for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a soil invertebrate screening level of 8,800 pg/L for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mammal toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

[b] Soil Biota Screening Level from Washington State Department of Ecology, Terrestrial Ecological Screening Values: Site Specific Ecological Evaluation WAC 173-340-7493

[c] Soil Invertebrate Screening Value from U.S. EPA, Region 4 Soil Screening Values for Hazardous Waste Sites

[d] Microbial benchmark from Efroymson et.al., 1997 ES/ER/TM-126/R2

[e] Earthworm benchmark from Efroymson et.al., 1997 ES/ER/TM-126/R2

Table 7-12
Benthic Invertebrate Evaluation Based on Maximum Stream Sediment Detections

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Sediment	Benthic Invertebrate Benchmark	Hazard Quotient	COPECs for Benthic Invertebrates
Dioxins/Furans (pg/g)				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.30E+00	3.00E+05[a]	7.67E-06	HQ<1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	1.20E-01	3.00E+04[a]	4.00E-06	HQ<1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	2.50E-01	3.00E+04[a]	8.33E-06	HQ<1
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	5.40E+00	3.40E+02[b]	1.59E-02	HQ<1
Metals (mg/kg)				
Aluminum	8.00E+03	5.80E+04[c]	1.38E-01	HQ<1
Arsenic	7.30E+00	1.21E+01[d]	6.03E-01	HQ<1
Barium	2.80E+02	2.00E+01[b]	1.40E+01	**Yes**
Beryllium	3.60E-01	None Reported	NA	**Yes**
Cadmium	1.10E+00	5.92E-01[d]	1.86E+00	**Yes**
Chromium	8.10E+00	5.60E+01[d]	1.45E-01	HQ<1
Cobalt	7.30E+00	5.00E+01[b]	1.46E-01	HQ<1
Copper	6.60E+00	2.80E+01[d]	2.36E-01	HQ<1
Iron	1.00E+04	2.00E+04[b]	5.00E-01	HQ<1
Lead	8.00E+00	3.42E+01[d]	2.34E-01	HQ<1
Manganese	9.90E+02	1.67E+03[d]	5.92E-01	HQ<1
Mercury	1.30E-02	2.00E-01[e]	6.50E-02	HQ<1
Methyl Mercury	3.80E-05	1.00E-05[a]	3.80E+00	**Yes**
Nickel	1.40E+01	3.96E+01[d]	3.54E-01	HQ<1
Vanadium	1.40E+01	None Reported	NA	**Yes**
Zinc	3.70E+01	1.59E+02[d]	2.33E-01	HQ<1

Notes:
COPEC - Chemical of Potential Ecological Concern
EHI - Ecological Hazard Index
pg/g - picograms per gram
mg/kg - milligrams per kilogram
NA - Not Analyzed

[a] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft; The benthic invertebrate benchmarks for 1,2,3,4,6,7,8-HpCDD; 1,2,3,6,7,8-HxCDD; and 1,2,3,7,8,9-HxCDD were calculated using a freshwater sediment screening value of 300 pg/g for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).
[b] Ecological Screening Value from U.S. EPA, Region 4 Sediment Screening Values for Hazardous Waste Sites
[c] Probable Effect Concentration reported in Jones et. al., 1997 (ES/ER/TM-95/R4)
[d] Threshold Effect Concentration reported in Jones et. al., 1997 (ES/ER/TM-95/R4)
[e] Lowest Effect Level reported in Jones et. al., 1997 (ES/ER/TM-95/R4)

Table 7-13
Terrestrial Plant Evaluation Based on Maximum Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Terrestiral Plants
Dioxins/Furans (pg/g)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E+02	None Reported	NA	**Yes**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E+03	None Reported	NA	**Yes**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E+02	None Reported	NA	**Yes**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E+02	None Reported	NA	**Yes**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E+00	None Reported	NA	**Yes**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E+01	None Reported	NA	**Yes**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E+00	None Reported	NA	**Yes**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+01	None Reported	NA	**Yes**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E+00	None Reported	NA	**Yes**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-01	None Reported	NA	**Yes**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E+00	None Reported	NA	**Yes**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E+01	None Reported	NA	**Yes**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E+00	None Reported	NA	**Yes**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+01	None Reported	NA	**Yes**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E+01	None Reported	NA	**Yes**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E+00	None Reported	NA	**Yes**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-01	None Reported	NA	**Yes**

Table 7-13
Terrestrial Plant Evaluation Based on Maximum Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Terrestrial Plants
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	None Reported	NA	**Yes**
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	2.50E-01[b]	1.00E-01	HQ<1
Acenaphthylene	1.90E-02	6.82E+02[a]	2.79E-05	HQ<1
Anthracene	4.50E-02	6.80E+00[b]	6.62E-03	HQ<1
Benzo(a)anthracene	2.10E-01	1.80E+01[b]	1.17E-02	HQ<1
Benzo(a)pyrene	1.40E-01	1.52E+00[a]	9.21E-02	HQ<1
Benzo(b)fluoranthene	1.60E-01	1.80E+01[b]	8.89E-03	HQ<1
Benzo(g,h,i)perylene	1.10E-01	1.19E+02[a]	9.24E-04	HQ<1
Benzo(k)fluoranthene	1.30E-01	1.48E+02[a]	8.78E-04	HQ<1
Chrysene	3.50E-01	4.73E+00[a]	7.40E-02	HQ<1
Dibenzo(a,h)anthracene	3.20E-02	1.84E+01[a]	1.74E-03	HQ<1
Dibenzofuran	1.30E-01	None Reported	NA	**Yes**
Dimethyl phthalate	5.60E-01	7.34E+02[a]	7.63E-04	HQ<1
Fluoranthene	2.60E-01	1.22E+02[a]	2.13E-03	HQ<1
Fluorene	2.60E-02	1.22E+02[a]	2.13E-04	HQ<1
Indeno(1,2,3-cd)pyrene	5.70E-02	1.09E+02[a]	5.23E-04	HQ<1
2-Methylnaphthalene	2.30E-01	3.24E+00[a]	7.10E-02	HQ<1
Naphthalene	1.40E+00	1.00E+00[b]	1.40E+00	**Yes**
Phenanthrene	1.50E+00	4.57E+01[a]	3.28E-02	HQ<1
Pyrene	2.60E-01	7.85E+01[a]	3.31E-03	HQ<1

Table 7-13
Terrestrial Plant Evaluation Based on Maximum Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Terrestrial Plants
Metals (mg/kg)				
Aluminum	2.30E+04	5.00E+01[c]	4.60E+02	**Yes**
Antimony	1.70E+00	5.00E+00[c]	3.40E-01	HQ<1
Arsenic	8.69E+01	1.00E+01[c]	8.69E+00	**Yes**
Barium	1.38E+03	5.00E+02[c]	2.76E+00	**Yes**
Beryllium	2.70E+00	1.00E+01[c]	2.70E-01	HQ<1
Cadmium	1.56E+01	4.00E+00[c]	3.90E+00	**Yes**
Chromium	2.30E+01	1.00E+00[c]	2.30E+01	**Yes**
Cobalt	1.60E+01	2.00E+01[c]	8.00E-01	HQ<1
Copper	2.00E+02	1.00E+02[c]	2.00E+00	**Yes**
Iron	7.60E+04	None Reported	NA	**Yes**
Lead	8.44E+02	5.00E+01[c]	1.69E+01	**Yes**
Manganese	4.50E+02	5.00E+02[c]	9.00E-01	HQ<1
Mercury	1.65E+01	3.00E-01[c]	5.50E+01	**Yes**
Methyl Mercury	2.65E-04	3.00E-01[b]	8.83E-04	HQ<1
Nickel	8.70E+01	3.00E+01[c]	2.90E+00	**Yes**
Selenium	2.40E+00	1.00E+00[c]	2.40E+00	**Yes**
Silver	9.70E-01	2.00E+00[c]	4.85E-01	HQ<1
Thallium	2.00E+00	1.00E+00[c]	2.00E+00	**Yes**
Vanadium	4.30E+01	2.00E+00[c]	2.15E+01	**Yes**
Zinc	1.38E+03	5.00E+01[c]	2.76E+01	**Yes**

Notes:
COPEC - Chemical of Potential Ecological Concern
EHI - Ecological Hazard Index
pg/g - picograms per gram
mg/kg - milligrams per kilogram
[a] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft
[b] Plant Screening Value from U.S. EPA, Region 4 Soil Screening Values for Hazardous Waste Sites
[c] Efroymson et al, 1997c ES/ER/TM-85/R3

Table 7-14
Terrestrial Plant Evaluation Based on Maximum Subsurface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Subsurface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Testrial Plants
Dioxins/Furans (pg/g)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	2.80E+01	None Reported	NA	**Yes**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3.50E+02	None Reported	NA	**Yes**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	4.20E+01	None Reported	NA	**Yes**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	4.00E+01	None Reported	NA	**Yes**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	3.30E+00	None Reported	NA	**Yes**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+01	None Reported	NA	**Yes**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	1.50E+00	None Reported	NA	**Yes**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+01	None Reported	NA	**Yes**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.00E+00	None Reported	NA	**Yes**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.50E+00	None Reported	NA	**Yes**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	3.40E+00	None Reported	NA	**Yes**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.40E+01	None Reported	NA	**Yes**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.50E+00	None Reported	NA	**Yes**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	8.30E+00	None Reported	NA	**Yes**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.60E+01	None Reported	NA	**Yes**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.30E+01	None Reported	NA	**Yes**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	7.60E-01	None Reported	NA	**Yes**

Table 7-14
Terrestrial Plant Evaluation Based on Maximum Subsurface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Subsurface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Testrial Plants
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	None Reported	NA	**Yes**
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	3.10E-02	2.50E-01[b]	1.24E-01	HQ<1
Acenaphthylene	6.00E-03	6.82E+02[a]	8.80E-06	HQ<1
Anthracene	3.80E-02	6.80E+00[b]	5.59E-03	HQ<1
Benzo(a)anthracene	1.60E-01	1.80E+01[b]	8.89E-03	HQ<1
Benzo(a)pyrene	1.20E-01	1.52E+00[a]	7.89E-02	HQ<1
Benzo(b)fluoranthene	1.50E-01	1.80E+01[b]	8.33E-03	HQ<1
Benzo(g,h,i)perylene	4.90E-02	1.19E+02[a]	4.12E-04	HQ<1
Benzo(k)fluoranthene	7.40E-02	1.48E+02[a]	5.00E-04	HQ<1
Chrysene	3.50E-01	4.73E+00[a]	7.40E-02	HQ<1
Dibenzo(a,h)anthracene	2.20E-02	1.84E+01[a]	1.20E-03	HQ<1
Dibenzofuran	6.40E-02	None Reported	NA	**Yes**
Dimethyl phthalate	1.10E+00	7.34E+02[a]	1.50E-03	HQ<1
Fluoranthene	2.40E-01	1.22E+02[a]	1.97E-03	HQ<1
Fluorene	4.40E-02	1.22E+02[a]	3.61E-04	HQ<1
Indeno(1,2,3-cd)pyrene	2.00E-02	1.09E+02[a]	1.83E-04	HQ<1
2-Methylnaphthalene	6.00E-02	3.24E+00[a]	1.85E-02	HQ<1
Naphthalene	1.70E+00	1.00E+00[b]	1.70E+00	**Yes**
Phenanthrene	2.00E+00	4.57E+01[a]	4.38E-02	HQ<1
Pyrene	2.50E-01	7.85E+01[a]	3.18E-03	HQ<1

Table 7-14
Terrestrial Plant Evaluation Based on Maximum Subsurface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Subsurface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Testrial Plants
Metals (mg/kg)				
Aluminum	3.50E+04	5.00E+01[c]	7.00E+02	**Yes**
Antimony	1.80E+00	5.00E+00[c]	3.60E-01	HQ<1
Arsenic	4.10E+01	1.00E+01[c]	4.10E+00	**Yes**
Barium	1.90E+03	5.00E+02[c]	3.80E+00	**Yes**
Beryllium	3.00E+00	1.00E+01[c]	3.00E-01	HQ<1
Cadmium	2.40E+01	4.00E+00[c]	6.00E+00	**Yes**
Chromium	3.10E+01	1.00E+00[c]	3.10E+01	**Yes**
Cobalt	1.60E+01	2.00E+01[c]	8.00E-01	HQ<1
Copper	1.20E+02	1.00E+02[c]	1.20E+00	**Yes**
Iron	1.00E+05	None Reported	NA	**Yes**
Lead	3.40E+02	5.00E+01[c]	6.80E+00	**Yes**
Manganese	6.70E+02	5.00E+02[c]	1.34E+00	**Yes**
Mercury	1.20E+00	3.00E-01[c]	4.00E+00	**Yes**
Methyl Mercury	1.26E-04	3.00E-01[b]	4.20E-04	HQ<1
Nickel	8.30E+01	3.00E+01[c]	2.77E+00	**Yes**
Selenium	1.70E+00	1.00E+00[c]	1.70E+00	**Yes**
Silver	1.50E+00	2.00E+00[c]	7.50E-01	HQ<1
Thallium	1.60E+00	1.00E+00[c]	1.60E+00	**Yes**
Vanadium	8.50E+01	2.00E+00[c]	4.25E+01	**Yes**
Zinc	6.50E+03	5.00E+01[c]	1.30E+02	**Yes**

Notes:
COPEC - Chemical of Potential Ecological Concern
EHI - Ecological Hazard Index
pg/g - picograms per gram
mg/kg - milligrams per kilogram
[a] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft
[b] Plant Screening Value from USEPA, Region 4, Soil Screening Values for Hazardous Waste Sites
[c] Efroymson et al, 1997c ES/ER/TM-85/R3

Table 7-15
Aquatic Plant Evaluation Based on Maximum Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Aquatic Plant Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Plants
Dioxins-Furans (pg/L)				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	5.20E+00	3.80E+04[a]	1.37E-04	HQ<1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E+00	3.80E+04[a]	1.47E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	1.20E+00	3.80E+03[a]	3.16E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-01	3.80E+02[a]	1.84E-03	HQ<1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E+00	3.80E+02[a]	4.47E-03	HQ<1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-01	7.60E+00[a]	9.74E-02	HQ<1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E+00	3.80E+01[a]	2.89E-02	HQ<1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-01	3.80E+02[a]	2.13E-03	HQ<1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+00	3.80E+01[a]	3.16E-02	HQ<1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E+00	3.80E+02[a]	5.00E-03	HQ<1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E+00	3.80E+00[a]	8.16E-01	HQ<1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E+00	7.60E+00[a]	1.32E-01	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-01	7.60E+01[a]	1.26E-02	HQ<1
Total Petroleum Hydrocarbons (ug/L)				
Diesel Range Organics	7.20E+01	None Reported	NA	**Yes**
Semivolitile Organic Compounds (ug/L)				
Benzo(a)pyrene	4.90E-03	5.00E+01[b]	9.80E-05	HQ<1
Benzo(k)fluoranthene	8.80E-03	6.40E-01[c]	1.38E-02	HQ<1
Chrysene	1.20E-02	4.70E+00[c]	2.55E-03	HQ<1
Pyrene	4.00E-03	3.00E-01[d]	1.33E-02	HQ<1

Table 7-15
Aquatic Plant Evaluation Based on Maximum Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Aquatic Plant Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Plants
Metals (ug/L)				
Aluminum	4.80E+01	4.60E+02[e]	1.04E-01	HQ<1
Arsenic	3.30E+00	2.32E+03[e]	1.42E-03	HQ<1
Barium	1.80E+02	2.20E+02[d]	8.18E-01	HQ<1
Copper	3.20E+00	1.00E+00[e]	3.20E+00	**Yes**
Manganese	6.00E+01	9.30E+01[c]	6.45E-01	HQ<1
Mercury	1.70E-01	5.00E+00[e]	3.40E-02	HQ<1
Methyl Mercury	9.40E-05	8.00E-01[e]	1.18E-04	HQ<1
Nickel	3.50E+00	5.00E+00[e]	7.00E-01	HQ<1
Vanadium	2.90E+00	1.20E+01[d]	2.42E-01	HQ<1
Zinc	3.70E+01	3.00E+01[e]	1.23E+00	**Yes**

Notes:

COPEC - Chemical of Potential Ecological Concern

EHI - Ecological Hazard Index

pg/L - picograms per liter

ug/L - micrograms per liter

NA - Not Analyzed

[a] The Aquatic Plant Benchmarks for Surface Water for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a Freshwater Toxicity Reverence Value of 3.8 pg/L for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) as a screening-level benchmark for aquatic plants (EPA, 1999; EPA530-D-99-001C) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

[b] USEPA ECOTOX Database (http://cfpub.epa.gov/ecotox/)

[c] Chronic Freshwater Screening Values from USEPA, Region 4 Surface Water Screening Values for Hazardous Waste Sites

[d] USEPA Region 4 Freswater Aquatic Life Chronic Screening Value from ORNL, 1996 ES/ER/TM-96/R2

[e] ORNL, 1996 ES/ER/TM-96/R2

Table 7-16
Aquatic Invertebrate Evaluation Based on Maximum Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Aquatic Invertebrate Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Invertebrates
Dioxins-Furans (pg/L)				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	5.20E+00	3.80E+04[a]	1.37E-04	HQ<1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E+00	3.80E+04[a]	1.47E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	1.20E+00	3.80E+03[a]	3.16E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-01	3.80E+02[a]	1.84E-03	HQ<1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E+00	3.80E+02[a]	4.47E-03	HQ<1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-01	7.60E+00[a]	9.74E-02	HQ<1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E+00	3.80E+01[a]	2.89E-02	HQ<1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-01	3.80E+02[a]	2.13E-03	HQ<1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+00	3.80E+01[a]	3.16E-02	HQ<1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E+00	3.80E+02[a]	5.00E-03	HQ<1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E+00	3.80E+00[a]	8.16E-01	HQ<1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E+00	7.60E+00[a]	1.32E-01	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-01	7.60E+01[a]	1.26E-02	HQ<1
Total Petroleum Hydrocarbons (ug/L)				
Diesel Range Organics	7.20E+01	None Reported	NA	**Yes**
Semivolitile Organic Compounds (ug/L)				
Benzo(a)pyrene	4.90E-03	3.00E-01[b]	1.63E-02	HQ<1
Benzo(k)fluoranthene	8.80E-03	6.40E-01[c]	1.38E-02	HQ<1
Chrysene	1.20E-02	4.70E+00[c]	2.55E-03	HQ<1
Pyrene	4.00E-03	4.60E+00[c]	8.70E-04	HQ<1

Table 7-16
Aquatic Invertebrate Evaluation Based on Maximum Surface Water Detections

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Aquatic Invertebrate Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Invertebrates
Metals (ug/L)				
Aluminum	4.80E+01	1.90E+03[b]	2.53E-02	HQ<1
Arsenic	3.30E+00	4.50E+02[b]	7.33E-03	HQ<1
Barium	1.80E+02	4.00E+00[d]	4.50E+01	**Yes**
Copper	3.20E+00	2.30E-01[b]	1.39E+01	**Yes**
Manganese	6.00E+01	1.10E+03[b]	5.45E-02	HQ<1
Mercury	1.70E-01	9.60E-01[b]	1.77E-01	HQ<1
Methyl Mercury	9.40E-05	4.00E-02[b]	2.35E-03	HQ<1
Nickel	3.50E+00	5.00E+00[b]	7.00E-01	HQ<1
Vanadium	2.90E+00	1.90E+03[b]	1.53E-03	HQ<1
Zinc	3.70E+01	4.67E+01[b]	7.92E-01	HQ<1

Notes:

COPEC - Chemical of Potential Ecological Concern

EHI - Ecological Hazard Index

pg/L - picograms per liter

ug/L - micrograms per liter

NA - Not Analyzed

[a] The Aquatic Invertebrate Benchmarks for Surface Water for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a Freshwater Toxicity Reverence Value of 3.8 pg/L for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) as a screening-level benchmark for aquatic invertebrates (EPA, 1999; EPA530-D-99-001C) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

[b] Lowest Chronic Value for Daphnids from ORNL, 1996 ES/ER/TM-96/R2

[c] Chronic Freshwater Screening Values from U.S. EPA, Region 4 Surface Water Screening Values for Hazardous Waste Sites

[d] Tier II Secondary Chronic Value from ORNL, 1996 ES/ER/TM-96/R2

Table 7-17
Fish Evaluation Based on Maximum Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Freswater Fish Benchmark for Surface Water	Hazard Quotient	COPECs for Freshwater Fish
Dioxins-Furans (pg/L)				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	5.20E+00	3.80E+04[a]	1.37E-04	HQ<1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E+00	3.80E+04[a]	1.47E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	1.20E+00	3.80E+03[a]	3.16E-04	HQ<1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-01	3.80E+02[a]	1.84E-03	HQ<1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E+00	3.80E+02[a]	4.47E-03	HQ<1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-01	7.60E+00[a]	9.74E-02	HQ<1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E+00	3.80E+01[a]	2.89E-02	HQ<1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-01	3.80E+02[a]	2.13E-03	HQ<1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E+00	3.80E+01[a]	3.16E-02	HQ<1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E+00	3.80E+02[a]	5.00E-03	HQ<1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E+00	3.80E+00[a]	8.16E-01	HQ<1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E+00	3.80E+01[a]	3.68E-02	HQ<1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E+00	7.60E+00[a]	1.32E-01	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-01	7.60E+01[a]	1.26E-02	HQ<1
Total Petroleum Hydrocarbons (ug/L)				
Diesel Range Organics	7.20E+01	None Reported	NA	**Yes**
Semivolitile Organic Compounds (ug/L)				
Benzo(a)pyrene	4.90E-03	3.00E-01[b]	1.63E-02	HQ<1
Benzo(k)fluoranthene	8.80E-03	6.40E-01[c]	1.38E-02	HQ<1
Chrysene	1.20E-02	4.70E+00[c]	2.55E-03	HQ<1
Pyrene	4.00E-03	4.60E+00[c]	8.70E-04	HQ<1

Table 7-17
Fish Evaluation Based on Maximum Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water	Freswater Fish Benchmark for Surface Water	Hazard Quotient	COPECs for Freshwater Fish
Metals (ug/L)				
Aluminum	4.80E+01	3.29E+03[d]	1.46E-02	HQ<1
Arsenic	3.30E+00	9.92E+02[d]	3.70E-03	HQ<1
Barium	1.80E+02	4.00E+00[e]	4.50E+01	**Yes**
Copper	3.20E+00	3.80E+00[d]	8.42E-01	HQ<1
Manganese	6.00E+01	1.78E+03[d]	3.37E-02	HQ<1
Mercury	1.70E-01	2.30E-01[d]	7.39E-01	HQ<1
Methyl Mercury	9.40E-05	5.20E-01[d]	1.81E-04	HQ<1
Nickel	3.50E+00	3.50E+01[d]	1.00E-01	HQ<1
Vanadium	2.90E+00	8.00E+01[d]	3.63E-02	HQ<1
Zinc	3.70E+01	3.64E+01[d]	1.02E+00	**Yes**

Notes:

COPEC - Chemical of Potential Ecological Concern

EHI - Ecological Hazard Index

pg/L - picograms per liter

ug/L - micrograms per liter

NA - Not Analyzed

[a] The Freswater Fish Benchmarks for Surface Water for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; 2,3,4,7,8-PeCDF; and 2,3,7,8-TCDF were calculated using a Freshwater Toxicity Reverence Value of 3.8 pg/L for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) as a screening-level benchmark for fish (EPA, 1999; EPA530-D-99-001C) and fish toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

[b] Lowest Chronic Value for Daphnids from ORNL, 1996 ES/ER/TM-96/R2

[c] Chronic Freshwater Screening Values from U.S. EPA, Region 4 Surface Water Screening Values for Hazardous Waste Sites

[d] Lowest Chronic Value for Fish from ORNL, 1996 ES/ER/TM-96/R2

[e] Tier II Secondary Chronic Value from ORNL, 1996 ES/ER/TM-96/R2

Table 7-18
Source Information for Mammal and Avian Benchmarks
WWI Incinerator, NW Camp Funston (CFI) SIte
Fort Riley, Kansas

Preliminary Chemical of Potential Ecological Concern (COPEC)	Form	Test Species	Body Weight (kg)	Duration	Effect/Endpoint	Exposure Route	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference
Dioxins/Furans									
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Rat	0.35	13 weeks	body weight, organ weight, blood chemistry	oral in diet	0.00016	0.0016	Poiger et al., 1989 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Rat	0.35	13 weeks	body weight, organ weight, blood chemistry	oral in diet	0.00016	0.0016	Poiger et al., 1989 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Rat	0.35	13 weeks	body weight, organ weight, blood chemistry	oral in diet	0.000016	0.00016	Poiger et al., 1989 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1-day old chicks	0.121	21 days	mortality, weight gain	oral in diet	0.000001	0.00001	McKinney et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Rat	0.35	3 generations	reporduction	oral in diet	0.000001	0.00001	Murray et al., 1979 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
		Ring-necked Pheasant	1	10 weeks	reporduction	intraperitoneal injection	0.000014	0.00014	Nosek et al., 1992 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Semivolatile Organic Compounds									
Acenaphthene	Acenaphthene	House Mouse (Mus musculus)	Not Reported (assumed to be 0.03 per EPA reference Value)	1 day	Enzyme Function	Intraperitoneal	5 (NOAEL was assumed to be 1/10th of the LOAEL)	50	Chaloupka,K., M. Santostefano, I.S. Goldfarb, G. Liu, M.J. Myers, I.B. Tsyrolv, H.V. Gelboin, V. Krishnan, and S. Safe. 1994. Aryl Hydrocarbon (Ah) Receptor-Independent Induction of CYP1A2 Gene Expression by Acenaphthylene and Related Compounds in B6C3F1 Mice. Carcinogenesis15(12): 2835-2840. (Ecotox Reference Number 94821)
Anthracene	Anthracene	Norway Rat (Rattus norvegicus)	Not Reported (assumed to be 0.35 per EPA reference value)	4 days	Enzyme Function	Intragastrical	100	Not Reported	Torronen,R., U. Nousiainen, and O. Hanninen. 1981. Induction of Aldehyde Dehydrogenase by Polycyclic Aromatic Hydrocarbons in Rats. Chem.-Biol. Interact.36(1): 33-44 (Ecotox Reference Number 94520)
Benzo(a)pyrene	Benzo(a)pyrene	Mouse	0.03	days 7-16 of gestation	reproduction	oral intubation	1	10	Mackenzie and Angevine, 1981 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Benzo(a)pyrene	Domestic Chicken (Gallus domesticus)	1.4 to 2.0	5 days	reproduction (egg shell thickness)	Oral via capsule	3.57	Not Reported	Chen,S.W., P.J. Dziuk, and B.M. Francis. 1994. Effect of Four Environmental Toxicants on Plasma Ca and Estradiol 17beta and Hepatic P450 in Laying Hens. Environ. Toxicol. Chem.13(5): 789-796. (Ecotox Reference Number 97126)
Chrysene	Chrysene	Norway Rat (Rattus norvegicus)	0.2	4 day	Physiology	Gavage	1 (NOAEL was assumed to be 1/10th of the LOAEL)	10	Piekoszewski,W., and J. Brandys. 1987. Effect of Phenobarbital and Chrysene on Theophylline Elimination Determined by Noncompartmental Analysis. Pol. J. Pharmacol. Pharm.39(2): 143-146. (Ecotox Reference Number 95117)

Table 7-18
Source Information for Mammal and Avian Benchmarks
WWI Incinerator, NW Camp Funston (CFI) SIte
Fort Riley, Kansas

Preliminary Chemical of Potential Ecological Concern (COPEC)	Form	Test Species	Body Weight (kg)	Duration	Effect/Endpoint	Exposure Route	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference
Semivolatile Organic Compounds Continued									
Diethyl phthalate (Note: The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL)	Diethyl phthalate	Mouse	0.03	105 days	reproduction	oral in diet	4,583	Not Reported	Lamb et al., 1987 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Fluoranthene	Fluoranthene	Norway Rat (Rattus norvegicus)	Not Reported (assumed to be 0.35 per EPA reference value)	90 days	Growth	Food	150	750	Ramesh,A., F. Inyang, D.B. Hood, and M.E. Knuckles. 2000. Aryl Hydrocarbon Hydroxylase Activity in F-344 Rats Subchronically Exposed to Benzo(a)pyrene and Fluoranthene Through Diet. J. Biochem. Mol. Toxicol.14(3): 155-161. (Ecotox Reference Number 73504)
		House Mouse (Mus musculus)	0.03	3 days	Morphology	Intraperitoneal	250	250	Moody,D.E., B.A. Narloch, L.R. Shull, and B.D. Hammock. 1991. The Effect of Structurally Divergent Herbicides on Mouse Liver Xenobiotic-Metabolizing Enzymes (P-450-Dependent Mono-Oxygenases, Epoxide Hydrolases and Glutathione S-Transferases) and Carnitine Acetyltransferase. Toxicol. Lett.59(1-3): 175-185. (Ecotox Reference Number 77500)
Fluorene	2-Chloro-9-hydroxy-9H-fluorene-9-carboxylic acid, Methyl ester	Northern Bobwhite Quail (Colinus virginianus)	Not Reported	21 days	Mortality	Oral via capsule	1.7	Not Reported	U.S. Environmental Protection Agency. 1992. Pesticide Ecotoxicity Database (Formerly: Environmental Effects Database (EEDB)). Environmental Fate and Effects Division, U.S.EPA, Washington, D.C.: EPA Office of Pesticides Program Database. (Ecotoc Reference Number 344)
Naphthalene	Naphthalene	Norway Rat (Rattus norvegicus)	0.271	14 days	Growth	Gavage	50	Not Reported	Navarro,H.A., C.J. Price, M.C. Marr, C.B. Myers, and J.J. Heindel. 1991. Developmental Toxicity of Naphthalene (CAS No.91-20-3) in Sprague-Dawley (CD) Rats on Gestational Days 6 Through 15. Final Study Report and Appendix. Natl.Toxicol.Prog., Natl.Inst.of Environ.Health Sci., Research Triangle Park, NC:113 p. (Ecotox Reference Number 73726)
Phenanthrene	Phenanthrene	Norway Rat (Rattus norvegicus)	0.3	4 days	Enzyme Function	Intragastrical	100	Not Reported	Torronen,R., U. Nousiainen, and O. Hanninen. 1981. Induction of Aldehyde Dehydrogenase by Polycyclic Aromatic Hydrocarbons in Rats. Chem.-Biol. Interact.36(1): 33-44. (Ecotox Reference Number 94520)
Pyrene	Pyrene	House Mouse (Mus musculus)	Not Reported (assumed to be 0.03 per EPA reference Value)	40 days	Reproduction	Intraperitoneal	206	257	Salamone,M.F., and D.M. Logan. 1988. Abnormal Sperm Test Results for Benzo(a)pyrene, Pyrene, 2-Acetylaminofluorene, and 4- Acetylaminofluorene Using Hybrid Mice. I. Intraperitoneal Treatment. In: Eval.Short-Term Tests Carcinol., Rep.Int.Prog.Chem.Safetys Collaborative Study In Vivo Assays(2): 235-242. (Ecotox Reference Number 95116)
Metals									
	$AlCl_3$	Mouse	0.03	3 generations	reproduction	oral in water	1.93	19.3	Ondreicka et al., 1966 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Aluminum	$Al_2(SO_4)_3$	Ringed Dove	0.155	4 months	reproduction	oral in diet	109.7	Not Reported	Carriere et al., 1986 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Antimony	Antimony Potassium Tartrate	Mouse	0.03	1 year	life span, longevity	oral in water	0.125	1.25	Schroeder et al., 1968b (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)

Table 7-18
Source Information for Mammal and Avian Benchmarks
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Fort Riley, Kansas

Preliminary Chemical of Potential Ecological Concern (COPEC)	Form	Test Species	Body Weight (kg)	Duration	Effect/Endpoint	Exposure Route	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference
Metals Continued									
	Arsenite (As^{+3})	Mouse	0.03	3 genereations	reproduction	oral in water	0.126	1.26	Schroeder and Mitchner, 1971 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Paris Green; Copper Acetoarsenite (44.34% As^{+3})	Brown-headed Cowbird (Males)	0.049	7 months	mortality	oral in diet	2.46	7.38	USFWS, 1969 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Arsenic	Sodium Arsenite (51.35% As^{+3})	Mallard Ducks	1	128 days	mortality	oral in diet	5.14	12.84	USFWS, 1964 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Barium Chloride	Rat	0.435	16 months	growth, hypertension	oral in water	5.1	Not Reported	Perry et al., 1983 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Barium Chloride	Rat	0.35	10 days	mortality	oral gavage in water	Not Reported	19.8	Borzelleca et al., 1988 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Barium	Barium Hydroxide	1-day Old Chicks	0.121	4 weeks	mortality	oral in diet	20.8	41.7	Johnson et al., 1960 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Beryllium	Beryllium Sulfate	Rat	0.35	lifetime	longevity, weight loss	oral in water	0.66	Not Reported	Schroeder and Mitchner, 1975 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	$CdCl_2$	Rat	0.303	6 weeks	reproduction	oral gavage in water	1	10	Sutou et al., 1980 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Cadmium	Cadmium Chloride	Mallard Duck	1.153	90 days	reproduction	oral in diet	1.45	20	White and Finley, 1978 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Cr^{+3} as Cr_2O_3	Rat	0.35	90 days and 2 years	reproduction, longevity	oral in diet	2737	Not Reported	Ivankovic and Preussmann, 1975 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Cr^{+6} as $K_2Cr_2O_4$	Rat	0.35	1 year	body weight and food consumption	oral in water	3.28	Not Reported	MacKenzie et al., 1958 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Cr^{+6}	Rat	0.35	3 months	mortality	oral in water	Not Reported	13.14	Steven et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Chromium	Cr^{+3} as $CrK(SO_4)_2$	Black Duck	1.25	10 months	reproduction	oral in diet	1	5	Haseltine et al., unpubl. data (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Copper Sulfate	Mink	1	357 days	reproduction	oral in diet	11.7	15.14	Aulerich et al., 1982 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Copper	Copper Oxide	1-day Old Chicks	0.534	10 weeks	growth, mortality	oral in diet	47	61.7	Mehring et al., 1960 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)

Table 7-18
Source Information for Mammal and Avian Benchmarks
WWI Incinerator, NW Camp Funston (CFI) SIte
Fort Riley, Kansas

Preliminary Chemical of Potential Ecological Concern (COPEC)	Form	Test Species	Body Weight (kg)	Duration	Effect/Endpoint	Exposure Route	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference
Metals Continued									
Lead	Lead Acetate	Rat	0.35	3 generations	reproduction	oral in diet	8	80	Azar et al., 1973 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Metallic	American Kestrels	0.13	7 months	reproduction	oral in diet	3.85		Pattee, 1984 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Lead Acetate	Japanese Quail	0.15	12 weeks	reproduction	oral in diet	1.13	11.3	Edens et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Manganese	Manganese Oxide (Mn_3O_4)	Rat	0.35	Through gestation for 224 days	reproduction	oral in diet	88	284	Laskey et al., 1982 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Manganese Oxide (Mn_3O_4)	Japanese Quail	0.072	75 days	growth, aggressive behavior	oral in diet	977	Not Reported	Laskey and Edens, 1985 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Mercury	Mercuric Chloride ($HgCl_2$)	Mink	1	6 months	reproduction	oral in diet	1	Not Reported	Aulerich et al., 1974 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Mercuric Chloride	Japanese Quail	0.15	1 year	reproduction	oral in diet	0.45	0.9	Hill and Schaffner, 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Mercuric sulfide	Mouse	0.03	20 month	mortality, liver and kidney histology, reproduction	oral in diet	13.2	Not Reported	Revis et al., 1989 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Methyl Mercury	Methyl Mercury Chloride	Mink	1	93 days	mortality, weight loss, ataxia	oral in diet	0.015	0.025	Wobeser et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Methyl Mercury Chloride (CH_3HgCl)	Rat	0.35	3 generations	reproduction	oral in diet	0.032	0.16	Verschuuren et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Methyl Mercury Dicyandiamide	Mallard Duck	1	3 generations	reproduction	oral in diet	0.0064	0.064	Heinz, 1979 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Nickel	Nickel Sulfate Hexahydrate	Rat	0.35	3 generations	reproduction	oral in diet	40	80	Ambrose et al., 1976 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Nickel Sulfate	Mallard Duckling	0.782	90 days	mortality, growth, behavior	oral in diet	77.4	107	Cain and Pafford, 1981 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)

Table 7-18
Source Information for Mammal and Avian Benchmarks
WWI Incinerator, NW Camp Funston (CFI) SIte
Fort Riley, Kansas

Preliminary Chemical of Potential Ecological Concern (COPEC)	Form	Test Species	Body Weight (kg)	Duration	Effect/Endpoint	Exposure Route	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference
Metals Continued									
	Potassium Selenate (SeO_4)	Rat	0.35	1 year, through 2 generations	reproduction	oral in water	0.20	0.33	Rosenfeld and Beath, 1954 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Sodium Selenite	Mallard Duck	1	78 days	reproduction	oral in diet	0.5	1	Heinz et al., 1987 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Selanomethionine	Mallard Duck	1	100 days	reproduction	oral in diet	0.4	0.8	Heinz et al., 1989 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Selenomethionine	Screech Owl	0.2	13.7 weeks through reproduction	reproduction	oral in diet	0.44	1.5	Wiemeyer and Hoffman, 1996 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Selenium	Selenomethionine	Black-Crowned Night-Heron	0.883	94 days through reproduction	reproduction	oral in diet	1.8	Not Reported	Smith et al., 1988 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Thallium	Thallium Sulfate	Rat	0.365	60 days	reproduction (male testicular function)	oral in water	0.0074	0.074	Formigli et al., 1986 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Sodium Metavanadate ($NaVO_3$)	Rat	0.26	60 days prior to gestation, plus through gestation, delivery and lactation	reproduction	oral intubation	0.21	2.1	Domingo et al., 1986 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Vanadium	Vanadyl Sulfate	Mallard Duck	1.17	12 weeks	mortality, body weight, blood chemistry	oral in diet	11.4	Not Reported	White and Dieter, 1978 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
	Zinc Oxide	Rat	0.35	Days 1-16 of gestation	reproduction	oral in diet	160	320	Schlicker and Cox, 1968 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)
Zinc	Zinc Sulfate	White Leghorn Hens	1.935	44 weeks	reproduction	oral in diet	14.5	131	Stahl et al., 1990 (Cited in Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3)

Notes:
kg - kilogram
mg/kg/day - milligrams per kilogram per day
NOAEL - No Observed Adverse Effect Level
LOAEL - Lowest Observed Adverse Effect Level

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	Short-tailed Shrew	1.17E-03	1.87E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	Short-tailed Shrew	1.17E-03	1.76E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	Short-tailed Shrew	1.17E-03	1.29E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	Short-tailed Shrew	1.17E-03	2.57E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	Short-tailed Shrew	1.17E-03	5.38E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	Short-tailed Shrew	1.17E-03	1.29E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	Short-tailed Shrew	1.17E-03	2.69E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	Short-tailed Shrew	1.17E-03	1.64E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	Short-tailed Shrew	1.17E-03	7.49E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	Short-tailed Shrew	1.17E-03	4.21E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	Short-tailed Shrew	1.17E-03	7.61E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	Short-tailed Shrew	1.17E-03	1.40E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	Short-tailed Shrew	1.17E-03	2.34E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	Short-tailed Shrew	1.17E-03	1.40E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	Short-tailed Shrew	1.17E-03	1.99E-08
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	Short-tailed Shrew	1.17E-03	2.22E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	Short-tailed Shrew	1.17E-03	9.59E-10
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	Short-tailed Shrew	1.17E-03	3.39E-01
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	Short-tailed Shrew	1.17E-03	2.93E-05
Acenaphthylene	1.90E-02	Short-tailed Shrew	1.17E-03	2.22E-05
Anthracene	4.50E-02	Short-tailed Shrew	1.17E-03	5.27E-05
Benzo(a)anthracene	2.10E-01	Short-tailed Shrew	1.17E-03	2.46E-04
Benzo(a)pyrene	1.40E-01	Short-tailed Shrew	1.17E-03	1.64E-04
Benzo(b)fluoranthene	1.60E-01	Short-tailed Shrew	1.17E-03	1.87E-04
Benzo(g,h,i)perylene	1.10E-01	Short-tailed Shrew	1.17E-03	1.29E-04
Benzo(k)fluoranthene	1.30E-01	Short-tailed Shrew	1.17E-03	1.52E-04
Chrysene	3.50E-01	Short-tailed Shrew	1.17E-03	4.10E-04
Dibenzo(a,h)anthracene	3.20E-02	Short-tailed Shrew	1.17E-03	3.74E-05
Dibenzofuran	1.30E-01	Short-tailed Shrew	1.17E-03	1.52E-04
Dimethyl phthalate	5.60E-01	Short-tailed Shrew	1.17E-03	6.55E-04
Fluoranthene	2.60E-01	Short-tailed Shrew	1.17E-03	3.04E-04
Fluorene	2.60E-02	Short-tailed Shrew	1.17E-03	3.04E-05
Indeno(1,2,3-cd)pyrene	5.70E-02	Short-tailed Shrew	1.17E-03	6.67E-05
2-Methylnaphthalene	2.30E-01	Short-tailed Shrew	1.17E-03	2.69E-04
Naphthalene	1.40E+00	Short-tailed Shrew	1.17E-03	1.64E-03
Phenanthrene	1.50E+00	Short-tailed Shrew	1.17E-03	1.76E-03
Pyrene	2.60E-01	Short-tailed Shrew	1.17E-03	3.04E-04

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	Short-tailed Shrew	1.17E-03	2.69E+01
Antimony	1.70E+00	Short-tailed Shrew	1.17E-03	1.99E-03
Arsenic	8.69E+01	Short-tailed Shrew	1.17E-03	1.02E-01
Barium	1.38E+03	Short-tailed Shrew	1.17E-03	1.61E+00
Beryllium	2.70E+00	Short-tailed Shrew	1.17E-03	3.16E-03
Cadmium	1.56E+01	Short-tailed Shrew	1.17E-03	1.83E-02
Chromium	2.30E+01	Short-tailed Shrew	1.17E-03	2.69E-02
Cobalt	1.60E+01	Short-tailed Shrew	1.17E-03	1.87E-02
Copper	2.00E+02	Short-tailed Shrew	1.17E-03	2.34E-01
Iron	7.60E+04	Short-tailed Shrew	1.17E-03	8.89E+01
Lead	8.44E+02	Short-tailed Shrew	1.17E-03	9.87E-01
Manganese	4.50E+02	Short-tailed Shrew	1.17E-03	5.27E-01
Mercury	1.65E+01	Short-tailed Shrew	1.17E-03	1.93E-02
Methyl Mercury	2.65E-04	Short-tailed Shrew	1.17E-03	3.10E-07
Nickel	8.70E+01	Short-tailed Shrew	1.17E-03	1.02E-01
Selenium	2.40E+00	Short-tailed Shrew	1.17E-03	2.81E-03
Silver	9.70E-01	Short-tailed Shrew	1.17E-03	1.13E-03
Thallium	2.00E+00	Short-tailed Shrew	1.17E-03	2.34E-03
Vanadium	4.30E+01	Short-tailed Shrew	1.17E-03	5.03E-02
Zinc	1.38E+03	Short-tailed Shrew	1.17E-03	1.61E+00

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	White-footed Mouse	6.80E-05	1.09E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	White-footed Mouse	6.80E-05	1.02E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	White-footed Mouse	6.80E-05	7.48E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	White-footed Mouse	6.80E-05	1.50E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	White-footed Mouse	6.80E-05	3.13E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	White-footed Mouse	6.80E-05	7.48E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	White-footed Mouse	6.80E-05	1.56E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	White-footed Mouse	6.80E-05	9.52E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	White-footed Mouse	6.80E-05	4.35E-10
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	White-footed Mouse	6.80E-05	2.45E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	White-footed Mouse	6.80E-05	4.42E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	White-footed Mouse	6.80E-05	8.16E-10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	White-footed Mouse	6.80E-05	1.36E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	White-footed Mouse	6.80E-05	8.16E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	White-footed Mouse	6.80E-05	1.16E-09
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	White-footed Mouse	6.80E-05	1.29E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	White-footed Mouse	6.80E-05	5.58E-11
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	White-footed Mouse	6.80E-05	1.97E-02
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	White-footed Mouse	6.80E-05	1.70E-06
Acenaphthylene	1.90E-02	White-footed Mouse	6.80E-05	1.29E-06
Anthracene	4.50E-02	White-footed Mouse	6.80E-05	3.06E-06
Benzo(a)anthracene	2.10E-01	White-footed Mouse	6.80E-05	1.43E-05
Benzo(a)pyrene	1.40E-01	White-footed Mouse	6.80E-05	9.52E-06
Benzo(b)fluoranthene	1.60E-01	White-footed Mouse	6.80E-05	1.09E-05
Benzo(g,h,i)perylene	1.10E-01	White-footed Mouse	6.80E-05	7.48E-06
Benzo(k)fluoranthene	1.30E-01	White-footed Mouse	6.80E-05	8.84E-06
Chrysene	3.50E-01	White-footed Mouse	6.80E-05	2.38E-05
Dibenzo(a,h)anthracene	3.20E-02	White-footed Mouse	6.80E-05	2.18E-06
Dibenzofuran	1.30E-01	White-footed Mouse	6.80E-05	8.84E-06
Dimethyl phthalate	5.60E-01	White-footed Mouse	6.80E-05	3.81E-05
Fluoranthene	2.60E-01	White-footed Mouse	6.80E-05	1.77E-05
Fluorene	2.60E-02	White-footed Mouse	6.80E-05	1.77E-06
Indeno(1,2,3-cd)pyrene	5.70E-02	White-footed Mouse	6.80E-05	3.88E-06
2-Methylnaphthalene	2.30E-01	White-footed Mouse	6.80E-05	1.56E-05
Naphthalene	1.40E+00	White-footed Mouse	6.80E-05	9.52E-05
Phenanthrene	1.50E+00	White-footed Mouse	6.80E-05	1.02E-04
Pyrene	2.60E-01	White-footed Mouse	6.80E-05	1.77E-05

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	White-footed Mouse	6.80E-05	1.56E+00
Antimony	1.70E+00	White-footed Mouse	6.80E-05	1.16E-04
Arsenic	8.69E+01	White-footed Mouse	6.80E-05	5.91E-03
Barium	1.38E+03	White-footed Mouse	6.80E-05	9.38E-02
Beryllium	2.70E+00	White-footed Mouse	6.80E-05	1.84E-04
Cadmium	1.56E+01	White-footed Mouse	6.80E-05	1.06E-03
Chromium	2.30E+01	White-footed Mouse	6.80E-05	1.56E-03
Cobalt	1.60E+01	White-footed Mouse	6.80E-05	1.09E-03
Copper	2.00E+02	White-footed Mouse	6.80E-05	1.36E-02
Iron	7.60E+04	White-footed Mouse	6.80E-05	5.17E+00
Lead	8.44E+02	White-footed Mouse	6.80E-05	5.74E-02
Manganese	4.50E+02	White-footed Mouse	6.80E-05	3.06E-02
Mercury	1.65E+01	White-footed Mouse	6.80E-05	1.12E-03
Methyl Mercury	2.65E-04	White-footed Mouse	6.80E-05	1.80E-08
Nickel	8.70E+01	White-footed Mouse	6.80E-05	5.92E-03
Selenium	2.40E+00	White-footed Mouse	6.80E-05	1.63E-04
Silver	9.70E-01	White-footed Mouse	6.80E-05	6.60E-05
Thallium	2.00E+00	White-footed Mouse	6.80E-05	1.36E-04
Vanadium	4.30E+01	White-footed Mouse	6.80E-05	2.92E-03
Zinc	1.38E+03	White-footed Mouse	6.80E-05	9.38E-02

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	Meadow Vole	1.20E-04	1.92E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	Meadow Vole	1.20E-04	1.80E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	Meadow Vole	1.20E-04	1.32E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	Meadow Vole	1.20E-04	2.64E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	Meadow Vole	1.20E-04	5.52E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	Meadow Vole	1.20E-04	1.32E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	Meadow Vole	1.20E-04	2.76E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	Meadow Vole	1.20E-04	1.68E-09
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	Meadow Vole	1.20E-04	7.68E-10
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	Meadow Vole	1.20E-04	4.32E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	Meadow Vole	1.20E-04	7.80E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	Meadow Vole	1.20E-04	1.44E-09
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	Meadow Vole	1.20E-04	2.40E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	Meadow Vole	1.20E-04	1.44E-09
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	Meadow Vole	1.20E-04	2.04E-09
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	Meadow Vole	1.20E-04	2.28E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	Meadow Vole	1.20E-04	9.84E-11
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	Meadow Vole	1.20E-04	3.48E-02
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	Meadow Vole	1.20E-04	3.00E-06
Acenaphthylene	1.90E-02	Meadow Vole	1.20E-04	2.28E-06
Anthracene	4.50E-02	Meadow Vole	1.20E-04	5.40E-06
Benzo(a)anthracene	2.10E-01	Meadow Vole	1.20E-04	2.52E-05
Benzo(a)pyrene	1.40E-01	Meadow Vole	1.20E-04	1.68E-05
Benzo(b)fluoranthene	1.60E-01	Meadow Vole	1.20E-04	1.92E-05
Benzo(g,h,i)perylene	1.10E-01	Meadow Vole	1.20E-04	1.32E-05
Benzo(k)fluoranthene	1.30E-01	Meadow Vole	1.20E-04	1.56E-05
Chrysene	3.50E-01	Meadow Vole	1.20E-04	4.20E-05
Dibenzo(a,h)anthracene	3.20E-02	Meadow Vole	1.20E-04	3.84E-06
Dibenzofuran	1.30E-01	Meadow Vole	1.20E-04	1.56E-05
Dimethyl phthalate	5.60E-01	Meadow Vole	1.20E-04	6.72E-05
Fluoranthene	2.60E-01	Meadow Vole	1.20E-04	3.12E-05
Fluorene	2.60E-02	Meadow Vole	1.20E-04	3.12E-06
Indeno(1,2,3-cd)pyrene	5.70E-02	Meadow Vole	1.20E-04	6.84E-06
2-Methylnaphthalene	2.30E-01	Meadow Vole	1.20E-04	2.76E-05
Naphthalene	1.40E+00	Meadow Vole	1.20E-04	1.68E-04
Phenanthrene	1.50E+00	Meadow Vole	1.20E-04	1.80E-04
Pyrene	2.60E-01	Meadow Vole	1.20E-04	3.12E-05

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	Meadow Vole	1.20E-04	2.76E+00
Antimony	1.70E+00	Meadow Vole	1.20E-04	2.04E-04
Arsenic	8.69E+01	Meadow Vole	1.20E-04	1.04E-02
Barium	1.38E+03	Meadow Vole	1.20E-04	1.66E-01
Beryllium	2.70E+00	Meadow Vole	1.20E-04	3.24E-04
Cadmium	1.56E+01	Meadow Vole	1.20E-04	1.87E-03
Chromium	2.30E+01	Meadow Vole	1.20E-04	2.76E-03
Cobalt	1.60E+01	Meadow Vole	1.20E-04	1.92E-03
Copper	2.00E+02	Meadow Vole	1.20E-04	2.40E-02
Iron	7.60E+04	Meadow Vole	1.20E-04	9.12E+00
Lead	8.44E+02	Meadow Vole	1.20E-04	1.01E-01
Manganese	4.50E+02	Meadow Vole	1.20E-04	5.40E-02
Mercury	1.65E+01	Meadow Vole	1.20E-04	1.98E-03
Methyl Mercury	2.65E-04	Meadow Vole	1.20E-04	3.18E-08
Nickel	8.70E+01	Meadow Vole	1.20E-04	1.04E-02
Selenium	2.40E+00	Meadow Vole	1.20E-04	2.88E-04
Silver	9.70E-01	Meadow Vole	1.20E-04	1.16E-04
Thallium	2.00E+00	Meadow Vole	1.20E-04	2.40E-04
Vanadium	4.30E+01	Meadow Vole	1.20E-04	5.16E-03
Zinc	1.38E+03	Meadow Vole	1.20E-04	1.66E-01

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	Eastern Cottontail Rabbit	1.49E-02	2.38E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	Eastern Cottontail Rabbit	1.49E-02	2.24E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	Eastern Cottontail Rabbit	1.49E-02	1.64E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	Eastern Cottontail Rabbit	1.49E-02	3.28E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	Eastern Cottontail Rabbit	1.49E-02	6.85E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	Eastern Cottontail Rabbit	1.49E-02	1.64E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	Eastern Cottontail Rabbit	1.49E-02	3.43E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	Eastern Cottontail Rabbit	1.49E-02	2.09E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	Eastern Cottontail Rabbit	1.49E-02	9.54E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	Eastern Cottontail Rabbit	1.49E-02	5.36E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	Eastern Cottontail Rabbit	1.49E-02	9.69E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	Eastern Cottontail Rabbit	1.49E-02	1.79E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	Eastern Cottontail Rabbit	1.49E-02	2.98E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	Eastern Cottontail Rabbit	1.49E-02	1.79E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	Eastern Cottontail Rabbit	1.49E-02	2.53E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	Eastern Cottontail Rabbit	1.49E-02	2.83E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	Eastern Cottontail Rabbit	1.49E-02	1.22E-08
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	Eastern Cottontail Rabbit	1.49E-02	4.32E+00
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	Eastern Cottontail Rabbit	1.49E-02	3.73E-04
Acenaphthylene	1.90E-02	Eastern Cottontail Rabbit	1.49E-02	2.83E-04
Anthracene	4.50E-02	Eastern Cottontail Rabbit	1.49E-02	6.71E-04
Benzo(a)anthracene	2.10E-01	Eastern Cottontail Rabbit	1.49E-02	3.13E-03
Benzo(a)pyrene	1.40E-01	Eastern Cottontail Rabbit	1.49E-02	2.09E-03
Benzo(b)fluoranthene	1.60E-01	Eastern Cottontail Rabbit	1.49E-02	2.38E-03
Benzo(g,h,i)perylene	1.10E-01	Eastern Cottontail Rabbit	1.49E-02	1.64E-03
Benzo(k)fluoranthene	1.30E-01	Eastern Cottontail Rabbit	1.49E-02	1.94E-03
Chrysene	3.50E-01	Eastern Cottontail Rabbit	1.49E-02	5.22E-03
Dibenzo(a,h)anthracene	3.20E-02	Eastern Cottontail Rabbit	1.49E-02	4.77E-04
Dibenzofuran	1.30E-01	Eastern Cottontail Rabbit	1.49E-02	1.94E-03
Dimethyl phthalate	5.60E-01	Eastern Cottontail Rabbit	1.49E-02	8.34E-03
Fluoranthene	2.60E-01	Eastern Cottontail Rabbit	1.49E-02	3.87E-03
Fluorene	2.60E-02	Eastern Cottontail Rabbit	1.49E-02	3.87E-04
Indeno(1,2,3-cd)pyrene	5.70E-02	Eastern Cottontail Rabbit	1.49E-02	8.49E-04
2-Methylnaphthalene	2.30E-01	Eastern Cottontail Rabbit	1.49E-02	3.43E-03
Naphthalene	1.40E+00	Eastern Cottontail Rabbit	1.49E-02	2.09E-02
Phenanthrene	1.50E+00	Eastern Cottontail Rabbit	1.49E-02	2.24E-02
Pyrene	2.60E-01	Eastern Cottontail Rabbit	1.49E-02	3.87E-03

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	Eastern Cottontail Rabbit	1.49E-02	3.43E+02
Antimony	1.70E+00	Eastern Cottontail Rabbit	1.49E-02	2.53E-02
Arsenic	8.69E+01	Eastern Cottontail Rabbit	1.49E-02	1.29E+00
Barium	1.38E+03	Eastern Cottontail Rabbit	1.49E-02	2.06E+01
Beryllium	2.70E+00	Eastern Cottontail Rabbit	1.49E-02	4.02E-02
Cadmium	1.56E+01	Eastern Cottontail Rabbit	1.49E-02	2.32E-01
Chromium	2.30E+01	Eastern Cottontail Rabbit	1.49E-02	3.43E-01
Cobalt	1.60E+01	Eastern Cottontail Rabbit	1.49E-02	2.38E-01
Copper	2.00E+02	Eastern Cottontail Rabbit	1.49E-02	2.98E+00
Iron	7.60E+04	Eastern Cottontail Rabbit	1.49E-02	1.13E+03
Lead	8.44E+02	Eastern Cottontail Rabbit	1.49E-02	1.26E+01
Manganese	4.50E+02	Eastern Cottontail Rabbit	1.49E-02	6.71E+00
Mercury	1.65E+01	Eastern Cottontail Rabbit	1.49E-02	2.46E-01
Methyl Mercury	2.65E-04	Eastern Cottontail Rabbit	1.49E-02	3.95E-06
Nickel	8.70E+01	Eastern Cottontail Rabbit	1.49E-02	1.30E+00
Selenium	2.40E+00	Eastern Cottontail Rabbit	1.49E-02	3.58E-02
Silver	9.70E-01	Eastern Cottontail Rabbit	1.49E-02	1.45E-02
Thallium	2.00E+00	Eastern Cottontail Rabbit	1.49E-02	2.98E-02
Vanadium	4.30E+01	Eastern Cottontail Rabbit	1.49E-02	6.41E-01
Zinc	1.38E+03	Eastern Cottontail Rabbit	1.49E-02	2.06E+01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	Red Fox	1.26E-02	2.02E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	Red Fox	1.26E-02	1.89E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	Red Fox	1.26E-02	1.39E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	Red Fox	1.26E-02	2.77E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	Red Fox	1.26E-02	5.80E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	Red Fox	1.26E-02	1.39E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	Red Fox	1.26E-02	2.90E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	Red Fox	1.26E-02	1.76E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	Red Fox	1.26E-02	8.06E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	Red Fox	1.26E-02	4.54E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	Red Fox	1.26E-02	8.19E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	Red Fox	1.26E-02	1.51E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	Red Fox	1.26E-02	2.52E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	Red Fox	1.26E-02	1.51E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	Red Fox	1.26E-02	2.14E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	Red Fox	1.26E-02	2.39E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	Red Fox	1.26E-02	1.03E-08
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	Red Fox	1.26E-02	3.65E+00
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	Red Fox	1.26E-02	3.15E-04
Acenaphthylene	1.90E-02	Red Fox	1.26E-02	2.39E-04
Anthracene	4.50E-02	Red Fox	1.26E-02	5.67E-04
Benzo(a)anthracene	2.10E-01	Red Fox	1.26E-02	2.65E-03
Benzo(a)pyrene	1.40E-01	Red Fox	1.26E-02	1.76E-03
Benzo(b)fluoranthene	1.60E-01	Red Fox	1.26E-02	2.02E-03
Benzo(g,h,i)perylene	1.10E-01	Red Fox	1.26E-02	1.39E-03
Benzo(k)fluoranthene	1.30E-01	Red Fox	1.26E-02	1.64E-03
Chrysene	3.50E-01	Red Fox	1.26E-02	4.41E-03
Dibenzo(a,h)anthracene	3.20E-02	Red Fox	1.26E-02	4.03E-04
Dibenzofuran	1.30E-01	Red Fox	1.26E-02	1.64E-03
Dimethyl phthalate	5.60E-01	Red Fox	1.26E-02	7.06E-03
Fluoranthene	2.60E-01	Red Fox	1.26E-02	3.28E-03
Fluorene	2.60E-02	Red Fox	1.26E-02	3.28E-04
Indeno(1,2,3-cd)pyrene	5.70E-02	Red Fox	1.26E-02	7.18E-04
2-Methylnaphthalene	2.30E-01	Red Fox	1.26E-02	2.90E-03
Naphthalene	1.40E+00	Red Fox	1.26E-02	1.76E-02
Phenanthrene	1.50E+00	Red Fox	1.26E-02	1.89E-02
Pyrene	2.60E-01	Red Fox	1.26E-02	3.28E-03

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	Red Fox	1.26E-02	2.90E+02
Antimony	1.70E+00	Red Fox	1.26E-02	2.14E-02
Arsenic	8.69E+01	Red Fox	1.26E-02	1.09E+00
Barium	1.38E+03	Red Fox	1.26E-02	1.74E+01
Beryllium	2.70E+00	Red Fox	1.26E-02	3.40E-02
Cadmium	1.56E+01	Red Fox	1.26E-02	1.97E-01
Chromium	2.30E+01	Red Fox	1.26E-02	2.90E-01
Cobalt	1.60E+01	Red Fox	1.26E-02	2.02E-01
Copper	2.00E+02	Red Fox	1.26E-02	2.52E+00
Iron	7.60E+04	Red Fox	1.26E-02	9.58E+02
Lead	8.44E+02	Red Fox	1.26E-02	1.06E+01
Manganese	4.50E+02	Red Fox	1.26E-02	5.67E+00
Mercury	1.65E+01	Red Fox	1.26E-02	2.08E-01
Methyl Mercury	2.65E-04	Red Fox	1.26E-02	3.34E-06
Nickel	8.70E+01	Red Fox	1.26E-02	1.10E+00
Selenium	2.40E+00	Red Fox	1.26E-02	3.02E-02
Silver	9.70E-01	Red Fox	1.26E-02	1.22E-02
Thallium	2.00E+00	Red Fox	1.26E-02	2.52E-02
Vanadium	4.30E+01	Red Fox	1.26E-02	5.42E-01
Zinc	1.38E+03	Red Fox	1.26E-02	1.74E+01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	White-tailed Deer	3.50E-02	5.60E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	White-tailed Deer	3.50E-02	5.25E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	White-tailed Deer	3.50E-02	3.85E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	White-tailed Deer	3.50E-02	7.70E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	White-tailed Deer	3.50E-02	1.61E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	White-tailed Deer	3.50E-02	3.85E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	White-tailed Deer	3.50E-02	8.05E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	White-tailed Deer	3.50E-02	4.90E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	White-tailed Deer	3.50E-02	2.24E-07
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	White-tailed Deer	3.50E-02	1.26E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	White-tailed Deer	3.50E-02	2.28E-07
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	White-tailed Deer	3.50E-02	4.20E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	White-tailed Deer	3.50E-02	7.00E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	White-tailed Deer	3.50E-02	4.20E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	White-tailed Deer	3.50E-02	5.95E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	White-tailed Deer	3.50E-02	6.65E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	White-tailed Deer	3.50E-02	2.87E-08
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	White-tailed Deer	3.50E-02	1.02E+01
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	White-tailed Deer	3.50E-02	8.75E-04
Acenaphthylene	1.90E-02	White-tailed Deer	3.50E-02	6.65E-04
Anthracene	4.50E-02	White-tailed Deer	3.50E-02	1.58E-03
Benzo(a)anthracene	2.10E-01	White-tailed Deer	3.50E-02	7.35E-03
Benzo(a)pyrene	1.40E-01	White-tailed Deer	3.50E-02	4.90E-03
Benzo(b)fluoranthene	1.60E-01	White-tailed Deer	3.50E-02	5.60E-03
Benzo(g,h,i)perylene	1.10E-01	White-tailed Deer	3.50E-02	3.85E-03
Benzo(k)fluoranthene	1.30E-01	White-tailed Deer	3.50E-02	4.55E-03
Chrysene	3.50E-01	White-tailed Deer	3.50E-02	1.23E-02
Dibenzo(a,h)anthracene	3.20E-02	White-tailed Deer	3.50E-02	1.12E-03
Dibenzofuran	1.30E-01	White-tailed Deer	3.50E-02	4.55E-03
Dimethyl phthalate	5.60E-01	White-tailed Deer	3.50E-02	1.96E-02
Fluoranthene	2.60E-01	White-tailed Deer	3.50E-02	9.10E-03
Fluorene	2.60E-02	White-tailed Deer	3.50E-02	9.10E-04
Indeno(1,2,3-cd)pyrene	5.70E-02	White-tailed Deer	3.50E-02	2.00E-03
2-Methylnaphthalene	2.30E-01	White-tailed Deer	3.50E-02	8.05E-03
Naphthalene	1.40E+00	White-tailed Deer	3.50E-02	4.90E-02
Phenanthrene	1.50E+00	White-tailed Deer	3.50E-02	5.25E-02
Pyrene	2.60E-01	White-tailed Deer	3.50E-02	9.10E-03

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	White-tailed Deer	3.50E-02	8.05E+02
Antimony	1.70E+00	White-tailed Deer	3.50E-02	5.95E-02
Arsenic	8.69E+01	White-tailed Deer	3.50E-02	3.04E+00
Barium	1.38E+03	White-tailed Deer	3.50E-02	4.83E+01
Beryllium	2.70E+00	White-tailed Deer	3.50E-02	9.45E-02
Cadmium	1.56E+01	White-tailed Deer	3.50E-02	5.46E-01
Chromium	2.30E+01	White-tailed Deer	3.50E-02	8.05E-01
Cobalt	1.60E+01	White-tailed Deer	3.50E-02	5.60E-01
Copper	2.00E+02	White-tailed Deer	3.50E-02	7.00E+00
Iron	7.60E+04	White-tailed Deer	3.50E-02	2.66E+03
Lead	8.44E+02	White-tailed Deer	3.50E-02	2.95E+01
Manganese	4.50E+02	White-tailed Deer	3.50E-02	1.58E+01
Mercury	1.65E+01	White-tailed Deer	3.50E-02	5.78E-01
Methyl Mercury	2.65E-04	White-tailed Deer	3.50E-02	9.28E-06
Nickel	8.70E+01	White-tailed Deer	3.50E-02	3.05E+00
Selenium	2.40E+00	White-tailed Deer	3.50E-02	8.40E-02
Silver	9.70E-01	White-tailed Deer	3.50E-02	3.40E-02
Thallium	2.00E+00	White-tailed Deer	3.50E-02	7.00E-02
Vanadium	4.30E+01	White-tailed Deer	3.50E-02	1.51E+00
Zinc	1.38E+03	White-tailed Deer	3.50E-02	4.83E+01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	American Robin	8.74E-03	1.40E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	American Robin	8.74E-03	1.31E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	American Robin	8.74E-03	9.61E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	American Robin	8.74E-03	1.92E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	American Robin	8.74E-03	4.02E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	American Robin	8.74E-03	9.61E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	American Robin	8.74E-03	2.01E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	American Robin	8.74E-03	1.22E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	American Robin	8.74E-03	5.59E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	American Robin	8.74E-03	3.15E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	American Robin	8.74E-03	5.68E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	American Robin	8.74E-03	1.05E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	American Robin	8.74E-03	1.75E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	American Robin	8.74E-03	1.05E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	American Robin	8.74E-03	1.49E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	American Robin	8.74E-03	1.66E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	American Robin	8.74E-03	7.17E-09
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	American Robin	8.74E-03	2.53E+00
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	American Robin	8.74E-03	2.19E-04
Acenaphthylene	1.90E-02	American Robin	8.74E-03	1.66E-04
Anthracene	4.50E-02	American Robin	8.74E-03	3.93E-04
Benzo(a)anthracene	2.10E-01	American Robin	8.74E-03	1.84E-03
Benzo(a)pyrene	1.40E-01	American Robin	8.74E-03	1.22E-03
Benzo(b)fluoranthene	1.60E-01	American Robin	8.74E-03	1.40E-03
Benzo(g,h,i)perylene	1.10E-01	American Robin	8.74E-03	9.61E-04
Benzo(k)fluoranthene	1.30E-01	American Robin	8.74E-03	1.14E-03
Chrysene	3.50E-01	American Robin	8.74E-03	3.06E-03
Dibenzo(a,h)anthracene	3.20E-02	American Robin	8.74E-03	2.80E-04
Dibenzofuran	1.30E-01	American Robin	8.74E-03	1.14E-03
Dimethyl phthalate	5.60E-01	American Robin	8.74E-03	4.89E-03
Fluoranthene	2.60E-01	American Robin	8.74E-03	2.27E-03
Fluorene	2.60E-02	American Robin	8.74E-03	2.27E-04
Indeno(1,2,3-cd)pyrene	5.70E-02	American Robin	8.74E-03	4.98E-04
2-Methylnaphthalene	2.30E-01	American Robin	8.74E-03	2.01E-03
Naphthalene	1.40E+00	American Robin	8.74E-03	1.22E-02
Phenanthrene	1.50E+00	American Robin	8.74E-03	1.31E-02
Pyrene	2.60E-01	American Robin	8.74E-03	2.27E-03

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	American Robin	8.74E-03	2.01E+02
Antimony	1.70E+00	American Robin	8.74E-03	1.49E-02
Arsenic	8.69E+01	American Robin	8.74E-03	7.60E-01
Barium	1.38E+03	American Robin	8.74E-03	1.21E+01
Beryllium	2.70E+00	American Robin	8.74E-03	2.36E-02
Cadmium	1.56E+01	American Robin	8.74E-03	1.36E-01
Chromium	2.30E+01	American Robin	8.74E-03	2.01E-01
Cobalt	1.60E+01	American Robin	8.74E-03	1.40E-01
Copper	2.00E+02	American Robin	8.74E-03	1.75E+00
Iron	7.60E+04	American Robin	8.74E-03	6.64E+02
Lead	8.44E+02	American Robin	8.74E-03	7.38E+00
Manganese	4.50E+02	American Robin	8.74E-03	3.93E+00
Mercury	1.65E+01	American Robin	8.74E-03	1.44E-01
Methyl Mercury	2.65E-04	American Robin	8.74E-03	2.32E-06
Nickel	8.70E+01	American Robin	8.74E-03	7.60E-01
Selenium	2.40E+00	American Robin	8.74E-03	2.10E-02
Silver	9.70E-01	American Robin	8.74E-03	8.48E-03
Thallium	2.00E+00	American Robin	8.74E-03	1.75E-02
Vanadium	4.30E+01	American Robin	8.74E-03	3.76E-01
Zinc	1.38E+03	American Robin	8.74E-03	1.21E+01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	Red-tailed Hawk	3.05E-03	4.88E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	Red-tailed Hawk	3.05E-03	4.58E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	Red-tailed Hawk	3.05E-03	3.36E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	Red-tailed Hawk	3.05E-03	6.71E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	Red-tailed Hawk	3.05E-03	1.40E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	Red-tailed Hawk	3.05E-03	3.36E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	Red-tailed Hawk	3.05E-03	7.02E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	Red-tailed Hawk	3.05E-03	4.27E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	Red-tailed Hawk	3.05E-03	1.95E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	Red-tailed Hawk	3.05E-03	1.10E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	Red-tailed Hawk	3.05E-03	1.98E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	Red-tailed Hawk	3.05E-03	3.66E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	Red-tailed Hawk	3.05E-03	6.10E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	Red-tailed Hawk	3.05E-03	3.66E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	Red-tailed Hawk	3.05E-03	5.19E-08
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	Red-tailed Hawk	3.05E-03	5.80E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	Red-tailed Hawk	3.05E-03	2.50E-09
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	2.90E+02	Red-tailed Hawk	3.05E-03	8.85E-01
Semivolatile Organic Compounds (mg/kg)				
Acenaphthene	2.50E-02	Red-tailed Hawk	3.05E-03	7.63E-05
Acenaphthylene	1.90E-02	Red-tailed Hawk	3.05E-03	5.80E-05
Anthracene	4.50E-02	Red-tailed Hawk	3.05E-03	1.37E-04
Benzo(a)anthracene	2.10E-01	Red-tailed Hawk	3.05E-03	6.41E-04
Benzo(a)pyrene	1.40E-01	Red-tailed Hawk	3.05E-03	4.27E-04
Benzo(b)fluoranthene	1.60E-01	Red-tailed Hawk	3.05E-03	4.88E-04
Benzo(g,h,i)perylene	1.10E-01	Red-tailed Hawk	3.05E-03	3.36E-04
Benzo(k)fluoranthene	1.30E-01	Red-tailed Hawk	3.05E-03	3.97E-04
Chrysene	3.50E-01	Red-tailed Hawk	3.05E-03	1.07E-03
Dibenzo(a,h)anthracene	3.20E-02	Red-tailed Hawk	3.05E-03	9.77E-05
Dibenzofuran	1.30E-01	Red-tailed Hawk	3.05E-03	3.97E-04
Dimethyl phthalate	5.60E-01	Red-tailed Hawk	3.05E-03	1.71E-03
Fluoranthene	2.60E-01	Red-tailed Hawk	3.05E-03	7.94E-04
Fluorene	2.60E-02	Red-tailed Hawk	3.05E-03	7.94E-05
Indeno(1,2,3-cd)pyrene	5.70E-02	Red-tailed Hawk	3.05E-03	1.74E-04
2-Methylnaphthalene	2.30E-01	Red-tailed Hawk	3.05E-03	7.02E-04
Naphthalene	1.40E+00	Red-tailed Hawk	3.05E-03	4.27E-03
Phenanthrene	1.50E+00	Red-tailed Hawk	3.05E-03	4.58E-03
Pyrene	2.60E-01	Red-tailed Hawk	3.05E-03	7.94E-04

Table 7-19
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	2.30E+04	Red-tailed Hawk	3.05E-03	7.02E+01
Antimony	1.70E+00	Red-tailed Hawk	3.05E-03	5.19E-03
Arsenic	8.69E+01	Red-tailed Hawk	3.05E-03	2.65E-01
Barium	1.38E+03	Red-tailed Hawk	3.05E-03	4.21E+00
Beryllium	2.70E+00	Red-tailed Hawk	3.05E-03	8.24E-03
Cadmium	1.56E+01	Red-tailed Hawk	3.05E-03	4.76E-02
Chromium	2.30E+01	Red-tailed Hawk	3.05E-03	7.02E-02
Cobalt	1.60E+01	Red-tailed Hawk	3.05E-03	4.88E-02
Copper	2.00E+02	Red-tailed Hawk	3.05E-03	6.10E-01
Iron	7.60E+04	Red-tailed Hawk	3.05E-03	2.32E+02
Lead	8.44E+02	Red-tailed Hawk	3.05E-03	2.58E+00
Manganese	4.50E+02	Red-tailed Hawk	3.05E-03	1.37E+00
Mercury	1.65E+01	Red-tailed Hawk	3.05E-03	5.04E-02
Methyl Mercury	2.65E-04	Red-tailed Hawk	3.05E-03	8.09E-07
Nickel	8.70E+01	Red-tailed Hawk	3.05E-03	2.66E-01
Selenium	2.40E+00	Red-tailed Hawk	3.05E-03	7.32E-03
Silver	9.70E-01	Red-tailed Hawk	3.05E-03	2.96E-03
Thallium	2.00E+00	Red-tailed Hawk	3.05E-03	6.10E-03
Vanadium	4.30E+01	Red-tailed Hawk	3.05E-03	1.31E-01
Zinc	1.38E+03	Red-tailed Hawk	3.05E-03	4.21E+00

Notes:
mg/kg - milligrams per kilogram
kg/day - kilograms per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Short-tailed Shrew	3.30E-03	1.85E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDI	5.20E-09	Short-tailed Shrew	3.30E-03	1.72E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Short-tailed Shrew	3.30E-03	2.31E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Short-tailed Shrew	3.30E-03	3.96E-12
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Short-tailed Shrew	3.30E-03	5.61E-12
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Short-tailed Shrew	3.30E-03	3.63E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Short-tailed Shrew	3.30E-03	2.44E-12
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Short-tailed Shrew	3.30E-03	3.96E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Short-tailed Shrew	3.30E-03	2.67E-12
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Short-tailed Shrew	3.30E-03	4.62E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Short-tailed Shrew	3.30E-03	6.27E-12
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Short-tailed Shrew	3.30E-03	1.02E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Short-tailed Shrew	3.30E-03	4.62E-12
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Short-tailed Shrew	3.30E-03	3.30E-12
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Short-tailed Shrew	3.30E-03	3.17E-12
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Short-tailed Shrew	3.30E-03	2.38E-04
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Short-tailed Shrew	3.30E-03	1.62E-08
Benzo(k)fluoranthene	4.00E-06	Short-tailed Shrew	3.30E-03	1.32E-08
Chrysene	1.20E-05	Short-tailed Shrew	3.30E-03	3.96E-08
Pyrene	4.00E-06	Short-tailed Shrew	3.30E-03	1.32E-08

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Short-tailed Shrew	3.30E-03	1.58E-04
Arsenic	3.30E-03	Short-tailed Shrew	3.30E-03	1.09E-05
Barium	1.80E-01	Short-tailed Shrew	3.30E-03	5.94E-04
Copper	3.20E-03	Short-tailed Shrew	3.30E-03	1.06E-05
Manganese	6.00E-02	Short-tailed Shrew	3.30E-03	1.98E-04
Mercury	1.70E-04	Short-tailed Shrew	3.30E-03	5.61E-07
Methyl Mercury	9.40E-08	Short-tailed Shrew	3.30E-03	3.10E-10
Nickel	3.50E-03	Short-tailed Shrew	3.30E-03	1.16E-05
Vanadium	2.90E-03	Short-tailed Shrew	3.30E-03	9.57E-06
Zinc	3.70E-02	Short-tailed Shrew	3.30E-03	1.22E-04

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	White-footed Mouse	6.60E-03	3.70E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDI	5.20E-09	White-footed Mouse	6.60E-03	3.43E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	White-footed Mouse	6.60E-03	4.62E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	White-footed Mouse	6.60E-03	7.92E-12
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	White-footed Mouse	6.60E-03	1.12E-11
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	White-footed Mouse	6.60E-03	7.26E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	White-footed Mouse	6.60E-03	4.88E-12
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	White-footed Mouse	6.60E-03	7.92E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	White-footed Mouse	6.60E-03	5.35E-12
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	White-footed Mouse	6.60E-03	9.24E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	White-footed Mouse	6.60E-03	1.25E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	White-footed Mouse	6.60E-03	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	White-footed Mouse	6.60E-03	2.05E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	White-footed Mouse	6.60E-03	9.24E-12
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	White-footed Mouse	6.60E-03	6.60E-12
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	White-footed Mouse	6.60E-03	6.34E-12
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	White-footed Mouse	6.60E-03	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	White-footed Mouse	6.60E-03	4.75E-04
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	White-footed Mouse	6.60E-03	3.23E-08
Benzo(k)fluoranthene	4.00E-06	White-footed Mouse	6.60E-03	2.64E-08
Chrysene	1.20E-05	White-footed Mouse	6.60E-03	7.92E-08
Pyrene	4.00E-06	White-footed Mouse	6.60E-03	2.64E-08

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	White-footed Mouse	6.60E-03	3.17E-04
Arsenic	3.30E-03	White-footed Mouse	6.60E-03	2.18E-05
Barium	1.80E-01	White-footed Mouse	6.60E-03	1.19E-03
Copper	3.20E-03	White-footed Mouse	6.60E-03	2.11E-05
Manganese	6.00E-02	White-footed Mouse	6.60E-03	3.96E-04
Mercury	1.70E-04	White-footed Mouse	6.60E-03	1.12E-06
Methyl Mercury	9.40E-08	White-footed Mouse	6.60E-03	6.20E-10
Nickel	3.50E-03	White-footed Mouse	6.60E-03	2.31E-05
Vanadium	2.90E-03	White-footed Mouse	6.60E-03	1.91E-05
Zinc	3.70E-02	White-footed Mouse	6.60E-03	2.44E-04

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Meadow Vole	6.00E-03	3.36E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	Meadow Vole	6.00E-03	3.12E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Meadow Vole	6.00E-03	4.20E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Meadow Vole	6.00E-03	7.20E-12
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Meadow Vole	6.00E-03	1.02E-11
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Meadow Vole	6.00E-03	6.60E-12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Meadow Vole	6.00E-03	4.44E-12
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Meadow Vole	6.00E-03	7.20E-12
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Meadow Vole	6.00E-03	4.86E-12
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Meadow Vole	6.00E-03	8.40E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Meadow Vole	6.00E-03	1.14E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Meadow Vole	6.00E-03	1.86E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Meadow Vole	6.00E-03	8.40E-12
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Meadow Vole	6.00E-03	6.00E-12
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Meadow Vole	6.00E-03	5.76E-12
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Meadow Vole	6.00E-03	4.32E-04
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Meadow Vole	6.00E-03	2.94E-08
Benzo(b)fluoranthene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Benzo(k)fluoranthene	4.00E-06	Meadow Vole	6.00E-03	2.40E-08
Chrysene	1.20E-05	Meadow Vole	6.00E-03	7.20E-08
Dibenzo(a,h)anthracene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Dibenzofuran	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Dimethyl phthalate	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Fluoranthene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Fluorene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
2-Methylnaphthalene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Naphthalene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Phenanthrene	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Pyrene	4.00E-06	Meadow Vole	6.00E-03	2.40E-08

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Meadow Vole	6.00E-03	2.88E-04
Arsenic	3.30E-03	Meadow Vole	6.00E-03	1.98E-05
Barium	1.80E-01	Meadow Vole	6.00E-03	1.08E-03
Copper	3.20E-03	Meadow Vole	6.00E-03	1.92E-05
Manganese	6.00E-02	Meadow Vole	6.00E-03	3.60E-04
Mercury	1.70E-04	Meadow Vole	6.00E-03	1.02E-06
Methyl Mercury	9.40E-08	Meadow Vole	6.00E-03	5.64E-10
Nickel	3.50E-03	Meadow Vole	6.00E-03	2.10E-05
Vanadium	2.90E-03	Meadow Vole	6.00E-03	1.74E-05
Zinc	3.70E-02	Meadow Vole	6.00E-03	2.22E-04

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Eastern Cottontail	1.16E-01	6.50E-10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	Eastern Cottontail	1.16E-01	6.03E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Eastern Cottontail	1.16E-01	8.12E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Eastern Cottontail	1.16E-01	1.39E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Eastern Cottontail	1.16E-01	1.97E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Eastern Cottontail	1.16E-01	1.28E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Eastern Cottontail	1.16E-01	8.58E-11
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Eastern Cottontail	1.16E-01	1.39E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Eastern Cottontail	1.16E-01	9.40E-11
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Eastern Cottontail	1.16E-01	1.62E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Eastern Cottontail	1.16E-01	2.20E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Eastern Cottontail	1.16E-01	3.60E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Eastern Cottontail	1.16E-01	1.62E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Eastern Cottontail	1.16E-01	1.16E-10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Eastern Cottontail	1.16E-01	1.11E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Eastern Cottontail	1.16E-01	8.35E-03
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Eastern Cottontail	1.16E-01	5.68E-07
Benzo(k)fluoranthene	4.00E-06	Eastern Cottontail	1.16E-01	4.64E-07
Chrysene	1.20E-05	Eastern Cottontail	1.16E-01	1.39E-06
Pyrene	4.00E-06	Eastern Cottontail	1.16E-01	4.64E-07

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Eastern Cottontail	1.16E-01	5.57E-03
Arsenic	3.30E-03	Eastern Cottontail	1.16E-01	3.83E-04
Barium	1.80E-01	Eastern Cottontail	1.16E-01	2.09E-02
Copper	3.20E-03	Eastern Cottontail	1.16E-01	3.71E-04
Manganese	6.00E-02	Eastern Cottontail	1.16E-01	6.96E-03
Mercury	1.70E-04	Eastern Cottontail	1.16E-01	1.97E-05
Methyl Mercury	9.40E-08	Eastern Cottontail	1.16E-01	1.09E-08
Nickel	3.50E-03	Eastern Cottontail	1.16E-01	4.06E-04
Vanadium	2.90E-03	Eastern Cottontail	1.16E-01	3.36E-04
Zinc	3.70E-02	Eastern Cottontail	1.16E-01	4.29E-03

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Red Fox	3.80E-01	2.13E-09
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	Red Fox	3.80E-01	1.98E-09
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Red Fox	3.80E-01	2.66E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Red Fox	3.80E-01	4.56E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Red Fox	3.80E-01	6.46E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Red Fox	3.80E-01	4.18E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Red Fox	3.80E-01	2.81E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Red Fox	3.80E-01	4.56E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Red Fox	3.80E-01	3.08E-10
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Red Fox	3.80E-01	5.32E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Red Fox	3.80E-01	7.22E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Red Fox	3.80E-01	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Red Fox	3.80E-01	1.18E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Red Fox	3.80E-01	5.32E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Red Fox	3.80E-01	3.80E-10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Red Fox	3.80E-01	3.65E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Red Fox	3.80E-01	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Red Fox	3.80E-01	2.74E-02
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Red Fox	3.80E-01	1.86E-06
Benzo(k)fluoranthene	4.00E-06	Red Fox	3.80E-01	1.52E-06
Chrysene	1.20E-05	Red Fox	3.80E-01	4.56E-06
Pyrene	4.00E-06	Red Fox	3.80E-01	1.52E-06

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Red Fox	3.80E-01	1.82E-02
Arsenic	3.30E-03	Red Fox	3.80E-01	1.25E-03
Barium	1.80E-01	Red Fox	3.80E-01	6.84E-02
Copper	3.20E-03	Red Fox	3.80E-01	1.22E-03
Manganese	6.00E-02	Red Fox	3.80E-01	2.28E-02
Mercury	1.70E-04	Red Fox	3.80E-01	6.46E-05
Methyl Mercury	9.40E-08	Red Fox	3.80E-01	3.57E-08
Nickel	3.50E-03	Red Fox	3.80E-01	1.33E-03
Vanadium	2.90E-03	Red Fox	3.80E-01	1.10E-03
Zinc	3.70E-02	Red Fox	3.80E-01	1.41E-02

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Raccoon	3.83E-01	2.14E-09
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	Raccoon	3.83E-01	1.99E-09
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Raccoon	3.83E-01	2.68E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Raccoon	3.83E-01	4.60E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Raccoon	3.83E-01	6.51E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Raccoon	3.83E-01	4.21E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Raccoon	3.83E-01	2.83E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Raccoon	3.83E-01	4.60E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Raccoon	3.83E-01	3.10E-10
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Raccoon	3.83E-01	5.36E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Raccoon	3.83E-01	7.28E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Raccoon	3.83E-01	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Raccoon	3.83E-01	1.19E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Raccoon	3.83E-01	5.36E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Raccoon	3.83E-01	3.83E-10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Raccoon	3.83E-01	3.68E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Raccoon	3.83E-01	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Raccoon	3.83E-01	2.76E-02
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Raccoon	3.83E-01	1.88E-06
Benzo(k)fluoranthene	4.00E-06	Raccoon	3.83E-01	1.53E-06
Chrysene	1.20E-05	Raccoon	3.83E-01	4.60E-06
Pyrene	4.00E-06	Raccoon	3.83E-01	1.53E-06

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Raccoon	3.83E-01	1.84E-02
Arsenic	3.30E-03	Raccoon	3.83E-01	1.26E-03
Barium	1.80E-01	Raccoon	3.83E-01	6.89E-02
Copper	3.20E-03	Raccoon	3.83E-01	1.23E-03
Manganese	6.00E-02	Raccoon	3.83E-01	2.30E-02
Mercury	1.70E-04	Raccoon	3.83E-01	6.51E-05
Methyl Mercury	9.40E-08	Raccoon	3.83E-01	3.60E-08
Nickel	3.50E-03	Raccoon	3.83E-01	1.34E-03
Vanadium	2.90E-03	Raccoon	3.83E-01	1.11E-03
Zinc	3.70E-02	Raccoon	3.83E-01	1.42E-02

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	White-tailed Deer	3.70E+00	2.07E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	White-tailed Deer	3.70E+00	1.92E-08
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	White-tailed Deer	3.70E+00	2.59E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	White-tailed Deer	3.70E+00	4.44E-09
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	White-tailed Deer	3.70E+00	6.29E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	White-tailed Deer	3.70E+00	4.07E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	White-tailed Deer	3.70E+00	2.74E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	White-tailed Deer	3.70E+00	4.44E-09
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	White-tailed Deer	3.70E+00	3.00E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	White-tailed Deer	3.70E+00	5.18E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	White-tailed Deer	3.70E+00	7.03E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	White-tailed Deer	3.70E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	White-tailed Deer	3.70E+00	1.15E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	White-tailed Deer	3.70E+00	5.18E-09
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	White-tailed Deer	3.70E+00	3.70E-09
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	White-tailed Deer	3.70E+00	3.55E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	White-tailed Deer	3.70E+00	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	White-tailed Deer	3.70E+00	2.66E-01
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	White-tailed Deer	3.70E+00	1.81E-05
Benzo(k)fluoranthene	4.00E-06	White-tailed Deer	3.70E+00	1.48E-05
Chrysene	1.20E-05	White-tailed Deer	3.70E+00	4.44E-05
Pyrene	4.00E-06	White-tailed Deer	3.70E+00	1.48E-05

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	White-tailed Deer	3.70E+00	1.78E-01
Arsenic	3.30E-03	White-tailed Deer	3.70E+00	1.22E-02
Barium	1.80E-01	White-tailed Deer	3.70E+00	6.66E-01
Copper	3.20E-03	White-tailed Deer	3.70E+00	1.18E-02
Manganese	6.00E-02	White-tailed Deer	3.70E+00	2.22E-01
Mercury	1.70E-04	White-tailed Deer	3.70E+00	6.29E-04
Methyl Mercury	9.40E-08	White-tailed Deer	3.70E+00	3.48E-07
Nickel	3.50E-03	White-tailed Deer	3.70E+00	1.30E-02
Vanadium	2.90E-03	White-tailed Deer	3.70E+00	1.07E-02
Zinc	3.70E-02	White-tailed Deer	3.70E+00	1.37E-01

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	American Robin	1.06E-02	5.94E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	American Robin	1.06E-02	5.51E-11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	American Robin	1.06E-02	7.42E-12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	American Robin	1.06E-02	1.27E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	American Robin	1.06E-02	1.80E-11
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	American Robin	1.06E-02	1.17E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	American Robin	1.06E-02	7.84E-12
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	American Robin	1.06E-02	1.27E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	American Robin	1.06E-02	8.59E-12
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	American Robin	1.06E-02	1.48E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	American Robin	1.06E-02	2.01E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	American Robin	1.06E-02	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	American Robin	1.06E-02	3.29E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	American Robin	1.06E-02	1.48E-11
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	American Robin	1.06E-02	1.06E-11
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	American Robin	1.06E-02	1.02E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	American Robin	1.06E-02	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	American Robin	1.06E-02	7.63E-04
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	American Robin	1.06E-02	5.19E-08
Benzo(k)fluoranthene	4.00E-06	American Robin	1.06E-02	4.24E-08
Chrysene	1.20E-05	American Robin	1.06E-02	1.27E-07
Pyrene	4.00E-06	American Robin	1.06E-02	4.24E-08

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	American Robin	1.06E-02	5.09E-04
Arsenic	3.30E-03	American Robin	1.06E-02	3.50E-05
Barium	1.80E-01	American Robin	1.06E-02	1.91E-03
Copper	3.20E-03	American Robin	1.06E-02	3.39E-05
Manganese	6.00E-02	American Robin	1.06E-02	6.36E-04
Mercury	1.70E-04	American Robin	1.06E-02	1.80E-06
Methyl Mercury	9.40E-08	American Robin	1.06E-02	9.96E-10
Nickel	3.50E-03	American Robin	1.06E-02	3.71E-05
Vanadium	2.90E-03	American Robin	1.06E-02	3.07E-05
Zinc	3.70E-02	American Robin	1.06E-02	3.92E-04

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	Red-tailed Hawk	6.40E-02	3.58E-10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	5.20E-09	Red-tailed Hawk	6.40E-02	3.33E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	Red-tailed Hawk	6.40E-02	4.48E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	Red-tailed Hawk	6.40E-02	7.68E-11
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	Red-tailed Hawk	6.40E-02	1.09E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	Red-tailed Hawk	6.40E-02	7.04E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	Red-tailed Hawk	6.40E-02	4.74E-11
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	Red-tailed Hawk	6.40E-02	7.68E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	Red-tailed Hawk	6.40E-02	5.18E-11
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Red-tailed Hawk	6.40E-02	8.96E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	Red-tailed Hawk	6.40E-02	1.22E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	Red-tailed Hawk	6.40E-02	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	Red-tailed Hawk	6.40E-02	1.98E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	Red-tailed Hawk	6.40E-02	8.96E-11
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	Red-tailed Hawk	6.40E-02	6.40E-11
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	Red-tailed Hawk	6.40E-02	6.14E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	Red-tailed Hawk	6.40E-02	0.00E+00
Total Petroleum Hydrocarbons				
Diesel Range Organics	7.20E-02	Red-tailed Hawk	6.40E-02	4.61E-03
Semivolatile Organic Compounds				
Benzo(a)pyrene	4.90E-06	Red-tailed Hawk	6.40E-02	3.14E-07
Benzo(k)fluoranthene	4.00E-06	Red-tailed Hawk	6.40E-02	2.56E-07
Chrysene	1.20E-05	Red-tailed Hawk	6.40E-02	7.68E-07
Pyrene	4.00E-06	Red-tailed Hawk	6.40E-02	2.56E-07

Table 7-20
Chemical Intake for Representative Wildlife Species Based on Ingestion of Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Red-tailed Hawk	6.40E-02	3.07E-03
Arsenic	3.30E-03	Red-tailed Hawk	6.40E-02	2.11E-04
Barium	1.80E-01	Red-tailed Hawk	6.40E-02	1.15E-02
Copper	3.20E-03	Red-tailed Hawk	6.40E-02	2.05E-04
Manganese	6.00E-02	Red-tailed Hawk	6.40E-02	3.84E-03
Mercury	1.70E-04	Red-tailed Hawk	6.40E-02	1.09E-05
Methyl Mercury	9.40E-08	Red-tailed Hawk	6.40E-02	6.02E-09
Nickel	3.50E-03	Red-tailed Hawk	6.40E-02	2.24E-04
Vanadium	2.90E-03	Red-tailed Hawk	6.40E-02	1.86E-04
Zinc	3.70E-02	Red-tailed Hawk	6.40E-02	2.37E-03

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-21
Chemical Intake for Representative Wildlife Species Based on Ingestion of Stream Sediment

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Pond Sediments (mg/kg)	Representative Wildlife Species	Consumption Rate of Sediment from Table 7-8 (kg dw/day)	Dose Received from Sediment (mg/day)
Dioxins-Furans				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCI	2.30E-06	Raccoon	2.22E-02	5.11E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD	1.20E-07	Raccoon	2.22E-02	2.66E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD	2.50E-07	Raccoon	2.22E-02	5.55E-09
Total Petroleum Hydrocarbons				
Diesel Range Organics	5.40E+00	Raccoon	2.22E-02	1.20E-01
Metals				
Aluminum	8.00E+03	Raccoon	2.22E-02	1.78E+02
Arsenic	7.30E+00	Raccoon	2.22E-02	1.62E-01
Barium	2.80E+02	Raccoon	2.22E-02	6.22E+00
Beryllium	3.60E-01	Raccoon	2.22E-02	7.99E-03
Cadmium	1.10E+00	Raccoon	2.22E-02	2.44E-02
Chromium	8.10E+00	Raccoon	2.22E-02	1.80E-01
Cobalt	7.30E+00	Raccoon	2.22E-02	1.62E-01
Copper	6.60E+00	Raccoon	2.22E-02	1.47E-01
Iron	1.00E+04	Raccoon	2.22E-02	2.22E+02
Lead	8.00E+00	Raccoon	2.22E-02	1.78E-01
Manganese	9.90E+02	Raccoon	2.22E-02	2.20E+01
Mercury	1.30E-02	Raccoon	2.22E-02	2.89E-04
Methyl Mercury	3.80E-05	Raccoon	2.22E-02	8.44E-07
Nickel	1.40E+01	Raccoon	2.22E-02	3.11E-01
Vanadium	1.40E+01	Raccoon	2.22E-02	3.11E-01
Zinc	3.70E+01	Raccoon	2.22E-02	8.21E-01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day
Consumption rate assumes that the raccoon is only obtaining food from the stream (Threemile Creek) located adjacent to the site (see Table 7-9).

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	2.50E-02	4.00E-06	Short-tailed Shrew	9.00E-03	3.60E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	1.90E-02	2.85E-05	Short-tailed Shrew	9.00E-03	2.57E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	1.70E-02	1.87E-06	Short-tailed Shrew	9.00E-03	1.68E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	8.10E-02	1.78E-05	Short-tailed Shrew	9.00E-03	1.60E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	6.20E-01	2.85E-06	Short-tailed Shrew	9.00E-03	2.57E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	1.21E-01	1.33E-06	Short-tailed Shrew	9.00E-03	1.20E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	4.90E-01	1.13E-06	Short-tailed Shrew	9.00E-03	1.01E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	3.00E-01	4.20E-06	Short-tailed Shrew	9.00E-03	3.78E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	1.90E-01	1.22E-06	Short-tailed Shrew	9.00E-03	1.09E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	1.00E+00	3.60E-07	Short-tailed Shrew	9.00E-03	3.24E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	2.20E-01	1.43E-06	Short-tailed Shrew	9.00E-03	1.29E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	3.20E-01	3.84E-06	Short-tailed Shrew	9.00E-03	3.46E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	1.46E+00	2.92E-06	Short-tailed Shrew	9.00E-03	2.63E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	1.07E+00	1.28E-05	Short-tailed Shrew	9.00E-03	1.16E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	2.54E+00	4.32E-05	Short-tailed Shrew	9.00E-03	3.89E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	1.27E+00	2.41E-06	Short-tailed Shrew	9.00E-03	2.17E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	1.59E+00	1.30E-06	Short-tailed Shrew	9.00E-03	1.17E-08
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	3.60E+01	1.04E+04	Short-tailed Shrew	9.00E-03	9.40E+01

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	1.12E+02	2.79E+00	Short-tailed Shrew	9.00E-03	2.51E-02
Acenaphthylene	1.90E-02	1.12E+02	2.12E+00	Short-tailed Shrew	9.00E-03	1.91E-02
Anthracene	4.50E-02	3.46E+02	1.56E+01	Short-tailed Shrew	9.00E-03	1.40E-01
Benzo(a)anthracene	2.10E-01	3.00E-02	6.30E-03	Short-tailed Shrew	9.00E-03	5.67E-05
Benzo(a)pyrene	1.40E-01	7.00E-02	9.80E-03	Short-tailed Shrew	9.00E-03	8.82E-05
Benzo(b)fluoranthene	1.60E-01	7.00E-02	1.12E-02	Short-tailed Shrew	9.00E-03	1.01E-04
Benzo(g,h,i)perylene	1.10E-01	1.75E+04	1.92E+03	Short-tailed Shrew	9.00E-03	1.73E+01
Benzo(k)fluoranthene	1.30E-01	8.00E-02	1.04E-02	Short-tailed Shrew	9.00E-03	9.36E-05
Chrysene	3.50E-01	4.00E-02	1.40E-02	Short-tailed Shrew	9.00E-03	1.26E-04
Dibenzo(a,h)anthracene	3.20E-02	7.00E-02	2.24E-03	Short-tailed Shrew	9.00E-03	2.02E-05
Dibenzofuran	1.30E-01	1.69E+02	2.20E+01	Short-tailed Shrew	9.00E-03	1.98E-01
Dimethyl phthalate	5.60E-01	6.00E-02	3.36E-02	Short-tailed Shrew	9.00E-03	3.02E-04
Fluoranthene	2.60E-01	1.30E+03	3.37E+02	Short-tailed Shrew	9.00E-03	3.03E+00
Fluorene	2.60E-02	1.89E+02	4.92E+00	Short-tailed Shrew	9.00E-03	4.43E-02
Indeno(1,2,3-cd)pyrene	5.70E-02	8.00E-02	4.56E-03	Short-tailed Shrew	9.00E-03	4.10E-05
2-Methylnaphthalene	2.30E-01	1.04E+02	2.38E+01	Short-tailed Shrew	9.00E-03	2.14E-01
Naphthalene	1.40E+00	3.60E+01	5.04E+01	Short-tailed Shrew	9.00E-03	4.54E-01
Phenanthrene	1.50E+00	3.21.17	1.50E+00	Short-tailed Shrew	9.00E-03	1.35E-02
Pyrene	2.60E-01	7.09E+02	1.84E+02	Short-tailed Shrew	9.00E-03	1.66E+00

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	2.20E-01	5.06E+03	Short-tailed Shrew	9.00E-03	4.55E+01
Antimony	1.70E+00	2.20E-01	3.74E-01	Short-tailed Shrew	9.00E-03	3.37E-03
Arsenic	8.69E+01	1.10E-01	9.56E+00	Short-tailed Shrew	9.00E-03	8.60E-02
Barium	1.38E+03	2.20E-01	3.04E+02	Short-tailed Shrew	9.00E-03	2.73E+00
Beryllium	2.70E+00	2.20E-01	5.94E-01	Short-tailed Shrew	9.00E-03	5.35E-03
Cadmium	1.56E+01	9.60E-01	1.50E+01	Short-tailed Shrew	9.00E-03	1.35E-01
Chromium	2.30E+01	1.00E-02	2.30E-01	Short-tailed Shrew	9.00E-03	2.07E-03
Cobalt	1.60E+01	2.20E-01	3.52E+00	Short-tailed Shrew	9.00E-03	3.17E-02
Copper	2.00E+02	4.00E-02	8.00E+00	Short-tailed Shrew	9.00E-03	7.20E-02
Iron	7.60E+04	2.20E-01	1.67E+04	Short-tailed Shrew	9.00E-03	1.50E+02
Lead	8.44E+02	3.00E-02	2.53E+01	Short-tailed Shrew	9.00E-03	2.28E-01
Manganese	4.50E+02	2.20E-01	9.90E+01	Short-tailed Shrew	9.00E-03	8.91E-01
Mercury	1.65E+01	4.00E-02	6.60E-01	Short-tailed Shrew	9.00E-03	5.94E-03
Methyl Mercury	2.65E-04	8.50E+00	2.25E-03	Short-tailed Shrew	9.00E-03	2.03E-05
Nickel	8.70E+01	2.00E-02	1.74E+00	Short-tailed Shrew	9.00E-03	1.57E-02
Selenium	2.40E+00	2.20E-01	5.28E-01	Short-tailed Shrew	9.00E-03	4.75E-03
Silver	9.70E-01	2.20E-01	2.13E-01	Short-tailed Shrew	9.00E-03	1.92E-03
Thallium	2.00E+00	2.20E-01	4.40E-01	Short-tailed Shrew	9.00E-03	3.96E-03
Vanadium	4.30E+01	2.20E-01	9.46E+00	Short-tailed Shrew	9.00E-03	8.51E-02
Zinc	1.38E+03	5.60E-01	7.73E+02	Short-tailed Shrew	9.00E-03	6.96E+00

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

A surrogate BCF value was used for aluminum, antimony, barium, beryllium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, silver, sodium, thallium, and vanadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium, chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate takes into account that all of the short-tailed shrew's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	2.50E-02	4.00E-06	Meadow Vole	2.50E-03	1.00E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	1.90E-02	2.85E-05	Meadow Vole	2.50E-03	7.13E-08
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	1.70E-02	1.87E-06	Meadow Vole	2.50E-03	4.68E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	8.10E-02	1.78E-05	Meadow Vole	2.50E-03	4.46E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	6.20E-01	2.85E-06	Meadow Vole	2.50E-03	7.13E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	1.21E-01	1.33E-06	Meadow Vole	2.50E-03	3.33E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	4.90E-01	1.13E-06	Meadow Vole	2.50E-03	2.82E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	3.00E-01	4.20E-06	Meadow Vole	2.50E-03	1.05E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	1.90E-01	1.22E-06	Meadow Vole	2.50E-03	3.04E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	1.00E+00	3.60E-07	Meadow Vole	2.50E-03	9.00E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	2.20E-01	1.43E-06	Meadow Vole	2.50E-03	3.58E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	3.20E-01	3.84E-06	Meadow Vole	2.50E-03	9.60E-09
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	1.46E+00	2.92E-06	Meadow Vole	2.50E-03	7.30E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	1.07E+00	1.28E-05	Meadow Vole	2.50E-03	3.21E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	2.54E+00	4.32E-05	Meadow Vole	2.50E-03	1.08E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	1.27E+00	2.41E-06	Meadow Vole	2.50E-03	6.03E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	1.59E+00	1.30E-06	Meadow Vole	2.50E-03	3.26E-09
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	3.60E+01	1.04E+04	Meadow Vole	2.50E-03	2.61E+01

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	1.12E+02	2.79E+00	Meadow Vole	2.50E-03	6.98E-03
Acenaphthylene	1.90E-02	1.12E+02	2.12E+00	Meadow Vole	2.50E-03	5.31E-03
Anthracene	4.50E-02	3.46E+02	1.56E+01	Meadow Vole	2.50E-03	3.90E-02
Benzo(a)anthracene	2.10E-01	3.00E-02	6.30E-03	Meadow Vole	2.50E-03	1.58E-05
Benzo(a)pyrene	1.40E-01	7.00E-02	9.80E-03	Meadow Vole	2.50E-03	2.45E-05
Benzo(b)fluoranthene	1.60E-01	7.00E-02	1.12E-02	Meadow Vole	2.50E-03	2.80E-05
Benzo(g,h,i)perylene	1.10E-01	1.75E+04	1.92E+03	Meadow Vole	2.50E-03	4.81E+00
Benzo(k)fluoranthene	1.30E-01	8.00E-02	1.04E-02	Meadow Vole	2.50E-03	2.60E-05
Chrysene	3.50E-01	4.00E-02	1.40E-02	Meadow Vole	2.50E-03	3.50E-05
Dibenzo(a,h)anthracene	3.20E-02	7.00E-02	2.24E-03	Meadow Vole	2.50E-03	5.60E-06
Dibenzofuran	1.30E-01	1.69E+02	2.20E+01	Meadow Vole	2.50E-03	5.50E-02
Dimethyl phthalate	5.60E-01	6.00E-02	3.36E-02	Meadow Vole	2.50E-03	8.40E-05
Fluoranthene	2.60E-01	1.30E+03	3.37E+02	Meadow Vole	2.50E-03	8.43E-01
Fluorene	2.60E-02	1.89E+02	4.92E+00	Meadow Vole	2.50E-03	1.23E-02
Indeno(1,2,3-cd)pyrene	5.70E-02	8.00E-02	4.56E-03	Meadow Vole	2.50E-03	1.14E-05
2-Methylnaphthalene	2.30E-01	1.04E+02	2.38E+01	Meadow Vole	2.50E-03	5.96E-02
Naphthalene	1.40E+00	3.60E+01	5.04E+01	Meadow Vole	2.50E-03	1.26E-01
Phenanthrene	1.50E+00	3.21.17	1.50E+00	Meadow Vole	2.50E-03	3.75E-03
Pyrene	2.60E-01	7.09E+02	1.84E+02	Meadow Vole	2.50E-03	4.61E-01

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	2.20E-01	5.06E+03	Meadow Vole	2.50E-03	1.27E+01
Antimony	1.70E+00	2.20E-01	3.74E-01	Meadow Vole	2.50E-03	9.35E-04
Arsenic	8.69E+01	1.10E-01	9.56E+00	Meadow Vole	2.50E-03	2.39E-02
Barium	1.38E+03	2.20E-01	3.04E+02	Meadow Vole	2.50E-03	7.59E-01
Beryllium	2.70E+00	2.20E-01	5.94E-01	Meadow Vole	2.50E-03	1.49E-03
Cadmium	1.56E+01	9.60E-01	1.50E+01	Meadow Vole	2.50E-03	3.74E-02
Chromium	2.30E+01	1.00E-02	2.30E-01	Meadow Vole	2.50E-03	5.75E-04
Cobalt	1.60E+01	2.20E-01	3.52E+00	Meadow Vole	2.50E-03	8.80E-03
Copper	2.00E+02	4.00E-02	8.00E+00	Meadow Vole	2.50E-03	2.00E-02
Iron	7.60E+04	2.20E-01	1.67E+04	Meadow Vole	2.50E-03	4.18E+01
Lead	8.44E+02	3.00E-02	2.53E+01	Meadow Vole	2.50E-03	6.33E-02
Manganese	4.50E+02	2.20E-01	9.90E+01	Meadow Vole	2.50E-03	2.48E-01
Mercury	1.65E+01	4.00E-02	6.60E-01	Meadow Vole	2.50E-03	1.65E-03
Methyl Mercury	2.65E-04	8.50E+00	2.25E-03	Meadow Vole	2.50E-03	5.63E-06
Nickel	8.70E+01	2.00E-02	1.74E+00	Meadow Vole	2.50E-03	4.35E-03
Selenium	2.40E+00	2.20E-01	5.28E-01	Meadow Vole	2.50E-03	1.32E-03
Silver	9.70E-01	2.20E-01	2.13E-01	Meadow Vole	2.50E-03	5.34E-04
Thallium	2.00E+00	2.20E-01	4.40E-01	Meadow Vole	2.50E-03	1.10E-03
Vanadium	4.30E+01	2.20E-01	9.46E+00	Meadow Vole	2.50E-03	2.37E-02
Zinc	1.38E+03	5.60E-01	7.73E+02	Meadow Vole	2.50E-03	1.93E+00

Notes:
COPEC - Chemical of Potential Ecological Concern
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

A surrogate BCF value was used for aluminum, antimony, barium, beryllium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, silver, sodium, thallium, and canadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium, chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate takes into account that 1/2 of the meadow vole's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	2.50E-02	4.00E-06	American Robin	7.44E-02	2.98E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	1.50E-03	1.90E-02	2.85E-05	American Robin	7.44E-02	2.12E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	1.70E-02	1.87E-06	American Robin	7.44E-02	1.39E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	2.20E-04	8.10E-02	1.78E-05	American Robin	7.44E-02	1.33E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	6.20E-01	2.85E-06	American Robin	7.44E-02	2.12E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	1.21E-01	1.33E-06	American Robin	7.44E-02	9.90E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	4.90E-01	1.13E-06	American Robin	7.44E-02	8.38E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	3.00E-01	4.20E-06	American Robin	7.44E-02	3.12E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	1.90E-01	1.22E-06	American Robin	7.44E-02	9.05E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	1.00E+00	3.60E-07	American Robin	7.44E-02	2.68E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	2.20E-01	1.43E-06	American Robin	7.44E-02	1.06E-07
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	3.20E-01	3.84E-06	American Robin	7.44E-02	2.86E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	1.46E+00	2.92E-06	American Robin	7.44E-02	2.17E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	1.07E+00	1.28E-05	American Robin	7.44E-02	9.55E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	2.54E+00	4.32E-05	American Robin	7.44E-02	3.21E-06
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	1.27E+00	2.41E-06	American Robin	7.44E-02	1.80E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	1.59E+00	1.30E-06	American Robin	7.44E-02	9.70E-08
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	3.60E+01	1.04E+04	American Robin	7.44E-02	7.77E+02

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	1.12E+02	2.79E+00	American Robin	7.44E-02	2.08E-01
Acenaphthylene	1.90E-02	1.12E+02	2.12E+00	American Robin	7.44E-02	1.58E-01
Anthracene	4.50E-02	3.46E+02	1.56E+01	American Robin	7.44E-02	1.16E+00
Benzo(a)anthracene	2.10E-01	3.00E-02	6.30E-03	American Robin	7.44E-02	4.69E-04
Benzo(a)pyrene	1.40E-01	7.00E-02	9.80E-03	American Robin	7.44E-02	7.29E-04
Benzo(b)fluoranthene	1.60E-01	7.00E-02	1.12E-02	American Robin	7.44E-02	8.33E-04
Benzo(g,h,i)perylene	1.10E-01	1.75E+04	1.92E+03	American Robin	7.44E-02	1.43E+02
Benzo(k)fluoranthene	1.30E-01	8.00E-02	1.04E-02	American Robin	7.44E-02	7.74E-04
Chrysene	3.50E-01	4.00E-02	1.40E-02	American Robin	7.44E-02	1.04E-03
Dibenzo(a,h)anthracene	3.20E-02	7.00E-02	2.24E-03	American Robin	7.44E-02	1.67E-04
Dibenzofuran	1.30E-01	1.69E+02	2.20E+01	American Robin	7.44E-02	1.64E+00
Dimethyl phthalate	5.60E-01	6.00E-02	3.36E-02	American Robin	7.44E-02	2.50E-03
Fluoranthene	2.60E-01	1.30E+03	3.37E+02	American Robin	7.44E-02	2.51E+01
Fluorene	2.60E-02	1.89E+02	4.92E+00	American Robin	7.44E-02	3.66E-01
Indeno(1,2,3-cd)pyrene	5.70E-02	8.00E-02	4.56E-03	American Robin	7.44E-02	3.39E-04
2-Methylnaphthalene	2.30E-01	1.04E+02	2.38E+01	American Robin	7.44E-02	1.77E+00
Naphthalene	1.40E+00	3.60E+01	5.04E+01	American Robin	7.44E-02	3.75E+00
Phenanthrene	1.50E+00	3.21.17	1.50E+00	American Robin	7.44E-02	1.12E-01
Pyrene	2.60E-01	7.09E+02	1.84E+02	American Robin	7.44E-02	1.37E+01

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	2.20E-01	5.06E+03	American Robin	7.44E-02	3.76E+02
Antimony	1.70E+00	2.20E-01	3.74E-01	American Robin	7.44E-02	2.78E-02
Arsenic	8.69E+01	1.10E-01	9.56E+00	American Robin	7.44E-02	7.11E-01
Barium	1.38E+03	2.20E-01	3.04E+02	American Robin	7.44E-02	2.26E+01
Beryllium	2.70E+00	2.20E-01	5.94E-01	American Robin	7.44E-02	4.42E-02
Cadmium	1.56E+01	9.60E-01	1.50E+01	American Robin	7.44E-02	1.11E+00
Chromium	2.30E+01	1.00E-02	2.30E-01	American Robin	7.44E-02	1.71E-02
Cobalt	1.60E+01	2.20E-01	3.52E+00	American Robin	7.44E-02	2.62E-01
Copper	2.00E+02	4.00E-02	8.00E+00	American Robin	7.44E-02	5.95E-01
Iron	7.60E+04	2.20E-01	1.67E+04	American Robin	7.44E-02	1.24E+03
Lead	8.44E+02	3.00E-02	2.53E+01	American Robin	7.44E-02	1.88E+00
Manganese	4.50E+02	2.20E-01	9.90E+01	American Robin	7.44E-02	7.37E+00
Mercury	1.65E+01	4.00E-02	6.60E-01	American Robin	7.44E-02	4.91E-02
Methyl Mercury	2.65E-04	8.50E+00	2.25E-03	American Robin	7.44E-02	1.68E-04
Nickel	8.70E+01	2.00E-02	1.74E+00	American Robin	7.44E-02	1.29E-01
Selenium	2.40E+00	2.20E-01	5.28E-01	American Robin	7.44E-02	3.93E-02
Silver	9.70E-01	2.20E-01	2.13E-01	American Robin	7.44E-02	1.59E-02
Thallium	2.00E+00	2.20E-01	4.40E-01	American Robin	7.44E-02	3.27E-02
Vanadium	4.30E+01	2.20E-01	9.46E+00	American Robin	7.44E-02	7.04E-01
Zinc	1.38E+03	5.60E-01	7.73E+02	American Robin	7.44E-02	5.75E+01

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per per day

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers fof Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-22
Exposure Rate Based on Maximum Concentration of COPEC in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Maximum Concentration of COPEC in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

A surrogate BCF value was used for aluminum, antimony, barium, beryllium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, silver, sodium, thallium, and vanadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium, chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate takes into account that 4/5 of the American robin's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	9.00E-05	1.44E-08	White-footed Mouse	3.40E-03	4.90E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	1.50E-03	6.70E-05	1.01E-07	White-footed Mouse	3.40E-03	3.42E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	6.20E-05	6.82E-09	White-footed Mouse	3.40E-03	2.32E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.20E-04	2.90E-04	6.38E-08	White-footed Mouse	3.40E-03	2.17E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	2.20E-03	1.01E-08	White-footed Mouse	3.40E-03	3.44E-11
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	4.30E-04	4.73E-09	White-footed Mouse	3.40E-03	1.61E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	1.70E-03	3.91E-09	White-footed Mouse	3.40E-03	1.33E-11
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	1.10E-03	1.54E-08	White-footed Mouse	3.40E-03	5.24E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	6.70E-04	4.29E-09	White-footed Mouse	3.40E-03	1.46E-11
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	3.50E-03	1.26E-09	White-footed Mouse	3.40E-03	4.28E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	7.80E-04	5.07E-09	White-footed Mouse	3.40E-03	1.72E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	1.10E-03	1.32E-08	White-footed Mouse	3.40E-03	4.49E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	5.20E-03	1.04E-08	White-footed Mouse	3.40E-03	3.54E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	3.80E-03	4.56E-08	White-footed Mouse	3.40E-03	1.55E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	9.00E-03	1.53E-07	White-footed Mouse	3.40E-03	5.20E-10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	4.50E-03	8.55E-09	White-footed Mouse	3.40E-03	2.91E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	5.60E-03	4.59E-09	White-footed Mouse	3.40E-03	1.56E-11

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	4.80E-01	1.39E+02	White-footed Mouse	3.40E-03	4.73E-01
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	2.20E-01	5.50E-03	White-footed Mouse	3.40E-03	1.87E-05
Acenaphthylene	1.90E-02	2.20E-01	4.18E-03	White-footed Mouse	3.40E-03	1.42E-05
Anthracene	4.50E-02	1.00E-01	4.50E-03	White-footed Mouse	3.40E-03	1.53E-05
Benzo(a)anthracene	2.10E-01	2.02E-02	4.24E-03	White-footed Mouse	3.40E-03	1.44E-05
Benzo(a)pyrene	1.40E-01	1.00E-02	1.40E-03	White-footed Mouse	3.40E-03	4.76E-06
Benzo(b)fluoranthene	1.60E-01	1.01E-02	1.62E-03	White-footed Mouse	3.40E-03	5.49E-06
Benzo(g,h,i)perylene	1.10E-01	6.10E-03	6.71E-04	White-footed Mouse	3.40E-03	2.28E-06
Benzo(k)fluoranthene	1.30E-01	1.01E-02	1.31E-03	White-footed Mouse	3.40E-03	4.46E-06
Chrysene	3.50E-01	1.87E-02	6.55E-03	White-footed Mouse	3.40E-03	2.23E-05
Dibenzo(a,h)anthracene	3.20E-02	6.40E-03	2.05E-04	White-footed Mouse	3.40E-03	6.96E-07
Dibenzofuran	1.30E-01	1.61E-01	2.09E-02	White-footed Mouse	3.40E-03	7.12E-05
Dimethyl phthalate	5.60E-01	5.47E+00	3.06E+00	White-footed Mouse	3.40E-03	1.04E-02
Fluoranthene	2.60E-01	3.80E-02	9.88E-03	White-footed Mouse	3.40E-03	3.36E-05
Fluorene	2.60E-02	1.49E-01	3.87E-03	White-footed Mouse	3.40E-03	1.32E-05
Indeno(1,2,3-cd)pyrene	5.70E-02	3.90E-03	2.22E-04	White-footed Mouse	3.40E-03	7.56E-07
2-Methylnaphthalene	2.30E-01	2.27E-01	5.22E-02	White-footed Mouse	3.40E-03	1.78E-04
Naphthalene	1.40E+00	4.80E-01	6.72E-01	White-footed Mouse	3.40E-03	2.28E-03
Phenanthrene	1.50E+00	1.02E-01	1.53E-01	White-footed Mouse	3.40E-03	5.20E-04
Pyrene	2.60E-01	5.90E-02	1.53E-02	White-footed Mouse	3.40E-03	5.22E-05

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	4.00E-03	9.20E+01	White-footed Mouse	3.40E-03	3.13E-01
Antimony	1.70E+00	2.00E-01	3.40E-01	White-footed Mouse	3.40E-03	1.16E-03
Arsenic	8.69E+01	3.60E-02	3.13E+00	White-footed Mouse	3.40E-03	1.06E-02
Barium	1.38E+03	1.50E-01	2.07E+02	White-footed Mouse	3.40E-03	7.04E-01
Beryllium	2.70E+00	1.00E-02	2.70E-02	White-footed Mouse	3.40E-03	9.18E-05
Cadmium	1.56E+01	3.64E-01	5.68E+00	White-footed Mouse	3.40E-03	1.93E-02
Chromium	2.30E+01	7.50E-03	1.73E-01	White-footed Mouse	3.40E-03	5.87E-04
Cobalt	1.60E+01	4.00E-01	6.40E+00	White-footed Mouse	3.40E-03	2.18E-02
Copper	2.00E+02	4.00E-01	8.00E+01	White-footed Mouse	3.40E-03	2.72E-01
Iron	7.60E+04	4.00E-01	3.04E+04	White-footed Mouse	3.40E-03	1.03E+02
Lead	8.44E+02	4.50E-02	3.80E+01	White-footed Mouse	3.40E-03	1.29E-01
Manganese	4.50E+02	4.00E-01	1.80E+02	White-footed Mouse	3.40E-03	6.12E-01
Mercury	1.65E+01	3.75E-02	6.19E-01	White-footed Mouse	3.40E-03	2.10E-03
Methyl Mercury	2.65E-04	1.37E-01	3.63E-05	White-footed Mouse	3.40E-03	1.23E-07
Nickel	8.70E+01	3.20E-02	2.78E+00	White-footed Mouse	3.40E-03	9.47E-03
Selenium	2.40E+00	1.60E-02	3.84E-02	White-footed Mouse	3.40E-03	1.31E-04
Silver	9.70E-01	4.00E-01	3.88E-01	White-footed Mouse	3.40E-03	1.32E-03
Thallium	2.00E+00	4.00E-03	8.00E-03	White-footed Mouse	3.40E-03	2.72E-05
Vanadium	4.30E+01	4.00E-01	1.72E+01	White-footed Mouse	3.40E-03	5.85E-02
Zinc	1.38E+03	1.20E-12	1.66E-09	White-footed Mouse	3.40E-03	5.63E-12

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for Calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium.

[b] Consumption rate takes into account that all of the white-footed mouse's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	9.00E-05	1.44E-08	Meadow Vole	2.50E-03	3.60E-11
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	1.50E-03	6.70E-05	1.01E-07	Meadow Vole	2.50E-03	2.51E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	6.20E-05	6.82E-09	Meadow Vole	2.50E-03	1.71E-11
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.20E-04	2.90E-04	6.38E-08	Meadow Vole	2.50E-03	1.60E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	2.20E-03	1.01E-08	Meadow Vole	2.50E-03	2.53E-11
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	4.30E-04	4.73E-09	Meadow Vole	2.50E-03	1.18E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	1.70E-03	3.91E-09	Meadow Vole	2.50E-03	9.78E-12
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	1.10E-03	1.54E-08	Meadow Vole	2.50E-03	3.85E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	6.70E-04	4.29E-09	Meadow Vole	2.50E-03	1.07E-11
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	3.50E-03	1.26E-09	Meadow Vole	2.50E-03	3.15E-12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	7.80E-04	5.07E-09	Meadow Vole	2.50E-03	1.27E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	1.10E-03	1.32E-08	Meadow Vole	2.50E-03	3.30E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	5.20E-03	1.04E-08	Meadow Vole	2.50E-03	2.60E-11
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	3.80E-03	4.56E-08	Meadow Vole	2.50E-03	1.14E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	9.00E-03	1.53E-07	Meadow Vole	2.50E-03	3.83E-10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	4.50E-03	8.55E-09	Meadow Vole	2.50E-03	2.14E-11
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	5.60E-03	4.59E-09	Meadow Vole	2.50E-03	1.15E-11

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	4.80E-01	1.39E+02	Meadow Vole	2.50E-03	3.48E-01
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	2.20E-01	5.50E-03	Meadow Vole	2.50E-03	1.38E-05
Acenaphthylene	1.90E-02	2.20E-01	4.18E-03	Meadow Vole	2.50E-03	1.05E-05
Anthracene	4.50E-02	1.00E-01	4.50E-03	Meadow Vole	2.50E-03	1.13E-05
Benzo(a)anthracene	2.10E-01	2.02E-02	4.24E-03	Meadow Vole	2.50E-03	1.06E-05
Benzo(a)pyrene	1.40E-01	1.00E-02	1.40E-03	Meadow Vole	2.50E-03	3.50E-06
Benzo(b)fluoranthene	1.60E-01	1.01E-02	1.62E-03	Meadow Vole	2.50E-03	4.04E-06
Benzo(g,h,i)perylene	1.10E-01	6.10E-03	6.71E-04	Meadow Vole	2.50E-03	1.68E-06
Benzo(k)fluoranthene	1.30E-01	1.01E-02	1.31E-03	Meadow Vole	2.50E-03	3.28E-06
Chrysene	3.50E-01	1.87E-02	6.55E-03	Meadow Vole	2.50E-03	1.64E-05
Dibenzo(a,h)anthracene	3.20E-02	6.40E-03	2.05E-04	Meadow Vole	2.50E-03	5.12E-07
Dibenzofuran	1.30E-01	1.61E-01	2.09E-02	Meadow Vole	2.50E-03	5.23E-05
Dimethyl phthalate	5.60E-01	5.47E+00	3.06E+00	Meadow Vole	2.50E-03	7.66E-03
Fluoranthene	2.60E-01	3.80E-02	9.88E-03	Meadow Vole	2.50E-03	2.47E-05
Fluorene	2.60E-02	1.49E-01	3.87E-03	Meadow Vole	2.50E-03	9.69E-06
Indeno(1,2,3-cd)pyrene	5.70E-02	3.90E-03	2.22E-04	Meadow Vole	2.50E-03	5.56E-07
2-Methylnaphthalene	2.30E-01	2.27E-01	5.22E-02	Meadow Vole	2.50E-03	1.31E-04
Naphthalene	1.40E+00	4.80E-01	6.72E-01	Meadow Vole	2.50E-03	1.68E-03
Phenanthrene	1.50E+00	1.02E-01	1.53E-01	Meadow Vole	2.50E-03	3.83E-04
Pyrene	2.60E-01	5.90E-02	1.53E-02	Meadow Vole	2.50E-03	3.84E-05

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	4.00E-03	9.20E+01	Meadow Vole	2.50E-03	2.30E-01
Antimony	1.70E+00	2.00E-01	3.40E-01	Meadow Vole	2.50E-03	8.50E-04
Arsenic	8.69E+01	3.60E-02	3.13E+00	Meadow Vole	2.50E-03	7.82E-03
Barium	1.38E+03	1.50E-01	2.07E+02	Meadow Vole	2.50E-03	5.18E-01
Beryllium	2.70E+00	1.00E-02	2.70E-02	Meadow Vole	2.50E-03	6.75E-05
Cadmium	1.56E+01	3.64E-01	5.68E+00	Meadow Vole	2.50E-03	1.42E-02
Chromium	2.30E+01	7.50E-03	1.73E-01	Meadow Vole	2.50E-03	4.31E-04
Cobalt	1.60E+01	4.00E-01	6.40E+00	Meadow Vole	2.50E-03	1.60E-02
Copper	2.00E+02	4.00E-01	8.00E+01	Meadow Vole	2.50E-03	2.00E-01
Iron	7.60E+04	4.00E-01	3.04E+04	Meadow Vole	2.50E-03	7.60E+01
Lead	8.44E+02	4.50E-02	3.80E+01	Meadow Vole	2.50E-03	9.50E-02
Manganese	4.50E+02	4.00E-01	1.80E+02	Meadow Vole	2.50E-03	4.50E-01
Mercury	1.65E+01	3.75E-02	6.19E-01	Meadow Vole	2.50E-03	1.55E-03
Methyl Mercury	2.65E-04	1.37E-01	3.63E-05	Meadow Vole	2.50E-03	9.08E-08
Nickel	8.70E+01	3.20E-02	2.78E+00	Meadow Vole	2.50E-03	6.96E-03
Selenium	2.40E+00	1.60E-02	3.84E-02	Meadow Vole	2.50E-03	9.60E-05
Silver	9.70E-01	4.00E-01	3.88E-01	Meadow Vole	2.50E-03	9.70E-04
Thallium	2.00E+00	4.00E-03	8.00E-03	Meadow Vole	2.50E-03	2.00E-05
Vanadium	4.30E+01	4.00E-01	1.72E+01	Meadow Vole	2.50E-03	4.30E-02
Zinc	1.38E+03	1.20E-12	1.66E-09	Meadow Vole	2.50E-03	4.14E-12

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for calcium, cobalt, iron, magnesium, manganese, potassium, dodium, and vanadium.

[b] Consumption rate takes into account that 1/2 of the meadow vole's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	9.00E-05	1.44E-08	Eastern Cottontail Rabbit	2.37E-01	3.41E-09
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	1.50E-03	6.70E-05	1.01E-07	Eastern Cottontail Rabbit	2.37E-01	2.38E-08
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	6.20E-05	6.82E-09	Eastern Cottontail Rabbit	2.37E-01	1.62E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.20E-04	2.90E-04	6.38E-08	Eastern Cottontail Rabbit	2.37E-01	1.51E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	2.20E-03	1.01E-08	Eastern Cottontail Rabbit	2.37E-01	2.40E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	4.30E-04	4.73E-09	Eastern Cottontail Rabbit	2.37E-01	1.12E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	1.70E-03	3.91E-09	Eastern Cottontail Rabbit	2.37E-01	9.27E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	1.10E-03	1.54E-08	Eastern Cottontail Rabbit	2.37E-01	3.65E-09
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	6.70E-04	4.29E-09	Eastern Cottontail Rabbit	2.37E-01	1.02E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	3.50E-03	1.26E-09	Eastern Cottontail Rabbit	2.37E-01	2.99E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	7.80E-04	5.07E-09	Eastern Cottontail Rabbit	2.37E-01	1.20E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	1.10E-03	1.32E-08	Eastern Cottontail Rabbit	2.37E-01	3.13E-09
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	5.20E-03	1.04E-08	Eastern Cottontail Rabbit	2.37E-01	2.46E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	3.80E-03	4.56E-08	Eastern Cottontail Rabbit	2.37E-01	1.08E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	9.00E-03	1.53E-07	Eastern Cottontail Rabbit	2.37E-01	3.63E-08
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	4.50E-03	8.55E-09	Eastern Cottontail Rabbit	2.37E-01	2.03E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	5.60E-03	4.59E-09	Eastern Cottontail Rabbit	2.37E-01	1.09E-09
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	4.80E-01	1.39E+02	Eastern Cottontail Rabbit	2.37E-01	3.30E+01

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	2.20E-01	5.50E-03	Eastern Cottontail Rabbit	2.37E-01	1.30E-03
Acenaphthylene	1.90E-02	2.20E-01	4.18E-03	Eastern Cottontail Rabbit	2.37E-01	9.91E-04
Anthracene	4.50E-02	1.00E-01	4.50E-03	Eastern Cottontail Rabbit	2.37E-01	1.07E-03
Benzo(a)anthracene	2.10E-01	2.02E-02	4.24E-03	Eastern Cottontail Rabbit	2.37E-01	1.01E-03
Benzo(a)pyrene	1.40E-01	1.00E-02	1.40E-03	Eastern Cottontail Rabbit	2.37E-01	3.32E-04
Benzo(b)fluoranthene	1.60E-01	1.01E-02	1.62E-03	Eastern Cottontail Rabbit	2.37E-01	3.83E-04
Benzo(g,h,i)perylene	1.10E-01	6.10E-03	6.71E-04	Eastern Cottontail Rabbit	2.37E-01	1.59E-04
Benzo(k)fluoranthene	1.30E-01	1.01E-02	1.31E-03	Eastern Cottontail Rabbit	2.37E-01	3.11E-04
Chrysene	3.50E-01	1.87E-02	6.55E-03	Eastern Cottontail Rabbit	2.37E-01	1.55E-03
Dibenzo(a,h)anthracene	3.20E-02	6.40E-03	2.05E-04	Eastern Cottontail Rabbit	2.37E-01	4.85E-05
Dibenzofuran	1.30E-01	1.61E-01	2.09E-02	Eastern Cottontail Rabbit	2.37E-01	4.96E-03
Dimethyl phthalate	5.60E-01	5.47E+00	3.06E+00	Eastern Cottontail Rabbit	2.37E-01	7.26E-01
Fluoranthene	2.60E-01	3.80E-02	9.88E-03	Eastern Cottontail Rabbit	2.37E-01	2.34E-03
Fluorene	2.60E-02	1.49E-01	3.87E-03	Eastern Cottontail Rabbit	2.37E-01	9.18E-04
Indeno(1,2,3-cd)pyrene	5.70E-02	3.90E-03	2.22E-04	Eastern Cottontail Rabbit	2.37E-01	5.27E-05
2-Methylnaphthalene	2.30E-01	2.27E-01	5.22E-02	Eastern Cottontail Rabbit	2.37E-01	1.24E-02
Naphthalene	1.40E+00	4.80E-01	6.72E-01	Eastern Cottontail Rabbit	2.37E-01	1.59E-01
Phenanthrene	1.50E+00	1.02E-01	1.53E-01	Eastern Cottontail Rabbit	2.37E-01	3.63E-02
Pyrene	2.60E-01	5.90E-02	1.53E-02	Eastern Cottontail Rabbit	2.37E-01	3.64E-03

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	4.00E-03	9.20E+01	Eastern Cottontail Rabbit	2.37E-01	2.18E+01
Antimony	1.70E+00	2.00E-01	3.40E-01	Eastern Cottontail Rabbit	2.37E-01	8.06E-02
Arsenic	8.69E+01	3.60E-02	3.13E+00	Eastern Cottontail Rabbit	2.37E-01	7.41E-01
Barium	1.38E+03	1.50E-01	2.07E+02	Eastern Cottontail Rabbit	2.37E-01	4.91E+01
Beryllium	2.70E+00	1.00E-02	2.70E-02	Eastern Cottontail Rabbit	2.37E-01	6.40E-03
Cadmium	1.56E+01	3.64E-01	5.68E+00	Eastern Cottontail Rabbit	2.37E-01	1.35E+00
Calcium	5.10E+04	4.00E-01	2.04E+04	Eastern Cottontail Rabbit	2.37E-01	4.83E+03
Chromium	2.30E+01	7.50E-03	1.73E-01	Eastern Cottontail Rabbit	2.37E-01	4.09E-02
Cobalt	1.60E+01	4.00E-01	6.40E+00	Eastern Cottontail Rabbit	2.37E-01	1.52E+00
Copper	2.00E+02	4.00E-01	8.00E+01	Eastern Cottontail Rabbit	2.37E-01	1.90E+01
Iron	7.60E+04	4.00E-01	3.04E+04	Eastern Cottontail Rabbit	2.37E-01	7.20E+03
Lead	8.44E+02	4.50E-02	3.80E+01	Eastern Cottontail Rabbit	2.37E-01	9.00E+00
Magnesium	5.30E+03	4.00E-01	2.12E+03	Eastern Cottontail Rabbit	2.37E-01	5.02E+02
Manganese	4.50E+02	4.00E-01	1.80E+02	Eastern Cottontail Rabbit	2.37E-01	4.27E+01
Mercury	1.65E+01	3.75E-02	6.19E-01	Eastern Cottontail Rabbit	2.37E-01	1.47E-01
Methyl Mercury	2.65E-04	1.37E-01	3.63E-05	Eastern Cottontail Rabbit	2.37E-01	8.60E-06
Nickel	8.70E+01	3.20E-02	2.78E+00	Eastern Cottontail Rabbit	2.37E-01	6.60E-01
Potassium	4.70E+03	4.00E-01	1.88E+03	Eastern Cottontail Rabbit	2.37E-01	4.46E+02
Selenium	2.40E+00	1.60E-02	3.84E-02	Eastern Cottontail Rabbit	2.37E-01	9.10E-03
Silver	9.70E-01	4.00E-01	3.88E-01	Eastern Cottontail Rabbit	2.37E-01	9.20E-02
Sodium	6.20E+02	4.00E-01	2.48E+02	Eastern Cottontail Rabbit	2.37E-01	5.88E+01
Thallium	2.00E+00	4.00E-03	8.00E-03	Eastern Cottontail Rabbit	2.37E-01	1.90E-03
Vanadium	4.30E+01	4.00E-01	1.72E+01	Eastern Cottontail Rabbit	2.37E-01	4.08E+00
Zinc	1.38E+03	1.20E-12	1.66E-09	Eastern Cottontail Rabbit	2.37E-01	3.92E-10

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium.

[b] Consumption rate takes into account that all of the eastern cottontail rabbit's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	9.00E-05	1.44E-08	White-tailed Deer	1.74E+00	2.51E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDI	1.50E-03	6.70E-05	1.01E-07	White-tailed Deer	1.74E+00	1.75E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	6.20E-05	6.82E-09	White-tailed Deer	1.74E+00	1.19E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.20E-04	2.90E-04	6.38E-08	White-tailed Deer	1.74E+00	1.11E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	2.20E-03	1.01E-08	White-tailed Deer	1.74E+00	1.76E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	4.30E-04	4.73E-09	White-tailed Deer	1.74E+00	8.23E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	1.70E-03	3.91E-09	White-tailed Deer	1.74E+00	6.80E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	1.10E-03	1.54E-08	White-tailed Deer	1.74E+00	2.68E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	6.70E-04	4.29E-09	White-tailed Deer	1.74E+00	7.46E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	3.50E-03	1.26E-09	White-tailed Deer	1.74E+00	2.19E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	7.80E-04	5.07E-09	White-tailed Deer	1.74E+00	8.82E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	1.10E-03	1.32E-08	White-tailed Deer	1.74E+00	2.30E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	5.20E-03	1.04E-08	White-tailed Deer	1.74E+00	1.81E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	3.80E-03	4.56E-08	White-tailed Deer	1.74E+00	7.93E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	9.00E-03	1.53E-07	White-tailed Deer	1.74E+00	2.66E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	4.50E-03	8.55E-09	White-tailed Deer	1.74E+00	1.49E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	5.60E-03	4.59E-09	White-tailed Deer	1.74E+00	7.99E-09

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	4.80E-01	1.39E+02	White-tailed Deer	1.74E+00	2.42E+02
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	2.20E-01	5.50E-03	White-tailed Deer	1.74E+00	9.57E-03
Acenaphthylene	1.90E-02	2.20E-01	4.18E-03	White-tailed Deer	1.74E+00	7.27E-03
Anthracene	4.50E-02	1.00E-01	4.50E-03	White-tailed Deer	1.74E+00	7.83E-03
Benzo(a)anthracene	2.10E-01	2.02E-02	4.24E-03	White-tailed Deer	1.74E+00	7.38E-03
Benzo(a)pyrene	1.40E-01	1.00E-02	1.40E-03	White-tailed Deer	1.74E+00	2.44E-03
Benzo(b)fluoranthene	1.60E-01	1.01E-02	1.62E-03	White-tailed Deer	1.74E+00	2.81E-03
Benzo(g,h,i)perylene	1.10E-01	6.10E-03	6.71E-04	White-tailed Deer	1.74E+00	1.17E-03
Benzo(k)fluoranthene	1.30E-01	1.01E-02	1.31E-03	White-tailed Deer	1.74E+00	2.28E-03
Chrysene	3.50E-01	1.87E-02	6.55E-03	White-tailed Deer	1.74E+00	1.14E-02
Dibenzo(a,h)anthracene	3.20E-02	6.40E-03	2.05E-04	White-tailed Deer	1.74E+00	3.56E-04
Dibenzofuran	1.30E-01	1.61E-01	2.09E-02	White-tailed Deer	1.74E+00	3.64E-02
Dimethyl phthalate	5.60E-01	5.47E+00	3.06E+00	White-tailed Deer	1.74E+00	5.33E+00
Fluoranthene	2.60E-01	3.80E-02	9.88E-03	White-tailed Deer	1.74E+00	1.72E-02
Fluorene	2.60E-02	1.49E-01	3.87E-03	White-tailed Deer	1.74E+00	6.74E-03
Indeno(1,2,3-cd)pyrene	5.70E-02	3.90E-03	2.22E-04	White-tailed Deer	1.74E+00	3.87E-04
2-Methylnaphthalene	2.30E-01	2.27E-01	5.22E-02	White-tailed Deer	1.74E+00	9.08E-02
Naphthalene	1.40E+00	4.80E-01	6.72E-01	White-tailed Deer	1.74E+00	1.17E+00
Phenanthrene	1.50E+00	1.02E-01	1.53E-01	White-tailed Deer	1.74E+00	2.66E-01
Pyrene	2.60E-01	5.90E-02	1.53E-02	White-tailed Deer	1.74E+00	2.67E-02

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	4.00E-03	9.20E+01	White-tailed Deer	1.74E+00	1.60E+02
Antimony	1.70E+00	2.00E-01	3.40E-01	White-tailed Deer	1.74E+00	5.92E-01
Arsenic	8.69E+01	3.60E-02	3.13E+00	White-tailed Deer	1.74E+00	5.44E+00
Barium	1.38E+03	1.50E-01	2.07E+02	White-tailed Deer	1.74E+00	3.60E+02
Beryllium	2.70E+00	1.00E-02	2.70E-02	White-tailed Deer	1.74E+00	4.70E-02
Cadmium	1.56E+01	3.64E-01	5.68E+00	White-tailed Deer	1.74E+00	9.88E+00
Chromium	2.30E+01	7.50E-03	1.73E-01	White-tailed Deer	1.74E+00	3.00E-01
Cobalt	1.60E+01	4.00E-01	6.40E+00	White-tailed Deer	1.74E+00	1.11E+01
Copper	2.00E+02	4.00E-01	8.00E+01	White-tailed Deer	1.74E+00	1.39E+02
Iron	7.60E+04	4.00E-01	3.04E+04	White-tailed Deer	1.74E+00	5.29E+04
Lead	8.44E+02	4.50E-02	3.80E+01	White-tailed Deer	1.74E+00	6.61E+01
Manganese	4.50E+02	4.00E-01	1.80E+02	White-tailed Deer	1.74E+00	3.13E+02
Mercury	1.65E+01	3.75E-02	6.19E-01	White-tailed Deer	1.74E+00	1.08E+00
Methyl Mercury	2.65E-04	1.37E-01	3.63E-05	White-tailed Deer	1.74E+00	6.32E-05
Nickel	8.70E+01	3.20E-02	2.78E+00	White-tailed Deer	1.74E+00	4.84E+00
Selenium	2.40E+00	1.60E-02	3.84E-02	White-tailed Deer	1.74E+00	6.68E-02
Silver	9.70E-01	4.00E-01	3.88E-01	White-tailed Deer	1.74E+00	6.75E-01
Thallium	2.00E+00	4.00E-03	8.00E-03	White-tailed Deer	1.74E+00	1.39E-02
Vanadium	4.30E+01	4.00E-01	1.72E+01	White-tailed Deer	1.74E+00	2.99E+01
Zinc	1.38E+03	1.20E-12	1.66E-09	White-tailed Deer	1.74E+00	2.88E-09

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium.

[b] Consumption rate takes into account that all of the white-tailed deer's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.60E-04	9.00E-05	1.44E-08	American Robin	1.86E-02	2.68E-10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD	1.50E-03	6.70E-05	1.01E-07	American Robin	1.86E-02	1.87E-09
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.10E-04	6.20E-05	6.82E-09	American Robin	1.86E-02	1.27E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.20E-04	2.90E-04	6.38E-08	American Robin	1.86E-02	1.19E-09
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.60E-06	2.20E-03	1.01E-08	American Robin	1.86E-02	1.88E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-05	4.30E-04	4.73E-09	American Robin	1.86E-02	8.80E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.30E-06	1.70E-03	3.91E-09	American Robin	1.86E-02	7.27E-11
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-05	1.10E-03	1.54E-08	American Robin	1.86E-02	2.86E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	6.40E-06	6.70E-04	4.29E-09	American Robin	1.86E-02	7.98E-11
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	3.60E-07	3.50E-03	1.26E-09	American Robin	1.86E-02	2.34E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	6.50E-06	7.80E-04	5.07E-09	American Robin	1.86E-02	9.43E-11
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.20E-05	1.10E-03	1.32E-08	American Robin	1.86E-02	2.46E-10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.00E-06	5.20E-03	1.04E-08	American Robin	1.86E-02	1.93E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-05	3.80E-03	4.56E-08	American Robin	1.86E-02	8.48E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.70E-05	9.00E-03	1.53E-07	American Robin	1.86E-02	2.85E-09
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.90E-06	4.50E-03	8.55E-09	American Robin	1.86E-02	1.59E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.20E-07	5.60E-03	4.59E-09	American Robin	1.86E-02	8.54E-11
Total Petroleum Hydrocarbons (mg/kg)						
Diesel Range Organics	2.90E+02	4.80E-01	1.39E+02	American Robin	1.86E-02	2.59E+00

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Semivolatile Organic Compounds (mg/kg)						
Acenaphthene	2.50E-02	2.20E-01	5.50E-03	American Robin	1.86E-02	1.02E-04
Acenaphthylene	1.90E-02	2.20E-01	4.18E-03	American Robin	1.86E-02	7.77E-05
Anthracene	4.50E-02	1.00E-01	4.50E-03	American Robin	1.86E-02	8.37E-05
Benzo(a)anthracene	2.10E-01	2.02E-02	4.24E-03	American Robin	1.86E-02	7.89E-05
Benzo(a)pyrene	1.40E-01	1.00E-02	1.40E-03	American Robin	1.86E-02	2.60E-05
Benzo(b)fluoranthene	1.60E-01	1.01E-02	1.62E-03	American Robin	1.86E-02	3.01E-05
Benzo(g,h,i)perylene	1.10E-01	6.10E-03	6.71E-04	American Robin	1.86E-02	1.25E-05
Benzo(k)fluoranthene	1.30E-01	1.01E-02	1.31E-03	American Robin	1.86E-02	2.44E-05
Chrysene	3.50E-01	1.87E-02	6.55E-03	American Robin	1.86E-02	1.22E-04
Dibenzo(a,h)anthracene	3.20E-02	6.40E-03	2.05E-04	American Robin	1.86E-02	3.81E-06
Dibenzofuran	1.30E-01	1.61E-01	2.09E-02	American Robin	1.86E-02	3.89E-04
Dimethyl phthalate	5.60E-01	5.47E+00	3.06E+00	American Robin	1.86E-02	5.70E-02
Fluoranthene	2.60E-01	3.80E-02	9.88E-03	American Robin	1.86E-02	1.84E-04
Fluorene	2.60E-02	1.49E-01	3.87E-03	American Robin	1.86E-02	7.21E-05
Indeno(1,2,3-cd)pyrene	5.70E-02	3.90E-03	2.22E-04	American Robin	1.86E-02	4.13E-06
2-Methylnaphthalene	2.30E-01	2.27E-01	5.22E-02	American Robin	1.86E-02	9.71E-04
Naphthalene	1.40E+00	4.80E-01	6.72E-01	American Robin	1.86E-02	1.25E-02
Phenanthrene	1.50E+00	1.02E-01	1.53E-01	American Robin	1.86E-02	2.85E-03
Pyrene	2.60E-01	5.90E-02	1.53E-02	American Robin	1.86E-02	2.85E-04

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	2.30E+04	4.00E-03	9.20E+01	American Robin	1.86E-02	1.71E+00
Antimony	1.70E+00	2.00E-01	3.40E-01	American Robin	1.86E-02	6.32E-03
Arsenic	8.69E+01	3.60E-02	3.13E+00	American Robin	1.86E-02	5.82E-02
Barium	1.38E+03	1.50E-01	2.07E+02	American Robin	1.86E-02	3.85E+00
Beryllium	2.70E+00	1.00E-02	2.70E-02	American Robin	1.86E-02	5.02E-04
Cadmium	1.56E+01	3.64E-01	5.68E+00	American Robin	1.86E-02	1.06E-01
Chromium	2.30E+01	7.50E-03	1.73E-01	American Robin	1.86E-02	3.21E-03
Cobalt	1.60E+01	4.00E-01	6.40E+00	American Robin	1.86E-02	1.19E-01
Copper	2.00E+02	4.00E-01	8.00E+01	American Robin	1.86E-02	1.49E+00
Iron	7.60E+04	4.00E-01	3.04E+04	American Robin	1.86E-02	5.65E+02
Lead	8.44E+02	4.50E-02	3.80E+01	American Robin	1.86E-02	7.06E-01
Manganese	4.50E+02	4.00E-01	1.80E+02	American Robin	1.86E-02	3.35E+00
Mercury	1.65E+01	3.75E-02	6.19E-01	American Robin	1.86E-02	1.15E-02
Methyl Mercury	2.65E-04	1.37E-01	3.63E-05	American Robin	1.86E-02	6.75E-07
Nickel	8.70E+01	3.20E-02	2.78E+00	American Robin	1.86E-02	5.18E-02
Selenium	2.40E+00	1.60E-02	3.84E-02	American Robin	1.86E-02	7.14E-04
Silver	9.70E-01	4.00E-01	3.88E-01	American Robin	1.86E-02	7.22E-03
Thallium	2.00E+00	4.00E-03	8.00E-03	American Robin	1.86E-02	1.49E-04
Vanadium	4.30E+01	4.00E-01	1.72E+01	American Robin	1.86E-02	3.20E-01
Zinc	1.38E+03	1.20E-12	1.66E-09	American Robin	1.86E-02	3.08E-11

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Gasoline Range Organics BCF was calculated using a log Kow = 2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Acenaphthene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Octanol/Water Partition Coefficient for Acenaphthene was used as a surrogate for the Octanol/Water Partition Coefficient for Acenaphthylene.

Acenaphthylene BCF was calculated using a log Kow = 3.9 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Anthracene BCF was calculated using a log Kow = 4.5 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Benzo(g,h,i)perylene BCF was calculated using a log Kow = 6.58 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Table 7-23
Exposure Rate Based on Maximum Concentration of COPEC in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Maximum Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)

Dibenzofuran BCF was calculated using a log Kow = 4.12 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Dimethyl phthalate BCF was calculated using a log Kow = 1.47 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluoranthene BCF was calculated using a log Kow = 5.2 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Fluorene BCF was calculated using a log Kow = 4.18 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

2-Methylnaphthalene BCF was calculated using a log Kow = 3.86 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Naphthalene BCF was calculated using a log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Phenanthrene BCF was calculated using a log Kow = 4.46 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

Pyrene BCF was calculated using a log Kow = 4.88 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium.

[b] Consumption rate takes into account that 1/5 of the American robin's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-24
Exposure Rate Based on Maximum Concentration of COPEC in Benthic Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Sediment (mg/kg)	Benthic Invert-Sediment Bioconcentration Factor[a]	Maximum Concentration of COPEC in Benthic Invert (mg/kg)	Representative Wildlife Species	Consumption Rate of Benthic Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Benthic Inverts (mg/day)
Dioxins-Furans						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCD	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	2.30E-06	9.94E+01	2.29E-04	Raccoon	1.19E-01	2.71E-05
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	1.20E-07	2.35E+03	2.82E-04	Raccoon	1.19E-01	3.34E-05
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	2.50E-07	2.75E+03	6.87E-04	Raccoon	1.19E-01	8.14E-05
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Total Petroleum Hydrocarbons						
Diesel Range Organics	5.40E+00	3.60E+01	1.95E+02	Raccoon	1.19E-01	2.31E+01
Gasoline Range Organics	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00

Table 7-24
Exposure Rate Based on Maximum Concentration of COPEC in Benthic Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Sediment (mg/kg)	Benthic Invert-Sediment Bioconcentration Factor[a]	Maximum Concentration of COPEC in Benthic Invert (mg/kg)	Representative Wildlife Species	Consumption Rate of Benthic Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Benthic Inverts (mg/day)
Semivolatile Organic Compounds						
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Chrysene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Dibenzofuran	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Dimethyl phthalate	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	Raccoon	1.19E-01	0.00E+00

Table 7-24
Exposure Rate Based on Maximum Concentration of COPEC in Benthic Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Sediment (mg/kg)	Benthic Invert-Sediment Bioconcentration Factor[a]	Maximum Concentration of COPEC in Benthic Invert (mg/kg)	Representative Wildlife Species	Consumption Rate of Benthic Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Benthic Inverts (mg/day)
Metals						
Aluminum	8.00E+03	9.00E-01	7.20E+03	Raccoon	1.19E-01	8.53E+02
Antimony	0.00E+00	9.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
Arsenic	7.30E+00	9.00E-01	6.57E+00	Raccoon	1.19E-01	7.79E-01
Barium	2.80E+02	9.00E-01	2.52E+02	Raccoon	1.19E-01	2.99E+01
Beryllium	3.60E-01	9.00E-01	3.24E-01	Raccoon	1.19E-01	3.84E-02
Cadmium	1.10E+00	3.40E+00	3.74E+00	Raccoon	1.19E-01	4.43E-01
Chromium	8.10E+00	3.90E-01	3.16E+00	Raccoon	1.19E-01	3.74E-01
Cobalt	7.30E+00	9.00E-01	6.57E+00	Raccoon	1.19E-01	7.79E-01
Copper	6.60E+00	3.00E-01	1.98E+00	Raccoon	1.19E-01	2.35E-01
Iron	1.00E+04	9.00E-01	9.00E+03	Raccoon	1.19E-01	1.07E+03
Lead	8.00E+00	6.30E-01	5.04E+00	Raccoon	1.19E-01	5.97E-01
Manganese	9.90E+02	9.00E-01	8.91E+02	Raccoon	1.19E-01	1.06E+02
Mercury	1.30E-02	6.80E-02	8.84E-04	Raccoon	1.19E-01	1.05E-04
Methyl Mercury	3.80E-05	4.80E-01	1.82E-05	Raccoon	1.19E-01	2.16E-06
Nickel	1.40E+01	9.00E-01	1.26E+01	Raccoon	1.19E-01	1.49E+00
Selenium	0.00E+00	9.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
Silver	0.00E+00	9.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
Thallium	0.00E+00	9.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
Vanadium	1.40E+01	9.00E-01	1.26E+01	Raccoon	1.19E-01	1.49E+00
Zinc	3.70E+01	5.70E-01	2.11E+01	Raccoon	1.19E-01	2.50E+00

Table 7-24
Exposure Rate Based on Maximum Concentration of COPEC in Benthic Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected in Sediment (mg/kg)	Benthic Invert-Sediment Bioconcentration Factor[a]	Maximum Concentration of COPEC in Benthic Invert (mg/kg)	Representative Wildlife Species	Consumption Rate of Benthic Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Benthic Inverts (mg/day)

Notes:
COPEC - Chemical of Potential Ecological Concern
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

[a] Sediment-to-Benthic invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

A surrogate BCF value was used for aluminum, anitmony, arsenic, barium, beryllium, calcium, cobalt, iron, magnesium, manganese, nickle, potassium, selenium, silver, sodium, thallium, and vanadium that is based on the arithmetic mean of the arithmetic average of 6 recommended values for those metals with empirical data (cadmium, chromium, copper, lead, inorganic mercury, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate assumes that 50% of the raccoon's diet is composed of benthic invertebrates (see Table 7-9).

Table 7-25
Exposure Rate Based on Maximum Concentration of COPEC in Fish Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected Surface Water (mg/L)	Fish Bioconcentration Factor[a]	Metabolic Reducution Factor	Maximum Concentration of COPEC in Fish (mg/kg)	Representative Wildlife Species	Consumption Rate of Fish Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Fish (mg/day)
Dioxins-Furans							
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	5.60E-09	6.78E+01	5.00E-01	1.90E-07	Raccoon	1.19E-01	2.25E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCD	5.20E-09	5.08E+01	5.00E-01	1.32E-07	Raccoon	1.19E-01	1.57E-08
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	7.00E-10	4.66E+01	5.00E-01	1.63E-08	Raccoon	1.19E-01	1.93E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCD	1.20E-09	2.16E+02	5.00E-01	1.30E-07	Raccoon	1.19E-01	1.54E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.70E-09	1.65E+03	5.00E-01	1.40E-06	Raccoon	1.19E-01	1.66E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.10E-09	3.22E+02	5.00E-01	1.77E-07	Raccoon	1.19E-01	2.10E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.40E-10	1.31E+03	5.00E-01	4.86E-07	Raccoon	1.19E-01	5.76E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.20E-09	8.05E+02	5.00E-01	4.83E-07	Raccoon	1.19E-01	5.72E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.10E-10	5.08E+02	5.00E-01	2.06E-07	Raccoon	1.19E-01	2.44E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	1.40E-09	2.67E+03	5.00E-01	1.87E-06	Raccoon	1.19E-01	2.21E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.90E-09	5.93E+02	5.00E-01	5.63E-07	Raccoon	1.19E-01	6.67E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.00E+00	9.32E+02	5.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.10E-09	3.90E+03	5.00E-01	6.04E-06	Raccoon	1.19E-01	7.16E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.40E-09	2.84E+03	5.00E-01	1.99E-06	Raccoon	1.19E-01	2.35E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.00E-09	6.78E+03	5.00E-01	3.39E-06	Raccoon	1.19E-01	4.01E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	9.60E-10	3.39E+03	5.00E-01	1.63E-06	Raccoon	1.19E-01	1.93E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	4.24E+03	5.00E-01	0.00E+00	Raccoon	1.19E-01	0.00E+00
Total Petroleum Hydrocarbons							
Diesel Range Organics	7.20E-02	1.64E+02	5.00E-01	5.92E+00	Raccoon	1.19E-01	7.01E-01
Semivolatile Organic Compounds							
Benzo(a)pyrene	4.90E-06	5.00E+02	5.00E-01	1.23E-03	Raccoon	1.19E-01	1.45E-04
Benzo(k)fluoranthene	8.80E-06	5.00E+02	5.00E-01	2.20E-03	Raccoon	1.19E-01	2.61E-04
Chrysene	1.20E-05	5.00E+02	5.00E-01	3.00E-03	Raccoon	1.19E-01	3.56E-04
Pyrene	4.00E-06	5.00E+02	5.00E-01	1.00E-03	Raccoon	1.19E-01	1.19E-04

Table 7-25
Exposure Rate Based on Maximum Concentration of COPEC in Fish Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Maximum Concentration Detected Surface Water (mg/L)	Fish Bioconcentration Factor[a]	Metabolic Reducution Factor	Maximum Concentration of COPEC in Fish (mg/kg)	Representative Wildlife Species	Consumption Rate of Fish Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Fish (mg/day)
Metals							
Aluminum	4.80E-02	2.70E+00	5.00E-01	6.48E-02	Raccoon	1.19E-01	7.68E-03
Arsenic	3.30E-03	1.14E+02	5.00E-01	1.88E-01	Raccoon	1.19E-01	2.23E-02
Barium	1.80E-01	6.33E+02	5.00E-01	5.70E+01	Raccoon	1.19E-01	6.75E+00
Copper	3.20E-03	7.10E+02	5.00E-01	1.14E+00	Raccoon	1.19E-01	1.35E-01
Manganese	6.00E-02	6.33E+02	5.00E-01	1.90E+01	Raccoon	1.19E-01	2.25E+00
Mercury	1.70E-04	3.53E+03	5.00E-01	3.00E-01	Raccoon	1.19E-01	3.56E-02
Methyl Mercury	9.40E-08	1.12E+04	5.00E-01	5.25E-04	Raccoon	1.19E-01	6.22E-05
Nickel	3.50E-03	7.80E+01	5.00E-01	1.37E-01	Raccoon	1.19E-01	1.62E-02
Vanadium	2.90E-03	6.33E+02	5.00E-01	9.18E-01	Raccoon	1.19E-01	1.09E-01
Zinc	3.70E-02	2.06E+03	5.00E-01	3.81E+01	Raccoon	1.19E-01	4.51E+00

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

[a] Water-to-fish bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.91 x log Kow -1.975 x log (6.8E-07 x Kow + 1.0) - 0.786 where Log Kow equals the octanol/water partition coefficient.

Diesel Range Organics BCF was calculated using the Diesel Fuel 2 log Kow = 3.3 per the Centers for Disease Control and Prevention International Chemical Safety Cards (ICSC) http://www.cdc.gov/niosh/ipcs/default.html.

The BCF for benzo(a)pyrene was used as a surrogate for benzo(k)fluoranthene, chrysene, and Pyrene.

A surrogate BCF value was used for barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium that is based on the arithmetic mean of the recommended values for 14 inorganics with empirical data available (aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate assumes that 50% of the raccoon's diet is composed of benthic invertebrates (see Table 7-9).

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red Fox	2.23E-07	1.10E-08	2.93E-08	2.39E-06	6.63E-07	3.20E-01	4.50E-01	1.41E+00	9.31E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red Fox	2.01E-06	1.02E-07	2.52E-07	2.24E-05	6.18E-06	3.20E-01	4.50E-01	1.41E+00	8.69E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red Fox	1.46E-07	7.51E-09	1.79E-08	1.64E-06	4.53E-07	3.20E-01	4.50E-01	1.41E+00	6.36E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red Fox	4.18E-07	1.52E-08	7.11E-08	3.29E-06	9.49E-07	3.20E-01	4.50E-01	1.41E+00	1.33E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red Fox	3.11E-08	3.58E-10	7.72E-09	7.11E-08	2.76E-08	3.20E-01	4.50E-01	1.41E+00	3.87E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	2.49E-08	7.71E-10	4.67E-09	1.65E-07	4.89E-08	3.20E-01	4.50E-01	1.41E+00	6.87E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	1.28E-08	1.75E-10	3.11E-09	3.53E-08	1.29E-08	3.20E-01	4.50E-01	1.41E+00	1.81E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	5.42E-08	1.01E-09	1.22E-08	2.12E-07	7.00E-08	3.20E-01	4.50E-01	1.41E+00	9.83E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	1.84E-08	4.55E-10	3.82E-09	9.65E-08	2.98E-08	3.20E-01	4.50E-01	1.41E+00	4.19E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red Fox	3.67E-09	3.80E-11	9.55E-10	5.83E-09	2.62E-09	3.20E-01	4.50E-01	1.41E+00	3.68E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	2.05E-08	4.72E-10	4.38E-09	9.83E-08	3.09E-08	3.20E-01	4.50E-01	1.41E+00	4.34E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	4.86E-08	8.61E-10	1.11E-08	1.82E-07	6.06E-08	3.20E-01	4.50E-01	1.41E+00	8.52E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red Fox	2.86E-08	1.92E-10	7.58E-09	3.26E-08	1.73E-08	3.20E-01	4.50E-01	1.41E+00	2.42E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	1.30E-07	9.80E-10	3.37E-08	1.90E-07	8.85E-08	3.20E-01	4.50E-01	1.41E+00	1.24E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	4.09E-07	1.68E-09	1.10E-07	2.90E-07	2.03E-07	3.20E-01	4.50E-01	1.41E+00	2.85E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red Fox	2.39E-08	1.65E-10	6.29E-09	3.04E-08	1.52E-08	3.20E-01	4.50E-01	1.41E+00	2.14E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red Fox	1.27E-08	7.14E-11	3.37E-09	1.33E-08	7.36E-09	3.20E-01	4.50E-01	1.41E+00	1.03E-08

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Red Fox	9.44E+01	4.93E-01	2.65E+01	3.73E+01	3.97E+01	3.20E-01	4.50E-01	1.41E+00	5.58E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Red Fox	2.52E-02	2.04E-05	7.00E-03	1.68E-03	8.46E-03	3.20E-01	4.50E-01	1.41E+00	1.19E-02
Acenaphthylene	Red Fox	1.91E-02	1.55E-05	5.32E-03	1.27E-03	6.43E-03	3.20E-01	4.50E-01	1.41E+00	9.04E-03
Anthracene	Red Fox	1.40E-01	1.84E-05	3.90E-02	1.74E-03	4.53E-02	3.20E-01	4.50E-01	1.41E+00	6.36E-02
Benzo(a)anthracene	Red Fox	3.02E-04	2.87E-05	5.16E-05	4.13E-03	1.13E-03	3.20E-01	4.50E-01	1.41E+00	1.59E-03
Benzo(a)pyrene	Red Fox	2.52E-04	1.43E-05	4.48E-05	2.42E-03	6.82E-04	3.20E-01	4.50E-01	1.41E+00	9.59E-04
Benzo(b)fluoranthene	Red Fox	2.88E-04	1.64E-05	5.12E-05	2.77E-03	7.81E-04	3.20E-01	4.50E-01	1.41E+00	1.10E-03
Benzo(g,h,i)perylene	Red Fox	1.73E+01	9.76E-06	4.81E+00	1.80E-03	5.53E+00	3.20E-01	4.50E-01	1.41E+00	7.78E+00
Benzo(k)fluoranthene	Red Fox	2.46E-04	1.33E-05	4.49E-05	2.25E-03	6.38E-04	3.20E-01	4.50E-01	1.41E+00	8.97E-04
Chrysene	Red Fox	5.36E-04	4.61E-05	9.34E-05	6.77E-03	1.86E-03	3.20E-01	4.50E-01	1.41E+00	2.61E-03
Dibenzo(a,h)anthracene	Red Fox	5.76E-05	2.87E-06	9.95E-06	5.25E-04	1.49E-04	3.20E-01	4.50E-01	1.41E+00	2.09E-04
Dibenzofuran	Red Fox	1.98E-01	8.00E-05	5.50E-02	6.90E-03	6.50E-02	3.20E-01	4.50E-01	1.41E+00	9.14E-02
Dimethyl phthalate	Red Fox	9.58E-04	1.05E-02	7.81E-03	7.34E-01	1.88E-01	3.20E-01	4.50E-01	1.41E+00	2.65E-01
Fluoranthene	Red Fox	3.03E+00	5.13E-05	8.43E-01	6.22E-03	9.71E-01	3.20E-01	4.50E-01	1.41E+00	1.36E+00
Fluorene	Red Fox	4.44E-02	1.49E-05	1.23E-02	1.31E-03	1.45E-02	3.20E-01	4.50E-01	1.41E+00	2.04E-02
Indeno(1,2,3-cd)pyrene	Red Fox	1.08E-04	4.63E-06	1.88E-05	9.02E-04	2.58E-04	3.20E-01	4.50E-01	1.41E+00	3.63E-04
2-Methylnaphthalene	Red Fox	2.15E-01	1.93E-04	5.97E-02	1.58E-02	7.26E-02	3.20E-01	4.50E-01	1.41E+00	1.02E-01
Naphthalene	Red Fox	4.56E-01	2.38E-03	1.28E-01	1.80E-01	1.92E-01	3.20E-01	4.50E-01	1.41E+00	2.69E-01
Phenanthrene	Red Fox	1.53E-02	6.22E-04	4.31E-03	5.86E-02	1.97E-02	3.20E-01	4.50E-01	1.41E+00	2.77E-02
Pyrene	Red Fox	1.66E+00	6.99E-05	4.61E-01	7.51E-03	5.32E-01	3.20E-01	4.50E-01	1.41E+00	7.48E-01

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Metals (mg/kg)										
Aluminum	Red Fox	7.25E+01	1.88E+00	1.56E+01	3.65E+02	1.14E+02	3.20E-01	4.50E-01	1.41E+00	1.60E+02
Antimony	Red Fox	5.36E-03	1.27E-03	1.99E-03	1.06E-01	2.86E-02	3.20E-01	4.50E-01	1.41E+00	4.02E-02
Arsenic	Red Fox	1.88E-01	1.66E-02	4.22E-02	2.04E+00	5.71E-01	3.20E-01	4.50E-01	1.41E+00	8.02E-01
Barium	Red Fox	4.35E+00	7.99E-01	1.44E+00	6.96E+01	1.91E+01	3.20E-01	4.50E-01	1.41E+00	2.68E+01
Beryllium	Red Fox	8.51E-03	2.75E-04	1.88E-03	4.66E-02	1.43E-02	3.20E-01	4.50E-01	1.41E+00	2.01E-02
Cadmium	Red Fox	1.53E-01	2.04E-02	5.35E-02	1.58E+00	4.51E-01	3.20E-01	4.50E-01	1.41E+00	6.34E-01
Chromium	Red Fox	2.90E-02	2.15E-03	3.77E-03	3.84E-01	1.05E-01	3.20E-01	4.50E-01	1.41E+00	1.47E-01
Cobalt	Red Fox	5.04E-02	2.28E-02	2.67E-02	1.76E+00	4.64E-01	3.20E-01	4.50E-01	1.41E+00	6.52E-01
Copper	Red Fox	3.06E-01	2.86E-01	2.44E-01	2.19E+01	5.69E+00	3.20E-01	4.50E-01	1.41E+00	8.00E+00
Iron	Red Fox	2.39E+02	1.09E+02	1.27E+02	8.34E+03	2.20E+03	3.20E-01	4.50E-01	1.41E+00	3.10E+03
Lead	Red Fox	1.22E+00	1.87E-01	2.60E-01	2.16E+01	5.81E+00	3.20E-01	4.50E-01	1.41E+00	8.16E+00
Manganese	Red Fox	1.42E+00	6.43E-01	7.52E-01	4.94E+01	1.30E+01	3.20E-01	4.50E-01	1.41E+00	1.83E+01
Mercury	Red Fox	2.52E-02	3.23E-03	5.18E-03	3.93E-01	1.07E-01	3.20E-01	4.50E-01	1.41E+00	1.50E-01
Methyl Mercury	Red Fox	2.06E-05	1.42E-07	5.75E-06	1.26E-05	9.76E-06	3.20E-01	4.50E-01	1.41E+00	1.37E-05
Nickel	Red Fox	1.17E-01	1.54E-02	2.18E-02	1.96E+00	5.28E-01	3.20E-01	4.50E-01	1.41E+00	7.42E-01
Selenium	Red Fox	7.56E-03	2.94E-04	1.70E-03	4.49E-02	1.36E-02	3.20E-01	4.50E-01	1.41E+00	1.91E-02
Silver	Red Fox	3.06E-03	1.39E-03	1.62E-03	1.06E-01	2.81E-02	3.20E-01	4.50E-01	1.41E+00	3.95E-02
Thallium	Red Fox	6.30E-03	1.63E-04	1.36E-03	3.17E-02	9.88E-03	3.20E-01	4.50E-01	1.41E+00	1.39E-02
Vanadium	Red Fox	1.35E-01	6.14E-02	7.18E-02	4.72E+00	1.25E+00	3.20E-01	4.50E-01	1.41E+00	1.75E+00
Zinc	Red Fox	8.57E+00	9.41E-02	2.10E+00	2.06E+01	7.83E+00	3.20E-01	4.50E-01	1.41E+00	1.10E+01

Notes:
mg/day - milligrams per day
kg - kilograms
kg dw/day - kilogram dry weight per day

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red-tailed Hawk	2.23E-07	1.10E-08	2.93E-08	2.39E-06	6.63E-07	3.20E-01	1.09E-01	3.40E-01	2.26E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red-tailed Hawk	2.01E-06	1.02E-07	2.52E-07	2.24E-05	6.18E-06	3.20E-01	1.09E-01	3.40E-01	2.11E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	1.46E-07	7.51E-09	1.79E-08	1.64E-06	4.53E-07	3.20E-01	1.09E-01	3.40E-01	1.54E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red-tailed Hawk	4.18E-07	1.52E-08	7.11E-08	3.29E-06	9.49E-07	3.20E-01	1.09E-01	3.40E-01	3.23E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	3.11E-08	3.58E-10	7.72E-09	7.11E-08	2.76E-08	3.20E-01	1.09E-01	3.40E-01	9.38E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	2.49E-08	7.71E-10	4.67E-09	1.65E-07	4.89E-08	3.20E-01	1.09E-01	3.40E-01	1.66E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	1.28E-08	1.75E-10	3.11E-09	3.53E-08	1.29E-08	3.20E-01	1.09E-01	3.40E-01	4.37E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	5.42E-08	1.01E-09	1.22E-08	2.12E-07	7.00E-08	3.20E-01	1.09E-01	3.40E-01	2.38E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	1.84E-08	4.55E-10	3.82E-09	9.65E-08	2.98E-08	3.20E-01	1.09E-01	3.40E-01	1.01E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	3.67E-09	3.80E-11	9.55E-10	5.83E-09	2.62E-09	3.20E-01	1.09E-01	3.40E-01	8.92E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	2.05E-08	4.72E-10	4.38E-09	9.83E-08	3.09E-08	3.20E-01	1.09E-01	3.40E-01	1.05E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	4.86E-08	8.61E-10	1.11E-08	1.82E-07	6.06E-08	3.20E-01	1.09E-01	3.40E-01	2.06E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red-tailed Hawk	2.86E-08	1.92E-10	7.58E-09	3.26E-08	1.73E-08	3.20E-01	1.09E-01	3.40E-01	5.87E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	1.30E-07	9.80E-10	3.37E-08	1.90E-07	8.85E-08	3.20E-01	1.09E-01	3.40E-01	3.01E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	4.09E-07	1.68E-09	1.10E-07	2.90E-07	2.03E-07	3.20E-01	1.09E-01	3.40E-01	6.89E-08
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red-tailed Hawk	2.39E-08	1.65E-10	6.29E-09	3.04E-08	1.52E-08	3.20E-01	1.09E-01	3.40E-01	5.18E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red-tailed Hawk	1.27E-08	7.14E-11	3.37E-09	1.33E-08	7.36E-09	3.20E-01	1.09E-01	3.40E-01	2.51E-09

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Red-tailed Hawk	9.44E+01	4.93E-01	2.65E+01	3.73E+01	3.97E+01	3.20E-01	1.09E-01	3.40E-01	1.35E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Red-tailed Hawk	2.52E-02	2.04E-05	7.00E-03	1.68E-03	8.46E-03	3.20E-01	1.09E-01	3.40E-01	2.88E-03
Acenaphthylene	Red-tailed Hawk	1.91E-02	1.55E-05	5.32E-03	1.27E-03	6.43E-03	3.20E-01	1.09E-01	3.40E-01	2.19E-03
Anthracene	Red-tailed Hawk	1.40E-01	1.84E-05	3.90E-02	1.74E-03	4.53E-02	3.20E-01	1.09E-01	3.40E-01	1.54E-02
Benzo(a)anthracene	Red-tailed Hawk	3.02E-04	2.87E-05	5.16E-05	4.13E-03	1.13E-03	3.20E-01	1.09E-01	3.40E-01	3.84E-04
Benzo(a)pyrene	Red-tailed Hawk	2.52E-04	1.43E-05	4.48E-05	2.42E-03	6.82E-04	3.20E-01	1.09E-01	3.40E-01	2.32E-04
Benzo(b)fluoranthene	Red-tailed Hawk	2.88E-04	1.64E-05	5.12E-05	2.77E-03	7.81E-04	3.20E-01	1.09E-01	3.40E-01	2.66E-04
Benzo(g,h,i)perylene	Red-tailed Hawk	1.73E+01	9.76E-06	4.81E+00	1.80E-03	5.53E+00	3.20E-01	1.09E-01	3.40E-01	1.88E+00
Benzo(k)fluoranthene	Red-tailed Hawk	2.46E-04	1.33E-05	4.49E-05	2.25E-03	6.38E-04	3.20E-01	1.09E-01	3.40E-01	2.17E-04
Chrysene	Red-tailed Hawk	5.36E-04	4.61E-05	9.34E-05	6.77E-03	1.86E-03	3.20E-01	1.09E-01	3.40E-01	6.33E-04
Dibenzo(a,h)anthracene	Red-tailed Hawk	5.76E-05	2.87E-06	9.95E-06	5.25E-04	1.49E-04	3.20E-01	1.09E-01	3.40E-01	5.07E-05
Dibenzofuran	Red-tailed Hawk	1.98E-01	8.00E-05	5.50E-02	6.90E-03	6.50E-02	3.20E-01	1.09E-01	3.40E-01	2.21E-02
Dimethyl phthalate	Red-tailed Hawk	9.58E-04	1.05E-02	7.81E-03	7.34E-01	1.88E-01	3.20E-01	1.09E-01	3.40E-01	6.41E-02
Fluoranthene	Red-tailed Hawk	3.03E+00	5.13E-05	8.43E-01	6.22E-03	9.71E-01	3.20E-01	1.09E-01	3.40E-01	3.30E-01
Fluorene	Red-tailed Hawk	4.44E-02	1.49E-05	1.23E-02	1.31E-03	1.45E-02	3.20E-01	1.09E-01	3.40E-01	4.94E-03
Indeno(1,2,3-cd)pyrene	Red-tailed Hawk	1.08E-04	4.63E-06	1.88E-05	9.02E-04	2.58E-04	3.20E-01	1.09E-01	3.40E-01	8.79E-05
2-Methylnaphthalene	Red-tailed Hawk	2.15E-01	1.93E-04	5.97E-02	1.58E-02	7.26E-02	3.20E-01	1.09E-01	3.40E-01	2.47E-02
Naphthalene	Red-tailed Hawk	4.56E-01	2.38E-03	1.28E-01	1.80E-01	1.92E-01	3.20E-01	1.09E-01	3.40E-01	6.52E-02
Phenanthrene	Red-tailed Hawk	1.53E-02	6.22E-04	4.31E-03	5.86E-02	1.97E-02	3.20E-01	1.09E-01	3.40E-01	6.71E-03
Pyrene	Red-tailed Hawk	1.66E+00	6.99E-05	4.61E-01	7.51E-03	5.32E-01	3.20E-01	1.09E-01	3.40E-01	1.81E-01

Table 7-26
Chemical Intake Based on Ingestion of Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Maximum Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Maximum Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Maximum Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Maximum Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8 (kg dw/day)	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Metals (mg/kg)										
Aluminum	Red-tailed Hawk	7.25E+01	1.88E+00	1.56E+01	3.65E+02	1.14E+02	3.20E-01	1.09E-01	3.40E-01	3.87E+01
Antimony	Red-tailed Hawk	5.36E-03	1.27E-03	1.99E-03	1.06E-01	2.86E-02	3.20E-01	1.09E-01	3.40E-01	9.74E-03
Arsenic	Red-tailed Hawk	1.88E-01	1.66E-02	4.22E-02	2.04E+00	5.71E-01	3.20E-01	1.09E-01	3.40E-01	1.94E-01
Barium	Red-tailed Hawk	4.35E+00	7.99E-01	1.44E+00	6.96E+01	1.91E+01	3.20E-01	1.09E-01	3.40E-01	6.49E+00
Beryllium	Red-tailed Hawk	8.51E-03	2.75E-04	1.88E-03	4.66E-02	1.43E-02	3.20E-01	1.09E-01	3.40E-01	4.87E-03
Cadmium	Red-tailed Hawk	1.53E-01	2.04E-02	5.35E-02	1.58E+00	4.51E-01	3.20E-01	1.09E-01	3.40E-01	1.54E-01
Chromium	Red-tailed Hawk	2.90E-02	2.15E-03	3.77E-03	3.84E-01	1.05E-01	3.20E-01	1.09E-01	3.40E-01	3.56E-02
Cobalt	Red-tailed Hawk	5.04E-02	2.28E-02	2.67E-02	1.76E+00	4.64E-01	3.20E-01	1.09E-01	3.40E-01	1.58E-01
Copper	Red-tailed Hawk	3.06E-01	2.86E-01	2.44E-01	2.19E+01	5.69E+00	3.20E-01	1.09E-01	3.40E-01	1.94E+00
Iron	Red-tailed Hawk	2.39E+02	1.09E+02	1.27E+02	8.34E+03	2.20E+03	3.20E-01	1.09E-01	3.40E-01	7.50E+02
Lead	Red-tailed Hawk	1.22E+00	1.87E-01	2.60E-01	2.16E+01	5.81E+00	3.20E-01	1.09E-01	3.40E-01	1.98E+00
Manganese	Red-tailed Hawk	1.42E+00	6.43E-01	7.52E-01	4.94E+01	1.30E+01	3.20E-01	1.09E-01	3.40E-01	4.44E+00
Mercury	Red-tailed Hawk	2.52E-02	3.23E-03	5.18E-03	3.93E-01	1.07E-01	3.20E-01	1.09E-01	3.40E-01	3.63E-02
Methyl Mercury	Red-tailed Hawk	2.06E-05	1.42E-07	5.75E-06	1.26E-05	9.76E-06	3.20E-01	1.09E-01	3.40E-01	3.32E-06
Nickel	Red-tailed Hawk	1.17E-01	1.54E-02	2.18E-02	1.96E+00	5.28E-01	3.20E-01	1.09E-01	3.40E-01	1.80E-01
Selenium	Red-tailed Hawk	7.56E-03	2.94E-04	1.70E-03	4.49E-02	1.36E-02	3.20E-01	1.09E-01	3.40E-01	4.63E-03
Silver	Red-tailed Hawk	3.06E-03	1.39E-03	1.62E-03	1.06E-01	2.81E-02	3.20E-01	1.09E-01	3.40E-01	9.57E-03
Thallium	Red-tailed Hawk	6.30E-03	1.63E-04	1.36E-03	3.17E-02	9.88E-03	3.20E-01	1.09E-01	3.40E-01	3.36E-03
Vanadium	Red-tailed Hawk	1.35E-01	6.14E-02	7.18E-02	4.72E+00	1.25E+00	3.20E-01	1.09E-01	3.40E-01	4.24E-01
Zinc	Red-tailed Hawk	8.57E+00	9.41E-02	2.10E+00	2.06E+01	7.83E+00	3.20E-01	1.09E-01	3.40E-01	2.67E+00

Notes:
mg/day - milligrams per day
kg - kilograms
kg dw/day - kilogram dry weight per day

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Short-tailed Shrew	1.87E-07	0.00E+00	1.85E-11	0.00E+00	3.60E-08	0.00E+00	0.00E+00	0.00E+00	2.23E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Short-tailed Shrew	1.76E-06	0.00E+00	1.72E-11	0.00E+00	2.57E-07	0.00E+00	0.00E+00	0.00E+00	2.01E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Short-tailed Shrew	1.29E-07	0.00E+00	2.31E-12	0.00E+00	1.68E-08	0.00E+00	0.00E+00	0.00E+00	1.46E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Short-tailed Shrew	2.57E-07	0.00E+00	3.96E-12	0.00E+00	1.60E-07	0.00E+00	0.00E+00	0.00E+00	4.18E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Short-tailed Shrew	5.38E-09	0.00E+00	5.61E-12	0.00E+00	2.57E-08	0.00E+00	0.00E+00	0.00E+00	3.11E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	1.29E-08	0.00E+00	3.63E-12	0.00E+00	1.20E-08	0.00E+00	0.00E+00	0.00E+00	2.49E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	2.69E-09	0.00E+00	2.44E-12	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	1.28E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	1.64E-08	0.00E+00	3.96E-12	0.00E+00	3.78E-08	0.00E+00	0.00E+00	0.00E+00	5.42E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	7.49E-09	0.00E+00	2.67E-12	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00	1.84E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	4.21E-10	0.00E+00	4.62E-12	0.00E+00	3.24E-09	0.00E+00	0.00E+00	0.00E+00	3.67E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	7.61E-09	0.00E+00	6.27E-12	0.00E+00	1.29E-08	0.00E+00	0.00E+00	0.00E+00	2.05E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	1.40E-08	0.00E+00	0.00E+00	0.00E+00	3.46E-08	0.00E+00	0.00E+00	0.00E+00	4.86E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Short-tailed Shrew	2.34E-09	0.00E+00	1.02E-11	0.00E+00	2.63E-08	0.00E+00	0.00E+00	0.00E+00	2.86E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	1.40E-08	0.00E+00	4.62E-12	0.00E+00	1.16E-07	0.00E+00	0.00E+00	0.00E+00	1.30E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	1.99E-08	0.00E+00	3.30E-12	0.00E+00	3.89E-07	0.00E+00	0.00E+00	0.00E+00	4.09E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Short-tailed Shrew	2.22E-09	0.00E+00	3.17E-12	0.00E+00	2.17E-08	0.00E+00	0.00E+00	0.00E+00	2.39E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Short-tailed Shrew	9.59E-10	0.00E+00	0.00E+00	0.00E+00	1.17E-08	0.00E+00	0.00E+00	0.00E+00	1.27E-08

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Short-tailed Shrew	3.39E-01	0.00E+00	2.38E-04	0.00E+00	9.40E+01	0.00E+00	0.00E+00	0.00E+00	9.44E+01
Gasoline Range Organics	Short-tailed Shrew	1.29E-02	0.00E+00	0.00E+00	0.00E+00	3.07E-01	0.00E+00	0.00E+00	0.00E+00	3.20E-01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Short-tailed Shrew	2.93E-05	0.00E+00	0.00E+00	0.00E+00	2.51E-02	0.00E+00	0.00E+00	0.00E+00	2.52E-02
Acenaphthylene	Short-tailed Shrew	2.22E-05	0.00E+00	0.00E+00	0.00E+00	1.91E-02	0.00E+00	0.00E+00	0.00E+00	1.91E-02
Anthracene	Short-tailed Shrew	5.27E-05	0.00E+00	0.00E+00	0.00E+00	1.40E-01	0.00E+00	0.00E+00	0.00E+00	1.40E-01
Benzo(a)anthracene	Short-tailed Shrew	2.46E-04	0.00E+00	0.00E+00	0.00E+00	5.67E-05	0.00E+00	0.00E+00	0.00E+00	3.02E-04
Benzo(a)pyrene	Short-tailed Shrew	1.64E-04	0.00E+00	1.62E-08	0.00E+00	8.82E-05	0.00E+00	0.00E+00	0.00E+00	2.52E-04
Benzo(b)fluoranthene	Short-tailed Shrew	1.87E-04	0.00E+00	0.00E+00	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	2.88E-04
Benzo(g,h,i)perylene	Short-tailed Shrew	1.29E-04	0.00E+00	0.00E+00	0.00E+00	1.73E+01	0.00E+00	0.00E+00	0.00E+00	1.73E+01
Benzo(k)fluoranthene	Short-tailed Shrew	1.52E-04	0.00E+00	1.32E-08	0.00E+00	9.36E-05	0.00E+00	0.00E+00	0.00E+00	2.46E-04
Chrysene	Short-tailed Shrew	4.10E-04	0.00E+00	3.96E-08	0.00E+00	1.26E-04	0.00E+00	0.00E+00	0.00E+00	5.36E-04
Dibenzo(a,h)anthracene	Short-tailed Shrew	3.74E-05	0.00E+00	0.00E+00	0.00E+00	2.02E-05	0.00E+00	0.00E+00	0.00E+00	5.76E-05
Dibenzofuran	Short-tailed Shrew	1.52E-04	0.00E+00	0.00E+00	0.00E+00	1.98E-01	0.00E+00	0.00E+00	0.00E+00	1.98E-01
Dimethyl phthalate	Short-tailed Shrew	6.55E-04	0.00E+00	0.00E+00	0.00E+00	3.02E-04	0.00E+00	0.00E+00	0.00E+00	9.58E-04
Fluoranthene	Short-tailed Shrew	3.04E-04	0.00E+00	0.00E+00	0.00E+00	3.03E+00	0.00E+00	0.00E+00	0.00E+00	3.03E+00
Fluorene	Short-tailed Shrew	3.04E-05	0.00E+00	0.00E+00	0.00E+00	4.43E-02	0.00E+00	0.00E+00	0.00E+00	4.44E-02
Indeno(1,2,3-cd)pyrene	Short-tailed Shrew	6.67E-05	0.00E+00	0.00E+00	0.00E+00	4.10E-05	0.00E+00	0.00E+00	0.00E+00	1.08E-04
2-Methylnaphthalene	Short-tailed Shrew	2.69E-04	0.00E+00	0.00E+00	0.00E+00	2.14E-01	0.00E+00	0.00E+00	0.00E+00	2.15E-01
Naphthalene	Short-tailed Shrew	1.64E-03	0.00E+00	0.00E+00	0.00E+00	4.54E-01	0.00E+00	0.00E+00	0.00E+00	4.56E-01
Phenanthrene	Short-tailed Shrew	1.76E-03	0.00E+00	0.00E+00	0.00E+00	1.35E-02	0.00E+00	0.00E+00	0.00E+00	1.53E-02
Pyrene	Short-tailed Shrew	3.04E-04	0.00E+00	1.32E-08	0.00E+00	1.66E+00	0.00E+00	0.00E+00	0.00E+00	1.66E+00

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Short-tailed Shrew	2.69E+01	0.00E+00	1.58E-04	0.00E+00	4.55E+01	0.00E+00	0.00E+00	0.00E+00	7.25E+01
Antimony	Short-tailed Shrew	1.99E-03	0.00E+00	0.00E+00	0.00E+00	3.37E-03	0.00E+00	0.00E+00	0.00E+00	5.36E-03
Arsenic	Short-tailed Shrew	1.02E-01	0.00E+00	1.09E-05	0.00E+00	8.60E-02	0.00E+00	0.00E+00	0.00E+00	1.88E-01
Barium	Short-tailed Shrew	1.61E+00	0.00E+00	5.94E-04	0.00E+00	2.73E+00	0.00E+00	0.00E+00	0.00E+00	4.35E+00
Beryllium	Short-tailed Shrew	3.16E-03	0.00E+00	0.00E+00	0.00E+00	5.35E-03	0.00E+00	0.00E+00	0.00E+00	8.51E-03
Cadmium	Short-tailed Shrew	1.83E-02	0.00E+00	0.00E+00	0.00E+00	1.35E-01	0.00E+00	0.00E+00	0.00E+00	1.53E-01
Chromium	Short-tailed Shrew	2.69E-02	0.00E+00	0.00E+00	0.00E+00	2.07E-03	0.00E+00	0.00E+00	0.00E+00	2.90E-02
Cobalt	Short-tailed Shrew	1.87E-02	0.00E+00	0.00E+00	0.00E+00	3.17E-02	0.00E+00	0.00E+00	0.00E+00	5.04E-02
Copper	Short-tailed Shrew	2.34E-01	0.00E+00	1.06E-05	0.00E+00	7.20E-02	0.00E+00	0.00E+00	0.00E+00	3.06E-01
Iron	Short-tailed Shrew	8.89E+01	0.00E+00	0.00E+00	0.00E+00	1.50E+02	0.00E+00	0.00E+00	0.00E+00	2.39E+02
Lead	Short-tailed Shrew	9.87E-01	0.00E+00	0.00E+00	0.00E+00	2.28E-01	0.00E+00	0.00E+00	0.00E+00	1.22E+00
Manganese	Short-tailed Shrew	5.27E-01	0.00E+00	1.98E-04	0.00E+00	8.91E-01	0.00E+00	0.00E+00	0.00E+00	1.42E+00
Mercury	Short-tailed Shrew	1.93E-02	0.00E+00	5.61E-07	0.00E+00	5.94E-03	0.00E+00	0.00E+00	0.00E+00	2.52E-02
Methyl Mercury	Short-tailed Shrew	3.10E-07	0.00E+00	3.10E-10	0.00E+00	2.03E-05	0.00E+00	0.00E+00	0.00E+00	2.06E-05
Nickel	Short-tailed Shrew	1.02E-01	0.00E+00	1.16E-05	0.00E+00	1.57E-02	0.00E+00	0.00E+00	0.00E+00	1.17E-01
Selenium	Short-tailed Shrew	2.81E-03	0.00E+00	0.00E+00	0.00E+00	4.75E-03	0.00E+00	0.00E+00	0.00E+00	7.56E-03
Silver	Short-tailed Shrew	1.13E-03	0.00E+00	0.00E+00	0.00E+00	1.92E-03	0.00E+00	0.00E+00	0.00E+00	3.06E-03
Thallium	Short-tailed Shrew	2.34E-03	0.00E+00	0.00E+00	0.00E+00	3.96E-03	0.00E+00	0.00E+00	0.00E+00	6.30E-03
Vanadium	Short-tailed Shrew	5.03E-02	0.00E+00	9.57E-06	0.00E+00	8.51E-02	0.00E+00	0.00E+00	0.00E+00	1.35E-01
Zinc	Short-tailed Shrew	1.61E+00	0.00E+00	1.22E-04	0.00E+00	6.96E+00	0.00E+00	0.00E+00	0.00E+00	8.57E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	White-footed Mouse	1.09E-08	0.00E+00	3.70E-11	0.00E+00	0.00E+00	4.90E-11	0.00E+00	0.00E+00	1.10E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	White-footed Mouse	1.02E-07	0.00E+00	3.43E-11	0.00E+00	0.00E+00	3.42E-10	0.00E+00	0.00E+00	1.02E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	White-footed Mouse	7.48E-09	0.00E+00	4.62E-12	0.00E+00	0.00E+00	2.32E-11	0.00E+00	0.00E+00	7.51E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	White-footed Mouse	1.50E-08	0.00E+00	7.92E-12	0.00E+00	0.00E+00	2.17E-10	0.00E+00	0.00E+00	1.52E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	White-footed Mouse	3.13E-10	0.00E+00	1.12E-11	0.00E+00	0.00E+00	3.44E-11	0.00E+00	0.00E+00	3.58E-10
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	7.48E-10	0.00E+00	7.26E-12	0.00E+00	0.00E+00	1.61E-11	0.00E+00	0.00E+00	7.71E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	1.56E-10	0.00E+00	4.88E-12	0.00E+00	0.00E+00	1.33E-11	0.00E+00	0.00E+00	1.75E-10
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	9.52E-10	0.00E+00	7.92E-12	0.00E+00	0.00E+00	5.24E-11	0.00E+00	0.00E+00	1.01E-09
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	4.35E-10	0.00E+00	5.35E-12	0.00E+00	0.00E+00	1.46E-11	0.00E+00	0.00E+00	4.55E-10
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	2.45E-11	0.00E+00	9.24E-12	0.00E+00	0.00E+00	4.28E-12	0.00E+00	0.00E+00	3.80E-11
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	4.42E-10	0.00E+00	1.25E-11	0.00E+00	0.00E+00	1.72E-11	0.00E+00	0.00E+00	4.72E-10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	White-footed Mouse	8.16E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.49E-11	0.00E+00	0.00E+00	8.61E-10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	White-footed Mouse	1.36E-10	0.00E+00	2.05E-11	0.00E+00	0.00E+00	3.54E-11	0.00E+00	0.00E+00	1.92E-10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	8.16E-10	0.00E+00	9.24E-12	0.00E+00	0.00E+00	1.55E-10	0.00E+00	0.00E+00	9.80E-10
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	White-footed Mouse	1.16E-09	0.00E+00	6.60E-12	0.00E+00	0.00E+00	5.20E-10	0.00E+00	0.00E+00	1.68E-09
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	White-footed Mouse	1.29E-10	0.00E+00	6.34E-12	0.00E+00	0.00E+00	2.91E-11	0.00E+00	0.00E+00	1.65E-10
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	White-footed Mouse	5.58E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-11	0.00E+00	0.00E+00	7.14E-11

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	White-footed Mouse	1.97E-02	0.00E+00	4.75E-04	0.00E+00	0.00E+00	4.73E-01	0.00E+00	0.00E+00	4.93E-01
Gasoline Range Organics	White-footed Mouse	7.48E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-01	0.00E+00	0.00E+00	1.02E-01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	White-footed Mouse	1.70E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-05	0.00E+00	0.00E+00	2.04E-05
Acenaphthylene	White-footed Mouse	1.29E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-05	0.00E+00	0.00E+00	1.55E-05
Anthracene	White-footed Mouse	3.06E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-05	0.00E+00	0.00E+00	1.84E-05
Benzo(a)anthracene	White-footed Mouse	1.43E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-05	0.00E+00	0.00E+00	2.87E-05
Benzo(a)pyrene	White-footed Mouse	9.52E-06	0.00E+00	3.23E-08	0.00E+00	0.00E+00	4.76E-06	0.00E+00	0.00E+00	1.43E-05
Benzo(b)fluoranthene	White-footed Mouse	1.09E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.49E-06	0.00E+00	0.00E+00	1.64E-05
Benzo(g,h,i)perylene	White-footed Mouse	7.48E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-06	0.00E+00	0.00E+00	9.76E-06
Benzo(k)fluoranthene	White-footed Mouse	8.84E-06	0.00E+00	2.64E-08	0.00E+00	0.00E+00	4.46E-06	0.00E+00	0.00E+00	1.33E-05
Chrysene	White-footed Mouse	2.38E-05	0.00E+00	7.92E-08	0.00E+00	0.00E+00	2.23E-05	0.00E+00	0.00E+00	4.61E-05
Dibenzo(a,h)anthracene	White-footed Mouse	2.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.96E-07	0.00E+00	0.00E+00	2.87E-06
Dibenzofuran	White-footed Mouse	8.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.12E-05	0.00E+00	0.00E+00	8.00E-05
Dimethyl phthalate	White-footed Mouse	3.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02	0.00E+00	0.00E+00	1.05E-02
Fluoranthene	White-footed Mouse	1.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.36E-05	0.00E+00	0.00E+00	5.13E-05
Fluorene	White-footed Mouse	1.77E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-05	0.00E+00	0.00E+00	1.49E-05
Indeno(1,2,3-cd)pyrene	White-footed Mouse	3.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.56E-07	0.00E+00	0.00E+00	4.63E-06
2-Methylnaphthalene	White-footed Mouse	1.56E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E-04	0.00E+00	0.00E+00	1.93E-04
Naphthalene	White-footed Mouse	9.52E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-03	0.00E+00	0.00E+00	2.38E-03
Phenanthrene	White-footed Mouse	1.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E-04	0.00E+00	0.00E+00	6.22E-04
Pyrene	White-footed Mouse	1.77E-05	0.00E+00	2.64E-08	0.00E+00	0.00E+00	5.22E-05	0.00E+00	0.00E+00	6.99E-05

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	White-footed Mouse	1.56E+00	0.00E+00	3.17E-04	0.00E+00	0.00E+00	3.13E-01	0.00E+00	0.00E+00	1.88E+00
Antimony	White-footed Mouse	1.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-03	0.00E+00	0.00E+00	1.27E-03
Arsenic	White-footed Mouse	5.91E-03	0.00E+00	2.18E-05	0.00E+00	0.00E+00	1.06E-02	0.00E+00	0.00E+00	1.66E-02
Barium	White-footed Mouse	9.38E-02	0.00E+00	1.19E-03	0.00E+00	0.00E+00	7.04E-01	0.00E+00	0.00E+00	7.99E-01
Beryllium	White-footed Mouse	1.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.18E-05	0.00E+00	0.00E+00	2.75E-04
Cadmium	White-footed Mouse	1.06E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-02	0.00E+00	0.00E+00	2.04E-02
Chromium	White-footed Mouse	1.56E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.87E-04	0.00E+00	0.00E+00	2.15E-03
Cobalt	White-footed Mouse	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-02	0.00E+00	0.00E+00	2.28E-02
Copper	White-footed Mouse	1.36E-02	0.00E+00	2.11E-05	0.00E+00	0.00E+00	2.72E-01	0.00E+00	0.00E+00	2.86E-01
Iron	White-footed Mouse	5.17E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+02	0.00E+00	0.00E+00	1.09E+02
Lead	White-footed Mouse	5.74E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.29E-01	0.00E+00	0.00E+00	1.87E-01
Manganese	White-footed Mouse	3.06E-02	0.00E+00	3.96E-04	0.00E+00	0.00E+00	6.12E-01	0.00E+00	0.00E+00	6.43E-01
Mercury	White-footed Mouse	1.12E-03	0.00E+00	1.12E-06	0.00E+00	0.00E+00	2.10E-03	0.00E+00	0.00E+00	3.23E-03
Methyl Mercury	White-footed Mouse	1.80E-08	0.00E+00	6.20E-10	0.00E+00	0.00E+00	1.23E-07	0.00E+00	0.00E+00	1.42E-07
Nickel	White-footed Mouse	5.92E-03	0.00E+00	2.31E-05	0.00E+00	0.00E+00	9.47E-03	0.00E+00	0.00E+00	1.54E-02
Selenium	White-footed Mouse	1.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-04	0.00E+00	0.00E+00	2.94E-04
Silver	White-footed Mouse	6.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-03	0.00E+00	0.00E+00	1.39E-03
Thallium	White-footed Mouse	1.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-05	0.00E+00	0.00E+00	1.63E-04
Vanadium	White-footed Mouse	2.92E-03	0.00E+00	1.91E-05	0.00E+00	0.00E+00	5.85E-02	0.00E+00	0.00E+00	6.14E-02
Zinc	White-footed Mouse	9.38E-02	0.00E+00	2.44E-04	0.00E+00	0.00E+00	5.63E-12	0.00E+00	0.00E+00	9.41E-02

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Meadow Vole	1.92E-08	0.00E+00	3.36E-11	0.00E+00	1.00E-08	3.60E-11	0.00E+00	0.00E+00	2.93E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Meadow Vole	1.80E-07	0.00E+00	3.12E-11	0.00E+00	7.13E-08	2.51E-10	0.00E+00	0.00E+00	2.52E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Meadow Vole	1.32E-08	0.00E+00	4.20E-12	0.00E+00	4.68E-09	1.71E-11	0.00E+00	0.00E+00	1.79E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Meadow Vole	2.64E-08	0.00E+00	7.20E-12	0.00E+00	4.46E-08	1.60E-10	0.00E+00	0.00E+00	7.11E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Meadow Vole	5.52E-10	0.00E+00	1.02E-11	0.00E+00	7.13E-09	2.53E-11	0.00E+00	0.00E+00	7.72E-09
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	1.32E-09	0.00E+00	6.60E-12	0.00E+00	3.33E-09	1.18E-11	0.00E+00	0.00E+00	4.67E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	2.76E-10	0.00E+00	4.44E-12	0.00E+00	2.82E-09	9.78E-12	0.00E+00	0.00E+00	3.11E-09
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	1.68E-09	0.00E+00	7.20E-12	0.00E+00	1.05E-08	3.85E-11	0.00E+00	0.00E+00	1.22E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	7.68E-10	0.00E+00	4.86E-12	0.00E+00	3.04E-09	1.07E-11	0.00E+00	0.00E+00	3.82E-09
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	4.32E-11	0.00E+00	8.40E-12	0.00E+00	9.00E-10	3.15E-12	0.00E+00	0.00E+00	9.55E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	7.80E-10	0.00E+00	1.14E-11	0.00E+00	3.58E-09	1.27E-11	0.00E+00	0.00E+00	4.38E-09
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Meadow Vole	1.44E-09	0.00E+00	0.00E+00	0.00E+00	9.60E-09	3.30E-11	0.00E+00	0.00E+00	1.11E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Meadow Vole	2.40E-10	0.00E+00	1.86E-11	0.00E+00	7.30E-09	2.60E-11	0.00E+00	0.00E+00	7.58E-09
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	1.44E-09	0.00E+00	8.40E-12	0.00E+00	3.21E-08	1.14E-10	0.00E+00	0.00E+00	3.37E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Meadow Vole	2.04E-09	0.00E+00	6.00E-12	0.00E+00	1.08E-07	3.83E-10	0.00E+00	0.00E+00	1.10E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Meadow Vole	2.28E-10	0.00E+00	5.76E-12	0.00E+00	6.03E-09	2.14E-11	0.00E+00	0.00E+00	6.29E-09
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Meadow Vole	9.84E-11	0.00E+00	0.00E+00	0.00E+00	3.26E-09	1.15E-11	0.00E+00	0.00E+00	3.37E-09

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Meadow Vole	3.48E-02	0.00E+00	4.32E-04	0.00E+00	2.61E+01	3.48E-01	0.00E+00	0.00E+00	2.65E+01
Gasoline Range Organics	Meadow Vole	1.32E-03	0.00E+00	0.00E+00	0.00E+00	8.53E-02	7.43E-02	0.00E+00	0.00E+00	1.61E-01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Meadow Vole	3.00E-06	0.00E+00	0.00E+00	0.00E+00	6.98E-03	1.38E-05	0.00E+00	0.00E+00	7.00E-03
Acenaphthylene	Meadow Vole	2.28E-06	0.00E+00	0.00E+00	0.00E+00	5.31E-03	1.05E-05	0.00E+00	0.00E+00	5.32E-03
Anthracene	Meadow Vole	5.40E-06	0.00E+00	0.00E+00	0.00E+00	3.90E-02	1.13E-05	0.00E+00	0.00E+00	3.90E-02
Benzo(a)anthracene	Meadow Vole	2.52E-05	0.00E+00	0.00E+00	0.00E+00	1.58E-05	1.06E-05	0.00E+00	0.00E+00	5.16E-05
Benzo(a)pyrene	Meadow Vole	1.68E-05	0.00E+00	2.94E-08	0.00E+00	2.45E-05	3.50E-06	0.00E+00	0.00E+00	4.48E-05
Benzo(b)fluoranthene	Meadow Vole	1.92E-05	0.00E+00	0.00E+00	0.00E+00	2.80E-05	4.04E-06	0.00E+00	0.00E+00	5.12E-05
Benzo(g,h,i)perylene	Meadow Vole	1.32E-05	0.00E+00	0.00E+00	0.00E+00	4.81E+00	1.68E-06	0.00E+00	0.00E+00	4.81E+00
Benzo(k)fluoranthene	Meadow Vole	1.56E-05	0.00E+00	2.40E-08	0.00E+00	2.60E-05	3.28E-06	0.00E+00	0.00E+00	4.49E-05
Chrysene	Meadow Vole	4.20E-05	0.00E+00	7.20E-08	0.00E+00	3.50E-05	1.64E-05	0.00E+00	0.00E+00	9.34E-05
Dibenzo(a,h)anthracene	Meadow Vole	3.84E-06	0.00E+00	0.00E+00	0.00E+00	5.60E-06	5.12E-07	0.00E+00	0.00E+00	9.95E-06
Dibenzofuran	Meadow Vole	1.56E-05	0.00E+00	0.00E+00	0.00E+00	5.50E-02	5.23E-05	0.00E+00	0.00E+00	5.50E-02
Dimethyl phthalate	Meadow Vole	6.72E-05	0.00E+00	0.00E+00	0.00E+00	8.40E-05	7.66E-03	0.00E+00	0.00E+00	7.81E-03
Fluoranthene	Meadow Vole	3.12E-05	0.00E+00	0.00E+00	0.00E+00	8.43E-01	2.47E-05	0.00E+00	0.00E+00	8.43E-01
Fluorene	Meadow Vole	3.12E-06	0.00E+00	0.00E+00	0.00E+00	1.23E-02	9.69E-06	0.00E+00	0.00E+00	1.23E-02
Indeno(1,2,3-cd)pyrene	Meadow Vole	6.84E-06	0.00E+00	0.00E+00	0.00E+00	1.14E-05	5.56E-07	0.00E+00	0.00E+00	1.88E-05
2-Methylnaphthalene	Meadow Vole	2.76E-05	0.00E+00	0.00E+00	0.00E+00	5.96E-02	1.31E-04	0.00E+00	0.00E+00	5.97E-02
Naphthalene	Meadow Vole	1.68E-04	0.00E+00	0.00E+00	0.00E+00	1.26E-01	1.68E-03	0.00E+00	0.00E+00	1.28E-01
Phenanthrene	Meadow Vole	1.80E-04	0.00E+00	0.00E+00	0.00E+00	3.75E-03	3.83E-04	0.00E+00	0.00E+00	4.31E-03
Pyrene	Meadow Vole	3.12E-05	0.00E+00	2.40E-08	0.00E+00	4.61E-01	3.84E-05	0.00E+00	0.00E+00	4.61E-01

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Meadow Vole	2.76E+00	0.00E+00	2.88E-04	0.00E+00	1.27E+01	2.30E-01	0.00E+00	0.00E+00	1.56E+01
Antimony	Meadow Vole	2.04E-04	0.00E+00	0.00E+00	0.00E+00	9.35E-04	8.50E-04	0.00E+00	0.00E+00	1.99E-03
Arsenic	Meadow Vole	1.04E-02	0.00E+00	1.98E-05	0.00E+00	2.39E-02	7.82E-03	0.00E+00	0.00E+00	4.22E-02
Barium	Meadow Vole	1.66E-01	0.00E+00	1.08E-03	0.00E+00	7.59E-01	5.18E-01	0.00E+00	0.00E+00	1.44E+00
Beryllium	Meadow Vole	3.24E-04	0.00E+00	0.00E+00	0.00E+00	1.49E-03	6.75E-05	0.00E+00	0.00E+00	1.88E-03
Cadmium	Meadow Vole	1.87E-03	0.00E+00	0.00E+00	0.00E+00	3.74E-02	1.42E-02	0.00E+00	0.00E+00	5.35E-02
Chromium	Meadow Vole	2.76E-03	0.00E+00	0.00E+00	0.00E+00	5.75E-04	4.31E-04	0.00E+00	0.00E+00	3.77E-03
Cobalt	Meadow Vole	1.92E-03	0.00E+00	0.00E+00	0.00E+00	8.80E-03	1.60E-02	0.00E+00	0.00E+00	2.67E-02
Copper	Meadow Vole	2.40E-02	0.00E+00	1.92E-05	0.00E+00	2.00E-02	2.00E-01	0.00E+00	0.00E+00	2.44E-01
Iron	Meadow Vole	9.12E+00	0.00E+00	0.00E+00	0.00E+00	4.18E+01	7.60E+01	0.00E+00	0.00E+00	1.27E+02
Lead	Meadow Vole	1.01E-01	0.00E+00	0.00E+00	0.00E+00	6.33E-02	9.50E-02	0.00E+00	0.00E+00	2.60E-01
Manganese	Meadow Vole	5.40E-02	0.00E+00	3.60E-04	0.00E+00	2.48E-01	4.50E-01	0.00E+00	0.00E+00	7.52E-01
Mercury	Meadow Vole	1.98E-03	0.00E+00	1.02E-06	0.00E+00	1.65E-03	1.55E-03	0.00E+00	0.00E+00	5.18E-03
Methyl Mercury	Meadow Vole	3.18E-08	0.00E+00	5.64E-10	0.00E+00	5.63E-06	9.08E-08	0.00E+00	0.00E+00	5.75E-06
Nickel	Meadow Vole	1.04E-02	0.00E+00	2.10E-05	0.00E+00	4.35E-03	6.96E-03	0.00E+00	0.00E+00	2.18E-02
Selenium	Meadow Vole	2.88E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-03	9.60E-05	0.00E+00	0.00E+00	1.70E-03
Silver	Meadow Vole	1.16E-04	0.00E+00	0.00E+00	0.00E+00	5.34E-04	9.70E-04	0.00E+00	0.00E+00	1.62E-03
Thallium	Meadow Vole	2.40E-04	0.00E+00	0.00E+00	0.00E+00	1.10E-03	2.00E-05	0.00E+00	0.00E+00	1.36E-03
Vanadium	Meadow Vole	5.16E-03	0.00E+00	1.74E-05	0.00E+00	2.37E-02	4.30E-02	0.00E+00	0.00E+00	7.18E-02
Zinc	Meadow Vole	1.66E-01	0.00E+00	2.22E-04	0.00E+00	1.93E+00	4.14E-12	0.00E+00	0.00E+00	2.10E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Eastern Cottontail Rabbit	2.38E-06	0.00E+00	6.50E-10	0.00E+00	0.00E+00	3.41E-09	0.00E+00	0.00E+00	2.39E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Eastern Cottontail Rabbit	2.24E-05	0.00E+00	6.03E-10	0.00E+00	0.00E+00	2.38E-08	0.00E+00	0.00E+00	2.24E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Eastern Cottontail Rabbit	1.64E-06	0.00E+00	8.12E-11	0.00E+00	0.00E+00	1.62E-09	0.00E+00	0.00E+00	1.64E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Eastern Cottontail Rabbit	3.28E-06	0.00E+00	1.39E-10	0.00E+00	0.00E+00	1.51E-08	0.00E+00	0.00E+00	3.29E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Eastern Cottontail Rabbit	6.85E-08	0.00E+00	1.97E-10	0.00E+00	0.00E+00	2.40E-09	0.00E+00	0.00E+00	7.11E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	1.64E-07	0.00E+00	1.28E-10	0.00E+00	0.00E+00	1.12E-09	0.00E+00	0.00E+00	1.65E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	3.43E-08	0.00E+00	8.58E-11	0.00E+00	0.00E+00	9.27E-10	0.00E+00	0.00E+00	3.53E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	2.09E-07	0.00E+00	1.39E-10	0.00E+00	0.00E+00	3.65E-09	0.00E+00	0.00E+00	2.12E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	9.54E-08	0.00E+00	9.40E-11	0.00E+00	0.00E+00	1.02E-09	0.00E+00	0.00E+00	9.65E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	5.36E-09	0.00E+00	1.62E-10	0.00E+00	0.00E+00	2.99E-10	0.00E+00	0.00E+00	5.83E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	9.69E-08	0.00E+00	2.20E-10	0.00E+00	0.00E+00	1.20E-09	0.00E+00	0.00E+00	9.83E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Eastern Cottontail Rabbit	1.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-09	0.00E+00	0.00E+00	1.82E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Eastern Cottontail Rabbit	2.98E-08	0.00E+00	3.60E-10	0.00E+00	0.00E+00	2.46E-09	0.00E+00	0.00E+00	3.26E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	1.79E-07	0.00E+00	1.62E-10	0.00E+00	0.00E+00	1.08E-08	0.00E+00	0.00E+00	1.90E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Eastern Cottontail Rabbit	2.53E-07	0.00E+00	1.16E-10	0.00E+00	0.00E+00	3.63E-08	0.00E+00	0.00E+00	2.90E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Eastern Cottontail Rabbit	2.83E-08	0.00E+00	1.11E-10	0.00E+00	0.00E+00	2.03E-09	0.00E+00	0.00E+00	3.04E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Eastern Cottontail Rabbit	1.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-09	0.00E+00	0.00E+00	1.33E-08

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Eastern Cottontail Rabbit	4.32E+00	0.00E+00	8.35E-03	0.00E+00	0.00E+00	3.30E+01	0.00E+00	0.00E+00	3.73E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Eastern Cottontail Rabbit	3.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-03	0.00E+00	0.00E+00	1.68E-03
Acenaphthylene	Eastern Cottontail Rabbit	2.83E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.91E-04	0.00E+00	0.00E+00	1.27E-03
Anthracene	Eastern Cottontail Rabbit	6.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.74E-03
Benzo(a)anthracene	Eastern Cottontail Rabbit	3.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-03	0.00E+00	0.00E+00	4.13E-03
Benzo(a)pyrene	Eastern Cottontail Rabbit	2.09E-03	0.00E+00	5.68E-07	0.00E+00	0.00E+00	3.32E-04	0.00E+00	0.00E+00	2.42E-03
Benzo(b)fluoranthene	Eastern Cottontail Rabbit	2.38E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.83E-04	0.00E+00	0.00E+00	2.77E-03
Benzo(g,h,i)perylene	Eastern Cottontail Rabbit	1.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	0.00E+00	0.00E+00	1.80E-03
Benzo(k)fluoranthene	Eastern Cottontail Rabbit	1.94E-03	0.00E+00	4.64E-07	0.00E+00	0.00E+00	3.11E-04	0.00E+00	0.00E+00	2.25E-03
Chrysene	Eastern Cottontail Rabbit	5.22E-03	0.00E+00	1.39E-06	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	6.77E-03
Dibenzo(a,h)anthracene	Eastern Cottontail Rabbit	4.77E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.85E-05	0.00E+00	0.00E+00	5.25E-04
Dibenzofuran	Eastern Cottontail Rabbit	1.94E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-03	0.00E+00	0.00E+00	6.90E-03
Dimethyl phthalate	Eastern Cottontail Rabbit	8.34E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.26E-01	0.00E+00	0.00E+00	7.34E-01
Fluoranthene	Eastern Cottontail Rabbit	3.87E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-03	0.00E+00	0.00E+00	6.22E-03
Fluorene	Eastern Cottontail Rabbit	3.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.18E-04	0.00E+00	0.00E+00	1.31E-03
Indeno(1,2,3-cd)pyrene	Eastern Cottontail Rabbit	8.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.27E-05	0.00E+00	0.00E+00	9.02E-04
2-Methylnaphthalene	Eastern Cottontail Rabbit	3.43E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-02	0.00E+00	0.00E+00	1.58E-02
Naphthalene	Eastern Cottontail Rabbit	2.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-01	0.00E+00	0.00E+00	1.80E-01
Phenanthrene	Eastern Cottontail Rabbit	2.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.63E-02	0.00E+00	0.00E+00	5.86E-02
Pyrene	Eastern Cottontail Rabbit	3.87E-03	0.00E+00	4.64E-07	0.00E+00	0.00E+00	3.64E-03	0.00E+00	0.00E+00	7.51E-03

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Eastern Cottontail Rabbit	3.43E+02	0.00E+00	5.57E-03	0.00E+00	0.00E+00	2.18E+01	0.00E+00	0.00E+00	3.65E+02
Antimony	Eastern Cottontail Rabbit	2.53E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.06E-02	0.00E+00	0.00E+00	1.06E-01
Arsenic	Eastern Cottontail Rabbit	1.29E+00	0.00E+00	3.83E-04	0.00E+00	0.00E+00	7.41E-01	0.00E+00	0.00E+00	2.04E+00
Barium	Eastern Cottontail Rabbit	2.06E+01	0.00E+00	2.09E-02	0.00E+00	0.00E+00	4.91E+01	0.00E+00	0.00E+00	6.96E+01
Beryllium	Eastern Cottontail Rabbit	4.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.40E-03	0.00E+00	0.00E+00	4.66E-02
Cadmium	Eastern Cottontail Rabbit	2.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E+00	0.00E+00	0.00E+00	1.58E+00
Chromium	Eastern Cottontail Rabbit	3.43E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.09E-02	0.00E+00	0.00E+00	3.84E-01
Cobalt	Eastern Cottontail Rabbit	2.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E+00	0.00E+00	0.00E+00	1.76E+00
Copper	Eastern Cottontail Rabbit	2.98E+00	0.00E+00	3.71E-04	0.00E+00	0.00E+00	1.90E+01	0.00E+00	0.00E+00	2.19E+01
Iron	Eastern Cottontail Rabbit	1.13E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.20E+03	0.00E+00	0.00E+00	8.34E+03
Lead	Eastern Cottontail Rabbit	1.26E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.00E+00	0.00E+00	0.00E+00	2.16E+01
Manganese	Eastern Cottontail Rabbit	6.71E+00	0.00E+00	6.96E-03	0.00E+00	0.00E+00	4.27E+01	0.00E+00	0.00E+00	4.94E+01
Mercury	Eastern Cottontail Rabbit	2.46E-01	0.00E+00	1.97E-05	0.00E+00	0.00E+00	1.47E-01	0.00E+00	0.00E+00	3.93E-01
Methyl Mercury	Eastern Cottontail Rabbit	3.95E-06	0.00E+00	1.09E-08	0.00E+00	0.00E+00	8.60E-06	0.00E+00	0.00E+00	1.26E-05
Nickel	Eastern Cottontail Rabbit	1.30E+00	0.00E+00	4.06E-04	0.00E+00	0.00E+00	6.60E-01	0.00E+00	0.00E+00	1.96E+00
Selenium	Eastern Cottontail Rabbit	3.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.10E-03	0.00E+00	0.00E+00	4.49E-02
Silver	Eastern Cottontail Rabbit	1.45E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.20E-02	0.00E+00	0.00E+00	1.06E-01
Thallium	Eastern Cottontail Rabbit	2.98E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-03	0.00E+00	0.00E+00	3.17E-02
Vanadium	Eastern Cottontail Rabbit	6.41E-01	0.00E+00	3.36E-04	0.00E+00	0.00E+00	4.08E+00	0.00E+00	0.00E+00	4.72E+00
Zinc	Eastern Cottontail Rabbit	2.06E+01	0.00E+00	4.29E-03	0.00E+00	0.00E+00	3.92E-10	0.00E+00	0.00E+00	2.06E+01

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red Fox	2.02E-06	0.00E+00	2.13E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.31E-07	2.95E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red Fox	1.89E-05	0.00E+00	1.98E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-06	2.76E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red Fox	1.39E-06	0.00E+00	2.66E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-07	2.02E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red Fox	2.77E-06	0.00E+00	4.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-06	4.11E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red Fox	5.80E-08	0.00E+00	6.46E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.87E-08	9.73E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	1.39E-07	0.00E+00	4.18E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.87E-08	2.08E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	2.90E-08	0.00E+00	2.81E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-08	4.73E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	1.76E-07	0.00E+00	4.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.83E-08	2.75E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	8.06E-08	0.00E+00	3.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-08	1.23E-07
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red Fox	4.54E-09	0.00E+00	5.32E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.68E-09	8.75E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	8.19E-08	0.00E+00	7.22E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-08	1.26E-07
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	1.51E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.52E-08	2.36E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red Fox	2.52E-08	0.00E+00	1.18E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.42E-08	5.06E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	1.51E-07	0.00E+00	5.32E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-07	2.76E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	2.14E-07	0.00E+00	3.80E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E-07	4.99E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red Fox	2.39E-08	0.00E+00	3.65E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-08	4.57E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red Fox	1.03E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-08	2.07E-08

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Red Fox	3.65E+00	0.00E+00	2.74E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.58E+01	5.94E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Red Fox	3.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02	1.22E-02
Acenaphthylene	Red Fox	2.39E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-03	9.28E-03
Anthracene	Red Fox	5.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-02	6.42E-02
Benzo(a)anthracene	Red Fox	2.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-03	4.23E-03
Benzo(a)pyrene	Red Fox	1.76E-03	0.00E+00	1.86E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.59E-04	2.72E-03
Benzo(b)fluoranthene	Red Fox	2.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-03	3.11E-03
Benzo(g,h,i)perylene	Red Fox	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.78E+00	7.78E+00
Benzo(k)fluoranthene	Red Fox	1.64E-03	0.00E+00	1.52E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.97E-04	2.54E-03
Chrysene	Red Fox	4.41E-03	0.00E+00	4.56E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-03	7.03E-03
Dibenzo(a,h)anthracene	Red Fox	4.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-04	6.12E-04
Dibenzofuran	Red Fox	1.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.14E-02	9.30E-02
Dimethyl phthalate	Red Fox	7.06E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-01	2.72E-01
Fluoranthene	Red Fox	3.28E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E+00	1.37E+00
Fluorene	Red Fox	3.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-02	2.07E-02
Indeno(1,2,3-cd)pyrene	Red Fox	7.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.63E-04	1.08E-03
2-Methylnaphthalene	Red Fox	2.90E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-01	1.05E-01
Naphthalene	Red Fox	1.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-01	2.87E-01
Phenanthrene	Red Fox	1.89E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-02	4.66E-02
Pyrene	Red Fox	3.28E-03	0.00E+00	1.52E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-01	7.51E-01

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Red Fox	2.90E+02	0.00E+00	1.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E+02	4.49E+02
Antimony	Red Fox	2.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.02E-02	6.17E-02
Arsenic	Red Fox	1.09E+00	0.00E+00	1.25E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.02E-01	1.90E+00
Barium	Red Fox	1.74E+01	0.00E+00	6.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E+01	4.42E+01
Beryllium	Red Fox	3.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-02	5.41E-02
Cadmium	Red Fox	1.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.34E-01	8.31E-01
Chromium	Red Fox	2.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-01	4.37E-01
Cobalt	Red Fox	2.02E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.52E-01	8.53E-01
Copper	Red Fox	2.52E+00	0.00E+00	1.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E+00	1.05E+01
Iron	Red Fox	9.58E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E+03	4.05E+03
Lead	Red Fox	1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E+00	1.88E+01
Manganese	Red Fox	5.67E+00	0.00E+00	2.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.83E+01	2.40E+01
Mercury	Red Fox	2.08E-01	0.00E+00	6.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-01	3.58E-01
Methyl Mercury	Red Fox	3.34E-06	0.00E+00	3.57E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-05	1.71E-05
Nickel	Red Fox	1.10E+00	0.00E+00	1.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.42E-01	1.84E+00
Selenium	Red Fox	3.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-02	4.94E-02
Silver	Red Fox	1.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E-02	5.17E-02
Thallium	Red Fox	2.52E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-02	3.91E-02
Vanadium	Red Fox	5.42E-01	0.00E+00	1.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+00	2.29E+00
Zinc	Red Fox	1.74E+01	0.00E+00	1.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E+01	2.84E+01

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Raccoon	0.00E+00	0.00E+00	2.14E-09	0.00E+00	0.00E+00	0.00E+00	2.25E-08	0.00E+00	2.46E-08
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Raccoon	0.00E+00	0.00E+00	1.99E-09	0.00E+00	0.00E+00	0.00E+00	1.57E-08	0.00E+00	1.76E-08
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Raccoon	0.00E+00	0.00E+00	2.68E-10	0.00E+00	0.00E+00	0.00E+00	1.93E-09	0.00E+00	2.20E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Raccoon	0.00E+00	5.11E-08	4.60E-10	2.71E-05	0.00E+00	0.00E+00	1.54E-08	0.00E+00	2.72E-05
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Raccoon	0.00E+00	0.00E+00	6.51E-10	0.00E+00	0.00E+00	0.00E+00	1.66E-07	0.00E+00	1.67E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	0.00E+00	0.00E+00	4.21E-10	0.00E+00	0.00E+00	0.00E+00	2.10E-08	0.00E+00	2.14E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	0.00E+00	0.00E+00	2.83E-10	0.00E+00	0.00E+00	0.00E+00	5.76E-08	0.00E+00	5.79E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	0.00E+00	0.00E+00	4.60E-10	0.00E+00	0.00E+00	0.00E+00	5.72E-08	0.00E+00	5.77E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	0.00E+00	2.66E-09	3.10E-10	3.34E-05	0.00E+00	0.00E+00	2.44E-08	0.00E+00	3.35E-05
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Raccoon	0.00E+00	0.00E+00	5.36E-10	0.00E+00	0.00E+00	0.00E+00	2.21E-07	0.00E+00	2.22E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	0.00E+00	5.55E-09	7.28E-10	8.14E-05	0.00E+00	0.00E+00	6.67E-08	0.00E+00	8.14E-05
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Raccoon	0.00E+00	0.00E+00	1.19E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	0.00E+00	7.17E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	0.00E+00	0.00E+00	5.36E-10	0.00E+00	0.00E+00	0.00E+00	2.35E-07	0.00E+00	2.36E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Raccoon	0.00E+00	0.00E+00	3.83E-10	0.00E+00	0.00E+00	0.00E+00	4.01E-07	0.00E+00	4.02E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Raccoon	0.00E+00	0.00E+00	3.68E-10	0.00E+00	0.00E+00	0.00E+00	1.93E-07	0.00E+00	1.93E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Raccoon	0.00E+00	1.20E-01	2.76E-02	2.31E+01	0.00E+00	0.00E+00	7.01E-01	0.00E+00	2.39E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	Raccoon	0.00E+00	0.00E+00	1.88E-06	0.00E+00	0.00E+00	0.00E+00	1.45E-04	0.00E+00	1.47E-04
Benzo(b)fluoranthene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	Raccoon	0.00E+00	0.00E+00	1.53E-06	0.00E+00	0.00E+00	0.00E+00	2.61E-04	0.00E+00	2.62E-04
Chrysene	Raccoon	0.00E+00	0.00E+00	4.60E-06	0.00E+00	0.00E+00	0.00E+00	3.56E-04	0.00E+00	3.60E-04
Dibenzo(a,h)anthracene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenzofuran	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dimethyl phthalate	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Methylnaphthalene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	Raccoon	0.00E+00	0.00E+00	1.53E-06	0.00E+00	0.00E+00	0.00E+00	1.19E-04	0.00E+00	1.20E-04

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Raccoon	0.00E+00	1.78E+02	1.84E-02	8.53E+02	0.00E+00	0.00E+00	7.68E-03	0.00E+00	1.03E+03
Antimony	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	Raccoon	0.00E+00	1.62E-01	1.26E-03	7.79E-01	0.00E+00	0.00E+00	2.23E-02	0.00E+00	9.64E-01
Barium	Raccoon	0.00E+00	6.22E+00	6.89E-02	2.99E+01	0.00E+00	0.00E+00	6.75E+00	0.00E+00	4.29E+01
Beryllium	Raccoon	0.00E+00	7.99E-03	0.00E+00	3.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.64E-02
Cadmium	Raccoon	0.00E+00	2.44E-02	0.00E+00	4.43E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.68E-01
Chromium	Raccoon	0.00E+00	1.80E-01	0.00E+00	3.74E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.54E-01
Cobalt	Raccoon	0.00E+00	1.62E-01	0.00E+00	7.79E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41E-01
Copper	Raccoon	0.00E+00	1.47E-01	1.23E-03	2.35E-01	0.00E+00	0.00E+00	1.35E-01	0.00E+00	5.17E-01
Iron	Raccoon	0.00E+00	2.22E+02	0.00E+00	1.07E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.29E+03
Lead	Raccoon	0.00E+00	1.78E-01	0.00E+00	5.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-01
Manganese	Raccoon	0.00E+00	2.20E+01	2.30E-02	1.06E+02	0.00E+00	0.00E+00	2.25E+00	0.00E+00	1.30E+02
Mercury	Raccoon	0.00E+00	2.89E-04	6.51E-05	1.05E-04	0.00E+00	0.00E+00	3.56E-02	0.00E+00	3.60E-02
Methyl Mercury	Raccoon	0.00E+00	8.44E-07	3.60E-08	2.16E-06	0.00E+00	0.00E+00	6.22E-05	0.00E+00	6.52E-05
Nickel	Raccoon	0.00E+00	3.11E-01	1.34E-03	1.49E+00	0.00E+00	0.00E+00	1.62E-02	0.00E+00	1.82E+00
Selenium	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	Raccoon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	Raccoon	0.00E+00	3.11E-01	1.11E-03	1.49E+00	0.00E+00	0.00E+00	1.09E-01	0.00E+00	1.91E+00
Zinc	Raccoon	0.00E+00	8.21E-01	1.42E-02	2.50E+00	0.00E+00	0.00E+00	4.51E+00	0.00E+00	7.85E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	White-tailed Deer	5.60E-06	0.00E+00	2.07E-08	0.00E+00	0.00E+00	2.51E-08	0.00E+00	0.00E+00	5.65E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	White-tailed Deer	5.25E-05	0.00E+00	1.92E-08	0.00E+00	0.00E+00	1.75E-07	0.00E+00	0.00E+00	5.27E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	White-tailed Deer	3.85E-06	0.00E+00	2.59E-09	0.00E+00	0.00E+00	1.19E-08	0.00E+00	0.00E+00	3.86E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	White-tailed Deer	7.70E-06	0.00E+00	4.44E-09	0.00E+00	0.00E+00	1.11E-07	0.00E+00	0.00E+00	7.82E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	White-tailed Deer	1.61E-07	0.00E+00	6.29E-09	0.00E+00	0.00E+00	1.76E-08	0.00E+00	0.00E+00	1.85E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	3.85E-07	0.00E+00	4.07E-09	0.00E+00	0.00E+00	8.23E-09	0.00E+00	0.00E+00	3.97E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	8.05E-08	0.00E+00	2.74E-09	0.00E+00	0.00E+00	6.80E-09	0.00E+00	0.00E+00	9.00E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	4.90E-07	0.00E+00	4.44E-09	0.00E+00	0.00E+00	2.68E-08	0.00E+00	0.00E+00	5.21E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	2.24E-07	0.00E+00	3.00E-09	0.00E+00	0.00E+00	7.46E-09	0.00E+00	0.00E+00	2.34E-07
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	1.26E-08	0.00E+00	5.18E-09	0.00E+00	0.00E+00	2.19E-09	0.00E+00	0.00E+00	2.00E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	2.28E-07	0.00E+00	7.03E-09	0.00E+00	0.00E+00	8.82E-09	0.00E+00	0.00E+00	2.43E-07
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	White-tailed Deer	4.20E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-08	0.00E+00	0.00E+00	4.43E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	White-tailed Deer	7.00E-08	0.00E+00	1.15E-08	0.00E+00	0.00E+00	1.81E-08	0.00E+00	0.00E+00	9.96E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	4.20E-07	0.00E+00	5.18E-09	0.00E+00	0.00E+00	7.93E-08	0.00E+00	0.00E+00	5.05E-07
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	White-tailed Deer	5.95E-07	0.00E+00	3.70E-09	0.00E+00	0.00E+00	2.66E-07	0.00E+00	0.00E+00	8.65E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	White-tailed Deer	6.65E-08	0.00E+00	3.55E-09	0.00E+00	0.00E+00	1.49E-08	0.00E+00	0.00E+00	8.49E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	White-tailed Deer	2.87E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.99E-09	0.00E+00	0.00E+00	3.67E-08

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	White-tailed Deer	1.02E+01	0.00E+00	2.66E-01	0.00E+00	0.00E+00	2.42E+02	0.00E+00	0.00E+00	2.53E+02
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	White-tailed Deer	8.75E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.57E-03	0.00E+00	0.00E+00	1.04E-02
Acenaphthylene	White-tailed Deer	6.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.27E-03	0.00E+00	0.00E+00	7.94E-03
Anthracene	White-tailed Deer	1.58E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.83E-03	0.00E+00	0.00E+00	9.41E-03
Benzo(a)anthracene	White-tailed Deer	7.35E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-03	0.00E+00	0.00E+00	1.47E-02
Benzo(a)pyrene	White-tailed Deer	4.90E-03	0.00E+00	1.81E-05	0.00E+00	0.00E+00	2.44E-03	0.00E+00	0.00E+00	7.35E-03
Benzo(b)fluoranthene	White-tailed Deer	5.60E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-03	0.00E+00	0.00E+00	8.41E-03
Benzo(g,h,i)perylene	White-tailed Deer	3.85E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-03	0.00E+00	0.00E+00	5.02E-03
Benzo(k)fluoranthene	White-tailed Deer	4.55E-03	0.00E+00	1.48E-05	0.00E+00	0.00E+00	2.28E-03	0.00E+00	0.00E+00	6.85E-03
Chrysene	White-tailed Deer	1.23E-02	0.00E+00	4.44E-05	0.00E+00	0.00E+00	1.14E-02	0.00E+00	0.00E+00	2.37E-02
Dibenzo(a,h)anthracene	White-tailed Deer	1.12E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E-04	0.00E+00	0.00E+00	1.48E-03
Dibenzofuran	White-tailed Deer	4.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.64E-02	0.00E+00	0.00E+00	4.10E-02
Dimethyl phthalate	White-tailed Deer	1.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.33E+00	0.00E+00	0.00E+00	5.35E+00
Fluoranthene	White-tailed Deer	9.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.63E-02
Fluorene	White-tailed Deer	9.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.74E-03	0.00E+00	0.00E+00	7.65E-03
Indeno(1,2,3-cd)pyrene	White-tailed Deer	2.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.87E-04	0.00E+00	0.00E+00	2.38E-03
2-Methylnaphthalene	White-tailed Deer	8.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-02	0.00E+00	0.00E+00	9.89E-02
Naphthalene	White-tailed Deer	4.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+00	0.00E+00	0.00E+00	1.22E+00
Phenanthrene	White-tailed Deer	5.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-01	0.00E+00	0.00E+00	3.19E-01
Pyrene	White-tailed Deer	9.10E-03	0.00E+00	1.48E-05	0.00E+00	0.00E+00	2.67E-02	0.00E+00	0.00E+00	3.58E-02

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	White-tailed Deer	8.05E+02	0.00E+00	1.78E-01	0.00E+00	0.00E+00	1.60E+02	0.00E+00	0.00E+00	9.65E+02
Antimony	White-tailed Deer	5.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-01	0.00E+00	0.00E+00	6.51E-01
Arsenic	White-tailed Deer	3.04E+00	0.00E+00	1.22E-02	0.00E+00	0.00E+00	5.44E+00	0.00E+00	0.00E+00	8.50E+00
Barium	White-tailed Deer	4.83E+01	0.00E+00	6.66E-01	0.00E+00	0.00E+00	3.60E+02	0.00E+00	0.00E+00	4.09E+02
Beryllium	White-tailed Deer	9.45E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.70E-02	0.00E+00	0.00E+00	1.41E-01
Cadmium	White-tailed Deer	5.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.88E+00	0.00E+00	0.00E+00	1.04E+01
Chromium	White-tailed Deer	8.05E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-01	0.00E+00	0.00E+00	1.11E+00
Cobalt	White-tailed Deer	5.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E+01	0.00E+00	0.00E+00	1.17E+01
Copper	White-tailed Deer	7.00E+00	0.00E+00	1.18E-02	0.00E+00	0.00E+00	1.39E+02	0.00E+00	0.00E+00	1.46E+02
Iron	White-tailed Deer	2.66E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.29E+04	0.00E+00	0.00E+00	5.56E+04
Lead	White-tailed Deer	2.95E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.61E+01	0.00E+00	0.00E+00	9.56E+01
Manganese	White-tailed Deer	1.58E+01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	3.13E+02	0.00E+00	0.00E+00	3.29E+02
Mercury	White-tailed Deer	5.78E-01	0.00E+00	6.29E-04	0.00E+00	0.00E+00	1.08E+00	0.00E+00	0.00E+00	1.65E+00
Methyl Mercury	White-tailed Deer	9.28E-06	0.00E+00	3.48E-07	0.00E+00	0.00E+00	6.32E-05	0.00E+00	0.00E+00	7.28E-05
Nickel	White-tailed Deer	3.05E+00	0.00E+00	1.30E-02	0.00E+00	0.00E+00	4.84E+00	0.00E+00	0.00E+00	7.90E+00
Selenium	White-tailed Deer	8.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-02	0.00E+00	0.00E+00	1.51E-01
Silver	White-tailed Deer	3.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.75E-01	0.00E+00	0.00E+00	7.09E-01
Thallium	White-tailed Deer	7.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-02	0.00E+00	0.00E+00	8.39E-02
Vanadium	White-tailed Deer	1.51E+00	0.00E+00	1.07E-02	0.00E+00	0.00E+00	2.99E+01	0.00E+00	0.00E+00	3.14E+01
Zinc	White-tailed Deer	4.83E+01	0.00E+00	1.37E-01	0.00E+00	0.00E+00	2.88E-09	0.00E+00	0.00E+00	4.84E+01

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	American Robin	1.40E-06	0.00E+00	5.94E-11	0.00E+00	2.98E-07	2.68E-10	0.00E+00	0.00E+00	1.70E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	American Robin	1.31E-05	0.00E+00	5.51E-11	0.00E+00	2.12E-06	1.87E-09	0.00E+00	0.00E+00	1.52E-05
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	American Robin	9.61E-07	0.00E+00	7.42E-12	0.00E+00	1.39E-07	1.27E-10	0.00E+00	0.00E+00	1.10E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	American Robin	1.92E-06	0.00E+00	1.27E-11	0.00E+00	1.33E-06	1.19E-09	0.00E+00	0.00E+00	3.25E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	American Robin	4.02E-08	0.00E+00	1.80E-11	0.00E+00	2.12E-07	1.88E-10	0.00E+00	0.00E+00	2.53E-07
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	9.61E-08	0.00E+00	1.17E-11	0.00E+00	9.90E-08	8.80E-11	0.00E+00	0.00E+00	1.95E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	2.01E-08	0.00E+00	7.84E-12	0.00E+00	8.38E-08	7.27E-11	0.00E+00	0.00E+00	1.04E-07
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	1.22E-07	0.00E+00	1.27E-11	0.00E+00	3.12E-07	2.86E-10	0.00E+00	0.00E+00	4.35E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	5.59E-08	0.00E+00	8.59E-12	0.00E+00	9.05E-08	7.98E-11	0.00E+00	0.00E+00	1.46E-07
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	American Robin	3.15E-09	0.00E+00	1.48E-11	0.00E+00	2.68E-08	2.34E-11	0.00E+00	0.00E+00	3.00E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	5.68E-08	0.00E+00	2.01E-11	0.00E+00	1.06E-07	9.43E-11	0.00E+00	0.00E+00	1.63E-07
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	1.05E-07	0.00E+00	0.00E+00	0.00E+00	2.86E-07	2.46E-10	0.00E+00	0.00E+00	3.91E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	American Robin	1.75E-08	0.00E+00	3.29E-11	0.00E+00	2.17E-07	1.93E-10	0.00E+00	0.00E+00	2.35E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	1.05E-07	0.00E+00	1.48E-11	0.00E+00	9.55E-07	8.48E-10	0.00E+00	0.00E+00	1.06E-06
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	1.49E-07	0.00E+00	1.06E-11	0.00E+00	3.21E-06	2.85E-09	0.00E+00	0.00E+00	3.36E-06
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	American Robin	1.66E-08	0.00E+00	1.02E-11	0.00E+00	1.80E-07	1.59E-10	0.00E+00	0.00E+00	1.96E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	American Robin	7.17E-09	0.00E+00	0.00E+00	0.00E+00	9.70E-08	8.54E-11	0.00E+00	0.00E+00	1.04E-07

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	American Robin	2.53E+00	0.00E+00	7.63E-04	0.00E+00	7.77E+02	2.59E+00	0.00E+00	0.00E+00	7.83E+02
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	American Robin	2.19E-04	0.00E+00	0.00E+00	0.00E+00	2.08E-01	1.02E-04	0.00E+00	0.00E+00	2.08E-01
Acenaphthylene	American Robin	1.66E-04	0.00E+00	0.00E+00	0.00E+00	1.58E-01	7.77E-05	0.00E+00	0.00E+00	1.58E-01
Anthracene	American Robin	3.93E-04	0.00E+00	0.00E+00	0.00E+00	1.16E+00	8.37E-05	0.00E+00	0.00E+00	1.16E+00
Benzo(a)anthracene	American Robin	1.84E-03	0.00E+00	0.00E+00	0.00E+00	4.69E-04	7.89E-05	0.00E+00	0.00E+00	2.38E-03
Benzo(a)pyrene	American Robin	1.22E-03	0.00E+00	5.19E-08	0.00E+00	7.29E-04	2.60E-05	0.00E+00	0.00E+00	1.98E-03
Benzo(b)fluoranthene	American Robin	1.40E-03	0.00E+00	0.00E+00	0.00E+00	8.33E-04	3.01E-05	0.00E+00	0.00E+00	2.26E-03
Benzo(g,h,i)perylene	American Robin	9.61E-04	0.00E+00	0.00E+00	0.00E+00	1.43E+02	1.25E-05	0.00E+00	0.00E+00	1.43E+02
Benzo(k)fluoranthene	American Robin	1.14E-03	0.00E+00	4.24E-08	0.00E+00	7.74E-04	2.44E-05	0.00E+00	0.00E+00	1.93E-03
Chrysene	American Robin	3.06E-03	0.00E+00	1.27E-07	0.00E+00	1.04E-03	1.22E-04	0.00E+00	0.00E+00	4.22E-03
Dibenzo(a,h)anthracene	American Robin	2.80E-04	0.00E+00	0.00E+00	0.00E+00	1.67E-04	3.81E-06	0.00E+00	0.00E+00	4.50E-04
Dibenzofuran	American Robin	1.14E-03	0.00E+00	0.00E+00	0.00E+00	1.64E+00	3.89E-04	0.00E+00	0.00E+00	1.64E+00
Dimethyl phthalate	American Robin	4.89E-03	0.00E+00	0.00E+00	0.00E+00	2.50E-03	5.70E-02	0.00E+00	0.00E+00	6.44E-02
Fluoranthene	American Robin	2.27E-03	0.00E+00	0.00E+00	0.00E+00	2.51E+01	1.84E-04	0.00E+00	0.00E+00	2.51E+01
Fluorene	American Robin	2.27E-04	0.00E+00	0.00E+00	0.00E+00	3.66E-01	7.21E-05	0.00E+00	0.00E+00	3.67E-01
Indeno(1,2,3-cd)pyrene	American Robin	4.98E-04	0.00E+00	0.00E+00	0.00E+00	3.39E-04	4.13E-06	0.00E+00	0.00E+00	8.42E-04
2-Methylnaphthalene	American Robin	2.01E-03	0.00E+00	0.00E+00	0.00E+00	1.77E+00	9.71E-04	0.00E+00	0.00E+00	1.78E+00
Naphthalene	American Robin	1.22E-02	0.00E+00	0.00E+00	0.00E+00	3.75E+00	1.25E-02	0.00E+00	0.00E+00	3.78E+00
Phenanthrene	American Robin	1.31E-02	0.00E+00	0.00E+00	0.00E+00	1.12E-01	2.85E-03	0.00E+00	0.00E+00	1.28E-01
Pyrene	American Robin	2.27E-03	0.00E+00	4.24E-08	0.00E+00	1.37E+01	2.85E-04	0.00E+00	0.00E+00	1.37E+01

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	American Robin	2.01E+02	0.00E+00	5.09E-04	0.00E+00	3.76E+02	1.71E+00	0.00E+00	0.00E+00	5.79E+02
Antimony	American Robin	1.49E-02	0.00E+00	0.00E+00	0.00E+00	2.78E-02	6.32E-03	0.00E+00	0.00E+00	4.90E-02
Arsenic	American Robin	7.60E-01	0.00E+00	3.50E-05	0.00E+00	7.11E-01	5.82E-02	0.00E+00	0.00E+00	1.53E+00
Barium	American Robin	1.21E+01	0.00E+00	1.91E-03	0.00E+00	2.26E+01	3.85E+00	0.00E+00	0.00E+00	3.85E+01
Beryllium	American Robin	2.36E-02	0.00E+00	0.00E+00	0.00E+00	4.42E-02	5.02E-04	0.00E+00	0.00E+00	6.83E-02
Cadmium	American Robin	1.36E-01	0.00E+00	0.00E+00	0.00E+00	1.11E+00	1.06E-01	0.00E+00	0.00E+00	1.36E+00
Chromium	American Robin	2.01E-01	0.00E+00	0.00E+00	0.00E+00	1.71E-02	3.21E-03	0.00E+00	0.00E+00	2.21E-01
Cobalt	American Robin	1.40E-01	0.00E+00	0.00E+00	0.00E+00	2.62E-01	1.19E-01	0.00E+00	0.00E+00	5.21E-01
Copper	American Robin	1.75E+00	0.00E+00	3.39E-05	0.00E+00	5.95E-01	1.49E+00	0.00E+00	0.00E+00	3.83E+00
Iron	American Robin	6.64E+02	0.00E+00	0.00E+00	0.00E+00	1.24E+03	5.65E+02	0.00E+00	0.00E+00	2.47E+03
Lead	American Robin	7.38E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+00	7.06E-01	0.00E+00	0.00E+00	9.97E+00
Manganese	American Robin	3.93E+00	0.00E+00	6.36E-04	0.00E+00	7.37E+00	3.35E+00	0.00E+00	0.00E+00	1.46E+01
Mercury	American Robin	1.44E-01	0.00E+00	1.80E-06	0.00E+00	4.91E-02	1.15E-02	0.00E+00	0.00E+00	2.05E-01
Methyl Mercury	American Robin	2.32E-06	0.00E+00	9.96E-10	0.00E+00	1.68E-04	6.75E-07	0.00E+00	0.00E+00	1.71E-04
Nickel	American Robin	7.60E-01	0.00E+00	3.71E-05	0.00E+00	1.29E-01	5.18E-02	0.00E+00	0.00E+00	9.42E-01
Selenium	American Robin	2.10E-02	0.00E+00	0.00E+00	0.00E+00	3.93E-02	7.14E-04	0.00E+00	0.00E+00	6.10E-02
Silver	American Robin	8.48E-03	0.00E+00	0.00E+00	0.00E+00	1.59E-02	7.22E-03	0.00E+00	0.00E+00	3.16E-02
Thallium	American Robin	1.75E-02	0.00E+00	0.00E+00	0.00E+00	3.27E-02	1.49E-04	0.00E+00	0.00E+00	5.04E-02
Vanadium	American Robin	3.76E-01	0.00E+00	3.07E-05	0.00E+00	7.04E-01	3.20E-01	0.00E+00	0.00E+00	1.40E+00
Zinc	American Robin	1.21E+01	0.00E+00	3.92E-04	0.00E+00	5.75E+01	3.08E-11	0.00E+00	0.00E+00	6.96E+01

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Dioxins/Furans (mg/kg)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red-tailed Hawk	4.88E-07	0.00E+00	3.58E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-07	7.14E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red-tailed Hawk	4.58E-06	0.00E+00	3.33E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.11E-06	6.68E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	3.36E-07	0.00E+00	4.48E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-07	4.90E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red-tailed Hawk	6.71E-07	0.00E+00	7.68E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.23E-07	9.95E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	1.40E-08	0.00E+00	1.09E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.38E-09	2.35E-08
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	3.36E-08	0.00E+00	7.04E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-08	5.03E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	7.02E-09	0.00E+00	4.74E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.37E-09	1.14E-08
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	4.27E-08	0.00E+00	7.68E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.38E-08	6.66E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	1.95E-08	0.00E+00	5.18E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-08	2.97E-08
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	1.10E-09	0.00E+00	8.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.92E-10	2.08E-09
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	1.98E-08	0.00E+00	1.22E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-08	3.05E-08
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	3.66E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E-08	5.73E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red-tailed Hawk	6.10E-09	0.00E+00	1.98E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.87E-09	1.22E-08
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	3.66E-08	0.00E+00	8.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E-08	6.68E-08
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	5.19E-08	0.00E+00	6.40E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.89E-08	1.21E-07
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red-tailed Hawk	5.80E-09	0.00E+00	6.14E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.18E-09	1.10E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red-tailed Hawk	2.50E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.51E-09	5.01E-09

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	Red-tailed Hawk	8.85E-01	0.00E+00	4.61E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E+01	1.44E+01
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	Red-tailed Hawk	7.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.88E-03	2.96E-03
Acenaphthylene	Red-tailed Hawk	5.80E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E-03	2.25E-03
Anthracene	Red-tailed Hawk	1.37E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-02	1.55E-02
Benzo(a)anthracene	Red-tailed Hawk	6.41E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.84E-04	1.03E-03
Benzo(a)pyrene	Red-tailed Hawk	4.27E-04	0.00E+00	3.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.32E-04	6.60E-04
Benzo(b)fluoranthene	Red-tailed Hawk	4.88E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-04	7.54E-04
Benzo(g,h,i)perylene	Red-tailed Hawk	3.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+00	1.88E+00
Benzo(k)fluoranthene	Red-tailed Hawk	3.97E-04	0.00E+00	2.56E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-04	6.14E-04
Chrysene	Red-tailed Hawk	1.07E-03	0.00E+00	7.68E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E-04	1.70E-03
Dibenzo(a,h)anthracene	Red-tailed Hawk	9.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.07E-05	1.48E-04
Dibenzofuran	Red-tailed Hawk	3.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.21E-02	2.25E-02
Dimethyl phthalate	Red-tailed Hawk	1.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.41E-02	6.58E-02
Fluoranthene	Red-tailed Hawk	7.94E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.30E-01	3.31E-01
Fluorene	Red-tailed Hawk	7.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-03	5.01E-03
Indeno(1,2,3-cd)pyrene	Red-tailed Hawk	1.74E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.79E-05	2.62E-04
2-Methylnaphthalene	Red-tailed Hawk	7.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-02	2.54E-02
Naphthalene	Red-tailed Hawk	4.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.52E-02	6.95E-02
Phenanthrene	Red-tailed Hawk	4.58E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.71E-03	1.13E-02
Pyrene	Red-tailed Hawk	7.94E-04	0.00E+00	2.56E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-01	1.82E-01

Table 7-27
Total Exposure for Representative Wildlife Species Based on Consumption of Surface Water, Soils, Stream Sediments, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Maximum Dose Received from Consuming Soil from Table 7-19 (mg/day)	Maximum Dose Received from Consuming Sediments from Table 7-21 (mg/day)	Maximum Dose Received from Consuming Surface Water from Table 7-20 (mg/day)	Maximum Dose Received from Consuming Benthic Invertebrates from Table 7-24 (mg/day)	Maximum Dose Received from Consuming Soil Invertebrates from Table 7-22 (mg/day)	Maximum Dose Received from Consuming Terrestrial Plants from Table 7-23 (mg/day)	Maximum Dose Received from Consuming Whole Fish from Table 7-25 (mg/day)	Maximum Dose Received from Consuming Small Mammals from Table 7-26 (mg/day)	Total Dose Received (mg/day)
Metals (mg/kg)										
Aluminum	Red-tailed Hawk	7.02E+01	0.00E+00	3.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.87E+01	1.09E+02
Antimony	Red-tailed Hawk	5.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.74E-03	1.49E-02
Arsenic	Red-tailed Hawk	2.65E-01	0.00E+00	2.11E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-01	4.60E-01
Barium	Red-tailed Hawk	4.21E+00	0.00E+00	1.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.49E+00	1.07E+01
Beryllium	Red-tailed Hawk	8.24E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-03	1.31E-02
Cadmium	Red-tailed Hawk	4.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-01	2.01E-01
Chromium	Red-tailed Hawk	7.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E-02	1.06E-01
Cobalt	Red-tailed Hawk	4.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E-01	2.07E-01
Copper	Red-tailed Hawk	6.10E-01	0.00E+00	2.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E+00	2.55E+00
Iron	Red-tailed Hawk	2.32E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.50E+02	9.82E+02
Lead	Red-tailed Hawk	2.58E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E+00	4.55E+00
Manganese	Red-tailed Hawk	1.37E+00	0.00E+00	3.84E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E+00	5.82E+00
Mercury	Red-tailed Hawk	5.04E-02	0.00E+00	1.09E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.63E-02	8.66E-02
Methyl Mercury	Red-tailed Hawk	8.09E-07	0.00E+00	6.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.32E-06	4.14E-06
Nickel	Red-tailed Hawk	2.66E-01	0.00E+00	2.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-01	4.45E-01
Selenium	Red-tailed Hawk	7.32E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.63E-03	1.20E-02
Silver	Red-tailed Hawk	2.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.57E-03	1.25E-02
Thallium	Red-tailed Hawk	6.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.36E-03	9.47E-03
Vanadium	Red-tailed Hawk	1.31E-01	0.00E+00	1.86E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-01	5.56E-01
Zinc	Red-tailed Hawk	4.21E+00	0.00E+00	2.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E+00	6.88E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Short-tailed Shrew	2.23E-07	1.00E+00	2.23E-07	1.50E-02	7.33E-03	1.10E-04	2.03E-03	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Short-tailed Shrew	2.01E-06	1.00E+00	2.01E-06	1.50E-02	7.33E-03	1.10E-04	1.83E-02	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Short-tailed Shrew	1.46E-07	1.00E+00	1.46E-07	1.50E-02	2.20E-04	3.30E-06	4.41E-02	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Short-tailed Shrew	4.18E-07	1.00E+00	4.18E-07	1.50E-02	2.20E-04	3.30E-06	1.27E-01	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Short-tailed Shrew	3.11E-08	1.00E+00	3.11E-08	1.50E-02	2.20E-04	3.30E-06	9.41E-03	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	2.49E-08	1.00E+00	2.49E-08	1.50E-02	2.20E-05	3.30E-07	7.53E-02	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	1.28E-08	1.00E+00	1.28E-08	1.50E-02	2.20E-05	3.30E-07	3.89E-02	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	5.42E-08	1.00E+00	5.42E-08	1.50E-02	2.20E-05	3.30E-07	1.64E-01	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	1.84E-08	1.00E+00	1.84E-08	1.50E-02	2.20E-05	3.30E-07	5.59E-02	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	3.67E-09	1.00E+00	3.67E-09	1.50E-02	2.20E-05	3.30E-07	1.11E-02	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Short-tailed Shrew	2.05E-08	1.00E+00	2.05E-08	1.50E-02	2.20E-05	3.30E-07	6.21E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	4.86E-08	1.00E+00	4.86E-08	1.50E-02	7.33E-05	1.10E-06	4.42E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Short-tailed Shrew	2.86E-08	1.00E+00	2.86E-08	1.50E-02	2.20E-06	3.30E-08	8.68E-01	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Short-tailed Shrew	1.30E-07	1.00E+00	1.30E-07	1.50E-02	2.20E-05	3.30E-07	3.93E-01	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	4.09E-07	1.00E+00	4.09E-07	1.50E-02	7.33E-06	1.10E-07	3.71E+00	**Yes**	7.33E-05	1.10E-06	3.71E-01	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Short-tailed Shrew	2.39E-08	1.00E+00	2.39E-08	1.50E-02	2.20E-05	3.30E-07	7.26E-02	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Short-tailed Shrew	1.27E-08	1.00E+00	1.27E-08	1.50E-02	2.20E-06	3.30E-08	3.85E-01	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Short-tailed Shrew	9.44E+01	1.00E+00	9.44E+01	1.50E-02	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	Short-tailed Shrew	2.52E-02	1.00E+00	2.52E-02	1.50E-02	5.95E+00	8.92E-02	2.82E-01	HQ<1				
Acenaphthylene	Short-tailed Shrew	1.91E-02	1.00E+00	1.91E-02	1.50E-02	Not Available	NA	NA	NA				
Anthracene	Short-tailed Shrew	1.40E-01	1.00E+00	1.40E-01	1.50E-02	2.20E+02	3.30E+00	4.25E-02	HQ<1				
Benzo(a)anthracene	Short-tailed Shrew	3.02E-04	1.00E+00	3.02E-04	1.50E-02	Not Available	NA	NA	NA				
Benzo(a)pyrene	Short-tailed Shrew	2.52E-04	1.00E+00	2.52E-04	1.50E-02	1.19E+00	1.79E-02	1.41E-02	HQ<1				
Benzo(b)fluoranthene	Short-tailed Shrew	2.88E-04	1.00E+00	2.88E-04	1.50E-02	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	Short-tailed Shrew	1.73E+01	1.00E+00	1.73E+01	1.50E-02	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	Short-tailed Shrew	2.46E-04	1.00E+00	2.46E-04	1.50E-02	Not Available	NA	NA	NA				
Chrysene	Short-tailed Shrew	5.36E-04	1.00E+00	5.36E-04	1.50E-02	1.91E+00	2.87E-02	1.87E-02	HQ<1				
Dibenzo(a,h)anthracene	Short-tailed Shrew	5.76E-05	1.00E+00	5.76E-05	1.50E-02	Not Available	NA	NA	NA				
Dibenzofuran	Short-tailed Shrew	1.98E-01	1.00E+00	1.98E-01	1.50E-02	Not Available	NA	NA	NA				
Dimethyl phthalate	Short-tailed Shrew	9.58E-04	1.00E+00	9.58E-04	1.50E-02	5.45E+03	8.18E+01	1.17E-05	HQ<1				
Fluoranthene	Short-tailed Shrew	3.03E+00	1.00E+00	3.03E+00	1.50E-02	3.30E+02	4.95E+00	6.14E-01	HQ<1				
Fluorene	Short-tailed Shrew	4.44E-02	1.00E+00	4.44E-02	1.50E-02	2.97E+02	4.46E+00	9.95E-03	HQ<1				
Indeno(1,2,3-cd)pyrene	Short-tailed Shrew	1.08E-04	1.00E+00	1.08E-04	1.50E-02	Not Available	NA	NA	NA				
2-Methylnaphthalene	Short-tailed Shrew	2.15E-01	1.00E+00	2.15E-01	1.50E-02	Not Available	NA	NA	NA				
Naphthalene	Short-tailed Shrew	4.56E-01	1.00E+00	4.56E-01	1.50E-02	1.03E+02	1.55E+00	2.95E-01	HQ<1				
Phenanthrene	Short-tailed Shrew	1.53E-02	1.00E+00	1.53E-02	1.50E-02	2.12E+02	3.17E+00	4.81E-03	HQ<1				
Pyrene	Short-tailed Shrew	1.66E+00	1.00E+00	1.66E+00	1.50E-02	2.45E+02	3.68E+00	4.52E-01	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Short-tailed Shrew	7.25E+01	1.00E+00	7.25E+01	1.50E-02	2.30E+00	3.44E-02	2.10E+03	**Yes**	2.30E+01	3.44E-01	2.10E+02	**Yes**
Antimony	Short-tailed Shrew	5.36E-03	1.00E+00	5.36E-03	1.50E-02	1.49E-01	2.24E-03	2.40E+00	**Yes**	1.49E+00	2.23E-02	2.40E-01	HQ<1
Arsenic	Short-tailed Shrew	1.88E-01	1.00E+00	1.88E-01	1.50E-02	1.50E-01	2.25E-03	8.34E+01	**Yes**	1.50E+00	2.25E-02	8.35E+00	**Yes**
Barium	Short-tailed Shrew	4.35E+00	1.00E+00	4.35E+00	1.50E-02	1.18E+01	1.77E-01	2.46E+01	**Yes**	4.35E+01	6.53E-01	6.66E+00	**Yes**
Beryllium	Short-tailed Shrew	8.51E-03	1.00E+00	8.51E-03	1.50E-02	1.45E+00	2.18E-02	3.91E-01	HQ<1				
Cadmium	Short-tailed Shrew	1.53E-01	1.00E+00	1.53E-01	1.50E-02	2.12E+00	3.18E-02	4.81E+00	**Yes**	2.12E+01	3.18E-01	4.81E-01	HQ<1
Chromium	Short-tailed Shrew	2.90E-02	1.00E+00	2.90E-02	1.50E-02	7.21E+00	1.08E-01	2.68E-01	HQ<1				
Cobalt	Short-tailed Shrew	5.04E-02	1.00E+00	5.04E-02	1.50E-02	Not Available	NA	NA	NA				
Copper	Short-tailed Shrew	3.06E-01	1.00E+00	3.06E-01	1.50E-02	3.34E+01	5.01E-01	6.11E-01	HQ<1				
Iron	Short-tailed Shrew	2.39E+02	1.00E+00	2.39E+02	1.50E-02	Not Available	NA	NA	NA				
Lead	Short-tailed Shrew	1.22E+00	1.00E+00	1.22E+00	1.50E-02	1.76E+01	2.64E-01	4.61E+00	**Yes**	1.76E+02	2.64E+00	4.61E-01	HQ<1
Manganese	Short-tailed Shrew	1.42E+00	1.00E+00	1.42E+00	1.50E-02	1.93E+02	2.90E+00	4.90E-01	HQ<1				
Mercury	Short-tailed Shrew	2.52E-02	1.00E+00	2.52E-02	1.50E-02	2.86E+00	4.29E-02	5.88E-01	HQ<1				
Methyl Mercury	Short-tailed Shrew	2.06E-05	1.00E+00	2.06E-05	1.50E-02	7.00E-02	1.05E-03	1.96E-02	HQ<1				
Nickel	Short-tailed Shrew	1.17E-01	1.00E+00	1.17E-01	1.50E-02	8.79E+01	1.32E+00	8.91E-02	HQ<1				
Selenium	Short-tailed Shrew	7.56E-03	1.00E+00	7.56E-03	1.50E-02	4.40E-01	6.60E-03	1.15E+00	**Yes**	7.25E-01	1.09E-02	6.95E-01	HQ<1
Silver	Short-tailed Shrew	3.06E-03	1.00E+00	3.06E-03	1.50E-02	Not Available	NA	NA	NA				
Thallium	Short-tailed Shrew	6.30E-03	1.00E+00	6.30E-03	1.50E-02	1.60E-02	2.40E-04	2.63E+01	**Yes**	1.64E-01	2.46E-03	2.56E+00	**Yes**
Vanadium	Short-tailed Shrew	1.35E-01	1.00E+00	1.35E-01	1.50E-02	4.28E-01	6.42E-03	2.11E+01	**Yes**	4.29E+00	6.43E-02	2.11E+00	**Yes**
Zinc	Short-tailed Shrew	8.57E+00	1.00E+00	8.57E+00	1.50E-02	3.52E+02	5.28E+00	1.62E+00	**Yes**	7.03E+02	1.05E+01	8.12E-01	HQ<1

Notes:

EHI - Ecological Hazard Index

kg - kilogram

mg/kg - milligrams per kilogram

mg/kg/day - milligrams per kilograms per day

NA - Not Analyzed

NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	White-footed Mouse	1.10E-08	1.00E+00	1.10E-08	2.20E-02	6.67E-03	1.47E-04	7.48E-05	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	White-footed Mouse	1.02E-07	1.00E+00	1.02E-07	2.20E-02	6.67E-03	1.47E-04	6.98E-04	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	White-footed Mouse	7.51E-09	1.00E+00	7.51E-09	2.20E-02	2.00E-04	4.40E-06	1.71E-03	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	White-footed Mouse	1.52E-08	1.00E+00	1.52E-08	2.20E-02	2.00E-04	4.40E-06	3.45E-03	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	White-footed Mouse	3.58E-10	1.00E+00	3.58E-10	2.20E-02	2.00E-04	4.40E-06	8.15E-05	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	7.71E-10	1.00E+00	7.71E-10	2.20E-02	2.00E-05	4.40E-07	1.75E-03	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	1.75E-10	1.00E+00	1.75E-10	2.20E-02	2.00E-05	4.40E-07	3.97E-04	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	1.01E-09	1.00E+00	1.01E-09	2.20E-02	2.00E-05	4.40E-07	2.30E-03	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	4.55E-10	1.00E+00	4.55E-10	2.20E-02	2.00E-05	4.40E-07	1.03E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	3.80E-11	1.00E+00	3.80E-11	2.20E-02	2.00E-05	4.40E-07	8.64E-05	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	White-footed Mouse	4.72E-10	1.00E+00	4.72E-10	2.20E-02	2.00E-05	4.40E-07	1.07E-03	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	White-footed Mouse	8.61E-10	1.00E+00	8.61E-10	2.20E-02	6.67E-05	1.47E-06	5.87E-04	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	White-footed Mouse	1.92E-10	1.00E+00	1.92E-10	2.20E-02	2.00E-06	4.40E-08	4.36E-03	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-footed Mouse	9.80E-10	1.00E+00	9.80E-10	2.20E-02	2.00E-05	4.40E-07	2.23E-03	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	White-footed Mouse	1.68E-09	1.00E+00	1.68E-09	2.20E-02	6.67E-06	1.47E-07	1.15E-02	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	White-footed Mouse	1.65E-10	1.00E+00	1.65E-10	2.20E-02	2.00E-05	4.40E-07	3.74E-04	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	White-footed Mouse	7.14E-11	1.00E+00	7.14E-11	2.20E-02	2.00E-06	4.40E-08	1.62E-03	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	White-footed Mouse	4.93E-01	1.00E+00	4.93E-01	2.20E-02	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	White-footed Mouse	2.04E-05	1.00E+00	2.04E-05	2.20E-02	5.40E+00	1.19E-01	1.72E-04	HQ<1				
Acenaphthylene	White-footed Mouse	1.55E-05	1.00E+00	1.55E-05	2.20E-02	Not Available	NA	NA	NA				
Anthracene	White-footed Mouse	1.84E-05	1.00E+00	1.84E-05	2.20E-02	2.00E+02	4.39E+00	4.18E-06	HQ<1				
Benzo(a)anthracene	White-footed Mouse	2.87E-05	1.00E+00	2.87E-05	2.20E-02	Not Available	NA	NA	NA				
Benzo(a)pyrene	White-footed Mouse	1.43E-05	1.00E+00	1.43E-05	2.20E-02	1.08E+00	2.38E-02	6.02E-04	HQ<1				
Benzo(b)fluoranthene	White-footed Mouse	1.64E-05	1.00E+00	1.64E-05	2.20E-02	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	White-footed Mouse	9.76E-06	1.00E+00	9.76E-06	2.20E-02	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	White-footed Mouse	1.33E-05	1.00E+00	1.33E-05	2.20E-02	Not Available	NA	NA	NA				
Chrysene	White-footed Mouse	4.61E-05	1.00E+00	4.61E-05	2.20E-02	1.74E+00	3.82E-02	1.21E-03	HQ<1				
Dibenzo(a,h)anthracene	White-footed Mouse	2.87E-06	1.00E+00	2.87E-06	2.20E-02	Not Available	NA	NA	NA				
Dibenzofuran	White-footed Mouse	8.00E-05	1.00E+00	8.00E-05	2.20E-02	Not Available	NA	NA	NA				
Dimethyl phthalate	White-footed Mouse	1.05E-02	1.00E+00	1.05E-02	2.20E-02	4.95E+03	1.09E+02	9.59E-05	HQ<1				
Fluoranthene	White-footed Mouse	5.13E-05	1.00E+00	5.13E-05	2.20E-02	3.00E+02	6.59E+00	7.78E-06	HQ<1				
Fluorene	White-footed Mouse	1.49E-05	1.00E+00	1.49E-05	2.20E-02	2.70E+02	5.94E+00	2.51E-06	HQ<1				
Indeno(1,2,3-cd)pyrene	White-footed Mouse	4.63E-06	1.00E+00	4.63E-06	2.20E-02	Not Available	NA	NA	NA				
2-Methylnaphthalene	White-footed Mouse	1.93E-04	1.00E+00	1.93E-04	2.20E-02	Not Available	NA	NA	NA				
Naphthalene	White-footed Mouse	2.38E-03	1.00E+00	2.38E-03	2.20E-02	9.37E+01	2.06E+00	1.15E-03	HQ<1				
Phenanthrene	White-footed Mouse	6.22E-04	1.00E+00	6.22E-04	2.20E-02	1.92E+02	4.23E+00	1.47E-04	HQ<1				
Pyrene	White-footed Mouse	6.99E-05	1.00E+00	6.99E-05	2.20E-02	2.23E+02	4.90E+00	1.43E-05	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	White-footed Mouse	1.88E+00	1.00E+00	1.88E+00	2.20E-02	2.09E+00	4.59E-02	4.09E+01	**Yes**	2.09E+01	4.59E-01	4.09E+00	**Yes**
Antimony	White-footed Mouse	1.27E-03	1.00E+00	1.27E-03	2.20E-02	1.35E-01	2.97E-03	4.28E-01	HQ<1				
Arsenic	White-footed Mouse	1.66E-02	1.00E+00	1.66E-02	2.20E-02	1.36E-01	2.99E-03	5.54E+00	**Yes**	1.36E+00	3.00E-02	5.53E-01	HQ<1
Barium	White-footed Mouse	7.99E-01	1.00E+00	7.99E-01	2.20E-02	1.08E+01	2.38E-01	3.36E+00	**Yes**	3.95E+01	8.69E-01	9.19E-01	HQ<1
Beryllium	White-footed Mouse	2.75E-04	1.00E+00	2.75E-04	2.20E-02	1.32E+00	2.90E-02	9.48E-03	HQ<1				
Cadmium	White-footed Mouse	2.04E-02	1.00E+00	2.04E-02	2.20E-02	1.93E+00	4.24E-02	4.81E-01	HQ<1				
Chromium	White-footed Mouse	2.15E-03	1.00E+00	2.15E-03	2.20E-02	6.55E+00	1.44E-01	1.49E-02	HQ<1				
Cobalt	White-footed Mouse	2.28E-02	1.00E+00	2.28E-02	2.20E-02	Not Available	NA	NA	NA				
Copper	White-footed Mouse	2.86E-01	1.00E+00	2.86E-01	2.20E-02	3.04E+01	6.69E-01	4.27E-01	HQ<1				
Iron	White-footed Mouse	1.09E+02	1.00E+00	1.09E+02	2.20E-02	Not Available	NA	NA	NA				
Lead	White-footed Mouse	1.87E-01	1.00E+00	1.87E-01	2.20E-02	1.60E+01	3.52E-01	5.31E-01	HQ<1				
Manganese	White-footed Mouse	6.43E-01	1.00E+00	6.43E-01	2.20E-02	1.76E+02	3.87E+00	1.66E-01	HQ<1				
Mercury	White-footed Mouse	3.23E-03	1.00E+00	3.23E-03	2.20E-02	2.60E+00	5.72E-02	5.64E-02	HQ<1				
Methyl Mercury	White-footed Mouse	1.42E-07	1.00E+00	1.42E-07	2.20E-02	6.40E-02	1.41E-03	1.01E-04	HQ<1				
Nickel	White-footed Mouse	1.54E-02	1.00E+00	1.54E-02	2.20E-02	7.99E+01	1.76E+00	8.76E-03	HQ<1				
Selenium	White-footed Mouse	2.94E-04	1.00E+00	2.94E-04	2.20E-02	3.99E-01	8.78E-03	3.35E-02	HQ<1				
Silver	White-footed Mouse	1.39E-03	1.00E+00	1.39E-03	2.20E-02	Not Available	NA	NA	NA				
Thallium	White-footed Mouse	1.63E-04	1.00E+00	1.63E-04	2.20E-02	1.50E-02	3.30E-04	4.95E-01	HQ<1				
Vanadium	White-footed Mouse	6.14E-02	1.00E+00	6.14E-02	2.20E-02	3.89E-01	8.56E-03	7.18E+00	**Yes**	3.89E+00	8.57E-02	7.17E-01	HQ<1
Zinc	White-footed Mouse	9.41E-02	1.00E+00	9.41E-02	2.20E-02	3.20E+02	7.03E+00	1.34E-02	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).
The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Meadow Vole	2.93E-08	1.00E+00	2.93E-08	4.40E-02	5.67E-03	2.49E-04	1.17E-04	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Meadow Vole	2.52E-07	1.00E+00	2.52E-07	4.40E-02	5.67E-03	2.49E-04	1.01E-03	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Meadow Vole	1.79E-08	1.00E+00	1.79E-08	4.40E-02	1.70E-04	7.48E-06	2.39E-03	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Meadow Vole	7.11E-08	1.00E+00	7.11E-08	4.40E-02	1.70E-04	7.48E-06	9.51E-03	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Meadow Vole	7.72E-09	1.00E+00	7.72E-09	4.40E-02	1.70E-04	7.48E-06	1.03E-03	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	4.67E-09	1.00E+00	4.67E-09	4.40E-02	1.70E-05	7.48E-07	6.24E-03	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	3.11E-09	1.00E+00	3.11E-09	4.40E-02	1.70E-05	7.48E-07	4.15E-03	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	1.22E-08	1.00E+00	1.22E-08	4.40E-02	1.70E-05	7.48E-07	1.63E-02	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	3.82E-09	1.00E+00	3.82E-09	4.40E-02	1.70E-05	7.48E-07	5.11E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	9.55E-10	1.00E+00	9.55E-10	4.40E-02	1.70E-05	7.48E-07	1.28E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Meadow Vole	4.38E-09	1.00E+00	4.38E-09	4.40E-02	1.70E-05	7.48E-07	5.85E-03	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Meadow Vole	1.11E-08	1.00E+00	1.11E-08	4.40E-02	5.67E-05	2.49E-06	4.44E-03	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Meadow Vole	7.58E-09	1.00E+00	7.58E-09	4.40E-02	1.70E-06	7.48E-08	1.01E-01	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Meadow Vole	3.37E-08	1.00E+00	3.37E-08	4.40E-02	1.70E-05	7.48E-07	4.50E-02	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Meadow Vole	1.10E-07	1.00E+00	1.10E-07	4.40E-02	5.67E-06	2.49E-07	4.43E-01	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Meadow Vole	6.29E-09	1.00E+00	6.29E-09	4.40E-02	1.70E-05	7.48E-07	8.41E-03	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Meadow Vole	3.37E-09	1.00E+00	3.37E-09	4.40E-02	1.70E-06	7.48E-08	4.50E-02	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Meadow Vole	2.65E+01	1.00E+00	2.65E+01	4.40E-02	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	Meadow Vole	7.00E-03	1.00E+00	7.00E-03	4.40E-02	4.54E+00	2.00E-01	3.50E-02	HQ<1				
Acenaphthylene	Meadow Vole	5.32E-03	1.00E+00	5.32E-03	4.40E-02	Not Available	NA	NA	NA				
Anthracene	Meadow Vole	3.90E-02	1.00E+00	3.90E-02	4.40E-02	1.68E+02	7.39E+00	5.28E-03	HQ<1				
Benzo(a)anthracene	Meadow Vole	5.16E-05	1.00E+00	5.16E-05	4.40E-02	Not Available	NA	NA	NA				
Benzo(a)pyrene	Meadow Vole	4.48E-05	1.00E+00	4.48E-05	4.40E-02	9.10E-01	4.00E-02	1.12E-03	HQ<1				
Benzo(b)fluoranthene	Meadow Vole	5.12E-05	1.00E+00	5.12E-05	4.40E-02	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	Meadow Vole	4.81E+00	1.00E+00	4.81E+00	4.40E-02	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	Meadow Vole	4.49E-05	1.00E+00	4.49E-05	4.40E-02	Not Available	NA	NA	NA				
Chrysene	Meadow Vole	9.34E-05	1.00E+00	9.34E-05	4.40E-02	1.46E+00	6.42E-02	1.45E-03	HQ<1				
Dibenzo(a,h)anthracene	Meadow Vole	9.95E-06	1.00E+00	9.95E-06	4.40E-02	Not Available	NA	NA	NA				
Dibenzofuran	Meadow Vole	5.50E-02	1.00E+00	5.50E-02	4.40E-02	Not Available	NA	NA	NA				
Dimethyl phthalate	Meadow Vole	7.81E-03	1.00E+00	7.81E-03	4.40E-02	4.17E+03	1.83E+02	4.26E-05	HQ<1				
Fluoranthene	Meadow Vole	8.43E-01	1.00E+00	8.43E-01	4.40E-02	2.52E+02	1.11E+01	7.60E-02	HQ<1				
Fluorene	Meadow Vole	1.23E-02	1.00E+00	1.23E-02	4.40E-02	2.27E+02	1.00E+01	1.23E-03	HQ<1				
Indeno(1,2,3-cd)pyrene	Meadow Vole	1.88E-05	1.00E+00	1.88E-05	4.40E-02	Not Available	NA	NA	NA				
2-Methylnaphthalene	Meadow Vole	5.97E-02	1.00E+00	5.97E-02	4.40E-02	Not Available	NA	NA	NA				
Naphthalene	Meadow Vole	1.28E-01	1.00E+00	1.28E-01	4.40E-02	7.88E+01	3.47E+00	3.69E-02	HQ<1				
Phenanthrene	Meadow Vole	4.31E-03	1.00E+00	4.31E-03	4.40E-02	1.62E+02	7.11E+00	6.07E-04	HQ<1				
Pyrene	Meadow Vole	4.61E-01	1.00E+00	4.61E-01	4.40E-02	1.87E+02	8.24E+00	5.60E-02	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Meadow Vole	1.56E+01	1.00E+00	1.56E+01	4.40E-02	1.75E+00	7.72E-02	2.03E+02	**Yes**	1.75E+01	7.72E-01	2.03E+01	**Yes**
Antimony	Meadow Vole	1.99E-03	1.00E+00	1.99E-03	4.40E-02	1.14E-01	5.02E-03	3.97E-01	HQ<1				
Arsenic	Meadow Vole	4.22E-02	1.00E+00	4.22E-02	4.40E-02	1.14E-01	5.02E-03	8.41E+00	**Yes**	1.15E+00	5.04E-02	8.37E-01	HQ<1
Barium	Meadow Vole	1.44E+00	1.00E+00	1.44E+00	4.40E-02	9.00E+00	3.96E-01	3.64E+00	**Yes**	3.33E+01	1.47E+00	9.85E-01	HQ<1
Beryllium	Meadow Vole	1.88E-03	1.00E+00	1.88E-03	4.40E-02	1.11E+00	4.88E-02	3.84E-02	HQ<1				
Cadmium	Meadow Vole	5.35E-02	1.00E+00	5.35E-02	4.40E-02	1.62E+01	7.13E-01	7.51E-02	HQ<1				
Chromium	Meadow Vole	3.77E-03	1.00E+00	3.77E-03	4.40E-02	5.51E+00	2.42E-01	1.55E-02	HQ<1				
Cobalt	Meadow Vole	2.67E-02	1.00E+00	2.67E-02	4.40E-02	Not Available	NA	NA	NA				
Copper	Meadow Vole	2.44E-01	1.00E+00	2.44E-01	4.40E-02	2.55E+01	1.12E+00	2.17E-01	HQ<1				
Iron	Meadow Vole	1.27E+02	1.00E+00	1.27E+02	4.40E-02	Not Available	NA	NA	NA				
Lead	Meadow Vole	2.60E-01	1.00E+00	2.60E-01	4.40E-02	1.34E+01	5.91E-01	4.39E-01	HQ<1				
Manganese	Meadow Vole	7.52E-01	1.00E+00	7.52E-01	4.40E-02	1.48E+02	6.51E+00	1.15E-01	HQ<1				
Mercury	Meadow Vole	5.18E-03	1.00E+00	5.18E-03	4.40E-02	2.18E+00	9.59E-02	5.40E-02	HQ<1				
Methyl Mercury	Meadow Vole	5.75E-06	1.00E+00	5.75E-06	4.40E-02	5.40E-02	2.38E-03	2.42E-03	HQ<1				
Nickel	Meadow Vole	2.18E-02	1.00E+00	2.18E-02	4.40E-02	6.72E+01	2.96E+00	7.37E-03	HQ<1				
Selenium	Meadow Vole	1.70E-03	1.00E+00	1.70E-03	4.40E-02	3.36E-01	1.48E-02	1.15E-01	HQ<1				
Silver	Meadow Vole	1.62E-03	1.00E+00	1.62E-03	4.40E-02	Not Available	NA	NA	NA				
Thallium	Meadow Vole	1.36E-03	1.00E+00	1.36E-03	4.40E-02	1.30E-02	5.72E-04	2.38E+00	**Yes**	1.26E-01	5.54E-03	2.45E-01	HQ<1
Vanadium	Meadow Vole	7.18E-02	1.00E+00	7.18E-02	4.40E-02	3.27E-01	1.44E-02	4.99E+00	**Yes**	3.27E+00	1.44E-01	4.99E-01	HQ<1
Zinc	Meadow Vole	2.10E+00	1.00E+00	2.10E+00	4.40E-02	2.69E+02	1.18E+01	1.77E-01	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Eastern Cottontail Rabbit	2.39E-06	1.00E+00	2.39E-06	1.20E+00	2.33E-03	2.80E-03	8.53E-04	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Eastern Cottontail Rabbit	2.24E-05	1.00E+00	2.24E-05	1.20E+00	2.33E-03	2.80E-03	7.99E-03	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Eastern Cottontail Rabbit	1.64E-06	1.00E+00	1.64E-06	1.20E+00	7.00E-05	8.40E-05	1.95E-02	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Eastern Cottontail Rabbit	3.29E-06	1.00E+00	3.29E-06	1.20E+00	7.00E-05	8.40E-05	3.92E-02	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Eastern Cottontail Rabbit	7.11E-08	1.00E+00	7.11E-08	1.20E+00	7.00E-05	8.40E-05	8.47E-04	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	1.65E-07	1.00E+00	1.65E-07	1.20E+00	7.00E-06	8.40E-06	1.97E-02	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	3.53E-08	1.00E+00	3.53E-08	1.20E+00	7.00E-06	8.40E-06	4.20E-03	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	2.12E-07	1.00E+00	2.12E-07	1.20E+00	7.00E-06	8.40E-06	2.53E-02	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	9.65E-08	1.00E+00	9.65E-08	1.20E+00	7.00E-06	8.40E-06	1.15E-02	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	5.83E-09	1.00E+00	5.83E-09	1.20E+00	7.00E-06	8.40E-06	6.93E-04	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Eastern Cottontail Rabbit	9.83E-08	1.00E+00	9.83E-08	1.20E+00	7.00E-06	8.40E-06	1.17E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Eastern Cottontail Rabbit	1.82E-07	1.00E+00	1.82E-07	1.20E+00	2.33E-05	2.80E-05	6.50E-03	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Eastern Cottontail Rabbit	3.26E-08	1.00E+00	3.26E-08	1.20E+00	7.00E-07	8.40E-07	3.88E-02	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Eastern Cottontail Rabbit	1.90E-07	1.00E+00	1.90E-07	1.20E+00	7.00E-06	8.40E-06	2.26E-02	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Eastern Cottontail Rabbit	2.90E-07	1.00E+00	2.90E-07	1.20E+00	2.33E-06	2.80E-06	1.03E-01	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Eastern Cottontail Rabbit	3.04E-08	1.00E+00	3.04E-08	1.20E+00	7.00E-06	8.40E-06	3.62E-03	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Eastern Cottontail Rabbit	1.33E-08	1.00E+00	1.33E-08	1.20E+00	7.00E-07	8.40E-07	1.58E-02	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Eastern Cottontail Rabbit	3.73E+01	1.00E+00	3.73E+01	1.20E+00	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	Eastern Cottontail Rabbit	1.68E-03	1.00E+00	1.68E-03	1.20E+00	1.99E+00	2.39E+00	7.03E-04	HQ<1				
Acenaphthylene	Eastern Cottontail Rabbit	1.27E-03	1.00E+00	1.27E-03	1.20E+00	Not Available	NA	NA	NA				
Anthracene	Eastern Cottontail Rabbit	1.74E-03	1.00E+00	1.74E-03	1.20E+00	7.35E+01	8.82E+01	1.97E-05	HQ<1				

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WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Benzo(a)anthracene	Eastern Cottontail Rabbit	4.13E-03	1.00E+00	4.13E-03	1.20E+00	Not Available	NA	NA	NA				
Benzo(a)pyrene	Eastern Cottontail Rabbit	2.42E-03	1.00E+00	2.42E-03	1.20E+00	4.00E-01	4.80E-01	5.04E-03	HQ<1				
Benzo(b)fluoranthene	Eastern Cottontail Rabbit	2.77E-03	1.00E+00	2.77E-03	1.20E+00	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	Eastern Cottontail Rabbit	1.80E-03	1.00E+00	1.80E-03	1.20E+00	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	Eastern Cottontail Rabbit	2.25E-03	1.00E+00	2.25E-03	1.20E+00	Not Available	NA	NA	NA				
Chrysene	Eastern Cottontail Rabbit	6.77E-03	1.00E+00	6.77E-03	1.20E+00	6.39E-01	7.67E-01	8.83E-03	HQ<1				
Dibenzo(a,h)anthracene	Eastern Cottontail Rabbit	5.25E-04	1.00E+00	5.25E-04	1.20E+00	Not Available	NA	NA	NA				
Dibenzofuran	Eastern Cottontail Rabbit	6.90E-03	1.00E+00	6.90E-03	1.20E+00	Not Available	NA	NA	NA				
Dimethyl phthalate	Eastern Cottontail Rabbit	7.34E-01	1.00E+00	7.34E-01	1.20E+00	1.82E+03	2.19E+03	3.36E-04	HQ<1				
Fluoranthene	Eastern Cottontail Rabbit	6.22E-03	1.00E+00	6.22E-03	1.20E+00	1.96E+02	2.35E+02	2.64E-05	HQ<1				
Fluorene	Eastern Cottontail Rabbit	1.31E-03	1.00E+00	1.31E-03	1.20E+00	9.94E+01	1.19E+02	1.09E-05	HQ<1				
Indeno(1,2,3-cd)pyrene	Eastern Cottontail Rabbit	9.02E-04	1.00E+00	9.02E-04	1.20E+00	Not Available	NA	NA	NA				
2-Methylnaphthalene	Eastern Cottontail Rabbit	1.58E-02	1.00E+00	1.58E-02	1.20E+00	Not Available	NA	NA	NA				
Naphthalene	Eastern Cottontail Rabbit	1.80E-01	1.00E+00	1.80E-01	1.20E+00	3.45E+01	4.14E+01	4.35E-03	HQ<1				
Phenanthrene	Eastern Cottontail Rabbit	5.86E-02	1.00E+00	5.86E-02	1.20E+00	7.07E+01	8.49E+01	6.91E-04	HQ<1				
Pyrene	Eastern Cottontail Rabbit	7.51E-03	1.00E+00	7.51E-03	1.20E+00	8.19E+01	9.83E+01	7.64E-05	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Eastern Cottontail Rabbit	3.65E+02	1.00E+00	3.65E+02	1.20E+00	7.67E-01	9.20E-01	3.96E+02	**Yes**	7.67E+00	9.21E+00	3.96E+01	**Yes**
Antimony	Eastern Cottontail Rabbit	1.06E-01	1.00E+00	1.06E-01	1.20E+00	5.00E-02	6.00E-02	1.77E+00	**Yes**	4.97E-01	5.96E-01	1.78E-01	HQ<1
Arsenic	Eastern Cottontail Rabbit	2.04E+00	1.00E+00	2.04E+00	1.20E+00	5.00E-02	6.00E-02	3.39E+01	**Yes**	5.01E-01	6.01E-01	3.39E+00	**Yes**
Barium	Eastern Cottontail Rabbit	6.96E+01	1.00E+00	6.96E+01	1.20E+00	4.00E+00	4.80E+00	1.45E+01	**Yes**	1.46E+01	1.75E+01	3.97E+00	**Yes**
Beryllium	Eastern Cottontail Rabbit	4.66E-02	1.00E+00	4.66E-02	1.20E+00	4.90E-01	5.88E-01	7.93E-02	HQ<1				
Cadmium	Eastern Cottontail Rabbit	1.58E+00	1.00E+00	1.58E+00	1.20E+00	7.09E-01	8.51E-01	1.85E+00	**Yes**	7.09E+00	8.51E+00	1.86E-01	HQ<1
Chromium	Eastern Cottontail Rabbit	3.84E-01	1.00E+00	3.84E-01	1.20E+00	2.41E+00	2.89E+00	1.33E-01	HQ<1				
Cobalt	Eastern Cottontail Rabbit	1.76E+00	1.00E+00	1.76E+00	1.20E+00	Not Available	NA	NA	NA				
Copper	Eastern Cottontail Rabbit	2.19E+01	1.00E+00	2.19E+01	1.20E+00	1.12E+01	1.34E+01	1.63E+00	**Yes**	1.47E+01	1.76E+01	1.24E+00	**Yes**
Iron	Eastern Cottontail Rabbit	8.34E+03	1.00E+00	8.34E+03	1.20E+00	Not Available	NA	NA	NA				
Lead	Eastern Cottontail Rabbit	2.16E+01	1.00E+00	2.16E+01	1.20E+00	5.88E+00	7.06E+00	3.06E+00	**Yes**	5.88E+01	7.05E+01	3.06E-01	HQ<1
Manganese	Eastern Cottontail Rabbit	4.94E+01	1.00E+00	4.94E+01	1.20E+00	6.50E+01	7.80E+01	6.33E-01	HQ<1				
Mercury	Eastern Cottontail Rabbit	3.93E-01	1.00E+00	3.93E-01	1.20E+00	9.60E-01	1.15E+00	3.41E-01	HQ<1				
Methyl Mercury	Eastern Cottontail Rabbit	1.26E-05	1.00E+00	1.26E-05	1.20E+00	2.40E-02	2.88E-02	4.36E-04	HQ<1				
Nickel	Eastern Cottontail Rabbit	1.96E+00	1.00E+00	1.96E+00	1.20E+00	2.94E+01	3.53E+01	5.55E-02	HQ<1				
Selenium	Eastern Cottontail Rabbit	4.49E-02	1.00E+00	4.49E-02	1.20E+00	1.47E-01	1.76E-01	2.54E-01	HQ<1				
Silver	Eastern Cottontail Rabbit	1.06E-01	1.00E+00	1.06E-01	1.20E+00	Not Available	NA	NA	NA				
Thallium	Eastern Cottontail Rabbit	3.17E-02	1.00E+00	3.17E-02	1.20E+00	5.00E-03	6.00E-03	5.28E+00	**Yes**	5.50E-02	6.60E-02	4.80E-01	HQ<1
Vanadium	Eastern Cottontail Rabbit	4.72E+00	1.00E+00	4.72E+00	1.20E+00	1.43E-01	1.72E-01	2.75E+01	**Yes**	1.43E+00	1.72E+00	2.74E+00	**Yes**
Zinc	Eastern Cottontail Rabbit	2.06E+01	1.00E+00	2.06E+01	1.20E+00	1.18E+02	1.41E+02	1.46E-01	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation

mg/kg - milligrams per kilogram

mg/kg/day - milligrams per kilograms per day

NA - Not Analyzed

NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red Fox	2.95E-06	1.30E-02	3.83E-08	4.50E+00	1.67E-03	7.50E-03	5.11E-06	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red Fox	2.76E-05	1.30E-02	3.59E-07	4.50E+00	1.67E-03	7.50E-03	4.78E-05	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red Fox	2.02E-06	1.30E-02	2.63E-08	4.50E+00	5.00E-05	2.25E-04	1.17E-04	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red Fox	4.11E-06	1.30E-02	5.34E-08	4.50E+00	5.00E-05	2.25E-04	2.37E-04	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red Fox	9.73E-08	1.30E-02	1.27E-09	4.50E+00	5.00E-05	2.25E-04	5.62E-06	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	2.08E-07	1.30E-02	2.70E-09	4.50E+00	5.00E-06	2.25E-05	1.20E-04	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	4.73E-08	1.30E-02	6.15E-10	4.50E+00	5.00E-06	2.25E-05	2.73E-05	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	2.75E-07	1.30E-02	3.58E-09	4.50E+00	5.00E-06	2.25E-05	1.59E-04	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	1.23E-07	1.30E-02	1.60E-09	4.50E+00	5.00E-06	2.25E-05	7.10E-05	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red Fox	8.75E-09	1.30E-02	1.14E-10	4.50E+00	5.00E-06	2.25E-05	5.06E-06	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red Fox	1.26E-07	1.30E-02	1.64E-09	4.50E+00	5.00E-06	2.25E-05	7.28E-05	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	2.36E-07	1.30E-02	3.07E-09	4.50E+00	1.67E-05	7.50E-05	4.10E-05	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red Fox	5.06E-08	1.30E-02	6.58E-10	4.50E+00	5.00E-07	2.25E-06	2.93E-04	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red Fox	2.76E-07	1.30E-02	3.59E-09	4.50E+00	5.00E-06	2.25E-05	1.60E-04	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red Fox	4.99E-07	1.30E-02	6.49E-09	4.50E+00	1.67E-06	7.50E-06	8.65E-04	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red Fox	4.57E-08	1.30E-02	5.94E-10	4.50E+00	5.00E-06	2.25E-05	2.64E-05	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red Fox	2.07E-08	1.30E-02	2.69E-10	4.50E+00	5.00E-07	2.25E-06	1.19E-04	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Red Fox	5.94E+01	1.30E-02	7.73E-01	4.50E+00	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	Red Fox	1.22E-02	1.30E-02	1.59E-04	4.50E+00	1.43E+00	6.43E+00	2.47E-05	HQ<1				
Acenaphthylene	Red Fox	9.28E-03	1.30E-02	1.21E-04	4.50E+00	Not Available	NA	NA	NA				
Anthracene	Red Fox	6.42E-02	1.30E-02	8.34E-04	4.50E+00	5.28E+01	2.38E+02	3.51E-06	HQ<1				
Benzo(a)anthracene	Red Fox	4.23E-03	1.30E-02	5.50E-05	4.50E+00	Not Available	NA	NA	NA				
Benzo(a)pyrene	Red Fox	2.72E-03	1.30E-02	3.54E-05	4.50E+00	2.90E-01	1.31E+00	2.71E-05	HQ<1				
Benzo(b)fluoranthene	Red Fox	3.11E-03	1.30E-02	4.05E-05	4.50E+00	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	Red Fox	7.78E+00	1.30E-02	1.01E-01	4.50E+00	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	Red Fox	2.54E-03	1.30E-02	3.30E-05	4.50E+00	Not Available	NA	NA	NA				
Chrysene	Red Fox	7.03E-03	1.30E-02	9.14E-05	4.50E+00	4.59E-01	2.07E+00	4.42E-05	HQ<1				
Dibenzo(a,h)anthracene	Red Fox	6.12E-04	1.30E-02	7.96E-06	4.50E+00	Not Available	NA	NA	NA				
Dibenzofuran	Red Fox	9.30E-02	1.30E-02	1.21E-03	4.50E+00	Not Available	NA	NA	NA				
Dimethyl phthalate	Red Fox	2.72E-01	1.30E-02	3.53E-03	4.50E+00	1.31E+03	5.90E+03	5.99E-07	HQ<1				
Fluoranthene	Red Fox	1.37E+00	1.30E-02	1.78E-02	4.50E+00	7.92E+01	3.56E+02	4.99E-05	HQ<1				
Fluorene	Red Fox	2.07E-02	1.30E-02	2.69E-04	4.50E+00	7.14E+01	3.21E+02	8.37E-07	HQ<1				
Indeno(1,2,3-cd)pyrene	Red Fox	1.08E-03	1.30E-02	1.41E-05	4.50E+00	Not Available	NA	NA	NA				
2-Methylnaphthalene	Red Fox	1.05E-01	1.30E-02	1.36E-03	4.50E+00	Not Available	NA	NA	NA				
Naphthalene	Red Fox	2.87E-01	1.30E-02	3.73E-03	4.50E+00	2.48E+01	1.11E+02	3.34E-05	HQ<1				
Phenanthrene	Red Fox	4.66E-02	1.30E-02	6.06E-04	4.50E+00	5.08E+01	2.29E+02	2.65E-06	HQ<1				
Pyrene	Red Fox	7.51E-01	1.30E-02	9.76E-03	4.50E+00	5.89E+01	2.65E+02	3.69E-05	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Red Fox	4.49E+02	1.30E-02	5.84E+00	4.50E+00	5.51E-01	2.48E+00	2.36E+00	**Yes**	5.52E+00	2.48E+01	2.35E-01	HQ<1
Antimony	Red Fox	6.17E-02	1.30E-02	8.01E-04	4.50E+00	3.60E-02	1.62E-01	4.95E-03	HQ<1				
Arsenic	Red Fox	1.90E+00	1.30E-02	2.47E-02	4.50E+00	3.60E-02	1.62E-01	1.52E-01	HQ<1				
Barium	Red Fox	4.42E+01	1.30E-02	5.75E-01	4.50E+00	2.80E+00	1.26E+01	4.56E-02	HQ<1				
Beryllium	Red Fox	5.41E-02	1.30E-02	7.04E-04	4.50E+00	3.50E-01	1.58E+00	4.47E-04	HQ<1				
Cadmium	Red Fox	8.31E-01	1.30E-02	1.08E-02	4.50E+00	5.09E-01	2.29E+00	4.71E-03	HQ<1				
Chromium	Red Fox	4.37E-01	1.30E-02	5.68E-03	4.50E+00	1.73E+00	7.79E+00	7.29E-04	HQ<1				
Cobalt	Red Fox	8.53E-01	1.30E-02	1.11E-02	4.50E+00	Not Available	NA	NA	NA				
Copper	Red Fox	1.05E+01	1.30E-02	1.37E-01	4.50E+00	8.00E+00	3.60E+01	3.80E-03	HQ<1				
Iron	Red Fox	4.05E+03	1.30E-02	5.27E+01	4.50E+00	Not Available	NA	NA	NA				
Lead	Red Fox	1.88E+01	1.30E-02	2.44E-01	4.50E+00	4.22E+00	1.90E+01	1.29E-02	HQ<1				
Manganese	Red Fox	2.40E+01	1.30E-02	3.12E-01	4.50E+00	4.60E+01	2.07E+02	1.51E-03	HQ<1				
Mercury	Red Fox	3.58E-01	1.30E-02	4.65E-03	4.50E+00	6.90E-01	3.11E+00	1.50E-03	HQ<1				
Methyl Mercury	Red Fox	1.71E-05	1.30E-02	2.22E-07	4.50E+00	1.00E-02	4.50E-02	4.94E-06	HQ<1				
Nickel	Red Fox	1.84E+00	1.30E-02	2.39E-02	4.50E+00	2.11E+01	9.50E+01	2.52E-04	HQ<1				
Selenium	Red Fox	4.94E-02	1.30E-02	6.42E-04	4.50E+00	1.06E-01	4.77E-01	1.35E-03	HQ<1				
Silver	Red Fox	5.17E-02	1.30E-02	6.73E-04	4.50E+00	Not Available	NA	NA	NA				
Thallium	Red Fox	3.91E-02	1.30E-02	5.08E-04	4.50E+00	4.00E-03	1.80E-02	2.82E-02	HQ<1				
Vanadium	Red Fox	2.29E+00	1.30E-02	2.98E-02	4.50E+00	1.03E-01	4.64E-01	6.44E-02	HQ<1				
Zinc	Red Fox	2.84E+01	1.30E-02	3.69E-01	4.50E+00	8.45E+01	3.80E+02	9.71E-04	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Raccoon	2.46E-08	4.00E-03	9.86E-11	5.20E+00	1.70E-03	8.84E-03	1.11E-08	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Raccoon	1.76E-08	4.00E-03	7.06E-11	5.20E+00	1.70E-03	8.84E-03	7.98E-09	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Raccoon	2.20E-09	4.00E-03	8.80E-12	5.20E+00	5.10E-05	2.65E-04	3.32E-08	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Raccoon	2.72E-05	4.00E-03	1.09E-07	5.20E+00	5.10E-05	2.65E-04	4.10E-04	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Raccoon	1.67E-07	4.00E-03	6.68E-10	5.20E+00	5.10E-05	2.65E-04	2.52E-06	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	2.14E-08	4.00E-03	8.56E-11	5.20E+00	5.10E-06	2.65E-05	3.23E-06	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	5.79E-08	4.00E-03	2.31E-10	5.20E+00	5.10E-06	2.65E-05	8.73E-06	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	5.77E-08	4.00E-03	2.31E-10	5.20E+00	5.10E-06	2.65E-05	8.70E-06	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	3.35E-05	4.00E-03	1.34E-07	5.20E+00	5.10E-06	2.65E-05	5.05E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Raccoon	2.22E-07	4.00E-03	8.87E-10	5.20E+00	5.10E-06	2.65E-05	3.35E-05	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Raccoon	8.14E-05	4.00E-03	3.26E-07	5.20E+00	5.10E-06	2.65E-05	1.23E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Raccoon	7.17E-07	4.00E-03	2.87E-09	5.20E+00	5.10E-07	2.65E-06	1.08E-03	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Raccoon	2.36E-07	4.00E-03	9.43E-10	5.20E+00	5.10E-06	2.65E-05	3.56E-05	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Raccoon	4.02E-07	4.00E-03	1.61E-09	5.20E+00	1.70E-06	8.84E-06	1.82E-04	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Raccoon	1.93E-07	4.00E-03	7.72E-10	5.20E+00	5.10E-06	2.65E-05	2.91E-05	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Raccoon	2.39E+01	4.00E-03	9.56E-02	5.20E+00	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Benzo(a)pyrene	Raccoon	1.47E-04	4.00E-03	5.88E-07	5.20E+00	2.80E-01	1.46E+00	4.04E-07	HQ<1				
Benzo(k)fluoranthene	Raccoon	2.62E-04	4.00E-03	1.05E-06	5.20E+00	Not Available	NA	NA	NA				
Chrysene	Raccoon	3.60E-04	4.00E-03	1.44E-06	5.20E+00	4.43E-01	2.30E+00	6.25E-07	HQ<1				
Pyrene	Raccoon	1.20E-04	4.00E-03	4.80E-07	5.20E+00	5.68E+01	2.95E+02	1.63E-09	HQ<1				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Raccoon	1.03E+03	4.00E-03	4.12E+00	5.20E+00	5.40E-01	2.81E+00	1.47E+00	**Yes**	5.40E+00	2.81E+01	1.47E-01	HQ<1
Arsenic	Raccoon	9.64E-01	4.00E-03	3.86E-03	5.20E+00	3.53E-02	1.83E-01	2.10E-02	HQ<1				
Barium	Raccoon	4.29E+01	4.00E-03	1.72E-01	5.20E+00	2.60E+00	1.35E+01	1.27E-02	HQ<1				
Beryllium	Raccoon	4.64E-02	4.00E-03	1.86E-04	5.20E+00	3.00E-01	1.56E+00	1.19E-04	HQ<1				
Cadmium	Raccoon	4.68E-01	4.00E-03	1.87E-03	5.20E+00	5.10E-01	2.65E+00	7.05E-04	HQ<1				
Chromium	Raccoon	5.54E-01	4.00E-03	2.22E-03	5.20E+00	1.67E+00	8.70E+00	2.55E-04	HQ<1				
Cobalt	Raccoon	9.41E-01	4.00E-03	3.76E-03	5.20E+00	Not Available	NA	NA	NA				
Copper	Raccoon	5.17E-01	4.00E-03	2.07E-03	5.20E+00	7.72E+00	4.02E+01	5.15E-05	HQ<1				
Iron	Raccoon	1.29E+03	4.00E-03	5.15E+00	5.20E+00	Not Available	NA	NA	NA				
Lead	Raccoon	7.75E-01	4.00E-03	3.10E-03	5.20E+00	4.08E+00	2.12E+01	1.46E-04	HQ<1				
Manganese	Raccoon	1.30E+02	4.00E-03	5.19E-01	5.20E+00	4.49E+01	2.33E+02	2.23E-03	HQ<1				
Mercury	Raccoon	3.60E-02	4.00E-03	1.44E-04	5.20E+00	6.60E-01	3.43E+00	4.20E-05	HQ<1				
Methyl Mercury	Raccoon	6.52E-05	4.00E-03	2.61E-07	5.20E+00	9.90E-03	5.15E-02	5.07E-06	HQ<1				
Nickel	Raccoon	1.82E+00	4.00E-03	7.29E-03	5.20E+00	2.04E+01	1.06E+02	6.87E-05	HQ<1				
Vanadium	Raccoon	1.91E+00	4.00E-03	7.66E-03	5.20E+00	1.07E-01	5.57E-01	1.37E-02	HQ<1				
Zinc	Raccoon	7.85E+00	4.00E-03	3.14E-02	5.20E+00	8.16E+01	4.24E+02	7.40E-05	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.
The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).
The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	White-tailed Deer	5.65E-06	6.00E-03	3.39E-08	5.65E+01	1.00E-03	5.65E-02	6.00E-07	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	White-tailed Deer	5.27E-05	6.00E-03	3.16E-07	5.65E+01	1.00E-03	5.65E-02	5.60E-06	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	White-tailed Deer	3.86E-06	6.00E-03	2.32E-08	5.65E+01	3.00E-05	1.70E-03	1.37E-05	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	White-tailed Deer	7.82E-06	6.00E-03	4.69E-08	5.65E+01	3.00E-05	1.70E-03	2.77E-05	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	White-tailed Deer	1.85E-07	6.00E-03	1.11E-09	5.65E+01	3.00E-05	1.70E-03	6.55E-07	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	3.97E-07	6.00E-03	2.38E-09	5.65E+01	3.00E-06	1.70E-04	1.41E-05	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	9.00E-08	6.00E-03	5.40E-10	5.65E+01	3.00E-06	1.70E-04	3.19E-06	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	5.21E-07	6.00E-03	3.13E-09	5.65E+01	3.00E-06	1.70E-04	1.85E-05	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	2.34E-07	6.00E-03	1.41E-09	5.65E+01	3.00E-06	1.70E-04	8.30E-06	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	2.00E-08	6.00E-03	1.20E-10	5.65E+01	3.00E-06	1.70E-04	7.07E-07	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	White-tailed Deer	2.43E-07	6.00E-03	1.46E-09	5.65E+01	3.00E-06	1.70E-04	8.61E-06	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	White-tailed Deer	4.43E-07	6.00E-03	2.66E-09	5.65E+01	1.00E-05	5.65E-04	4.70E-06	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	White-tailed Deer	9.96E-08	6.00E-03	5.97E-10	5.65E+01	3.00E-07	1.70E-05	3.52E-05	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	White-tailed Deer	5.05E-07	6.00E-03	3.03E-09	5.65E+01	3.00E-06	1.70E-04	1.79E-05	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	White-tailed Deer	8.65E-07	6.00E-03	5.19E-09	5.65E+01	1.00E-06	5.65E-05	9.18E-05	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	White-tailed Deer	8.49E-08	6.00E-03	5.10E-10	5.65E+01	3.00E-06	1.70E-04	3.01E-06	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	White-tailed Deer	3.67E-08	6.00E-03	2.20E-10	5.65E+01	3.00E-07	1.70E-05	1.30E-05	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	White-tailed Deer	2.53E+02	6.00E-03	1.52E+00	5.65E+01	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	White-tailed Deer	1.04E-02	6.00E-03	6.27E-05	5.65E+01	7.59E-01	4.29E+01	1.46E-06	HQ<1				
Acenaphthylene	White-tailed Deer	7.94E-03	6.00E-03	4.76E-05	5.65E+01	Not Available	NA	NA	NA				
Anthracene	White-tailed Deer	9.41E-03	6.00E-03	5.64E-05	5.65E+01	2.81E+01	1.58E+03	3.56E-08	HQ<1				
Benzo(a)anthracene	White-tailed Deer	1.47E-02	6.00E-03	8.84E-05	5.65E+01	Not Available	NA	NA	NA				
Benzo(a)pyrene	White-tailed Deer	7.35E-03	6.00E-03	4.41E-05	5.65E+01	1.50E-01	8.48E+00	5.21E-06	HQ<1				
Benzo(b)fluoranthene	White-tailed Deer	8.41E-03	6.00E-03	5.05E-05	5.65E+01	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	White-tailed Deer	5.02E-03	6.00E-03	3.01E-05	5.65E+01	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	White-tailed Deer	6.85E-03	6.00E-03	4.11E-05	5.65E+01	Not Available	NA	NA	NA				
Chrysene	White-tailed Deer	2.37E-02	6.00E-03	1.42E-04	5.65E+01	2.44E-01	1.38E+01	1.03E-05	HQ<1				
Dibenzo(a,h)anthracene	White-tailed Deer	1.48E-03	6.00E-03	8.86E-06	5.65E+01	Not Available	NA	NA	NA				
Dibenzofuran	White-tailed Deer	4.10E-02	6.00E-03	2.46E-04	5.65E+01	Not Available	NA	NA	NA				
Dimethyl phthalate	White-tailed Deer	5.35E+00	6.00E-03	3.21E-02	5.65E+01	6.96E+02	3.93E+04	8.16E-07	HQ<1				
Fluoranthene	White-tailed Deer	2.63E-02	6.00E-03	1.58E-04	5.65E+01	4.21E+01	2.38E+03	6.63E-08	HQ<1				
Fluorene	White-tailed Deer	7.65E-03	6.00E-03	4.59E-05	5.65E+01	3.80E+01	2.14E+03	2.14E-08	HQ<1				
Indeno(1,2,3-cd)pyrene	White-tailed Deer	2.38E-03	6.00E-03	1.43E-05	5.65E+01	Not Available	NA	NA	NA				
2-Methylnaphthalene	White-tailed Deer	9.89E-02	6.00E-03	5.93E-04	5.65E+01	Not Available	NA	NA	NA				
Naphthalene	White-tailed Deer	1.22E+00	6.00E-03	7.31E-03	5.65E+01	1.32E+01	7.44E+02	9.83E-06	HQ<1				
Phenanthrene	White-tailed Deer	3.19E-01	6.00E-03	1.91E-03	5.65E+01	2.70E+01	1.52E+03	1.25E-06	HQ<1				
Pyrene	White-tailed Deer	3.58E-02	6.00E-03	2.15E-04	5.65E+01	3.13E+01	1.77E+03	1.22E-07	HQ<1				

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Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	White-tailed Deer	9.65E+02	6.00E-03	5.79E+00	5.65E+01	2.93E-01	1.66E+01	3.50E-01	HQ<1				
Antimony	White-tailed Deer	6.51E-01	6.00E-03	3.91E-03	5.65E+01	1.90E-02	1.07E+00	3.64E-03	HQ<1				
Arsenic	White-tailed Deer	8.50E+00	6.00E-03	5.10E-02	5.65E+01	1.90E-02	1.07E+00	4.75E-02	HQ<1				
Barium	White-tailed Deer	4.09E+02	6.00E-03	2.45E+00	5.65E+01	1.50E+00	8.48E+01	2.90E-02	HQ<1				
Beryllium	White-tailed Deer	1.41E-01	6.00E-03	8.49E-04	5.65E+01	1.90E-01	1.07E+01	7.91E-05	HQ<1				
Cadmium	White-tailed Deer	1.04E+01	6.00E-03	6.26E-02	5.65E+01	2.71E-01	1.53E+01	4.09E-03	HQ<1				
Chromium	White-tailed Deer	1.11E+00	6.00E-03	6.63E-03	5.65E+01	9.20E-01	5.20E+01	1.28E-04	HQ<1				
Cobalt	White-tailed Deer	1.17E+01	6.00E-03	7.02E-02	5.65E+01	Not Available	NA	NA	NA				
Copper	White-tailed Deer	1.46E+02	6.00E-03	8.77E-01	5.65E+01	4.30E+00	2.43E+02	3.61E-03	HQ<1				
Iron	White-tailed Deer	5.56E+04	6.00E-03	3.33E+02	5.65E+01	Not Available	NA	NA	NA				
Lead	White-tailed Deer	9.56E+01	6.00E-03	5.74E-01	5.65E+01	2.24E+00	1.27E+02	4.53E-03	HQ<1				
Manganese	White-tailed Deer	3.29E+02	6.00E-03	1.98E+00	5.65E+01	2.50E+01	1.41E+03	1.40E-03	HQ<1				
Mercury	White-tailed Deer	1.65E+00	6.00E-03	9.93E-03	5.65E+01	3.60E-01	2.03E+01	4.88E-04	HQ<1				
Methyl Mercury	White-tailed Deer	7.28E-05	6.00E-03	4.37E-07	5.65E+01	9.00E-03	5.09E-01	8.59E-07	HQ<1				
Nickel	White-tailed Deer	7.90E+00	6.00E-03	4.74E-02	5.65E+01	1.12E+01	6.34E+02	7.48E-05	HQ<1				
Selenium	White-tailed Deer	1.51E-01	6.00E-03	9.05E-04	5.65E+01	5.60E-02	3.16E+00	2.86E-04	HQ<1				
Silver	White-tailed Deer	7.09E-01	6.00E-03	4.25E-03	5.65E+01	Not Available	NA	NA	NA				
Thallium	White-tailed Deer	8.39E-02	6.00E-03	5.04E-04	5.65E+01	2.00E-03	1.13E-01	4.46E-03	HQ<1				
Vanadium	White-tailed Deer	3.14E+01	6.00E-03	1.89E-01	5.65E+01	5.50E-02	3.11E+00	6.07E-02	HQ<1				
Zinc	White-tailed Deer	4.84E+01	6.00E-03	2.91E-01	5.65E+01	4.49E+01	2.54E+03	1.15E-04	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.
The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,7,8-TCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).
The estimated Wildlife NOAEL for Diethyl phthalate was used as a surrogate for the Dimethyl phthalate NOAEL

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	American Robin	1.70E-06	1.00E+00	1.70E-06	7.70E-02	1.40E-01	1.08E-02	1.57E-04	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	American Robin	1.52E-05	1.00E+00	1.52E-05	7.70E-02	1.40E-01	1.08E-02	1.41E-03	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	American Robin	1.10E-06	1.00E+00	1.10E-06	7.70E-02	1.40E-03	1.08E-04	1.02E-02	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	American Robin	3.25E-06	1.00E+00	3.25E-06	7.70E-02	1.40E-02	1.08E-03	3.01E-03	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	American Robin	2.53E-07	1.00E+00	2.53E-07	7.70E-02	1.40E-03	1.08E-04	2.34E-03	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	1.95E-07	1.00E+00	1.95E-07	7.70E-02	1.40E-04	1.08E-05	1.81E-02	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	1.04E-07	1.00E+00	1.04E-07	7.70E-02	2.80E-05	2.16E-06	4.83E-02	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	4.35E-07	1.00E+00	4.35E-07	7.70E-02	1.40E-04	1.08E-05	4.04E-02	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	1.46E-07	1.00E+00	1.46E-07	7.70E-02	1.40E-03	1.08E-04	1.36E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	American Robin	3.00E-08	1.00E+00	3.00E-08	7.70E-02	1.40E-04	1.08E-05	2.78E-03	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	American Robin	1.63E-07	1.00E+00	1.63E-07	7.70E-02	1.40E-04	1.08E-05	1.51E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	3.91E-07	1.00E+00	3.91E-07	7.70E-02	1.40E-04	1.08E-05	3.63E-02	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	American Robin	2.35E-07	1.00E+00	2.35E-07	7.70E-02	1.40E-05	1.08E-06	2.18E-01	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	American Robin	1.06E-06	1.00E+00	1.06E-06	7.70E-02	1.40E-04	1.08E-05	9.84E-02	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	3.36E-06	1.00E+00	3.36E-06	7.70E-02	1.40E-05	1.08E-06	3.12E+00	**Yes**	1.40E-04	1.08E-05	3.12E-01	HQ<1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	American Robin	1.96E-07	1.00E+00	1.96E-07	7.70E-02	1.40E-05	1.08E-06	1.82E-01	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	American Robin	1.04E-07	1.00E+00	1.04E-07	7.70E-02	1.40E-05	1.08E-06	9.67E-02	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	American Robin	7.83E+02	1.00E+00	7.83E+02	7.70E-02	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	American Robin	2.08E-01	1.00E+00	2.08E-01	7.70E-02	Not Available	NA	NA	NA				
Acenaphthylene	American Robin	1.58E-01	1.00E+00	1.58E-01	7.70E-02	Not Available	NA	NA	NA				
Anthracene	American Robin	1.16E+00	1.00E+00	1.16E+00	7.70E-02	Not Available	NA	NA	NA				
Benzo(a)anthracene	American Robin	2.38E-03	1.00E+00	2.38E-03	7.70E-02	Not Available	NA	NA	NA				
Benzo(a)pyrene	American Robin	1.98E-03	1.00E+00	1.98E-03	7.70E-02	3.57E+00	2.75E-01	7.20E-03	HQ<1				
Benzo(b)fluoranthene	American Robin	2.26E-03	1.00E+00	2.26E-03	7.70E-02	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	American Robin	1.43E+02	1.00E+00	1.43E+02	7.70E-02	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	American Robin	1.93E-03	1.00E+00	1.93E-03	7.70E-02	Not Available	NA	NA	NA				
Chrysene	American Robin	4.22E-03	1.00E+00	4.22E-03	7.70E-02	Not Available	NA	NA	NA				
Dibenzo(a,h)anthracene	American Robin	4.50E-04	1.00E+00	4.50E-04	7.70E-02	Not Available	NA	NA	NA				
Dibenzofuran	American Robin	1.64E+00	1.00E+00	1.64E+00	7.70E-02	Not Available	NA	NA	NA				
Dimethyl phthalate	American Robin	6.44E-02	1.00E+00	6.44E-02	7.70E-02	Not Available	NA	NA	NA				
Fluoranthene	American Robin	2.51E+01	1.00E+00	2.51E+01	7.70E-02	Not Available	NA	NA	NA				
Fluorene	American Robin	3.67E-01	1.00E+00	3.67E-01	7.70E-02	1.70E+00	1.31E-01	2.80E+00	**Yes**	1.70E+01	1.31E+00	2.80E-01	HQ<1
Indeno(1,2,3-cd)pyrene	American Robin	8.42E-04	1.00E+00	8.42E-04	7.70E-02	Not Available	NA	NA	NA				
2-Methylnaphthalene	American Robin	1.78E+00	1.00E+00	1.78E+00	7.70E-02	Not Available	NA	NA	NA				
Naphthalene	American Robin	3.78E+00	1.00E+00	3.78E+00	7.70E-02	Not Available	NA	NA	NA				
Phenanthrene	American Robin	1.28E-01	1.00E+00	1.28E-01	7.70E-02	Not Available	NA	NA	NA				
Pyrene	American Robin	1.37E+01	1.00E+00	1.37E+01	7.70E-02	Not Available	NA	NA	NA				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	American Robin	5.79E+02	1.00E+00	5.79E+02	7.70E-02	1.10E+02	8.45E+00	6.86E+01	**Yes**	4.45E+01	3.43E+00	1.69E+02	**Yes**
Antimony	American Robin	4.90E-02	1.00E+00	4.90E-02	7.70E-02	Not Available	NA	NA	NA				
Arsenic	American Robin	1.53E+00	1.00E+00	1.53E+00	7.70E-02	5.10E+00	3.93E-01	3.89E+00	**Yes**	1.28E+01	9.86E-01	1.55E+00	**Yes**
Barium	American Robin	3.85E+01	1.00E+00	3.85E+01	7.70E-02	2.08E+01	1.60E+00	2.40E+01	**Yes**	4.17E+01	3.21E+00	1.20E+01	**Yes**
Beryllium	American Robin	6.83E-02	1.00E+00	6.83E-02	7.70E-02	Not Available	NA	NA	NA				
Cadmium	American Robin	1.36E+00	1.00E+00	1.36E+00	7.70E-02	1.45E+00	1.12E-01	1.21E+01	**Yes**	2.00E+01	1.54E+00	8.81E-01	HQ<1
Chromium	American Robin	2.21E-01	1.00E+00	2.21E-01	7.70E-02	1.00E+00	7.70E-02	2.87E+00	**Yes**	5.00E+00	3.85E-01	5.75E-01	HQ<1
Cobalt	American Robin	5.21E-01	1.00E+00	5.21E-01	7.70E-02	Not Available	NA	NA	NA				
Copper	American Robin	3.83E+00	1.00E+00	3.83E+00	7.70E-02	4.70E+01	3.62E+00	1.06E+00	**Yes**	6.17E+01	4.75E+00	8.06E-01	HQ<1
Iron	American Robin	2.47E+03	1.00E+00	2.47E+03	7.70E-02	Not Available	NA	NA	NA				
Lead	American Robin	9.97E+00	1.00E+00	9.97E+00	7.70E-02	1.13E+00	8.70E-02	1.15E+02	**Yes**	1.13E+01	8.70E-01	1.15E+01	**Yes**
Manganese	American Robin	1.46E+01	1.00E+00	1.46E+01	7.70E-02	9.97E+02	7.68E+01	1.91E-01	HQ<1				
Mercury	American Robin	2.05E-01	1.00E+00	2.05E-01	7.70E-02	4.50E-01	3.47E-02	5.91E+00	**Yes**	9.00E-01	6.93E-02	2.96E+00	**Yes**
Methyl Mercury	American Robin	1.71E-04	1.00E+00	1.71E-04	7.70E-02	6.00E-03	4.62E-04	3.69E-01	HQ<1				
Nickel	American Robin	9.42E-01	1.00E+00	9.42E-01	7.70E-02	7.74E+01	5.96E+00	1.58E-01	HQ<1				
Selenium	American Robin	6.10E-02	1.00E+00	6.10E-02	7.70E-02	5.00E-01	3.85E-02	1.58E+00	**Yes**	1.00E+00	7.70E-02	7.92E-01	HQ<1
Silver	American Robin	3.16E-02	1.00E+00	3.16E-02	7.70E-02	Not Available	NA	NA	NA				
Thallium	American Robin	5.04E-02	1.00E+00	5.04E-02	7.70E-02	Not Available	NA	NA	NA				
Vanadium	American Robin	1.40E+00	1.00E+00	1.40E+00	7.70E-02	1.14E+01	8.78E-01	1.59E+00	**Yes**	2.28E+01	1.76E+00	7.97E-01	HQ<1
Zinc	American Robin	6.96E+01	1.00E+00	6.96E+01	7.70E-02	1.45E+01	1.12E+00	6.23E+01	**Yes**	1.31E+02	1.01E+01	6.90E+00	**Yes**

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,4,7,8-PeCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and avian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	Red-tailed Hawk	7.14E-07	2.00E-03	1.43E-09	1.13E+00	1.40E-01	1.58E-01	9.06E-09	HQ<1				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	Red-tailed Hawk	6.68E-06	2.00E-03	1.34E-08	1.13E+00	1.40E-01	1.58E-01	8.48E-08	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	4.90E-07	2.00E-03	9.80E-10	1.13E+00	1.40E-03	1.58E-03	6.22E-07	HQ<1				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Red-tailed Hawk	9.95E-07	2.00E-03	1.99E-09	1.13E+00	1.40E-02	1.58E-02	1.26E-07	HQ<1				
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	Red-tailed Hawk	2.35E-08	2.00E-03	4.71E-11	1.13E+00	1.40E-03	1.58E-03	2.99E-08	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	5.03E-08	2.00E-03	1.01E-10	1.13E+00	1.40E-04	1.58E-04	6.38E-07	HQ<1				
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	1.14E-08	2.00E-03	2.29E-11	1.13E+00	2.80E-05	3.15E-05	7.26E-07	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	6.66E-08	2.00E-03	1.33E-10	1.13E+00	1.40E-04	1.58E-04	8.45E-07	HQ<1				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	2.97E-08	2.00E-03	5.95E-11	1.13E+00	1.40E-03	1.58E-03	3.77E-08	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	2.08E-09	2.00E-03	4.16E-12	1.13E+00	1.40E-04	1.58E-04	2.64E-08	HQ<1				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	Red-tailed Hawk	3.05E-08	2.00E-03	6.10E-11	1.13E+00	1.40E-04	1.58E-04	3.87E-07	HQ<1				
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	5.73E-08	2.00E-03	1.15E-10	1.13E+00	1.40E-04	1.58E-04	7.26E-07	HQ<1				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	Red-tailed Hawk	1.22E-08	2.00E-03	2.44E-11	1.13E+00	1.40E-05	1.58E-05	1.54E-06	HQ<1				
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	Red-tailed Hawk	6.68E-08	2.00E-03	1.34E-10	1.13E+00	1.40E-04	1.58E-04	8.48E-07	HQ<1				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Red-tailed Hawk	1.21E-07	2.00E-03	2.42E-10	1.13E+00	1.40E-05	1.58E-05	1.53E-05	HQ<1				
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	Red-tailed Hawk	1.10E-08	2.00E-03	2.21E-11	1.13E+00	1.40E-05	1.58E-05	1.40E-06	HQ<1				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	Red-tailed Hawk	5.01E-09	2.00E-03	1.00E-11	1.13E+00	1.40E-05	1.58E-05	6.35E-07	HQ<1				
Total Petroleum Hydrocarbons													
Diesel Range Organics	Red-tailed Hawk	1.44E+01	2.00E-03	2.88E-02	1.13E+00	Not Available	NA	NA	NA				
Semivolatile Organic Compounds													
Acenaphthene	Red-tailed Hawk	2.96E-03	2.00E-03	5.91E-06	1.13E+00	Not Available	NA	NA	NA				
Acenaphthylene	Red-tailed Hawk	2.25E-03	2.00E-03	4.50E-06	1.13E+00	Not Available	NA	NA	NA				
Anthracene	Red-tailed Hawk	1.55E-02	2.00E-03	3.11E-05	1.13E+00	Not Available	NA	NA	NA				
Benzo(a)anthracene	Red-tailed Hawk	1.03E-03	2.00E-03	2.05E-06	1.13E+00	Not Available	NA	NA	NA				
Benzo(a)pyrene	Red-tailed Hawk	6.60E-04	2.00E-03	1.32E-06	1.13E+00	3.57E+00	4.02E+00	3.28E-07	HQ<1				
Benzo(b)fluoranthene	Red-tailed Hawk	7.54E-04	2.00E-03	1.51E-06	1.13E+00	Not Available	NA	NA	NA				
Benzo(g,h,i)perylene	Red-tailed Hawk	1.88E+00	2.00E-03	3.77E-03	1.13E+00	Not Available	NA	NA	NA				
Benzo(k)fluoranthene	Red-tailed Hawk	6.14E-04	2.00E-03	1.23E-06	1.13E+00	Not Available	NA	NA	NA				
Chrysene	Red-tailed Hawk	1.70E-03	2.00E-03	3.40E-06	1.13E+00	Not Available	NA	NA	NA				
Dibenzo(a,h)anthracene	Red-tailed Hawk	1.48E-04	2.00E-03	2.97E-07	1.13E+00	Not Available	NA	NA	NA				
Dibenzofuran	Red-tailed Hawk	2.25E-02	2.00E-03	4.51E-05	1.13E+00	Not Available	NA	NA	NA				
Dimethyl phthalate	Red-tailed Hawk	6.58E-02	2.00E-03	1.32E-04	1.13E+00	Not Available	NA	NA	NA				
Fluoranthene	Red-tailed Hawk	3.31E-01	2.00E-03	6.62E-04	1.13E+00	Not Available	NA	NA	NA				
Fluorene	Red-tailed Hawk	5.01E-03	2.00E-03	1.00E-05	1.13E+00	1.70E+00	1.91E+00	5.24E-06	HQ<1				
Indeno(1,2,3-cd)pyrene	Red-tailed Hawk	2.62E-04	2.00E-03	5.24E-07	1.13E+00	Not Available	NA	NA	NA				
2-Methylnaphthalene	Red-tailed Hawk	2.54E-02	2.00E-03	5.08E-05	1.13E+00	Not Available	NA	NA	NA				
Naphthalene	Red-tailed Hawk	6.95E-02	2.00E-03	1.39E-04	1.13E+00	Not Available	NA	NA	NA				
Phenanthrene	Red-tailed Hawk	1.13E-02	2.00E-03	2.26E-05	1.13E+00	Not Available	NA	NA	NA				
Pyrene	Red-tailed Hawk	1.82E-01	2.00E-03	3.64E-04	1.13E+00	Not Available	NA	NA	NA				

Table 7-28
Chemical-Specific Risk Estimates for Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-27 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Red-tailed Hawk	1.09E+02	2.00E-03	2.18E-01	1.13E+00	1.10E+02	1.24E+02	1.76E-03	HQ<1				
Antimony	Red-tailed Hawk	1.49E-02	2.00E-03	2.99E-05	1.13E+00	Not Available	NA	NA	NA				
Arsenic	Red-tailed Hawk	4.60E-01	2.00E-03	9.19E-04	1.13E+00	5.10E+00	5.74E+00	1.60E-04	HQ<1				
Barium	Red-tailed Hawk	1.07E+01	2.00E-03	2.14E-02	1.13E+00	2.08E+01	2.34E+01	9.15E-04	HQ<1				
Beryllium	Red-tailed Hawk	1.31E-02	2.00E-03	2.62E-05	1.13E+00	Not Available	NA	NA	NA				
Cadmium	Red-tailed Hawk	2.01E-01	2.00E-03	4.02E-04	1.13E+00	1.45E+00	1.63E+00	2.46E-04	HQ<1				
Chromium	Red-tailed Hawk	1.06E-01	2.00E-03	2.12E-04	1.13E+00	1.00E+00	1.13E+00	1.88E-04	HQ<1				
Cobalt	Red-tailed Hawk	2.07E-01	2.00E-03	4.13E-04	1.13E+00	Not Available	NA	NA	NA				
Copper	Red-tailed Hawk	2.55E+00	2.00E-03	5.10E-03	1.13E+00	4.70E+01	5.29E+01	9.63E-05	HQ<1				
Iron	Red-tailed Hawk	9.82E+02	2.00E-03	1.96E+00	1.13E+00	Not Available	NA	NA	NA				
Lead	Red-tailed Hawk	4.55E+00	2.00E-03	9.11E-03	1.13E+00	1.13E+00	1.27E+00	7.16E-03	HQ<1				
Manganese	Red-tailed Hawk	5.82E+00	2.00E-03	1.16E-02	1.13E+00	9.97E+02	1.12E+03	1.04E-05	HQ<1				
Mercury	Red-tailed Hawk	8.66E-02	2.00E-03	1.73E-04	1.13E+00	4.50E-01	5.07E-01	3.42E-04	HQ<1				
Methyl Mercury	Red-tailed Hawk	4.14E-06	2.00E-03	8.27E-09	1.13E+00	6.00E-03	6.76E-03	1.22E-06	HQ<1				
Nickel	Red-tailed Hawk	4.45E-01	2.00E-03	8.91E-04	1.13E+00	7.74E+01	8.72E+01	1.02E-05	HQ<1				
Selenium	Red-tailed Hawk	1.20E-02	2.00E-03	2.39E-05	1.13E+00	5.00E-01	5.63E-01	4.25E-05	HQ<1				
Silver	Red-tailed Hawk	1.25E-02	2.00E-03	2.51E-05	1.13E+00	Not Available	NA	NA	NA				
Thallium	Red-tailed Hawk	9.47E-03	2.00E-03	1.89E-05	1.13E+00	Not Available	NA	NA	NA				
Vanadium	Red-tailed Hawk	5.56E-01	2.00E-03	1.11E-03	1.13E+00	1.14E+01	1.28E+01	8.66E-05	HQ<1				
Zinc	Red-tailed Hawk	6.88E+00	2.00E-03	1.38E-02	1.13E+00	1.45E+01	1.63E+01	8.43E-04	HQ<1				

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.
The Wildlife NOAEL for OCDF; OCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,7,8,9-HpCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDF; 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDF; 1,2,3,7,8-PeCDD; 2,3,4,6,7,8-HxCDF; and 2,3,4,7,8-PeCDF were calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and avian toxicity equivalence factors (EPA, 2008; EPA/100/R-08/004).

Table 7-29
Earthworm Evaluation Based on 95% UCL Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil	Soil Organism Benchmark	Hazard Quotient	COPECs for Soil Invertebrates based on 95% UCL Evaluation
Total Petroleum Hydrocarbons (mg/kg)				
Diesel Range Organics	9.78E+01	2.00E+02[a]	4.89E-01	HQ<1
Semivolatile Organic Compounds (mg/kg)				
Naphthalene	2.42E-01	9.94E-02[b]	2.43E+00	**Yes**
Metals (mg/kg)				
Aluminum	1.60E+04	6.00E+02[c]	2.66E+01	**Yes**
Arsenic	1.24E+01	6.00E+01[d]	2.06E-01	HQ<1
Chromium	1.19E+01	4.00E-01[d]	2.97E+01	**Yes**
Copper	5.58E+01	6.00E+01[d]	9.30E-01	HQ<1
Iron	2.68E+04	2.00E+02[c]	1.34E+02	**Yes**
Lead	1.20E+02	5.00E+02[d]	2.40E-01	HQ<1
Manganese	3.52E+02	1.00E+02[c]	3.52E+00	**Yes**
Mercury	7.31E-01	1.00E-01[d]	7.31E+00	**Yes**
Vanadium	2.99E+01	2.00E+01[c]	1.50E+00	**Yes**
Zinc	3.87E+02	1.00E+02[d]	3.87E+00	**Yes**

Notes:

COPEC - Chemical of Potential Ecological Concern

mg/kg - milligrams per kilogram

[a] Soil Biota Screening Level from Washington State Department of Ecology, Terrestrial Ecological Screening Values: Site Specific Ecological Evaluation WAC 173-340-7493

[b] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft.

[c] Microbial benchmark from Efroymson et.al., 1997 ES/ER/TM-126/R2

[d] Earthworm benchmark from Efroymson et.al., 1997 ES/ER/TM-126/R2

Table 7-30
Benthic Invertebrate Evaluation Based on 95% UCL Stream Sediment Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Sediment	Benthic Invertebrate Benchmark	Hazard Quotient	COPECs for Benthic Invertebrates based on 95% UCL Evaluation
Metals (mg/kg)				
Barium	3.22E+02	2.00E+01[a]	1.61E+01	**Yes**
Cadmium	1.04E+00	5.92E-01[b]	1.76E+00	**Yes**
Methyl Mercury	3.57E-05	1.00E-05[c]	3.57E+00	**Yes**

Notes:
COPEC - Chemical of Potential Ecological Concern
mg/kg - milligrams per kilogram
[a] Ecological Screening Value from U.S. EPA, Region 4 Sediment Screening Values for Hazardous Waste Sites
[b] Threshold Effect Concentration reported in Jones et. al., 1997 (ES/ER/TM-95/R4)
[c] USEPA, 2015, Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft

Table 7-31
Terrestrial Plant Evaluation Based on 95% UCL Surface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Terrestiral Plants based on 95% UCL Evaluation
Semivolatile Organic Compounds (mg/kg)				
Naphthalene	2.42E-01	1.00E+00[a]	2.42E-01	HQ<1
Metals (mg/kg)				
Aluminum	1.60E+04	5.00E+01[b]	3.20E+02	**Yes**
Arsenic	1.24E+01	1.00E+01[b]	1.24E+00	**Yes**
Barium	3.22E+02	5.00E+02[b]	6.43E-01	HQ<1
Cadmium	1.71E+00	4.00E+00[b]	4.28E-01	HQ<1
Chromium	1.19E+01	1.00E+00[b]	1.19E+01	**Yes**
Copper	5.58E+01	1.00E+02[b]	5.58E-01	HQ<1
Lead	1.20E+02	5.00E+01[b]	2.40E+00	**Yes**
Mercury	7.31E-01	3.00E-01[b]	2.44E+00	**Yes**
Nickel	4.07E+01	3.00E+01[b]	1.36E+00	**Yes**
Selenium	7.63E-01	1.00E+00[b]	7.63E-01	HQ<1
Thallium	7.50E-01	1.00E+00[b]	7.50E-01	HQ<1
Vanadium	2.99E+01	2.00E+00[b]	1.50E+01	**Yes**
Zinc	3.87E+02	5.00E+01[b]	7.73E+00	**Yes**

Notes:
COPEC - Chemical of Potential Ecological
mg/kg - milligrams per kilogram
[a] Plant Screening Value from U.S. EPA, Region 4 Soil Screening Values for Hazardous Waste Sites
[b] Efroymson et al, 1997c ES/ER/TM-85/R3

Table 7-32
Terrestrial Plant Evaluation Based on 95% UCL Subsurface Soil Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Subsurface Soils	Terrestrial Plant Benchmark	Hazard Quotient	COPECs for Testrial Plants based on 95% UCL Evaluation
Semivolatile Organic Compounds (mg/kg)				
Naphthalene	2.67E-01	1.00E+00[a]	2.67E-01	HQ<1
Metals (mg/kg)				
Aluminum	1.99E+04	5.00E+01[b]	3.98E+02	**Yes**
Arsenic	1.53E+01	1.00E+01[b]	1.53E+00	**Yes**
Barium	3.62E+02	5.00E+02[b]	7.25E-01	HQ<1
Cadmium	3.01E+00	4.00E+00[b]	7.52E-01	HQ<1
Chromium	1.82E+01	1.00E+00[b]	1.82E+01	**Yes**
Copper	2.62E+01	1.00E+02[b]	2.62E-01	HQ<1
Lead	6.91E+01	5.00E+01[b]	1.38E+00	**Yes**
Manganese	3.81E+02	5.00E+02[b]	7.62E-01	HQ<1
Mercury	1.56E-01	3.00E-01[b]	5.20E-01	HQ<1
Nickel	2.86E+01	3.00E+01[b]	9.53E-01	HQ<1
Selenium	5.37E-01	1.00E+00[b]	5.37E-01	HQ<1
Thallium	3.79E-01	1.00E+00[b]	3.79E-01	HQ<1
Vanadium	3.82E+01	2.00E+00[b]	1.91E+01	**Yes**
Zinc	6.83E+02	5.00E+01[b]	1.37E+01	**Yes**

Notes:
COPEC - Chemical of Potential Ecological
mg/kg - milligrams per kilogram
[a] Plant Screening Value from USEPA, Region 4, Soil Screening Values for Hazardous Waste Sites
[b] Efroymson et al, 1997c ES/ER/TM-85/R3

Table 7-33
Aquatic Plant Evaluation Based on 95% UCL Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water	Aquatic Plant Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Plants based on 95% UCL Evaluation
Metals (ug/L)				
Copper	2.04E+00	1.00E+00[a]	2.04E+00	**Yes**
Zinc	1.13E+01	3.00E+01[a]	3.76E-01	HQ<1

Notes:
COPEC - Chemical of Potential Ecological
ug/L - micrograms per liter
[a] ORNL, 1996 ES/ER/TM-96/R2

Table 7-34
Aquatic Invertebrate Evaluation Based on 95% UCL Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water	Aquatic Invertebrate Benchmark for Surface Water	Hazard Quotient	COPECs for Aquatic Invertebrates based on 95% UCL Evaluation
Metals (ug/L)				
Barium	1.65E+02	4.00E+00[a]	4.12E+01	**Yes**
Copper	2.04E+00	2.30E-01[b]	8.86E+00	**Yes**

Notes:
COPEC - Chemical of Potential Ecological
ug/L - micrograms per liter
NA - Not Analyzed
[a] Tier II Secondary Chronic Value from ORNL, 1996 ES/ER/TM-96/R2
[b] Lowest Chronic Value for Daphnids from ORNL, 1996 ES/ER/TM-96/R2

Table 7-35
Fish Evaluation Based on 95% UCL Surface Water Detections
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water	Freswater Fish Benchmark for Surface Water	Hazard Quotient	COPECs for Freshwater Fish based on 95% UCL Evaluation
Metals (ug/L)				
Barium	1.65E+02	4.00E+00[a]	4.12E+01	**Yes**
Zinc	1.13E+01	3.64E+01[b]	3.10E-01	HQ<1

Notes:
COPEC - Chemical of Potential Ecological
ug/L - micrograms per liter
[a] Tier II Secondary Chronic Value from ORNL, 1996 ES/ER/TM-96/R2
[b] Lowest Chronic Value for Fish from ORNL, 1996 ES/ER/TM-96/R2

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF	1.85E-06	Short-tailed Shrew	1.17E-03	2.16E-09
Metals (mg/kg)				
Aluminum	1.60E+04	Short-tailed Shrew	1.17E-03	1.87E+01
Antimony	5.80E-01	Short-tailed Shrew	1.17E-03	6.79E-04
Arsenic	1.24E+01	Short-tailed Shrew	1.17E-03	1.44E-02
Barium	3.22E+02	Short-tailed Shrew	1.17E-03	3.76E-01
Cadmium	1.71E+00	Short-tailed Shrew	1.17E-03	2.00E-03
Lead	1.20E+02	Short-tailed Shrew	1.17E-03	1.40E-01
Selenium	7.63E-01	Short-tailed Shrew	1.17E-03	8.93E-04
Thallium	7.50E-01	Short-tailed Shrew	1.17E-03	8.78E-04
Vanadium	2.99E+01	Short-tailed Shrew	1.17E-03	3.50E-02
Zinc	3.87E+02	Short-tailed Shrew	1.17E-03	4.52E-01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	1.60E+04	White-footed Mouse	6.80E-05	1.09E+00
Arsenic	1.24E+01	White-footed Mouse	6.80E-05	8.40E-04
Barium	3.22E+02	White-footed Mouse	6.80E-05	2.19E-02
Vanadium	2.99E+01	White-footed Mouse	6.80E-05	2.04E-03

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	1.60E+04	Meadow Vole	1.20E-04	1.92E+00
Arsenic	1.24E+01	Meadow Vole	1.20E-04	1.48E-03
Barium	3.22E+02	Meadow Vole	1.20E-04	3.86E-02
Thallium	7.50E-01	Meadow Vole	1.20E-04	9.00E-05
Vanadium	2.99E+01	Meadow Vole	1.20E-04	3.59E-03

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	1.60E+04	Eastern Cottontail	1.49E-02	2.38E+02
Antimony	5.80E-01	Eastern Cottontail	1.49E-02	8.64E-03
Arsenic	1.24E+01	Eastern Cottontail	1.49E-02	1.84E-01
Barium	3.22E+02	Eastern Cottontail	1.49E-02	4.79E+00
Cadmium	1.71E+00	Eastern Cottontail	1.49E-02	2.55E-02
Copper	5.58E+01	Eastern Cottontail	1.49E-02	8.31E-01
Lead	1.20E+02	Eastern Cottontail	1.49E-02	1.79E+00
Thallium	7.50E-01	Eastern Cottontail	1.49E-02	1.12E-02
Vanadium	2.99E+01	Eastern Cottontail	1.49E-02	4.46E-01

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Metals (mg/kg)				
Aluminum	1.60E+04	Red Fox	1.26E-02	2.01E+02

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Table 7-36
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentraion for Surface Soil

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil from Table 7-8 (kg dw/day)	Dose Received from Soil (mg/day)
Dioxins/Furans (mg/kg)				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF	1.85E-06	American Robin	8.74E-03	1.61E-08
Semivolatile Organic Compounds (mg/kg)				
Fluorene	1.07E-02	American Robin	8.74E-03	9.35E-05
Metals (mg/kg)				
Aluminum	1.60E+04	American Robin	8.74E-03	1.40E+02
Arsenic	1.24E+01	American Robin	8.74E-03	1.08E-01
Barium	3.22E+02	American Robin	8.74E-03	2.81E+00
Cadmium	1.71E+00	American Robin	8.74E-03	1.50E-02
Chromium	1.19E+01	American Robin	8.74E-03	1.04E-01
Copper	5.58E+01	American Robin	8.74E-03	4.88E-01
Lead	1.20E+02	American Robin	8.74E-03	1.05E+00
Mercury	7.31E-01	American Robin	8.74E-03	6.39E-03
Selenium	7.63E-01	American Robin	8.74E-03	6.67E-03
Vanadium	2.99E+01	American Robin	8.74E-03	2.62E-01
Zinc	3.87E+02	American Robin	8.74E-03	3.38E+00

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF	1.00E-09	Short-tailed Shrew	3.30E-03	3.30E-12
Metals				
Aluminum	4.80E-02	Short-tailed Shrew	3.30E-03	1.58E-04
Antimony	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Arsenic	2.83E-03	Short-tailed Shrew	3.30E-03	9.33E-06
Barium	1.65E-01	Short-tailed Shrew	3.30E-03	5.44E-04
Cadmium	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Lead	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Selenium	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Thallium	0.00E+00	Short-tailed Shrew	3.30E-03	0.00E+00
Vanadium	2.89E-03	Short-tailed Shrew	3.30E-03	9.53E-06
Zinc	1.13E-02	Short-tailed Shrew	3.30E-03	3.72E-05

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	White-footed Mouse	6.60E-03	3.17E-04
Arsenic	2.83E-03	White-footed Mouse	6.60E-03	1.87E-05
Barium	1.65E-01	White-footed Mouse	6.60E-03	1.09E-03
Vanadium	2.89E-03	White-footed Mouse	6.60E-03	1.91E-05

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site

Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Meadow Vole	6.00E-03	2.88E-04
Arsenic	2.83E-03	Meadow Vole	6.00E-03	1.70E-05
Barium	1.65E-01	Meadow Vole	6.00E-03	9.88E-04
Thallium	0.00E+00	Meadow Vole	6.00E-03	0.00E+00
Vanadium	2.89E-03	Meadow Vole	6.00E-03	1.73E-05

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Eastern Cottontail	1.16E-01	5.57E-03
Antimony	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
Arsenic	2.83E-03	Eastern Cottontail	1.16E-01	3.28E-04
Barium	1.65E-01	Eastern Cottontail	1.16E-01	1.91E-02
Cadmium	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
Copper	2.04E-03	Eastern Cottontail	1.16E-01	2.36E-04
Lead	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
Thallium	0.00E+00	Eastern Cottontail	1.16E-01	0.00E+00
Vanadium	2.89E-03	Eastern Cottontail	1.16E-01	3.35E-04

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Red Fox	3.80E-01	1.82E-02

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Metals				
Aluminum	4.80E-02	Raccoon	3.83E-01	1.84E-02

Notes:

mg/L - milligrams per liter

L/day - liter per day

mg/day - milligrams per day

Table 7-37
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Surface Water

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface Water (mg/L)	Representative Wildlife Species	Consumption Rate of Water from Table 7-8 (L/day)	Dose Received from Surface Water (mg/day)
Dioxins-Furans				
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF	1.00E-09	American Robin	1.06E-02	1.06E-11
Semivolatile Organic Compounds				
Fluorene	0.00E+00	American Robin	1.06E-02	0.00E+00
Metals				
Aluminum	4.80E-02	American Robin	1.06E-02	5.09E-04
Arsenic	2.83E-03	American Robin	1.06E-02	3.00E-05
Barium	1.65E-01	American Robin	1.06E-02	1.75E-03
Cadmium	0.00E+00	American Robin	1.06E-02	0.00E+00
Chromium	0.00E+00	American Robin	1.06E-02	0.00E+00
Copper	2.04E-03	American Robin	1.06E-02	2.16E-05
Lead	0.00E+00	American Robin	1.06E-02	0.00E+00
Mercury	1.13E-04	American Robin	1.06E-02	1.20E-06
Selenium	0.00E+00	American Robin	1.06E-02	0.00E+00
Vanadium	2.89E-03	American Robin	1.06E-02	3.06E-05
Zinc	1.13E-02	American Robin	1.06E-02	1.20E-04

Notes:
mg/L - milligrams per liter
L/day - liter per day
mg/day - milligrams per day

Table 7-38
Chemical Intake for Representative Wildlife Species Based on Ingestion of the 95% UCL Concentration for Stream Sediment
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Stream Sediments (mg/kg)	Representative Wildlife Species	Consumption Rate of Sediment from Table 7-8 (kg dw/day)	Dose Received from Sediment (mg/day)
Metals				
Aluminum	9.41E+03	Raccoon	2.22E-02	2.09E+02

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

Consumption rate assumes that the raccoon is only obtaining food from the stream (Threemile Creek) located adjacent to the site (see Table 7-9).

Table 7-39
Exposure Rate Based on 95% UCL Concentrations in Soil Invertebrates Due to Uptake

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Concentration in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Dioxins/Furans (mg/kg)						
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.85E-06	2.54E+00	4.69E-06	Short-tailed Shrew	9.00E-03	4.22E-08
Metals (mg/kg)						
Aluminum	1.60E+04	2.20E-01	3.52E+03	Short-tailed Shrew	9.00E-03	3.17E+01
Antimony	5.80E-01	2.20E-01	1.28E-01	Short-tailed Shrew	9.00E-03	1.15E-03
Arsenic	1.24E+01	1.10E-01	1.36E+00	Short-tailed Shrew	9.00E-03	1.22E-02
Barium	3.22E+02	2.20E-01	7.07E+01	Short-tailed Shrew	9.00E-03	6.37E-01
Cadmium	1.71E+00	9.60E-01	1.64E+00	Short-tailed Shrew	9.00E-03	1.48E-02
Lead	1.20E+02	3.00E-02	3.60E+00	Short-tailed Shrew	9.00E-03	3.24E-02
Selenium	7.63E-01	2.20E-01	1.68E-01	Short-tailed Shrew	9.00E-03	1.51E-03
Thallium	7.50E-01	2.20E-01	1.65E-01	Short-tailed Shrew	9.00E-03	1.49E-03
Vanadium	2.99E+01	2.20E-01	6.59E+00	Short-tailed Shrew	9.00E-03	5.93E-02
Zinc	3.87E+02	5.60E-01	2.16E+02	Short-tailed Shrew	9.00E-03	1.95E+00

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

A surrogate BCF value was used for aluminum, antimony, barium, selenium, thallium, and vanadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium,chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).

[b] Consumption rate takes into account that all of the short-tailed shrew's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-39
Exposure Rate Based on 95% UCL Concentrations in Soil Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Concentration in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Metals (mg/kg)						
Aluminum	1.60E+04	2.20E-01	3.52E+03	Meadow Vole	2.50E-03	8.79E+00
Arsenic	1.24E+01	1.10E-01	1.36E+00	Meadow Vole	2.50E-03	3.40E-03
Barium	3.22E+02	2.20E-01	7.07E+01	Meadow Vole	2.50E-03	1.77E-01
Thallium	7.50E-01	2.20E-01	1.65E-01	Meadow Vole	2.50E-03	4.13E-04
Vanadium	2.99E+01	2.20E-01	6.59E+00	Meadow Vole	2.50E-03	1.65E-02

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

A surrogate BCF value was used for aluminum, barium, thallium, and vanadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium, chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA

[b] Consumption rate takes into account that 1/2 of the meadow vole's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-39
Exposure Rate Based on 95% UCL Concentrations in Soil Invertebrates Due to Uptake

WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Soil (mg/kg)	Soil-to-Soil Invertebrate Bioconcentration Factor[a]	Concentration in Soil Invertebrate Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Soil Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Soil Invertebrates (mg/day)
Dioxins/Furans (mg/kg)						
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.85E-06	2.54E+00	4.69E-06	American Robin	7.44E-02	3.49E-07
Semivolatile Organic Compounds (mg/kg)						
Fluorene	1.07E-02	1.89E+02	2.03E+00	American Robin	7.44E-02	1.51E-01
Metals (mg/kg)						
Aluminum	1.60E+04	2.20E-01	3.52E+03	American Robin	7.44E-02	2.62E+02
Arsenic	1.24E+01	1.10E-01	1.36E+00	American Robin	7.44E-02	1.01E-01
Barium	3.22E+02	2.20E-01	7.07E+01	American Robin	7.44E-02	5.26E+00
Cadmium	1.71E+00	9.60E-01	1.64E+00	American Robin	7.44E-02	1.22E-01
Chromium	1.19E+01	1.00E-02	1.19E-01	American Robin	7.44E-02	8.82E-03
Copper	5.58E+01	4.00E-02	2.23E+00	American Robin	7.44E-02	1.66E-01
Lead	1.20E+02	3.00E-02	3.60E+00	American Robin	7.44E-02	2.68E-01
Mercury	7.31E-01	4.00E-02	2.92E-02	American Robin	7.44E-02	2.18E-03
Selenium	7.63E-01	2.20E-01	1.68E-01	American Robin	7.44E-02	1.25E-02
Vanadium	2.99E+01	2.20E-01	6.59E+00	American Robin	7.44E-02	4.90E-01
Zinc	3.87E+02	5.60E-01	2.16E+02	American Robin	7.44E-02	1.61E+01

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per per day

[a] Soil-to-soil invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.

A surrogate BCF value was used for aluminum, barium, selenium, and vanadium that is based on the arithmetic mean of the recommended values for those inorganics with empirical data available (arsenic, cadmium, chromium, copper, lead, inorganic mercury, nickel, and zinc) as reported in in USEPA (1999b; EPA

[b] Consumption rate takes into account that 4/5 of the American robin's diet is composed of soil invertebrates from the site (see Table 7-9).

Table 7-40
Exposure Rate Based on 95% UCL Concentrations in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	1.99E+04	4.00E-03	7.96E+01	White-footed Mouse	3.40E-03	2.71E-01
Arsenic	1.53E+01	3.60E-02	5.52E-01	White-footed Mouse	3.40E-03	1.88E-03
Barium	3.62E+02	1.50E-01	5.43E+01	White-footed Mouse	3.40E-03	1.85E-01
Vanadium	3.82E+01	4.00E-01	1.53E+01	White-footed Mouse	3.40E-03	5.19E-02

Notes:

mg/kg - milligrams per kilogram

mg/day - millgrams per day

kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for vanadium.

[b] Consumption rate takes into account that all of the white-footed mouse's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-40
Exposure Rate Based on 95% UCL Concentrations in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	1.99E+04	4.00E-03	7.96E+01	Meadow Vole	2.50E-03	1.99E-01
Arsenic	1.53E+01	3.60E-02	5.52E-01	Meadow Vole	2.50E-03	1.38E-03
Barium	3.62E+02	1.50E-01	5.43E+01	Meadow Vole	2.50E-03	1.36E-01
Thallium	7.50E-01	4.00E-03	3.00E-03	Meadow Vole	2.50E-03	7.50E-06
Vanadium	3.82E+01	4.00E-01	1.53E+01	Meadow Vole	2.50E-03	3.82E-02

Notes:
mg/kg - milligrams per kilogram
mg/day - millgrams per day
kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.
The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for vanadium.
[b] Consumption rate takes into account that 1/2 of the meadow vole's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-40
Exposure Rate Based on 95% UCL Concentrations in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Metals (mg/kg)						
Aluminum	1.99E+04	4.00E-03	7.96E+01	Eastern Cottontail Rabbit	2.37E-01	1.89E+01
Antimony	5.80E-01	2.00E-01	1.16E-01	Eastern Cottontail Rabbit	2.37E-01	2.75E-02
Arsenic	1.53E+01	3.60E-02	5.52E-01	Eastern Cottontail Rabbit	2.37E-01	1.31E-01
Barium	3.62E+02	1.50E-01	5.43E+01	Eastern Cottontail Rabbit	2.37E-01	1.29E+01
Cadmium	3.01E+00	3.64E-01	1.10E+00	Eastern Cottontail Rabbit	2.37E-01	2.60E-01
Copper	5.58E+01	4.00E-01	2.23E+01	Eastern Cottontail Rabbit	2.37E-01	5.29E+00
Lead	1.20E+02	4.50E-02	5.40E+00	Eastern Cottontail Rabbit	2.37E-01	1.28E+00
Thallium	7.50E-01	4.00E-03	3.00E-03	Eastern Cottontail Rabbit	2.37E-01	7.11E-04
Vanadium	3.82E+01	4.00E-01	1.53E+01	Eastern Cottontail Rabbit	2.37E-01	3.62E+00

Notes:
mg/kg - milligrams per kilogram
mg/day - millgrams per day
kg dw/day - kilograms dry weight per day

[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.

The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for and vanadium.

[b] Consumption rate takes into account that all of the eastern cottontail rabbit's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-40
Exposure Rate Based on 95% UCL Concentrations in Plants Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Surface or Subsurface Soil (mg/kg)	Plant Bioconcentration Factor[a]	Concentration of COPEC in Plants Due to Uptake (mg/kg)	Representative Wildlife Species	Consumption Rate of Plants Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Plants (mg/day)
Dioxins/Furans (mg/kg)						
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.85E-06	9.00E-03	1.66E-08	American Robin	1.86E-02	3.09E-10
Semivolatile Organic Compounds (mg/kg)						
Fluorene	1.07E-02	1.49E-01	1.59E-03	American Robin	1.86E-02	2.97E-05
Metals (mg/kg)						
Aluminum	1.99E+04	4.00E-03	7.96E+01	American Robin	1.86E-02	1.48E+00
Arsenic	1.53E+01	3.60E-02	5.52E-01	American Robin	1.86E-02	1.03E-02
Barium	3.62E+02	1.50E-01	5.43E+01	American Robin	1.86E-02	1.01E+00
Cadmium	3.01E+00	3.64E-01	1.10E+00	American Robin	1.86E-02	2.04E-02
Chromium	1.82E+01	7.50E-03	1.37E-01	American Robin	1.86E-02	2.54E-03
Copper	5.58E+01	4.00E-01	2.23E+01	American Robin	1.86E-02	4.15E-01
Lead	1.20E+02	4.50E-02	5.40E+00	American Robin	1.86E-02	1.00E-01
Mercury	7.31E-01	3.75E-02	2.74E-02	American Robin	1.86E-02	5.10E-04
Selenium	7.63E-01	1.60E-02	1.22E-02	American Robin	1.86E-02	2.27E-04
Vanadium	3.82E+01	4.00E-01	1.53E+01	American Robin	1.86E-02	2.84E-01
Zinc	6.83E+02	1.20E-12	8.20E-10	American Robin	1.86E-02	1.52E-11

Notes:
mg/kg - milligrams per kilogram
mg/day - millgrams per day
kg dw/day - kilograms dry weight per day
[a] Soil-to-plant bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 1.588 - 0.578 log Kow where Log Kow equals the octanol/water partition coefficient.
The BCF value for copper that was reported in in USEPA (1999b; EPA 530-D-99-001A) was used as a surrogate for vanadium.
[b] Consumption rate takes into account that 1/5 of the American robin's diet is composed of terrestrial plants from the site (see Table 7-9).

Table 7-41
Exposure Rate Based on 95% UCL Concentrations in Benthic Invertebrates Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected in Sediment (mg/kg)	Benthic Invert-Sediment Bioconcentration Factor [a]	Concentration of COPEC in Benthic Invert (mg/kg)	Representative Wildlife Species	Consumption Rate of Benthic Invertebrates Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Benthic Inverts (mg/day)
Metals						
Aluminum	9.41E+03	9.00E-01	8.47E+03	Raccoon	1.19E-01	1.00E+03

Notes:
mg/kg - milligrams per kilogram
kg dw/day - kilograms dry weight per day
mg/day - milligrams per day

[a] Sediment-to-Benthic invertebrate bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.819 log Kow - 1.146 where Log Kow equals the octanol/water partition coefficient.
A surrogate BCF value was used for aluminum that is based on the arithmetic mean of the arithmetic average of 6 recommended values for those metals with empirical data (cadmium, chromium, copper, lead, inorganic mercury, and zinc) as reported in in USEPA (1999b; EPA 530-D-99-001A).
[b] Consumption rate assumes that 50% of the raccoon's diet is composed of benthic invertebrates (see Table 7-9).

Table 7-42
Exposure Rate Based on 95% UCL Concentrations in Fish Due to Uptake
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	95% UCL Concentration Detected Surface Water (mg/L)	Fish Bioconcentration Factor[a]	Metabolic Reducution Factor	Concentration of COPEC in Fish (mg/kg)	Representative Wildlife Species	Consumption Rate of Fish Based on Diet Composition from Table 7-8[b] (kg dw/day)	Dose Received from Fish (mg/day)
Metals							
Aluminum	4.80E-02	2.70E+00	5.00E-01	6.48E-02	Raccoon	1.19E-01	7.68E-03

Notes:

mg/kg - milligrams per kilogram

kg dw/day - kilograms dry weight per day

mg/day - milligrams per day

[a] Water-to-fish bioconcentration factor (BCF) as reported in USEPA (1999b; EPA 530-D-99-001A) or calculated from log BCF = 0.91 x log Kow -1.975 x log (6.8E-07 x Kow + 1.0) - 0.786 where Log Kow equals the octanol/water partition coefficient.

[b] Consumption rate assumes that 50% of the raccoon's diet is composed of benthic invertebrates (see Table 7-9).

Table 7-43
Chemical Intake Based on Ingestion of 95% UCL Concentrations for Small Mammal Prey by Representative Wildlife Species
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Concentration Estimated in Short-tailed Shrew From Table 7-27 (mg)	Concentration Estimated in White-footed Mouse from Table 7-27 (mg)	Concentration Estimated in Meadow Vole from Table 7-27 (mg)	Concentration Estimated in Eastern Cottontail Rabbit from Table 7-27 (mg)	Average Concentration in Small Mammals (mg)	Average Mass of Small Mammal Prey from Table 7-8 (kg)	Predator Consumption Rate of Small Mammal Prey from Table 7-8	Quantity of Small Mammal Prey Consumed Each Day	Dose Received from Small Mammal Prey (mg/day)
Metals (mg/kg)										
Aluminum	Red Fox	5.04E+01	1.36E+00	1.09E+01	2.57E+02	7.99E+01	3.20E-01	4.50E-01	1.41E+00	1.12E+02

Notes:
mg/day - milligrams per day
kg - kilograms
kg dw/day - kilogram dry weight per day

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Dioxins/Furans (mg/kg)										
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	2.16E-09	0.00E+00	3.30E-12	0.00E+00	4.22E-08	0.00E+00	0.00E+00	0.00E+00	4.43E-08
Metals (mg/kg)										
Aluminum	Short-tailed Shrew	1.87E+01	0.00E+00	1.58E-04	0.00E+00	3.17E+01	0.00E+00	0.00E+00	0.00E+00	5.04E+01
Antimony	Short-tailed Shrew	6.79E-04	0.00E+00	0.00E+00	0.00E+00	1.15E-03	0.00E+00	0.00E+00	0.00E+00	1.83E-03
Arsenic	Short-tailed Shrew	1.44E-02	0.00E+00	9.33E-06	0.00E+00	1.22E-02	0.00E+00	0.00E+00	0.00E+00	2.67E-02
Barium	Short-tailed Shrew	3.76E-01	0.00E+00	5.44E-04	0.00E+00	6.37E-01	0.00E+00	0.00E+00	0.00E+00	1.01E+00
Cadmium	Short-tailed Shrew	2.00E-03	0.00E+00	0.00E+00	0.00E+00	1.48E-02	0.00E+00	0.00E+00	0.00E+00	1.68E-02
Lead	Short-tailed Shrew	1.40E-01	0.00E+00	0.00E+00	0.00E+00	3.24E-02	0.00E+00	0.00E+00	0.00E+00	1.73E-01
Selenium	Short-tailed Shrew	8.93E-04	0.00E+00	0.00E+00	0.00E+00	1.51E-03	0.00E+00	0.00E+00	0.00E+00	2.40E-03
Thallium	Short-tailed Shrew	8.78E-04	0.00E+00	0.00E+00	0.00E+00	1.49E-03	0.00E+00	0.00E+00	0.00E+00	2.36E-03
Vanadium	Short-tailed Shrew	3.50E-02	0.00E+00	9.53E-06	0.00E+00	5.93E-02	0.00E+00	0.00E+00	0.00E+00	9.43E-02
Zinc	Short-tailed Shrew	4.52E-01	0.00E+00	3.72E-05	0.00E+00	1.95E+00	0.00E+00	0.00E+00	0.00E+00	2.40E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Metals (mg/kg)										
Aluminum	White-footed Mouse	1.09E+00	0.00E+00	3.17E-04	0.00E+00	0.00E+00	2.71E-01	0.00E+00	0.00E+00	1.36E+00
Arsenic	White-footed Mouse	8.40E-04	0.00E+00	1.87E-05	0.00E+00	0.00E+00	1.88E-03	0.00E+00	0.00E+00	2.74E-03
Barium	White-footed Mouse	2.19E-02	0.00E+00	1.09E-03	0.00E+00	0.00E+00	1.85E-01	0.00E+00	0.00E+00	2.08E-01
Vanadium	White-footed Mouse	2.04E-03	0.00E+00	1.91E-05	0.00E+00	0.00E+00	5.19E-02	0.00E+00	0.00E+00	5.40E-02

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Metals (mg/kg)										
Aluminum	Meadow Vole	1.92E+00	0.00E+00	2.88E-04	0.00E+00	8.79E+00	1.99E-01	0.00E+00	0.00E+00	1.09E+01
Arsenic	Meadow Vole	1.48E-03	0.00E+00	1.70E-05	0.00E+00	3.40E-03	1.38E-03	0.00E+00	0.00E+00	6.28E-03
Barium	Meadow Vole	3.86E-02	0.00E+00	9.88E-04	0.00E+00	1.77E-01	1.36E-01	0.00E+00	0.00E+00	3.52E-01
Thallium	Meadow Vole	9.00E-05	0.00E+00	0.00E+00	0.00E+00	4.13E-04	7.50E-06	0.00E+00	0.00E+00	5.10E-04
Vanadium	Meadow Vole	3.59E-03	0.00E+00	1.73E-05	0.00E+00	1.65E-02	3.82E-02	0.00E+00	0.00E+00	5.82E-02

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Metals (mg/kg)										
Aluminum	Eastern Cottontail Rabbit	2.38E+02	0.00E+00	5.57E-03	0.00E+00	0.00E+00	1.89E+01	0.00E+00	0.00E+00	2.57E+02
Antimony	Eastern Cottontail Rabbit	8.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-02	0.00E+00	0.00E+00	3.61E-02
Arsenic	Eastern Cottontail Rabbit	1.84E-01	0.00E+00	3.28E-04	0.00E+00	0.00E+00	1.31E-01	0.00E+00	0.00E+00	3.15E-01
Barium	Eastern Cottontail Rabbit	4.79E+00	0.00E+00	1.91E-02	0.00E+00	0.00E+00	1.29E+01	0.00E+00	0.00E+00	1.77E+01
Cadmium	Eastern Cottontail Rabbit	2.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-01	0.00E+00	0.00E+00	2.85E-01
Copper	Eastern Cottontail Rabbit	8.31E-01	0.00E+00	2.36E-04	0.00E+00	0.00E+00	5.29E+00	0.00E+00	0.00E+00	6.12E+00
Lead	Eastern Cottontail Rabbit	1.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E+00	0.00E+00	0.00E+00	3.07E+00
Thallium	Eastern Cottontail Rabbit	1.12E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.11E-04	0.00E+00	0.00E+00	1.19E-02
Vanadium	Eastern Cottontail Rabbit	4.46E-01	0.00E+00	3.35E-04	0.00E+00	0.00E+00	3.62E+00	0.00E+00	0.00E+00	4.06E+00

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Metals (mg/kg)										
Aluminum	Red Fox	2.01E+02	0.00E+00	1.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+02	3.14E+02

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Metals (mg/kg)										
Aluminum	Raccoon	0.00E+00	2.09E+02	1.84E-02	1.00E+03	0.00E+00	0.00E+00	7.68E-03	0.00E+00	1.21E+03

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-44
Total Exposure for Representative Wildlife Species Based on 95% UCL Concentrations and Consumption of Surface Water, Soils, Stream Sediment, and Food
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Dose Received from Consuming Soil from Table 7-36 (mg/day)	Dose Received from Consuming Sediments from Table 7-38 (mg/day)	Dose Received from Consuming Surface Water from Table 7-37 (mg/day)	Dose Received from Consuming Benthic Invertebrates from Table 7-41 (mg/day)	Dose Received from Consuming Soil Invertebrates from Table 7-39 (mg/day)	Dose Received from Consuming Terrestrial Plants from Table 7-40 (mg/day)	Dose Received from Consuming Whole Fish from Table 7-42 (mg/day)	Dose Received from Consuming Small Mammals from Table 7-43 (mg/day)	Total Dose Received based on 95% UCL Evaluation (mg/day)
Dioxins/Furans (mg/kg)										
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	1.61E-08	0.00E+00	1.06E-11	0.00E+00	3.49E-07	3.09E-10	0.00E+00	0.00E+00	3.65E-07
Semivolatile Organic Compounds (mg/kg)										
Fluorene	American Robin	9.35E-05	0.00E+00	0.00E+00	0.00E+00	1.51E-01	2.97E-05	0.00E+00	0.00E+00	1.51E-01
Metals (mg/kg)										
Aluminum	American Robin	1.40E+02	0.00E+00	5.09E-04	0.00E+00	2.62E+02	1.48E+00	0.00E+00	0.00E+00	4.03E+02
Arsenic	American Robin	1.08E-01	0.00E+00	3.00E-05	0.00E+00	1.01E-01	1.03E-02	0.00E+00	0.00E+00	2.19E-01
Barium	American Robin	2.81E+00	0.00E+00	1.75E-03	0.00E+00	5.26E+00	1.01E+00	0.00E+00	0.00E+00	9.08E+00
Cadmium	American Robin	1.50E-02	0.00E+00	0.00E+00	0.00E+00	1.22E-01	2.04E-02	0.00E+00	0.00E+00	1.58E-01
Chromium	American Robin	1.04E-01	0.00E+00	0.00E+00	0.00E+00	8.82E-03	2.54E-03	0.00E+00	0.00E+00	1.15E-01
Copper	American Robin	4.88E-01	0.00E+00	2.16E-05	0.00E+00	1.66E-01	4.15E-01	0.00E+00	0.00E+00	1.07E+00
Lead	American Robin	1.05E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-01	1.00E-01	0.00E+00	0.00E+00	1.42E+00
Mercury	American Robin	6.39E-03	0.00E+00	1.20E-06	0.00E+00	2.18E-03	5.10E-04	0.00E+00	0.00E+00	9.08E-03
Selenium	American Robin	6.67E-03	0.00E+00	0.00E+00	0.00E+00	1.25E-02	2.27E-04	0.00E+00	0.00E+00	1.94E-02
Vanadium	American Robin	2.62E-01	0.00E+00	3.06E-05	0.00E+00	4.90E-01	2.84E-01	0.00E+00	0.00E+00	1.04E+00
Zinc	American Robin	3.38E+00	0.00E+00	1.20E-04	0.00E+00	1.61E+01	1.52E-11	0.00E+00	0.00E+00	1.95E+01

Notes:
mg/day - milligrams per day
A value of 0.00E+00 indicates that the chemical was not ingested by the receptor species because it was not encountered due to a species life history.

Table 7-45
Chemical-Specific Risk Estimates for Representative Wildlife Species Based on 95% UCL Evaluation
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-44 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	Short-tailed Shrew	4.43E-08	1.00E+00	4.43E-08	1.50E-02	7.33E-06	1.10E-07	4.03E-01	HQ<1	7.33E-05	1.10E-06	4.03E-02	HQ<1
Metals													
Aluminum	Short-tailed Shrew	5.04E+01	1.00E+00	5.04E+01	1.50E-02	2.30E+00	3.44E-02	1.46E+03	**Yes**	2.30E+01	3.44E-01	1.46E+02	**Yes**
Antimony	Short-tailed Shrew	1.83E-03	1.00E+00	1.83E-03	1.50E-02	1.49E-01	2.24E-03	8.17E-01	HQ<1	1.49E+00	2.23E-02	8.19E-02	HQ<1
Arsenic	Short-tailed Shrew	2.67E-02	1.00E+00	2.67E-02	1.50E-02	1.50E-01	2.25E-03	1.19E+01	**Yes**	1.50E+00	2.25E-02	1.19E+00	**Yes**
Barium	Short-tailed Shrew	1.01E+00	1.00E+00	1.01E+00	1.50E-02	1.18E+01	1.77E-01	5.72E+00	**Yes**	4.35E+01	6.53E-01	1.55E+00	**Yes**
Cadmium	Short-tailed Shrew	1.68E-02	1.00E+00	1.68E-02	1.50E-02	2.12E+00	3.18E-02	5.28E-01	HQ<1	2.12E+01	3.18E-01	5.28E-02	HQ<1
Lead	Short-tailed Shrew	1.73E-01	1.00E+00	1.73E-01	1.50E-02	1.76E+01	2.64E-01	6.55E-01	HQ<1	1.76E+02	2.64E+00	6.55E-02	HQ<1
Selenium	Short-tailed Shrew	2.40E-03	1.00E+00	2.40E-03	1.50E-02	4.40E-01	6.60E-03	3.64E-01	HQ<1	7.25E-01	1.09E-02	2.21E-01	HQ<1
Thallium	Short-tailed Shrew	2.36E-03	1.00E+00	2.36E-03	1.50E-02	1.60E-02	2.40E-04	9.84E+00	**Yes**	1.64E-01	2.46E-03	9.60E-01	HQ<1
Vanadium	Short-tailed Shrew	9.43E-02	1.00E+00	9.43E-02	1.50E-02	4.28E-01	6.42E-03	1.47E+01	**Yes**	4.29E+00	6.43E-02	1.47E+00	**Yes**
Zinc	Short-tailed Shrew	2.40E+00	1.00E+00	2.40E+00	1.50E-02	3.52E+02	5.28E+00	4.55E-01	HQ<1	7.03E+02	1.05E+01	2.28E-01	HQ<1

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.
The Wildlife NOAEL for 2,3,4,7,8-PeCDF was calculated using the estmated wildlife NOAEL for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and mamalian toxicity equivalence factors (USEPA, 2008; EPA/100/R-08/004).

Table 7-45
Chemical-Specific Risk Estimates for Representative Wildlife Species Based on 95% UCL Evaluation
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-44 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	White-footed Mouse	1.36E+00	1.00E+00	1.36E+00	2.20E-02	2.09E+00	4.59E-02	2.96E+01	**Yes**	2.09E+01	4.59E-01	2.96E+00	**Yes**
Arsenic	White-footed Mouse	2.74E-03	1.00E+00	2.74E-03	2.20E-02	1.36E-01	2.99E-03	9.14E-01	HQ<1	1.36E+00	3.00E-02	9.13E-02	HQ<1
Barium	White-footed Mouse	2.08E-01	1.00E+00	2.08E-01	2.20E-02	1.08E+01	2.38E-01	8.74E-01	HQ<1	3.95E+01	8.69E-01	2.39E-01	HQ<1
Vanadium	White-footed Mouse	5.40E-02	1.00E+00	5.40E-02	2.20E-02	3.89E-01	8.56E-03	6.30E+00	**Yes**	3.89E+00	8.57E-02	6.30E-01	HQ<1

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

Table 7-45
Chemical-Specific Risk Estimates for Representative Wildlife Species Based on 95% UCL Evaluation
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-44 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Meadow Vole	1.09E+01	1.00E+00	1.09E+01	4.40E-02	1.75E+00	7.72E-02	1.41E+02	**Yes**	1.75E+01	7.72E-01	1.41E+01	**Yes**
Arsenic	Meadow Vole	6.28E-03	1.00E+00	6.28E-03	4.40E-02	1.14E-01	5.02E-03	1.25E+00	**Yes**	1.15E+00	5.04E-02	1.25E-01	HQ<1
Barium	Meadow Vole	3.52E-01	1.00E+00	3.52E-01	4.40E-02	9.00E+00	3.96E-01	8.90E-01	HQ<1	3.33E+01	1.47E+00	2.40E-01	HQ<1
Thallium	Meadow Vole	5.10E-04	1.00E+00	5.10E-04	4.40E-02	1.30E-02	5.72E-04	8.92E-01	HQ<1	1.26E-01	5.54E-03	9.20E-02	HQ<1
Vanadium	Meadow Vole	5.82E-02	1.00E+00	5.82E-02	4.40E-02	3.27E-01	1.44E-02	4.05E+00	**Yes**	3.27E+00	1.44E-01	4.04E-01	HQ<1

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

Table 7-45
Chemical-Specific Risk Estimates for Representative Wildlife Species Based on 95% UCL Evaluation
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-44 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Metals													
Aluminum	Eastern Cottontail Rabbit	2.57E+02	1.00E+00	2.57E+02	1.20E+00	7.67E-01	9.20E-01	2.79E+02	**Yes**	7.67E+00	9.21E+00	2.79E+01	**Yes**
Antimony	Eastern Cottontail Rabbit	3.61E-02	1.00E+00	3.61E-02	1.20E+00	5.00E-02	6.00E-02	6.02E-01	HQ<1	4.97E-01	5.96E-01	6.06E-02	HQ<1
Arsenic	Eastern Cottontail Rabbit	3.15E-01	1.00E+00	3.15E-01	1.20E+00	5.00E-02	6.00E-02	5.25E+00	**Yes**	5.01E-01	6.01E-01	5.24E-01	HQ<1
Barium	Eastern Cottontail Rabbit	1.77E+01	1.00E+00	1.77E+01	1.20E+00	4.00E+00	4.80E+00	3.69E+00	**Yes**	1.46E+01	1.75E+01	1.01E+00	**Yes**
Cadmium	Eastern Cottontail Rabbit	2.85E-01	1.00E+00	2.85E-01	1.20E+00	7.09E-01	8.51E-01	3.35E-01	HQ<1	7.09E+00	8.51E+00	3.35E-02	HQ<1
Copper	Eastern Cottontail Rabbit	6.12E+00	1.00E+00	6.12E+00	1.20E+00	1.12E+01	1.34E+01	4.55E-01	HQ<1	1.47E+01	1.76E+01	3.47E-01	HQ<1
Lead	Eastern Cottontail Rabbit	3.07E+00	1.00E+00	3.07E+00	1.20E+00	5.88E+00	7.06E+00	4.35E-01	HQ<1	5.88E+01	7.05E+01	4.35E-02	HQ<1
Thallium	Eastern Cottontail Rabbit	1.19E-02	1.00E+00	1.19E-02	1.20E+00	5.00E-03	6.00E-03	1.98E+00	**Yes**	5.50E-02	6.60E-02	1.80E-01	HQ<1
Vanadium	Eastern Cottontail Rabbit	4.06E+00	1.00E+00	4.06E+00	1.20E+00	1.43E-01	1.72E-01	2.37E+01	**Yes**	1.43E+00	1.72E+00	2.36E+00	**Yes**

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

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Metals													
Aluminum	Red Fox	3.14E+02	1.30E-02	4.08E+00	4.50E+00	5.51E-01	2.48E+00	1.65E+00	**Yes**	5.52E+00	2.48E+01	1.64E-01	HQ<1

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

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WWI Incinerator, NW Camp Funston (CFI) Site
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Metals													
Aluminum	Raccoon	1.21E+03	4.00E-03	4.85E+00	5.20E+00	5.40E-01	2.81E+00	1.73E+00	**Yes**	5.40E+00	2.81E+01	1.73E-01	HQ<1

Notes:
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.

Table 7-45
Chemical-Specific Risk Estimates for Representative Wildlife Species Based on 95% UCL Evaluation
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas

Parameter	Representative Wildlife Species	Total Dose Received from Table 7-44 (mg/day)	Fraction of Home Range Within Area Site from Table 7-10	Total Dose Received Based on Fraction of Area Within Home Range (mg/day)	Average Body Weight from Table 7-8 (kg)	No Observed Adverse Effects Level (NOAEL) (mg/kg/day)	Weight Normalized NOAEL (mg/day)	NOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on NOAEL Evaluation	Lowest Observed Adverse Effects Level (LOAEL) (mg/kg/day)	Weight Normalized LOAEL (mg/day)	LOAEL Based Ecological Hazard Quotient	COPECs for Wildlife based on LOAEL Evaluation
Dioxins/Furans													
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	American Robin	3.65E-07	1.00E+00	3.65E-07	7.70E-02	1.40E-05	1.08E-06	3.39E-01	HQ<1	1.40E-04	1.08E-05	3.39E-02	HQ<1
Semivolatile Organic Compounds													
Fluorene	American Robin	1.51E-01	1.00E+00	1.51E-01	7.70E-02	1.70E+00	1.31E-01	1.15E+00	**Yes**	1.70E+01	1.31E+00	1.15E-01	HQ<1
Metals													
Aluminum	American Robin	4.03E+02	1.00E+00	4.03E+02	7.70E-02	1.10E+02	8.45E+00	4.77E+01	**Yes**	4.45E+01	3.43E+00	1.18E+02	**Yes**
Arsenic	American Robin	2.19E-01	1.00E+00	2.19E-01	7.70E-02	5.10E+00	3.93E-01	5.58E-01	HQ<1	1.28E+01	9.86E-01	2.23E-01	HQ<1
Barium	American Robin	9.08E+00	1.00E+00	9.08E+00	7.70E-02	2.08E+01	1.60E+00	5.67E+00	**Yes**	4.17E+01	3.21E+00	2.83E+00	**Yes**
Cadmium	American Robin	1.58E-01	1.00E+00	1.58E-01	7.70E-02	1.45E+00	1.12E-01	1.41E+00	**Yes**	2.00E+01	1.54E+00	1.02E-01	HQ<1
Chromium	American Robin	1.15E-01	1.00E+00	1.15E-01	7.70E-02	1.00E+00	7.70E-02	1.49E+00	**Yes**	5.00E+00	3.85E-01	2.99E-01	HQ<1
Copper	American Robin	1.07E+00	1.00E+00	1.07E+00	7.70E-02	4.70E+01	3.62E+00	2.95E-01	HQ<1	6.17E+01	4.75E+00	2.25E-01	HQ<1
Lead	American Robin	1.42E+00	1.00E+00	1.42E+00	7.70E-02	1.13E+00	8.70E-02	1.63E+01	**Yes**	1.13E+01	8.70E-01	1.63E+00	**Yes**
Mercury	American Robin	9.08E-03	1.00E+00	9.08E-03	7.70E-02	4.50E-01	3.47E-02	2.62E-01	HQ<1	9.00E-01	6.93E-02	1.31E-01	HQ<1
Selenium	American Robin	1.94E-02	1.00E+00	1.94E-02	7.70E-02	5.00E-01	3.85E-02	5.03E-01	HQ<1	1.00E+00	7.70E-02	2.52E-01	HQ<1
Vanadium	American Robin	1.04E+00	1.00E+00	1.04E+00	7.70E-02	1.14E+01	8.78E-01	1.18E+00	**Yes**	2.28E+01	1.76E+00	5.90E-01	HQ<1
Zinc	American Robin	1.95E+01	1.00E+00	1.95E+01	7.70E-02	1.45E+01	1.12E+00	1.74E+01	**Yes**	1.31E+02	1.01E+01	1.93E+00	**Yes**

Notes:
EHI - Ecological Hazard Index
kg - kilogram
mg/kg - milligrams per kilogram
mg/kg/day - milligrams per kilograms per day
NA - Not Analyzed
NOAELs were calculated using the wildlife mass provided in Table 7-8 and the test species mass and NOAELs provided in Table 7-18 per Toxicological Benchmarks for Wildlife: 1996 Revision, Sample et. al., 1996; ES/ER/TM-86/R3.
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FIGURES

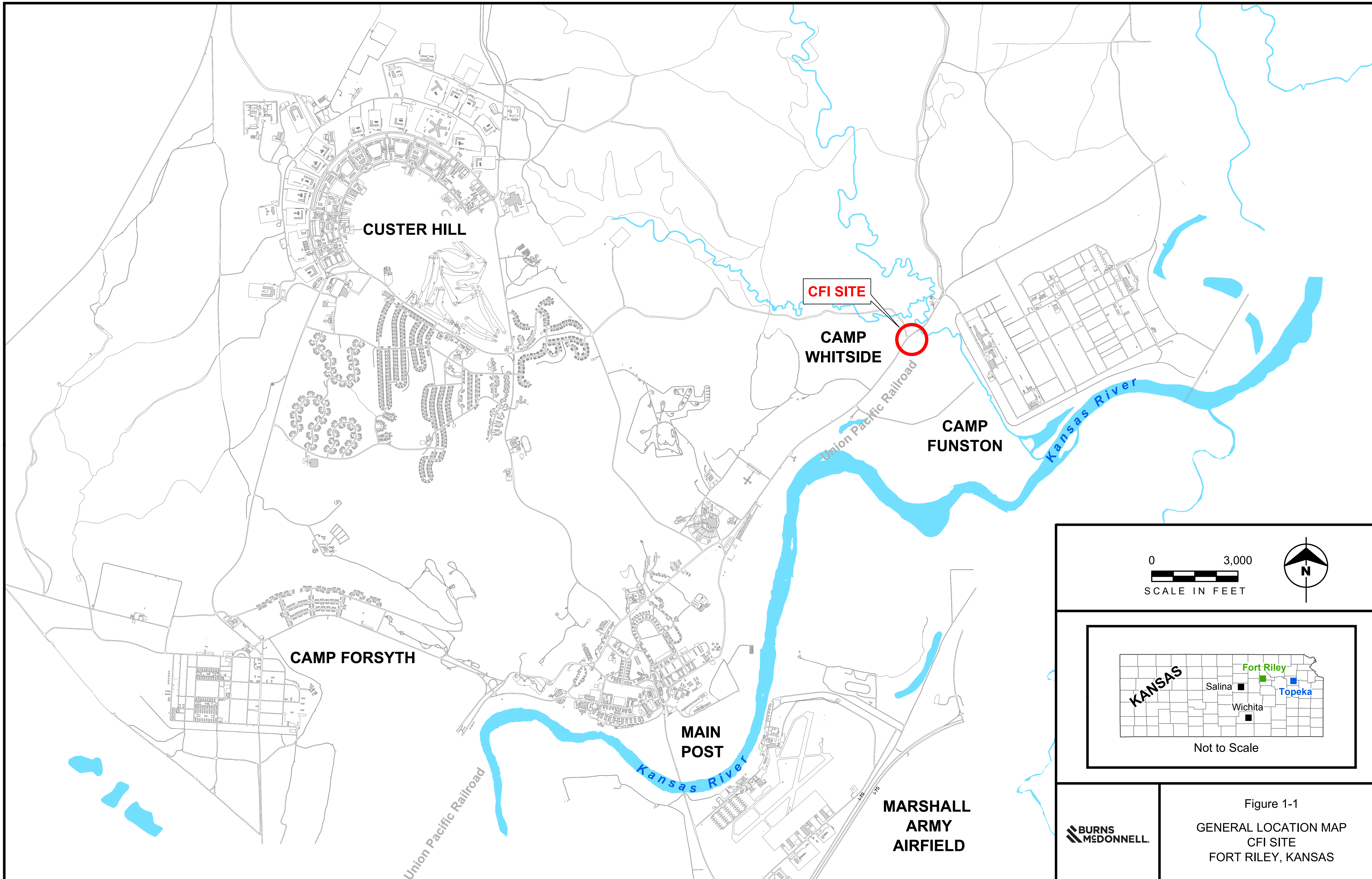

Figure 1-1

GENERAL LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

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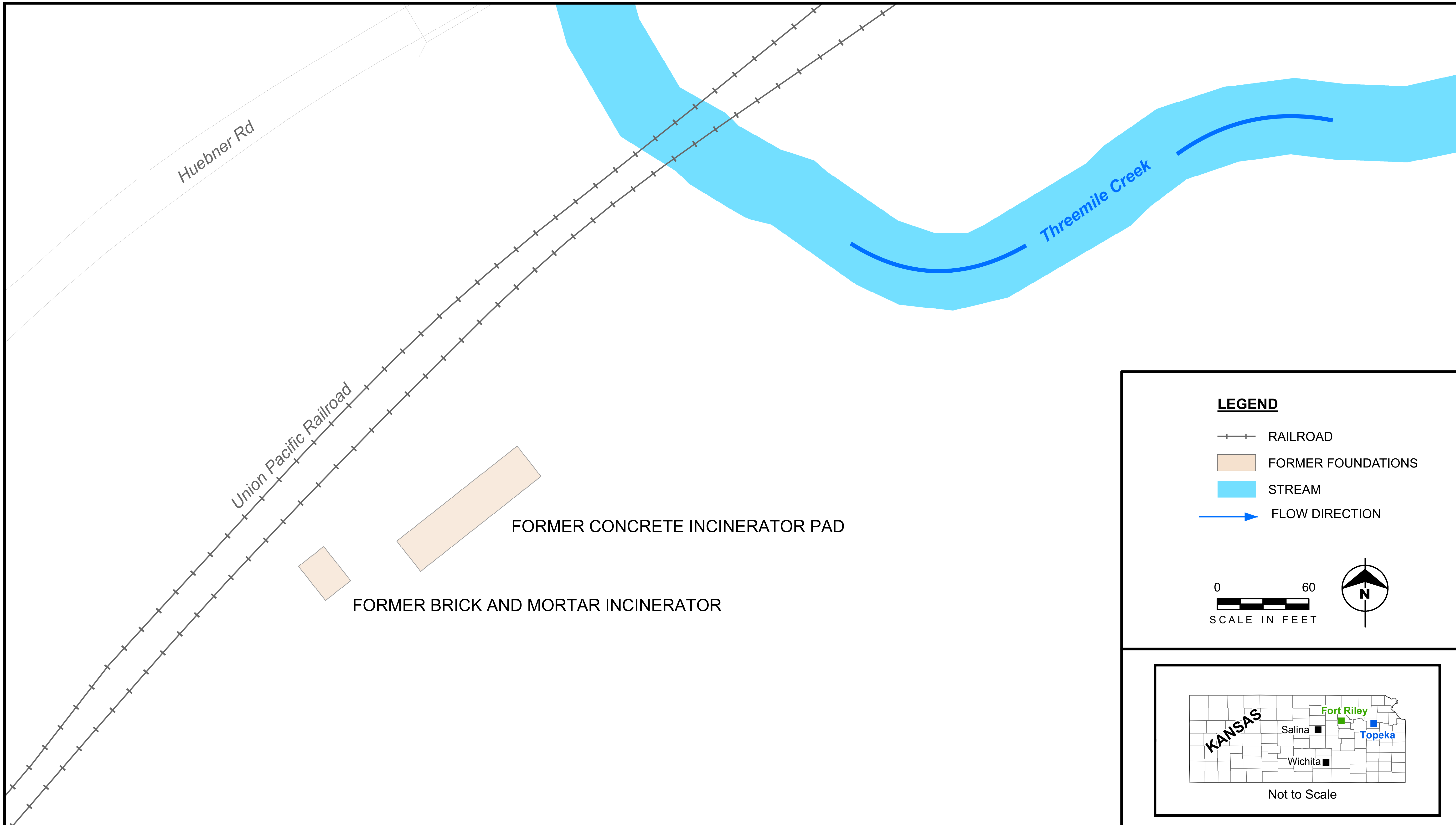

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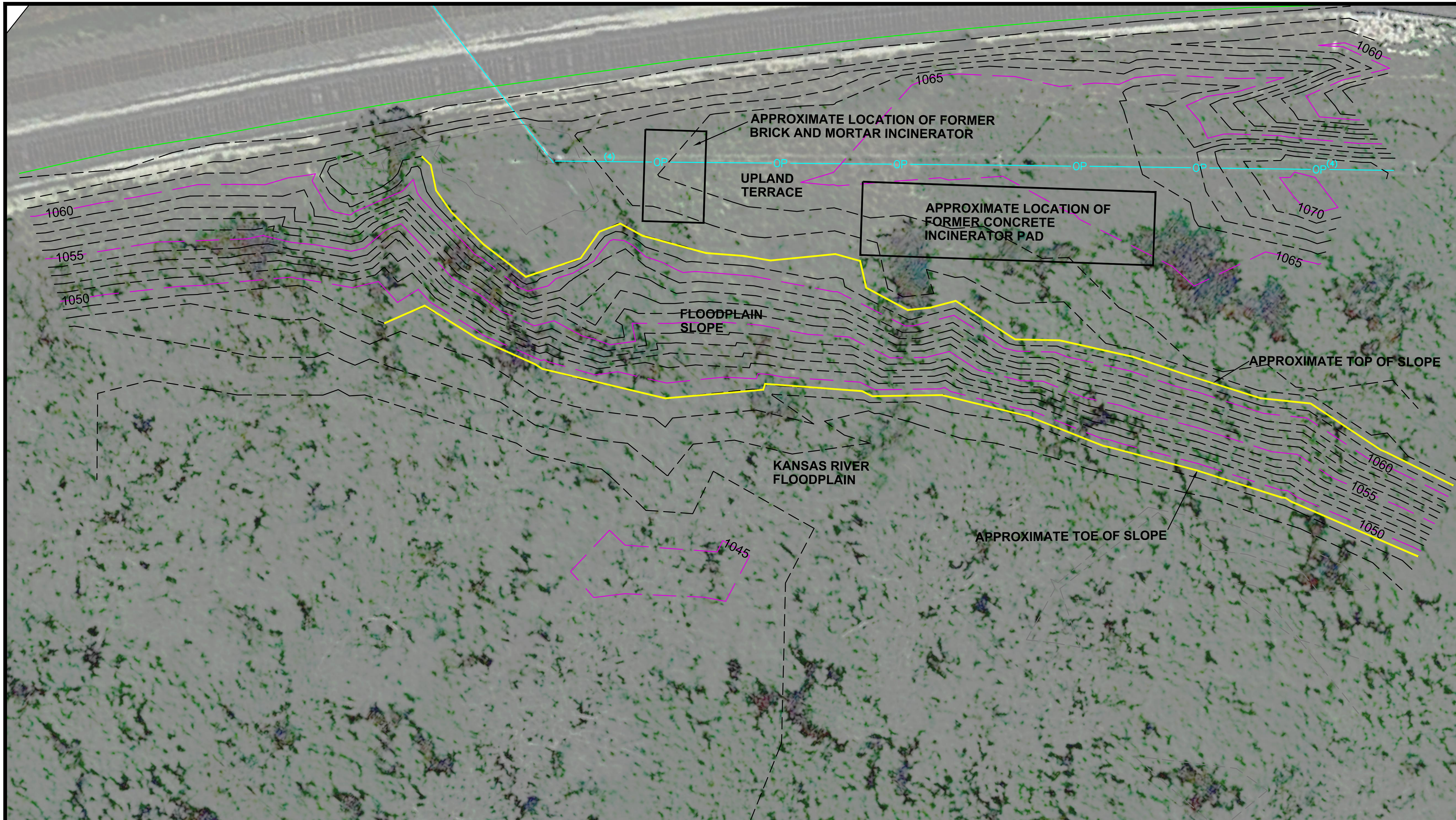
Figure 1-2

GENERAL SITE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

Document Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig1-2_CFI_Site_General_Location_Map.mxd



LEGEND:

— — — — — — SURFACE ELEVATION CONTOUR

0 30' 60'
SCALE IN FEET

N

BURNS McDONNELL

Figure 1-3

CFI SITE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

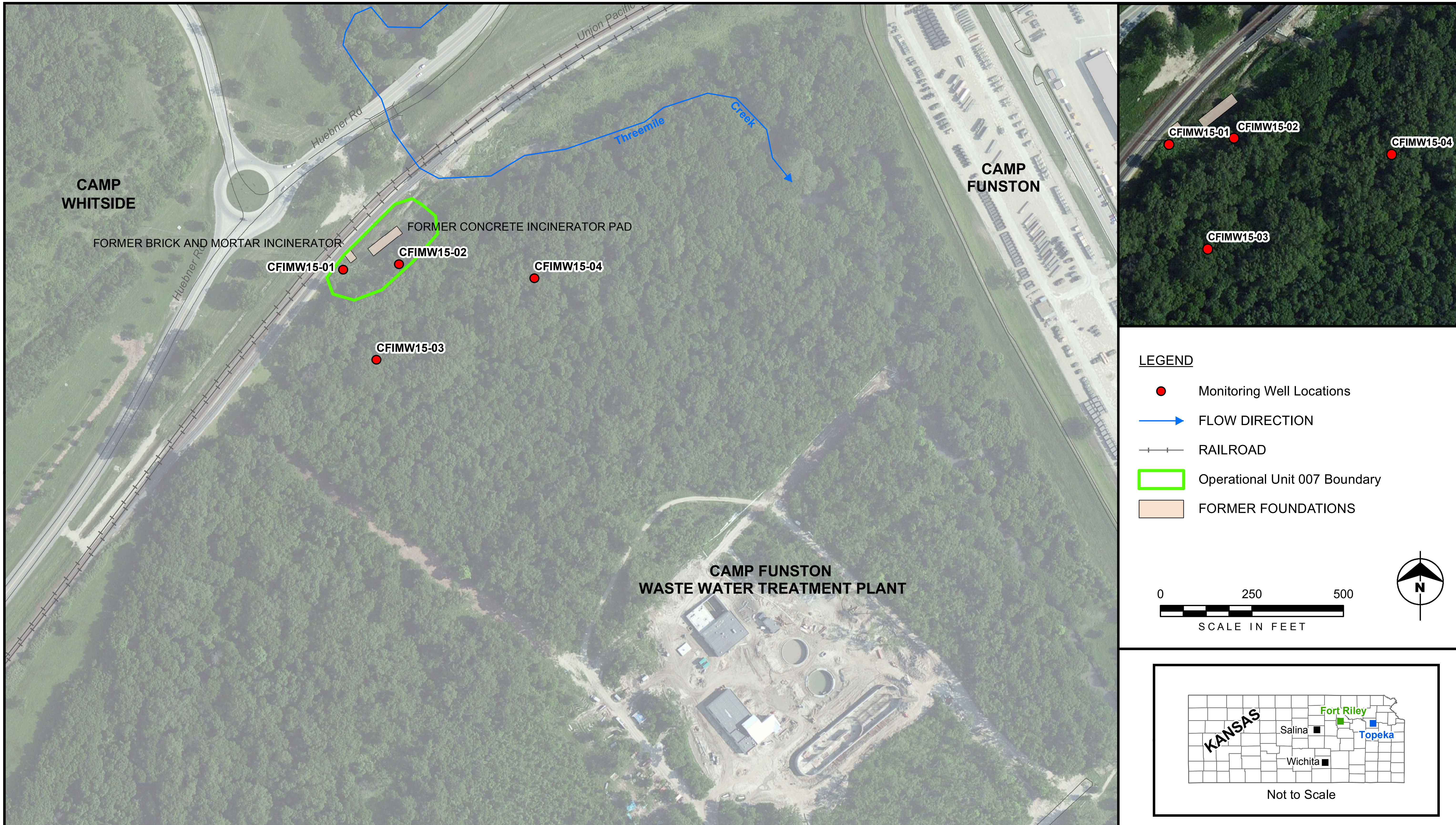


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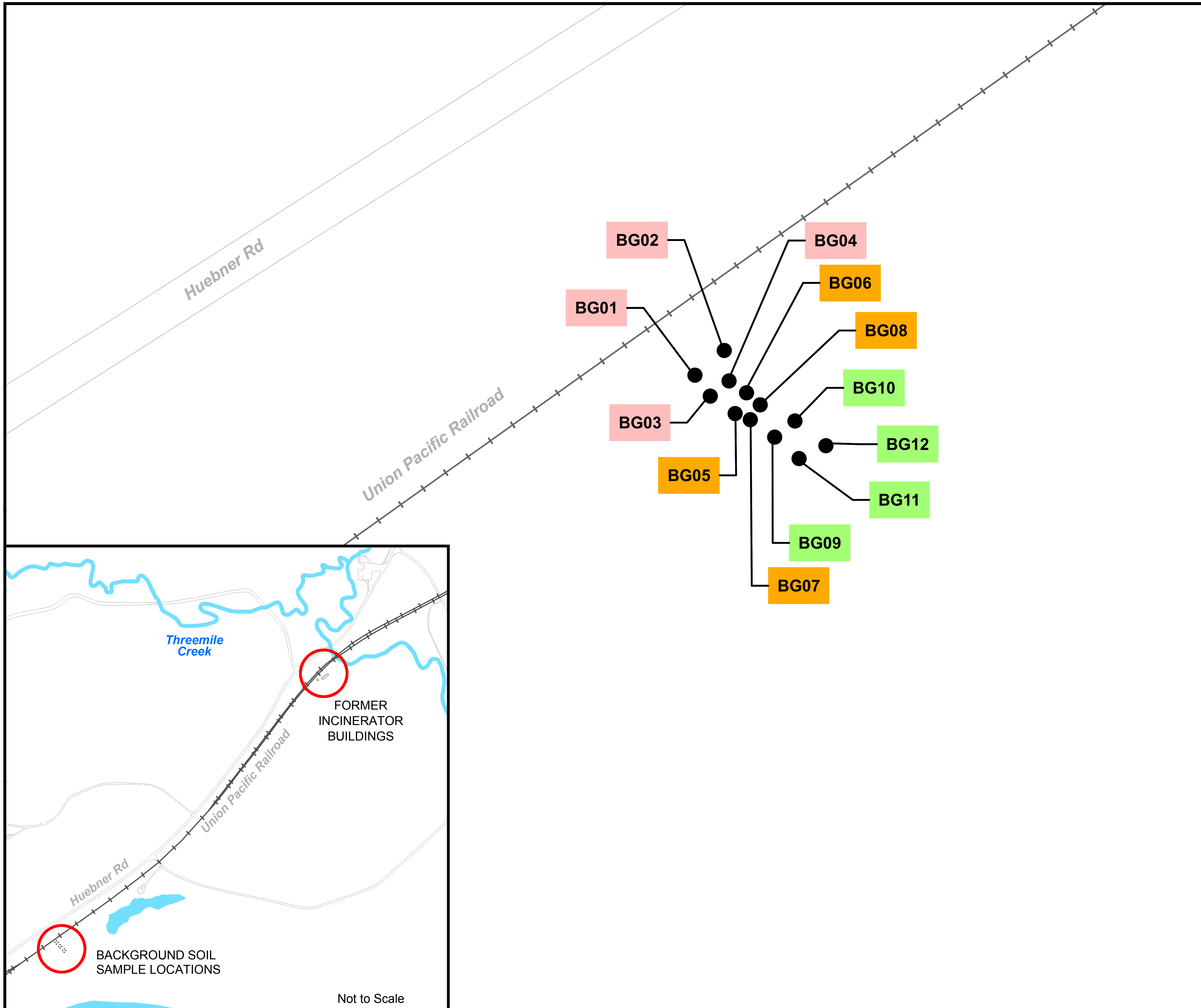
Figure 1-4

OPERATIONAL UNIT 007
BOUNDARY MAP
FORT RILEY, KANSAS

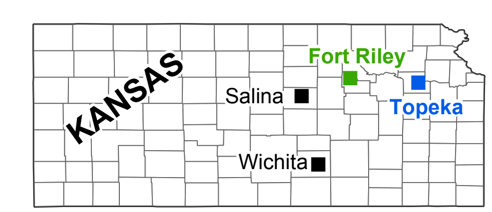
Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig1-4_Operational_Unit_007_Boundary_Map.mxd Date: 8/29/2016



LEGEND

- BACKGROUND SOIL SAMPLE LOCATION
- BACKGROUND SAMPLES REPRESENTING UPLAND TERRACE
- BACKGROUND SAMPLES REPRESENTING FLOODPLAIN SLOPE
- BACKGROUND SAMPLES REPRESENTING KANSAS RIVER FLOODPLAIN
- RAILROAD

0 60
SCALE IN FEET
N



Not to Scale

BURNS McDONNELL

Figure 2-1

BACKGROUND SOIL SAMPLE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

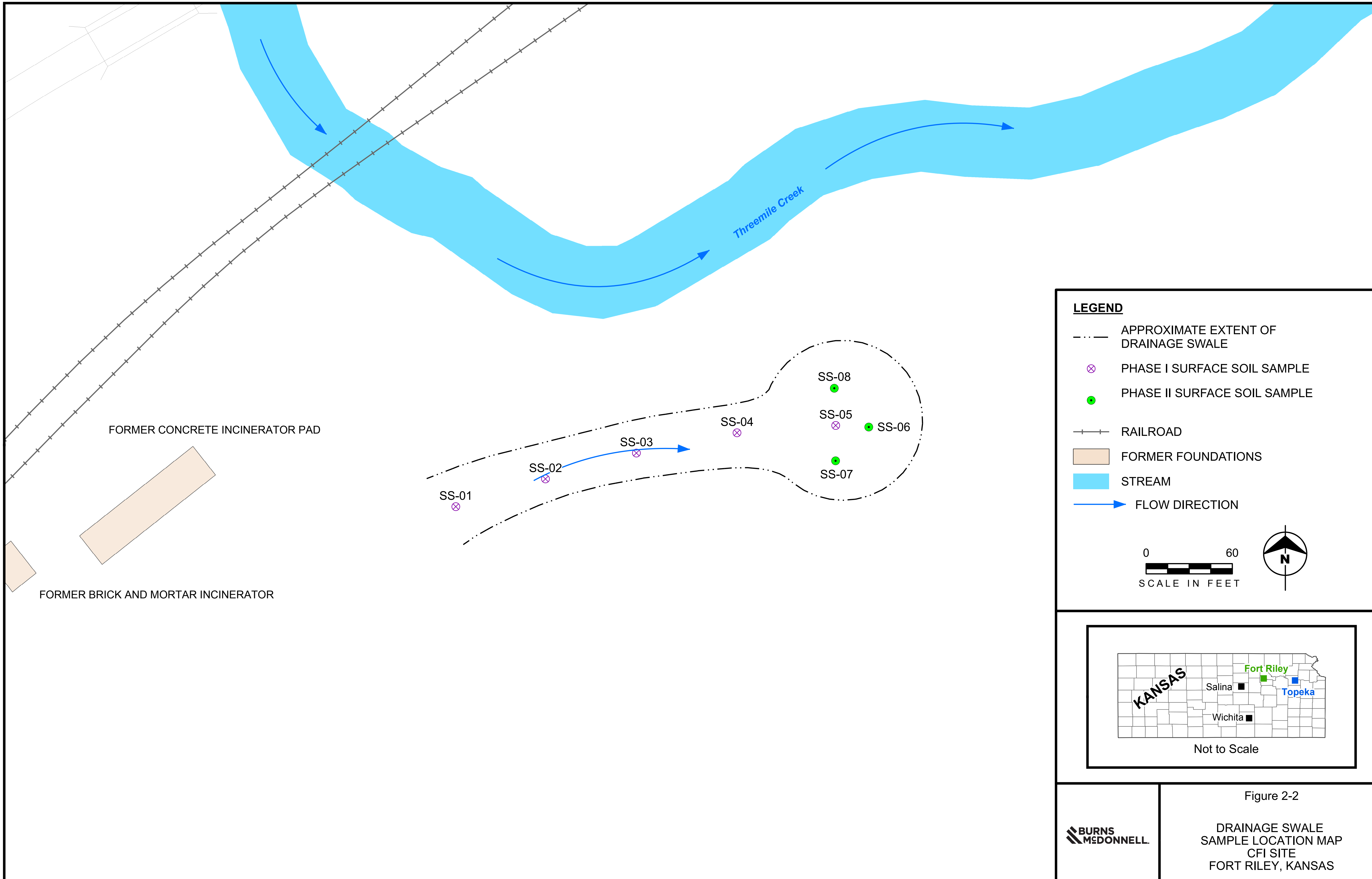
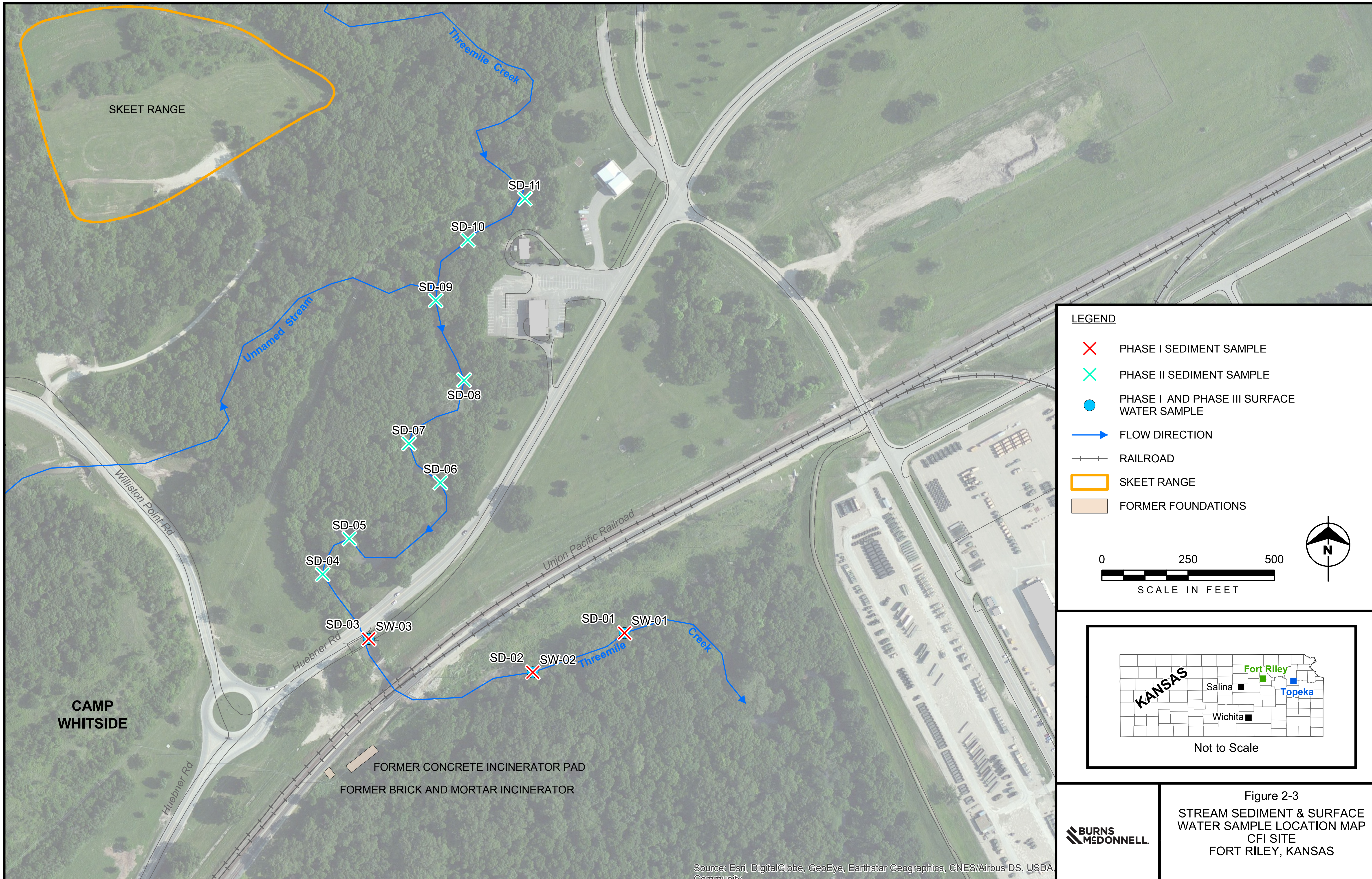


Figure 2-2

DRAINAGE SWALE
SAMPLE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS



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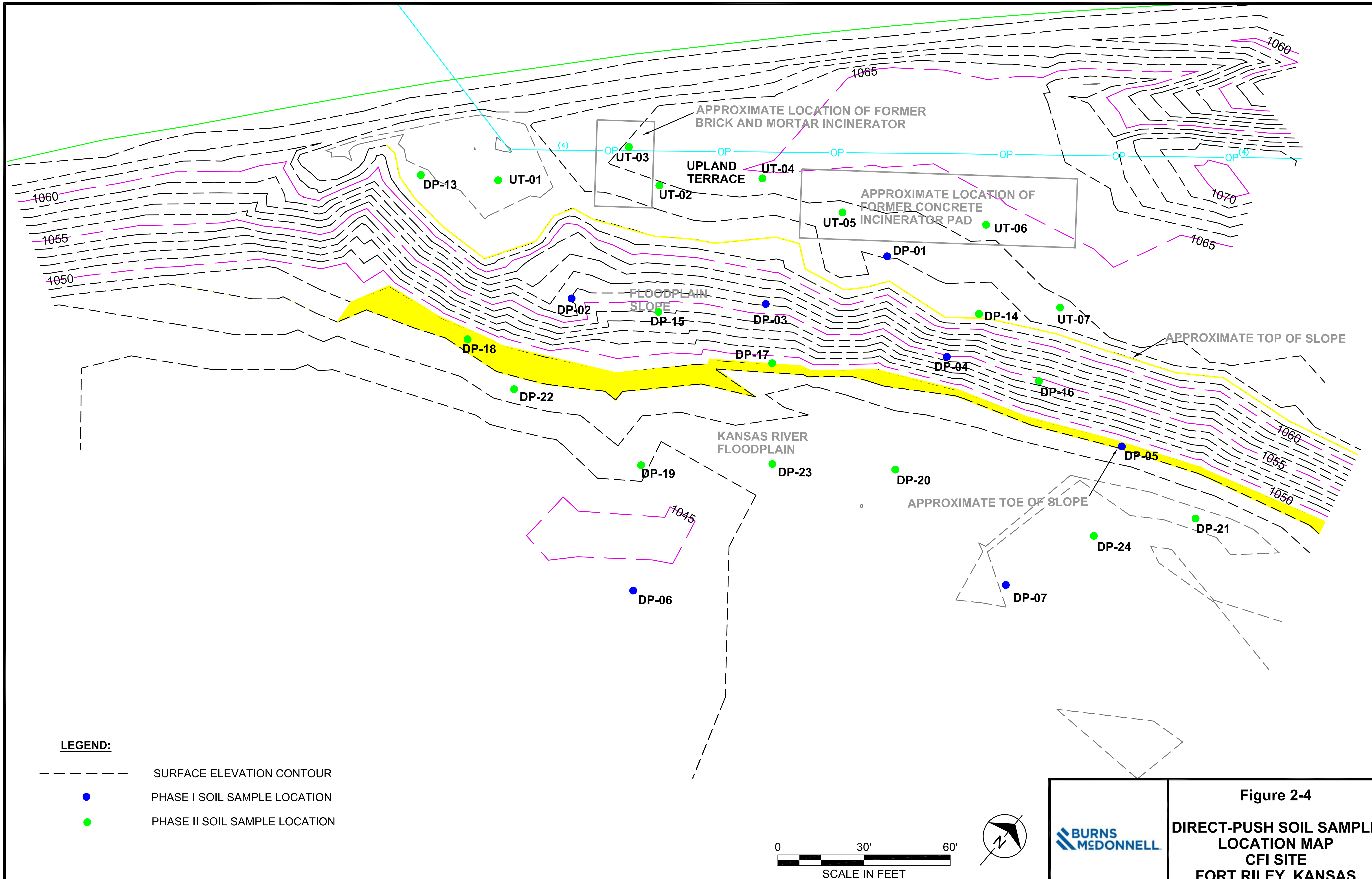
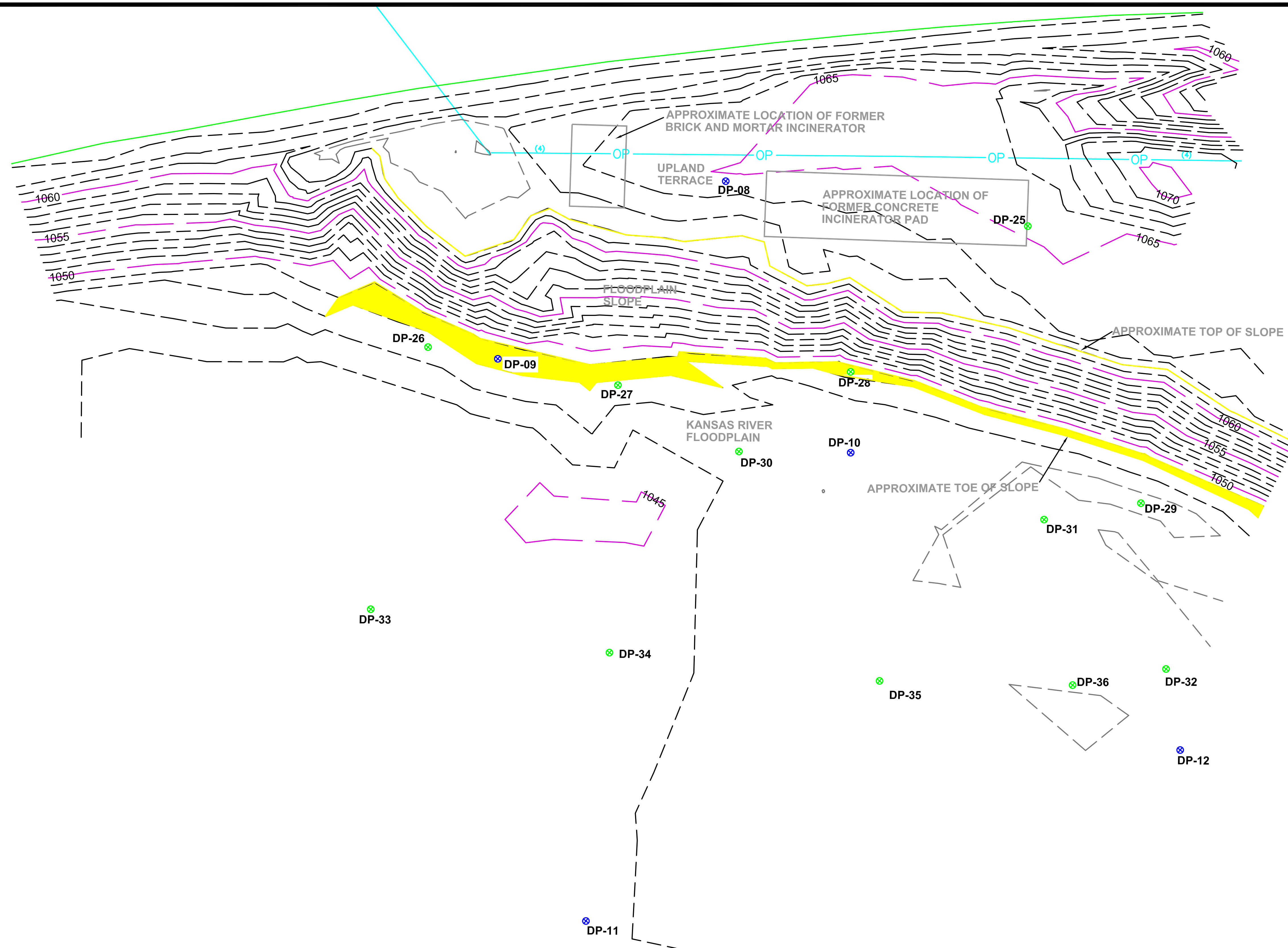


Figure 2-4

DIRECT-PUSH SOIL SAMPLE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\STUDIES\DELIVERABLES\RI\FIGURES\FIGURE 2-4 DIRECT PUSH LOCATIONS.DWG 3/7/2016 1:23 PM KSCHUTTE



LEGEND:

SURFACE ELEVATION CONTOUR

PHASE I GROUNDWATER SAMPLE LOCATION

PHASE II GROUNDWATER SAMPLE LOCATION

0 20' 40' 80'

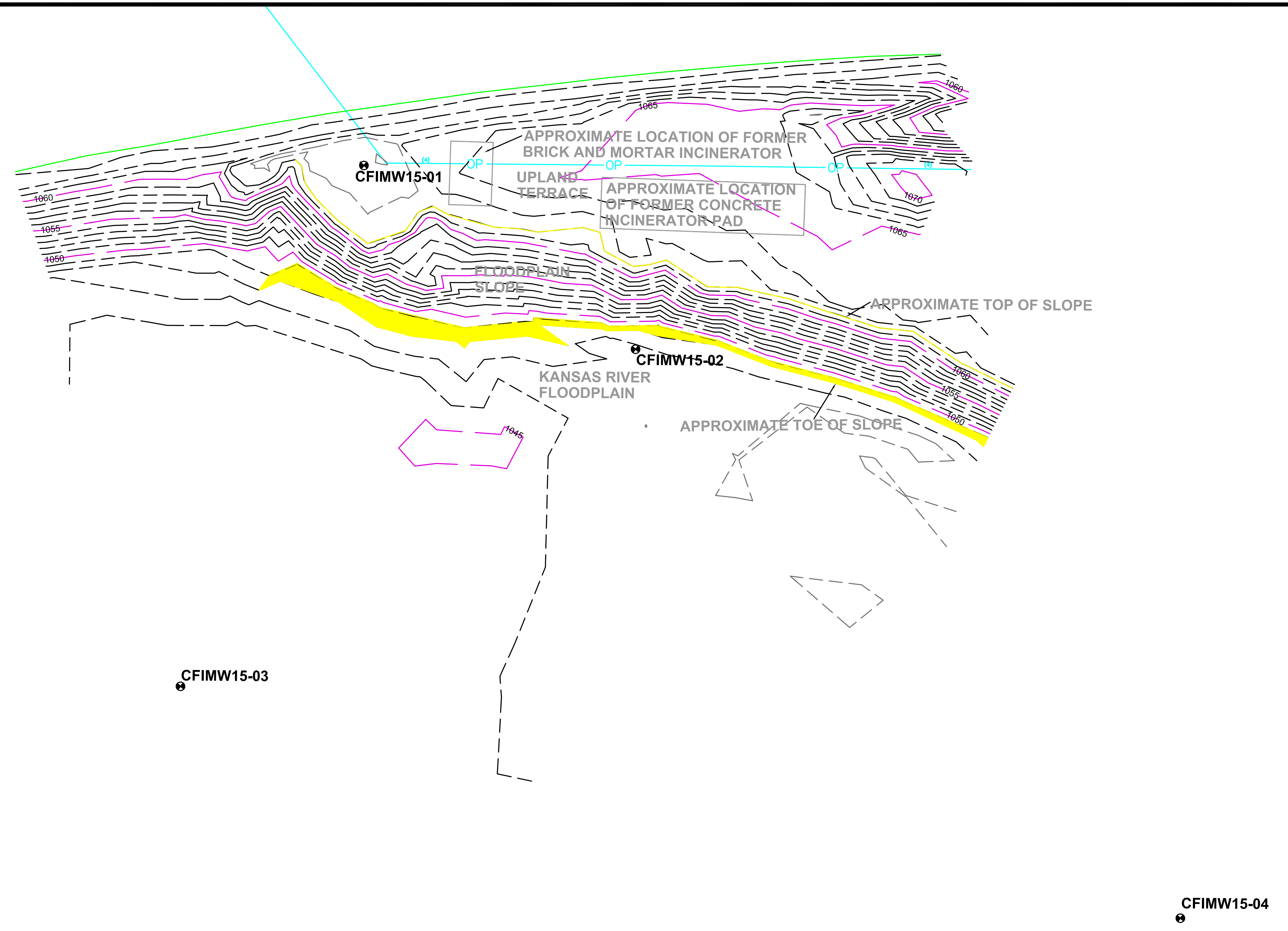
SCALE IN FEET

BURNS McDONNELL

Figure 2-5

DIRECT-PUSH GROUNDWATER SAMPLE LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\STUDIES\DELIVERABLES\RI\FIGURES\FIGURE 2-5 PHASE I_II GW.DWG 3/7/2016 1:17 PM KSCHUTTE



LEGEND:

SURFACE ELEVATION CONTOUR

MONITORING WELL LOCATION

0 50' 100'

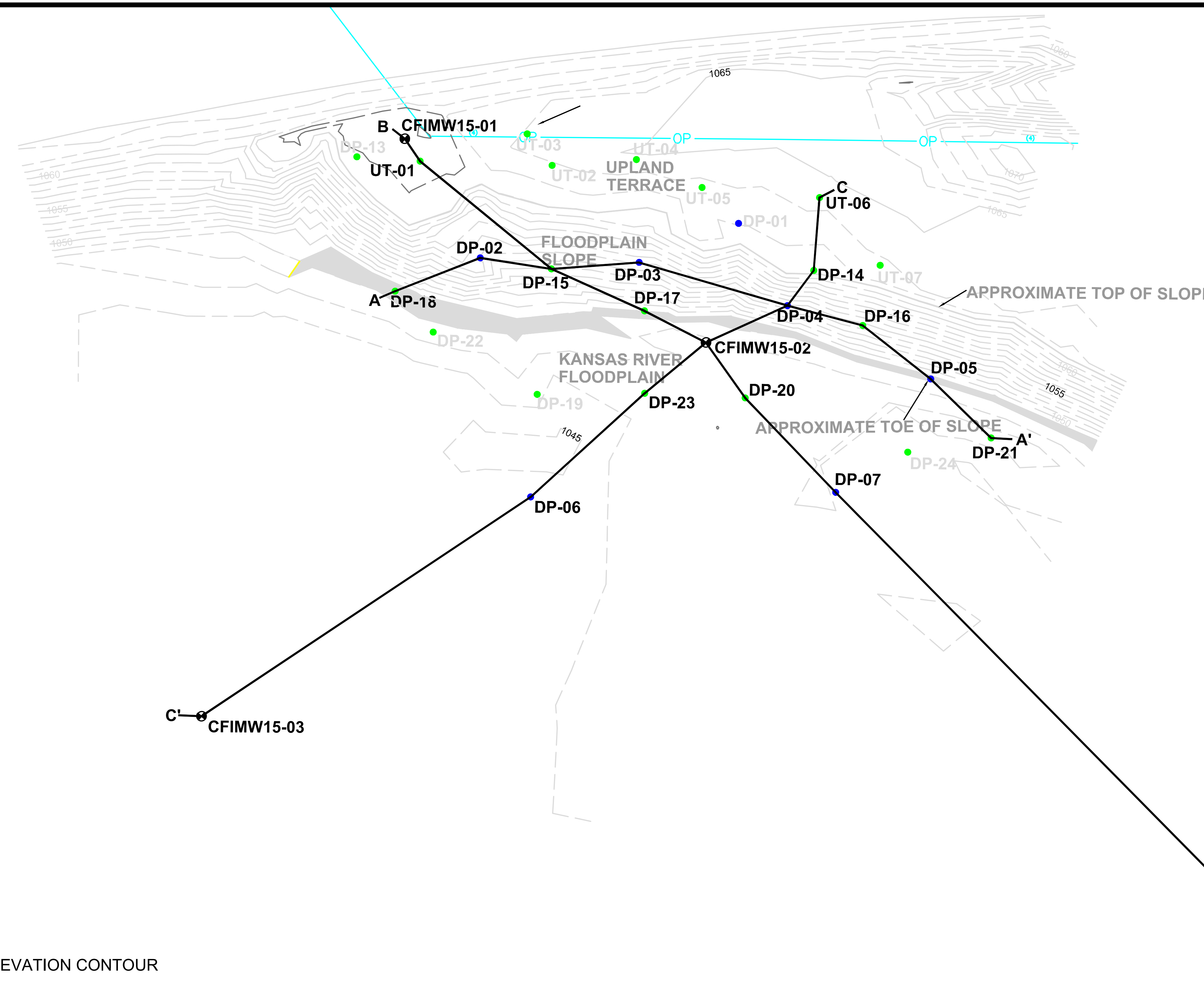
SCALE IN FEET

BURNS McDONNELL

Figure 2-6

MONITORING WELL LOCATION MAP
CFI SITE
FORT RILEY, KANSAS

Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\STUDIES\DELIVERABLES\RI\FIGURES\FIGURE 2-6 WELLS.DWG 3/16/2016 10:41 AM KSCHUTTE



LEGEND:

— — — — — —	SURFACE ELEVATION CONTOUR
●	PHASE I SOIL SAMPLE LOCATION
●	PHASE II SOIL SAMPLE LOCATION
⊕	MONITORING WELL LOCATION
A ——— A'	CROSS SECTION (FIGURE 3-2)
B ——— B'	CROSS SECTION (FIGURE 3-3)
C ——— C'	CROSS SECTION (FIGURE 3-4)

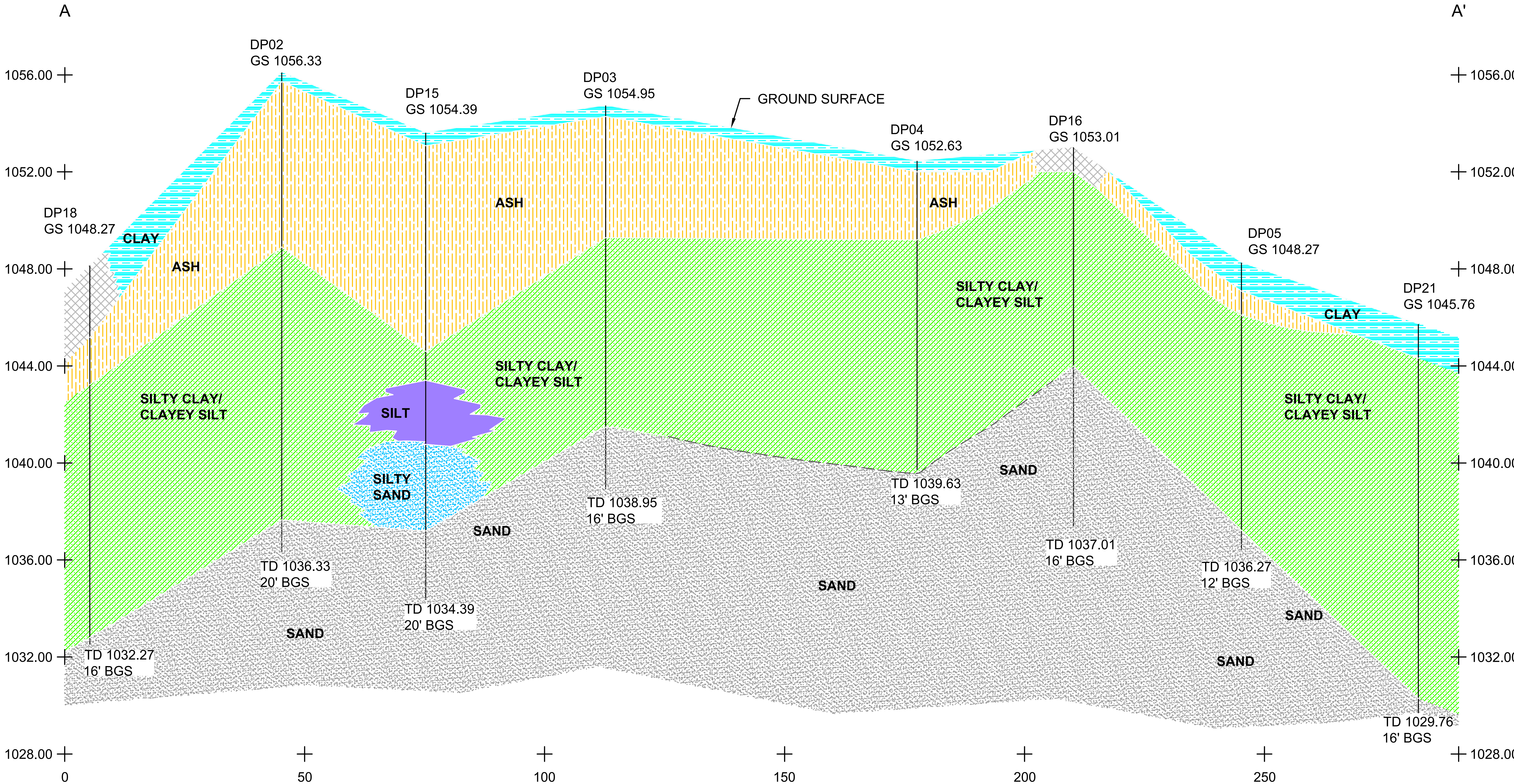
0 50' 100'

SCALE IN FEET

BURNS McDONNELL

Figure 3-1

GEOLOGICAL CROSS SECTION LOCATIONS
CFI SITE
FORT RILEY, KANSAS



LEGEND

- DIRECT-PUSH BORING
- CONTACT ZONE INFERRED
- BGS — BELOW GROUND SURFACE
- ASH
- CLAY
- SAND
- SILT
- SILTY SAND
- SILTY CLAY/ CLAYEY SILT
- CLAY TRACE ASH
- GS — GROUND SURFACE

NOTE:

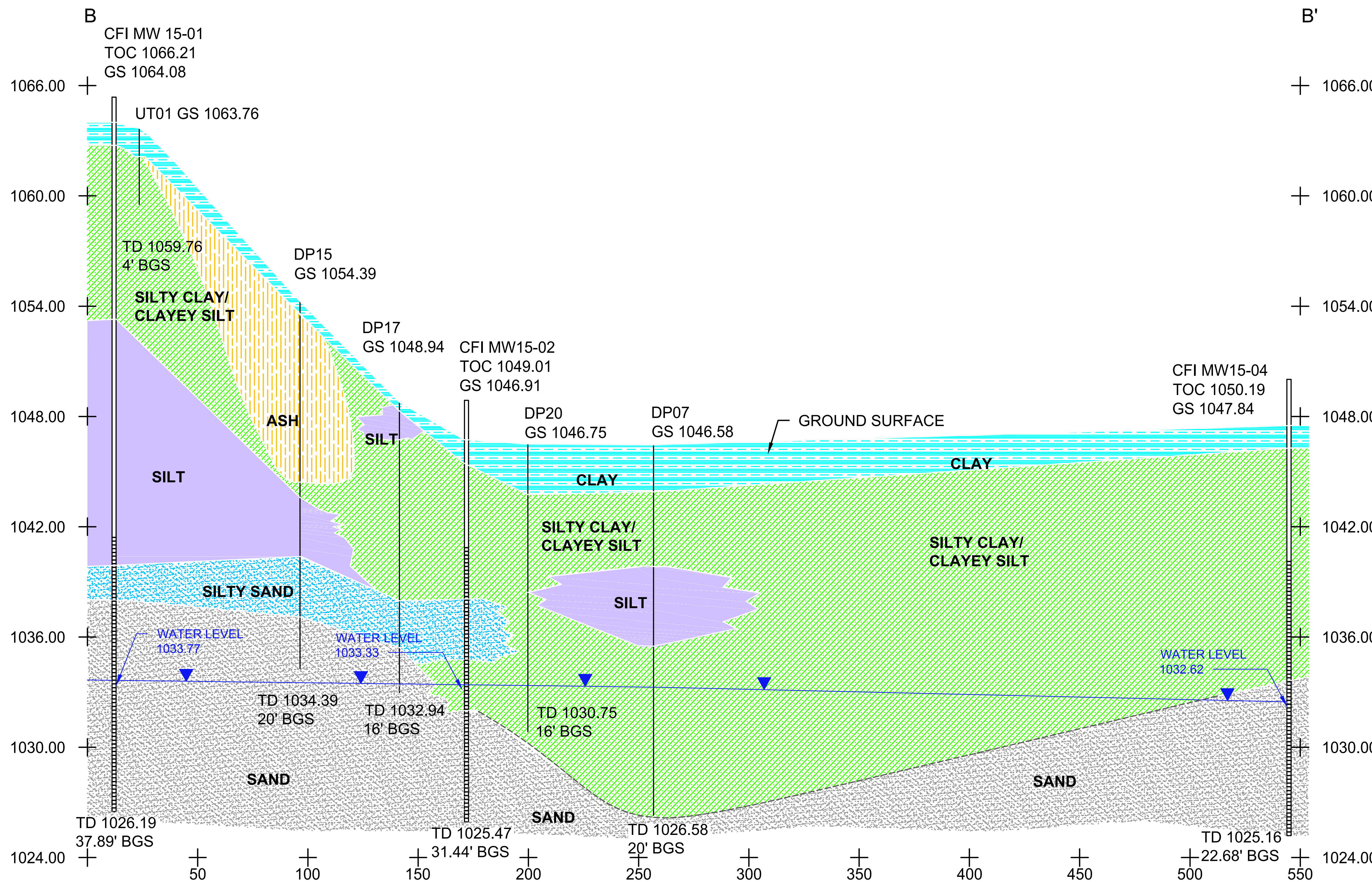
1. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

VERTICAL - 0 4' 8' SCALE IN FEET

HORIZONTAL - 0 10' 20' 40' SCALE IN FEET

BURNS McDONNELL

Figure 3-2
GEOLOGIC CROSS SECTION
A-A'
CFI SITE
FORT RILEY, KANSAS



LEGEND

(line)	DIRECT-PUSH BORING	(symbol)	SILTY SAND	(symbol)	PIEZOMETRIC SURFACE
BGS	BELOW GROUND SURFACE	(symbol)	SILTY CLAY/ CLAYEY SILT	(dashed line)	CONTACT ZONE INFERRED
(symbol)	ASH	(symbol)	SCREENED INTERVAL		
(symbol)	CLAY	(symbol)	MONITORING WELL		
(symbol)	SAND	GS	GROUND SURFACE		
(symbol)	SILT	TOC	TOP OF CASING		

NOTES:

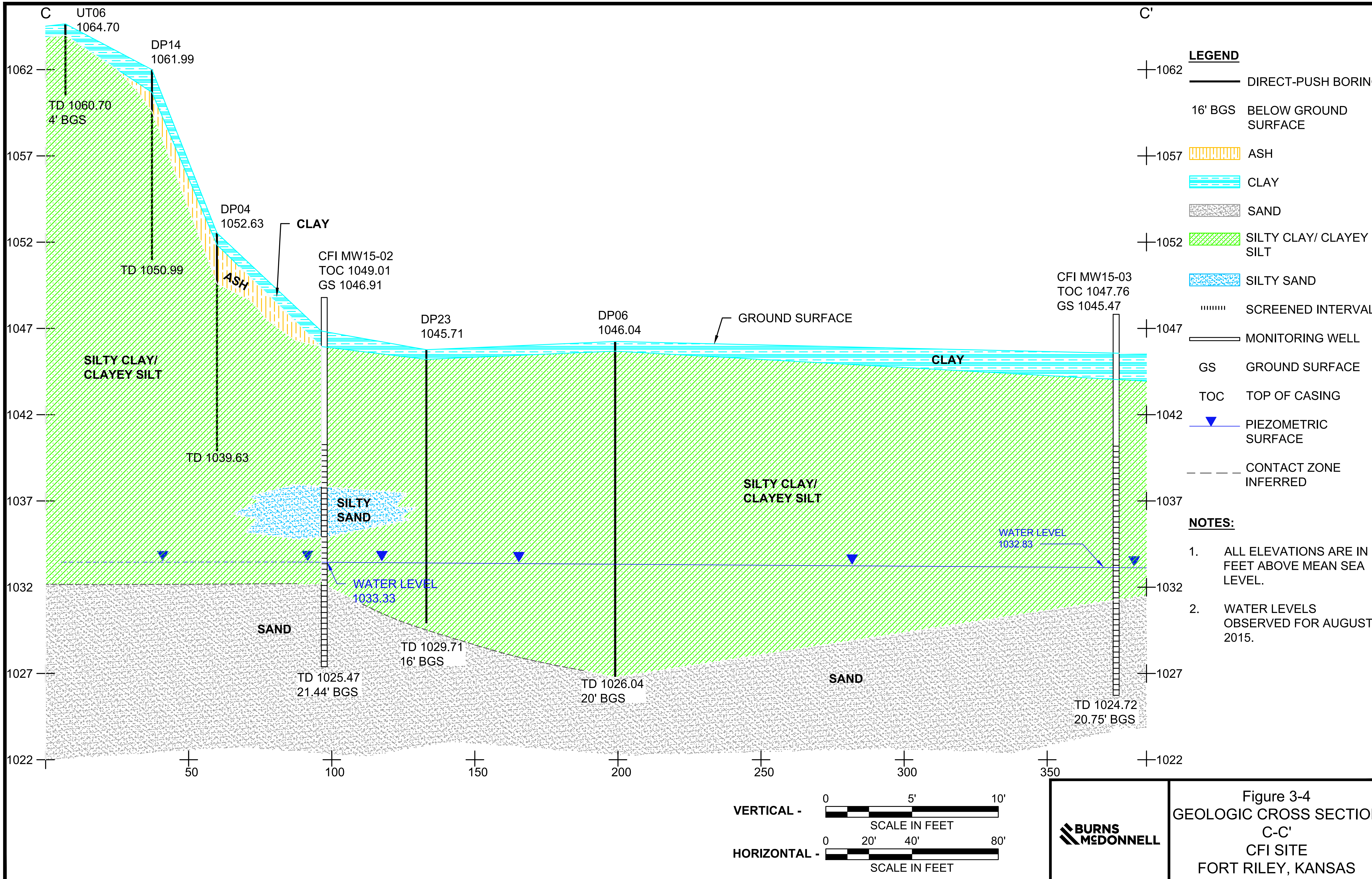
1. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
2. WATER LEVELS OBSERVED FOR AUGUST 2015.

VERTICAL - 0 6' 12' SCALE IN FEET

HORIZONTAL - 0 50' 100' SCALE IN FEET

BURNS McDONNELL

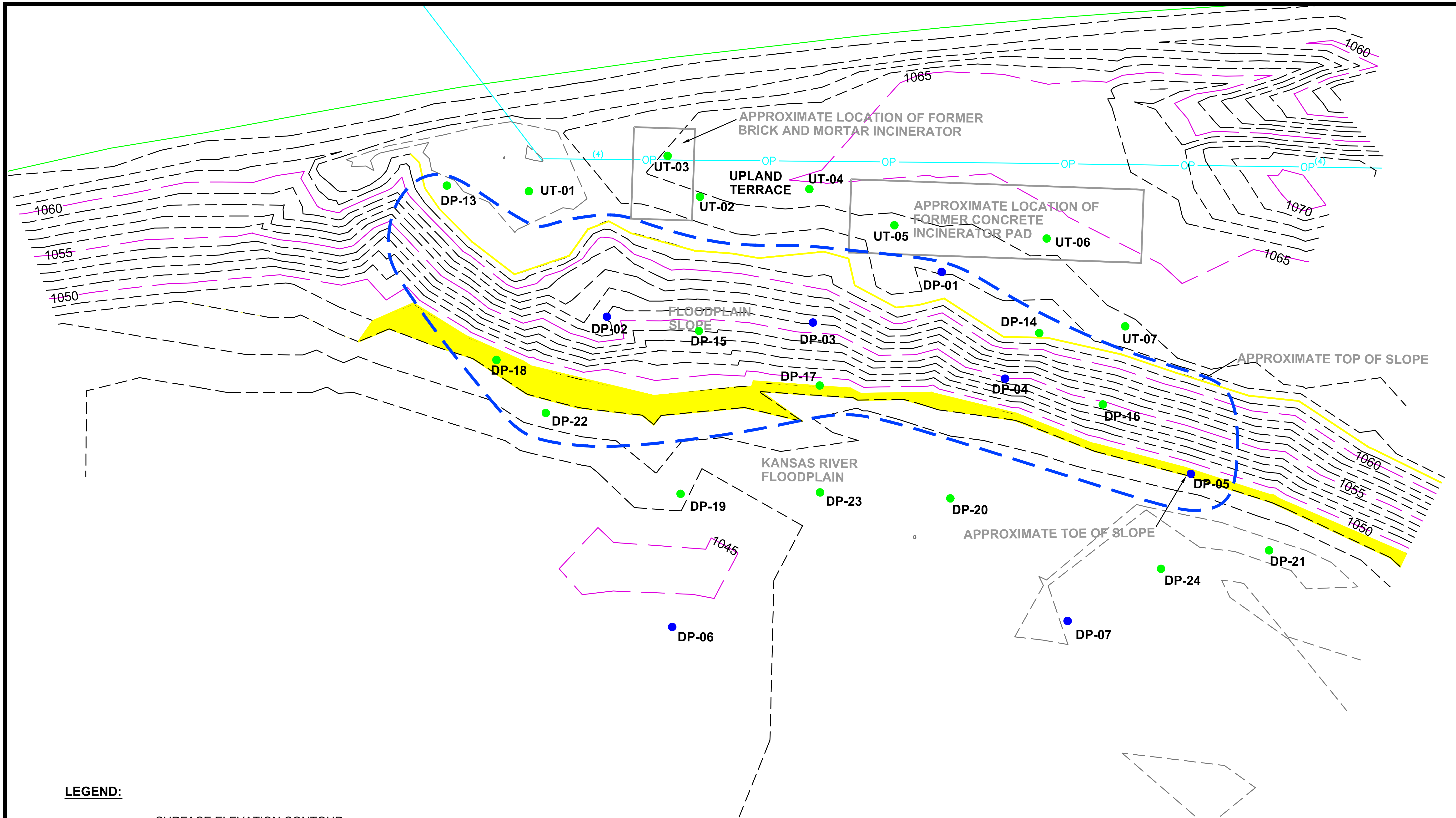
Figure 3-3
GEOLOGIC CROSS SECTION
B-B'
CFI SITE
FORT RILEY, KANSAS



BURNS McDONNELL

Figure 3-4
GEOLOGIC CROSS SECTION
C-C'
CFI SITE
FORT RILEY, KANSAS

Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\DESIGN\CADD\DWGS\63525-CFI-SECTION PROFILE C-C'.DWG 8/22/2016 2:32 PM KEDWARDS



LEGEND:

SURFACE ELEVATION CONTOUR

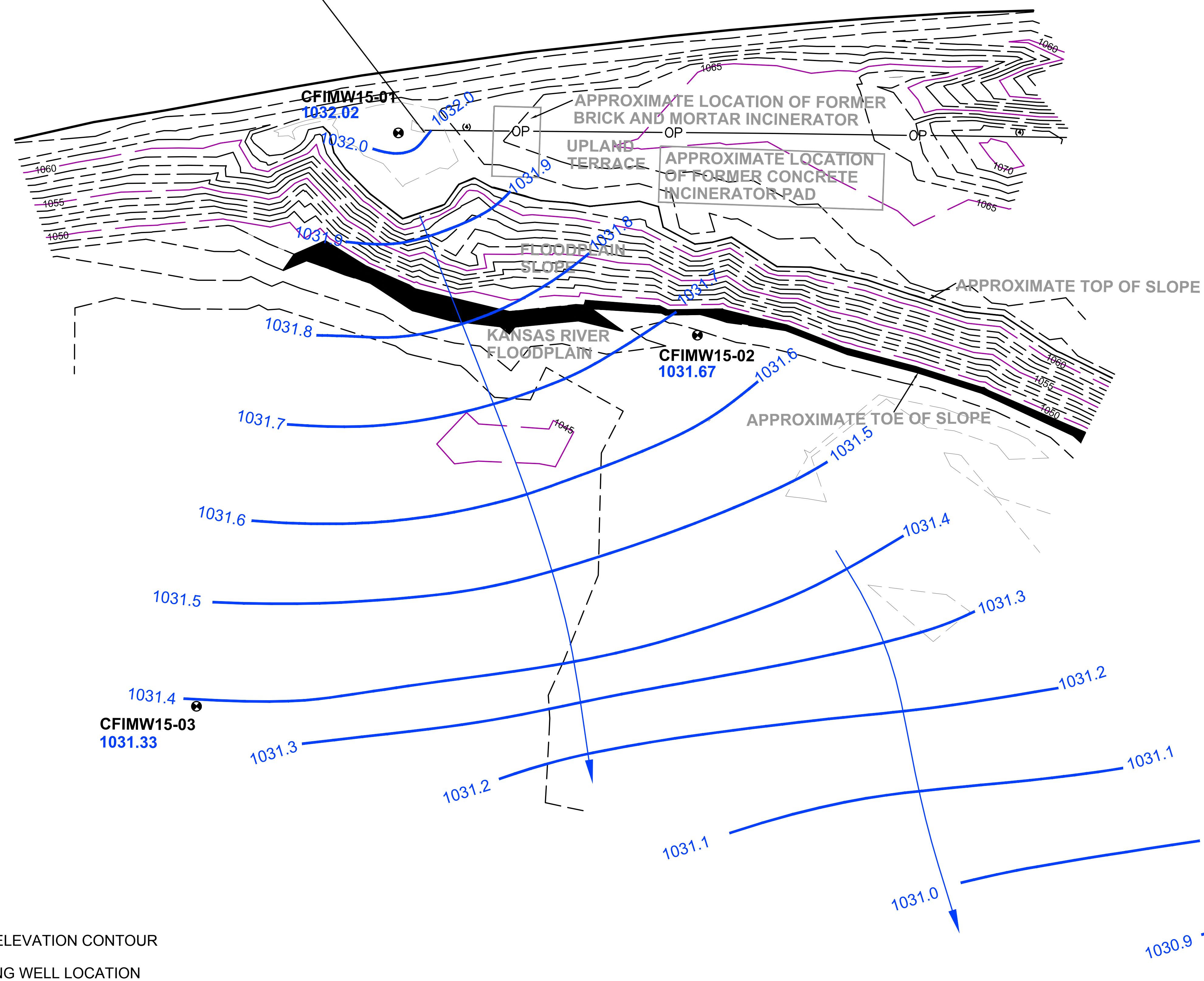
APPROXIMATE EXTENT OF ASH / CINDER DEPOSITS

PHASE I SOIL SAMPLE LOCATION

PHASE II SOIL SAMPLE LOCATION

BURNS McDONNELL

Figure 3-5
APPROXIMATE EXTENT OF ASH / CINDER DEPOSITS
CFI SITE
FORT RILEY, KANSAS



LEGEND:

SURFACE ELEVATION CONTOUR

MONITORING WELL LOCATION

GROUNDWATER FLOW CONTOUR

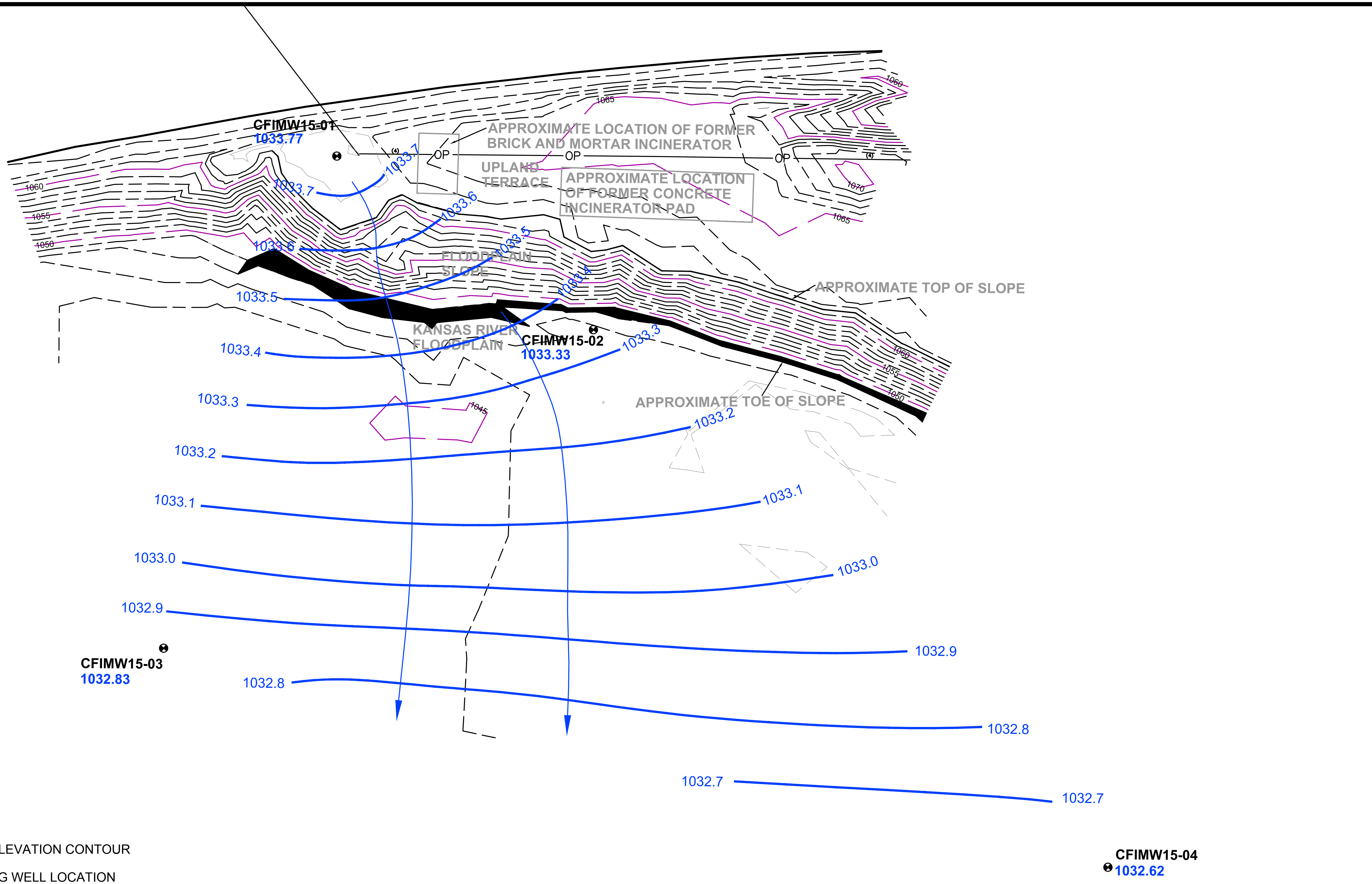
1031.33 GROUNDWATER ELEVATION

GROUNDWATER FLOW DIRECTION

BURNS McDONNELL

Figure 3-6

PIEZOMETRIC MAP
MAY 5, 2015
CFI SITE
FORT RILEY, KANSAS



LEGEND:

— — — —	SURFACE ELEVATION CONTOUR
●	MONITORING WELL LOCATION
———	GROUNDWATER FLOW CONTOUR
1031.33	GROUNDWATER ELEVATION
——▶	GROUNDWATER FLOW DIRECTION

0 50' 100'

SCALE IN FEET

N

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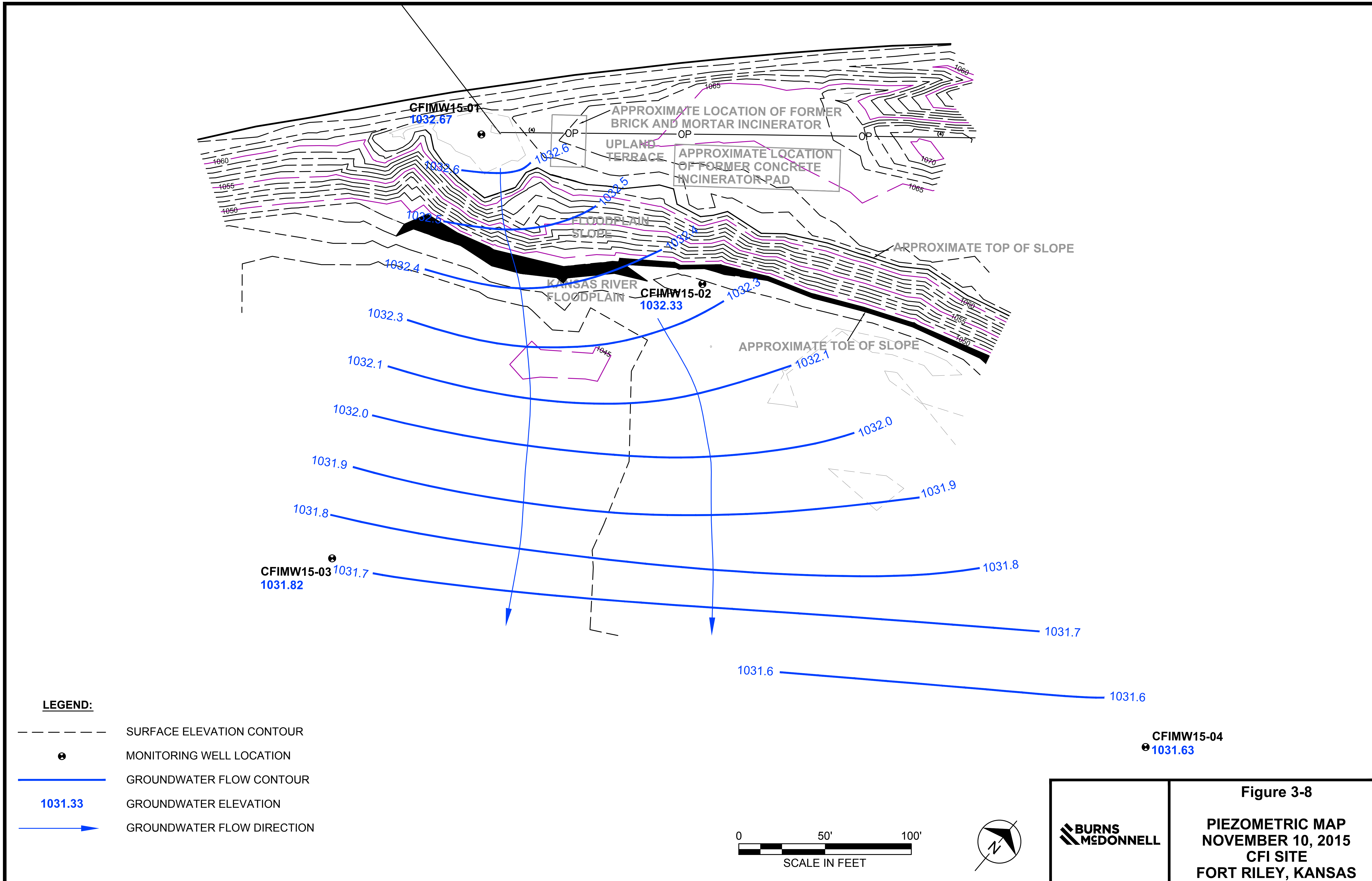
Figure 3-7

PIEZOMETRIC MAP
AUGUST 11, 2015
CFI SITE
FORT RILEY, KANSAS

Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\STUDIES\DELIVERABLES\RI\FIGURES\FIGURE 3-6 GW CONTOURS.DWG 5/5/2016 8:07 AM TDUCKER



BURNS McDONNELL

Figure 3-8

PIEZOMETRIC MAP
NOVEMBER 10, 2015
CFI SITE
FORT RILEY, KANSAS

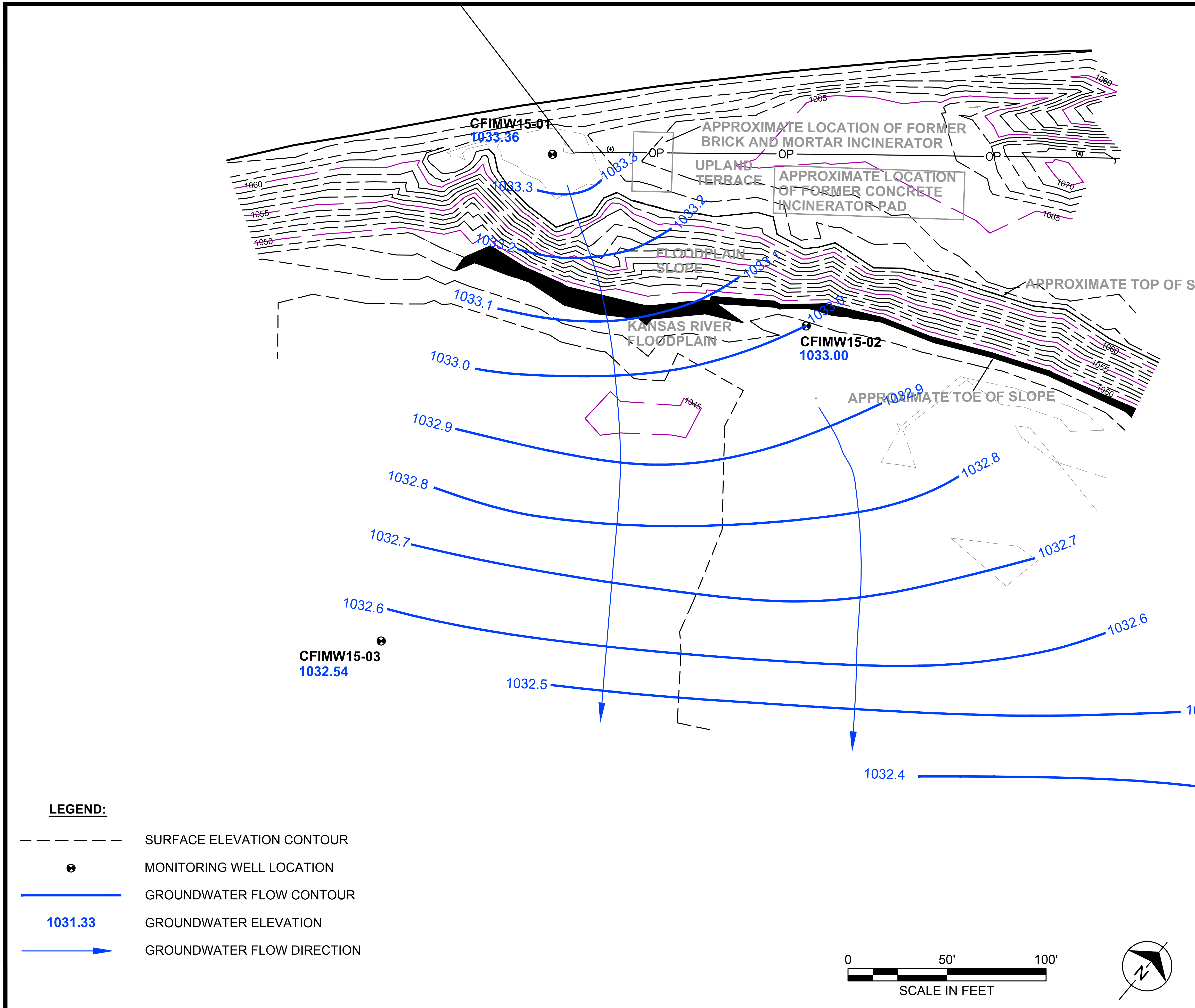
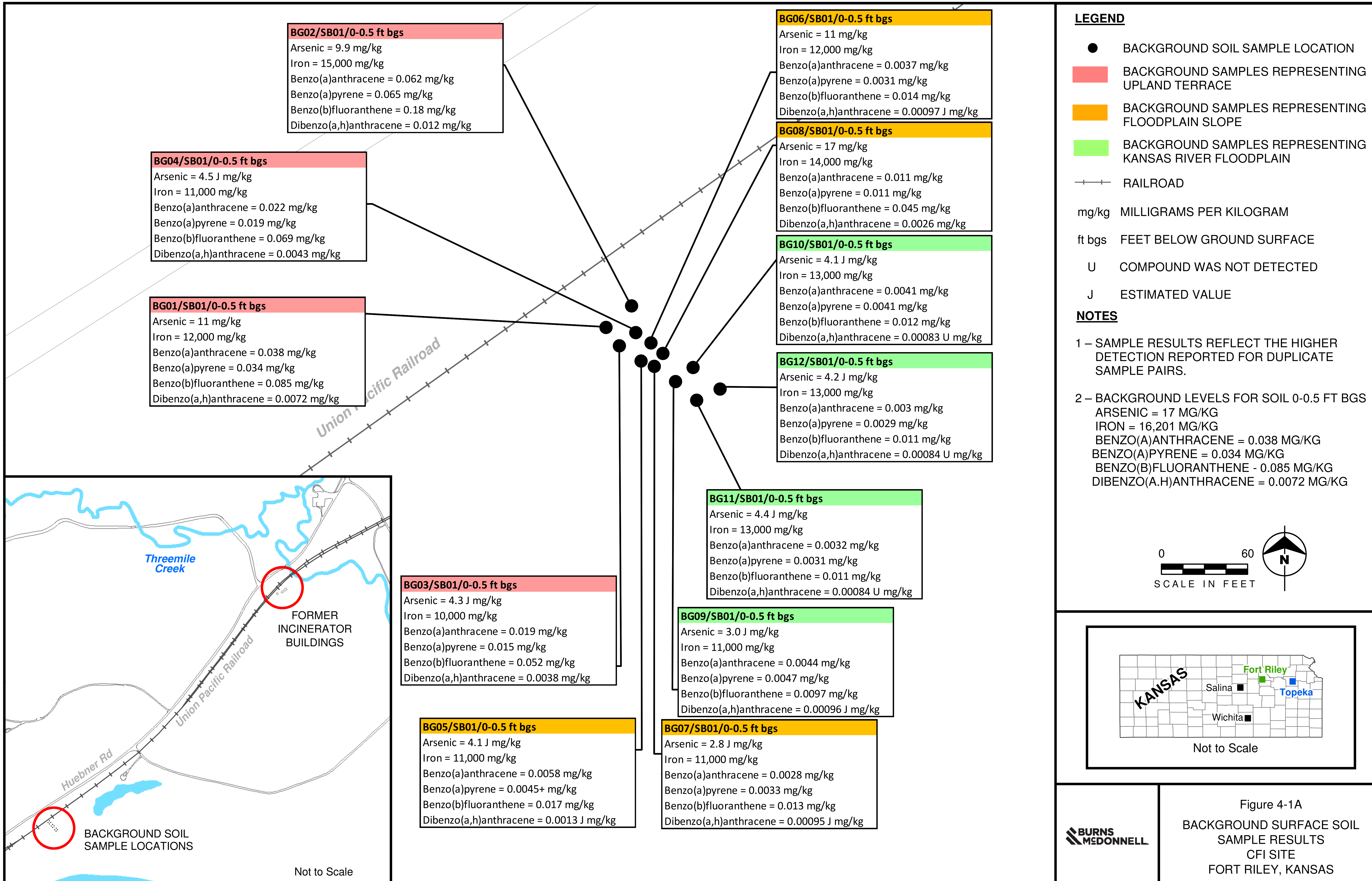


Figure 3-9

PIEZOMETRIC MAP
FEBRUARY 11, 2016
CFI SITE
FORT RILEY, KANSAS



Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig4-1a_Background_SS_Location_Map.mxd Date: 5/12/2016

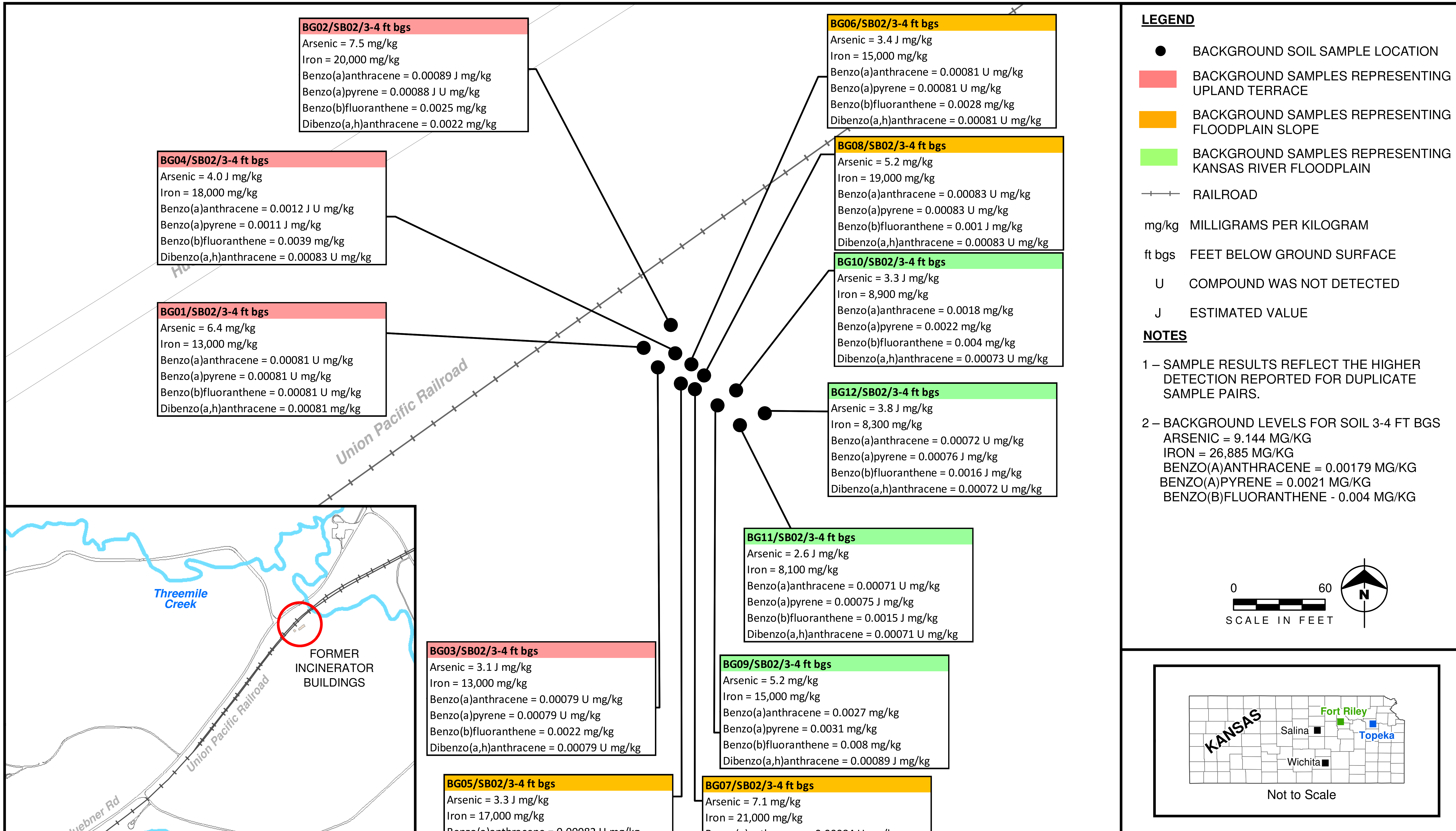


Figure 4-1B
BACKGROUND SUBSURFACE SOIL SAMPLE RESULTS
CFI SITE
FORT RILEY, KANSAS

Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig4-1b_Background_SS_Location_Map.mxd Date: 5/12/2016

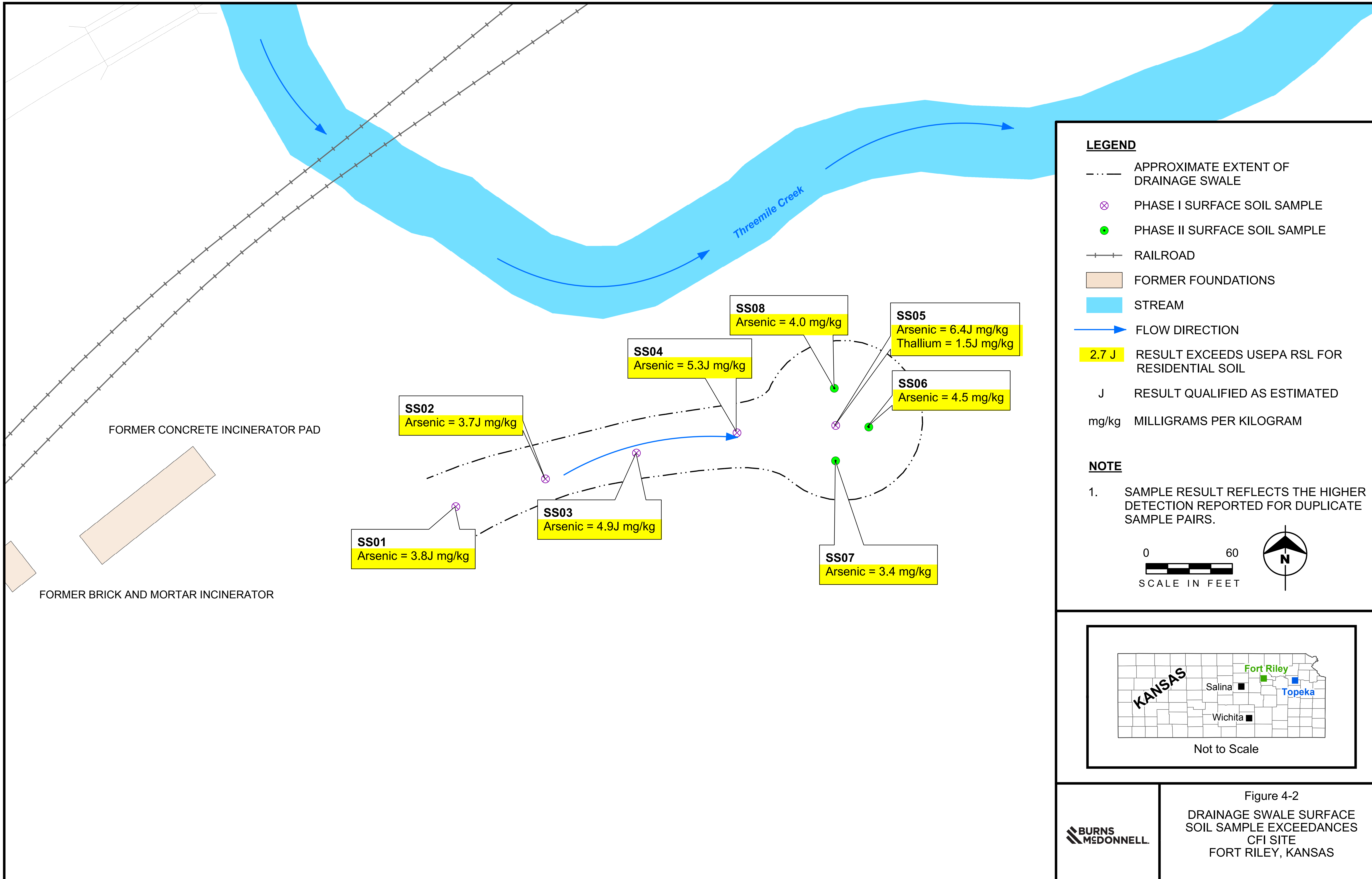
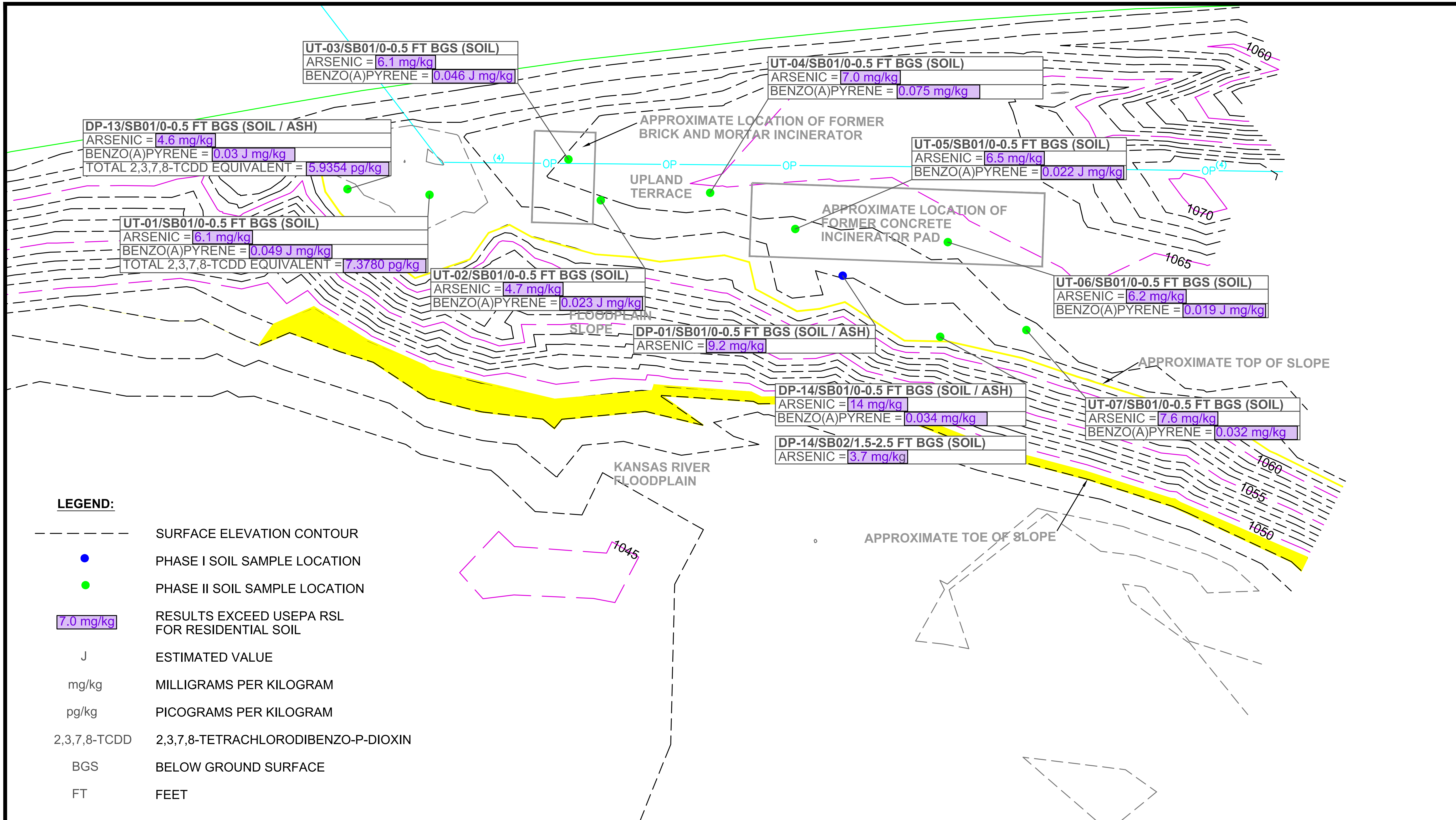


Figure 4-2

DRAINAGE SWALE SURFACE SOIL SAMPLE EXCEEDANCES
CFI SITE
FORT RILEY, KANSAS

Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig4-2_Surface_Soil_Sample_Exceedance.mxd Date: 5/11/2016



LEGEND:

— — — —	SURFACE ELEVATION CONTOUR
● (blue)	PHASE I SOIL SAMPLE LOCATION
● (green)	PHASE II SOIL SAMPLE LOCATION
7.0 mg/kg	RESULTS EXCEED USEPA RSL FOR RESIDENTIAL SOIL
J	ESTIMATED VALUE
mg/kg	MILLIGRAMS PER KILOGRAM
pg/kg	PICOGRAMS PER KILOGRAM
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
BGS	BELOW GROUND SURFACE
FT	FEET

NOTES:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.
2. 2,3,7,8-TCDD IS REPRESENTATIVE OF TOTAL 2,3,7,8-TCDD EQUIVALENT.

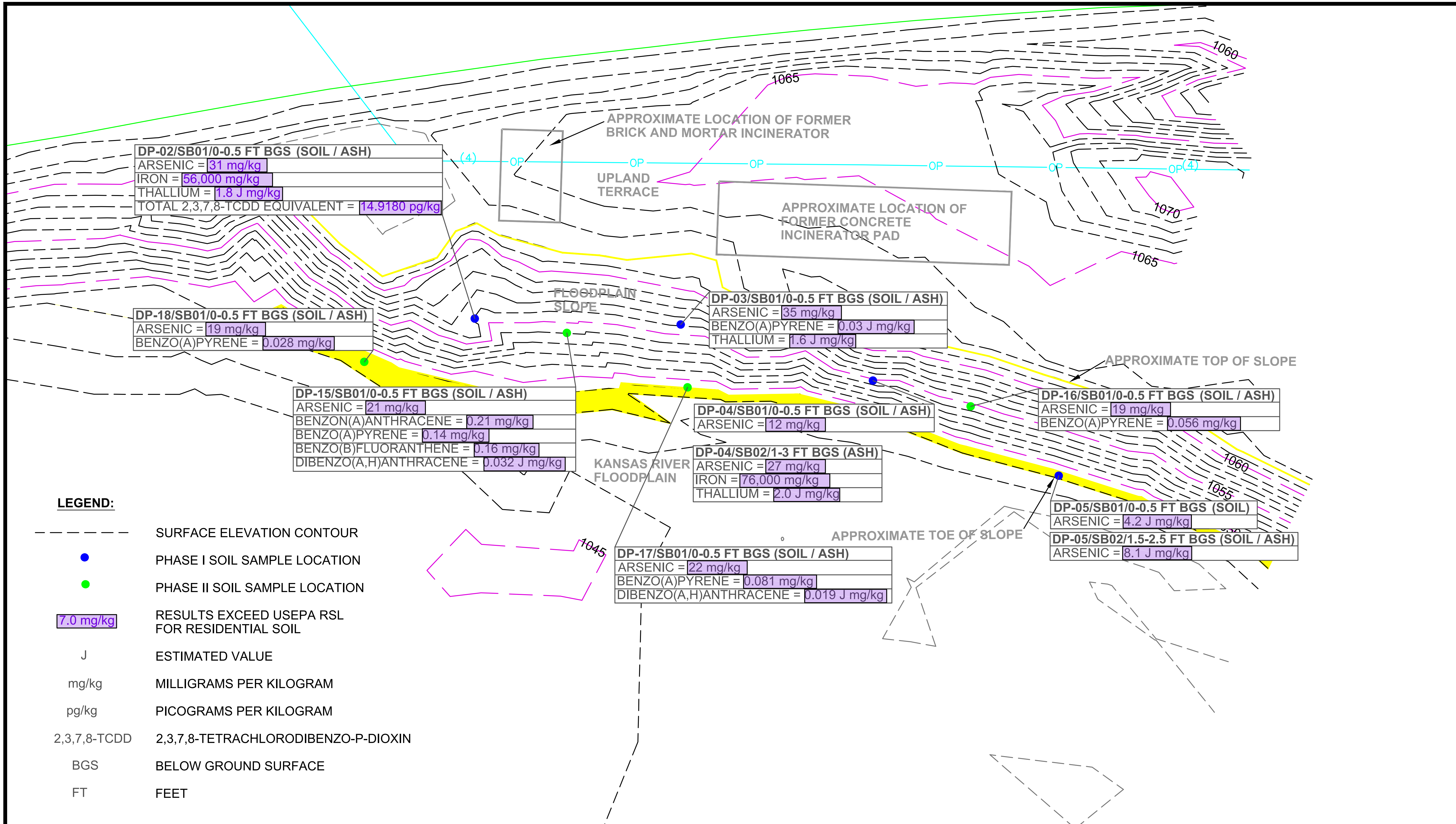
0 30' 60'
SCALE IN FEET

N

BURNS McDONNELL

Figure 4-3

UPLAND TERRACE SURFACE SOIL SAMPLE EXCEEDANCES MAP
CFI SITE
FORT RILEY, KANSAS



LEGEND:

– – – – – –	SURFACE ELEVATION CONTOUR
● (blue)	PHASE I SOIL SAMPLE LOCATION
● (green)	PHASE II SOIL SAMPLE LOCATION
7.0 mg/kg	RESULTS EXCEED USEPA RSL FOR RESIDENTIAL SOIL
J	ESTIMATED VALUE
mg/kg	MILLIGRAMS PER KILOGRAM
pg/kg	PICOGRAMS PER KILOGRAM
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
BGS	BELOW GROUND SURFACE
FT	FEET

NOTES:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.
2. 2,3,7,8-TCDD IS REPRESENTATIVE OF TOTAL 2,3,7,8-TCDD EQUIVALENT.

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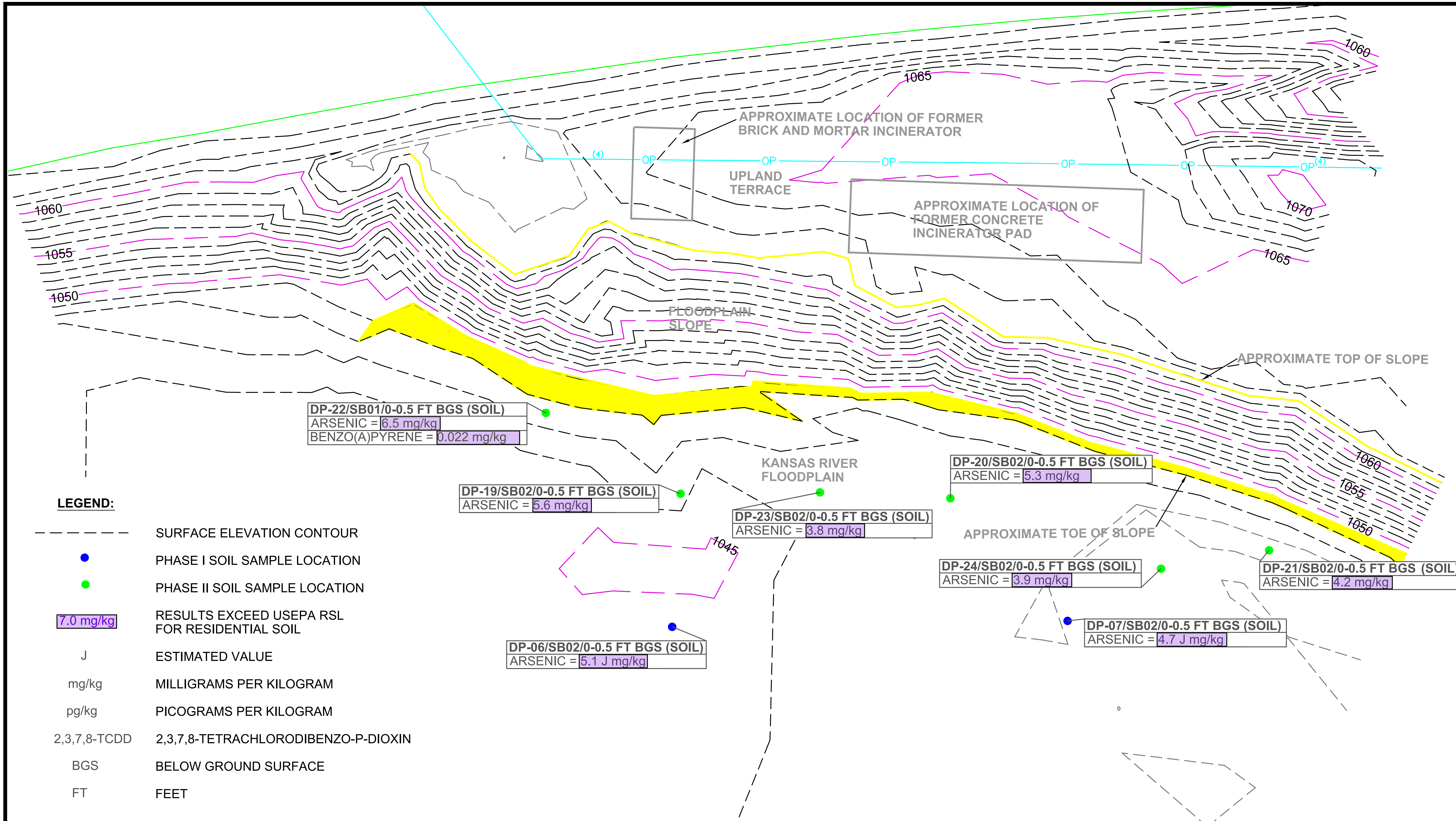
Figure 4-4

FLOODPLAIN SLOPE SURFACE SOIL SAMPLE EXCEEDANCES CFI SITE FORT RILEY, KANSAS



LEGEND:

— — — —	SURFACE ELEVATION CONTOUR
● (blue)	PHASE I SOIL SAMPLE LOCATION
● (green)	PHASE II SOIL SAMPLE LOCATION
7.0 mg/kg	RESULTS EXCEED USEPA RSL FOR RESIDENTIAL SOIL
J	ESTIMATED VALUE
mg/kg	MILLIGRAMS PER KILOGRAM
pg/kg	PICOGRAMS PER KILOGRAM
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
BGS	BELOW GROUND SURFACE
FT	FEET

NOTES:

1. **SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.**
2. **2,3,7,8-TCDD IS REPRESENTATIVE OF TOTAL 2,3,7,8-TCDD EQUIVALENT.**

0 30' 60'
SCALE IN FEET

N

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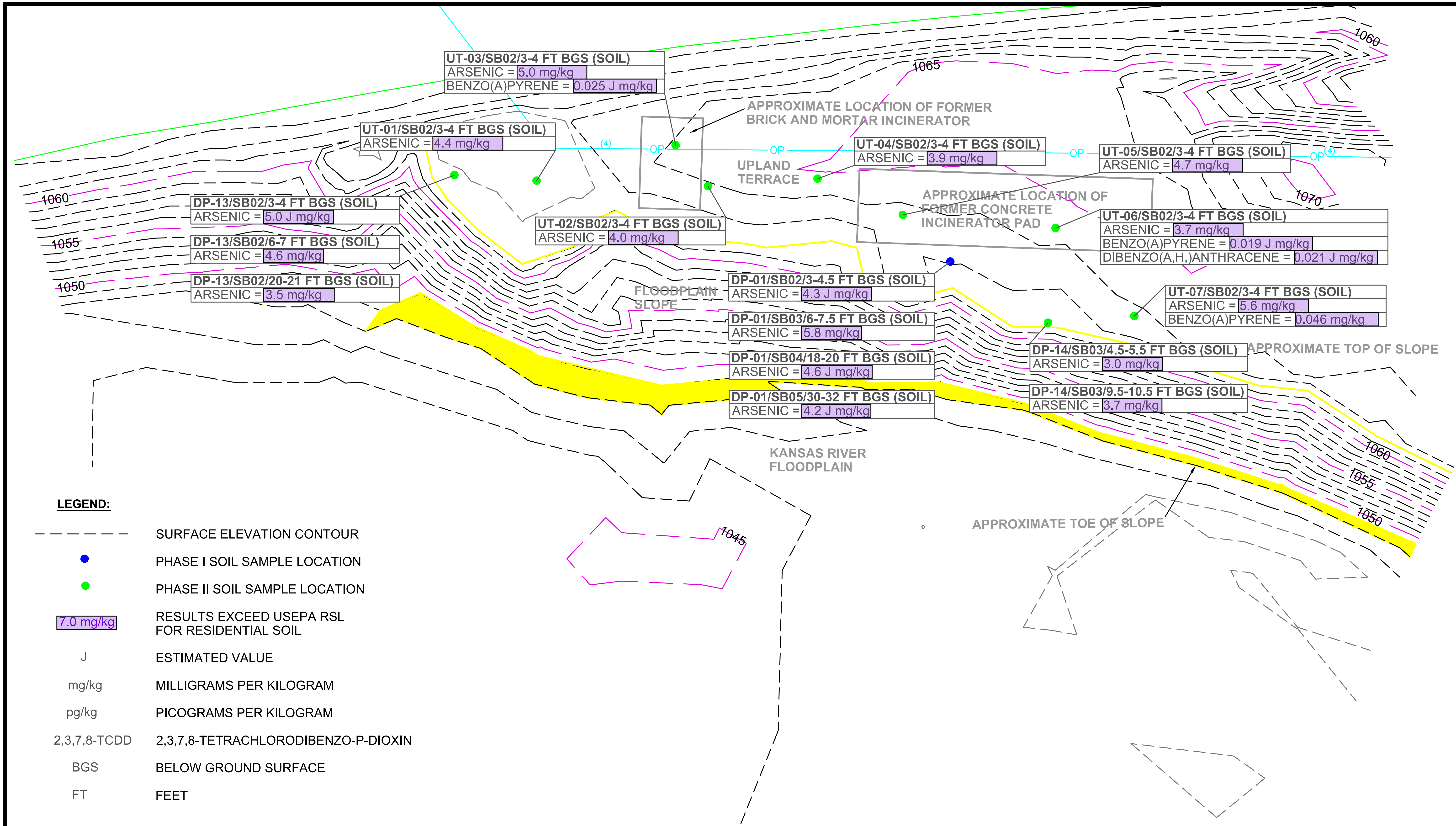
Figure 4-5
KANSAS RIVER FLOODPLAIN SURFACE SOIL EXCEEDENCES CFI SITE FORT RILEY, KANSAS



LEGEND:

— — — —	SURFACE ELEVATION CONTOUR
● (blue)	PHASE I SOIL SAMPLE LOCATION
● (green)	PHASE II SOIL SAMPLE LOCATION
7.0 mg/kg	RESULTS EXCEED USEPA RSL FOR RESIDENTIAL SOIL
J	ESTIMATED VALUE
mg/kg	MILLIGRAMS PER KILOGRAM
pg/kg	PICOGRAMS PER KILOGRAM
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
BGS	BELOW GROUND SURFACE
FT	FEET

NOTES:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.
2. 2,3,7,8-TCDD IS REPRESENTATIVE OF TOTAL 2,3,7,8-TCDD EQUIVALENT.

0 30' 60'
SCALE IN FEET

N

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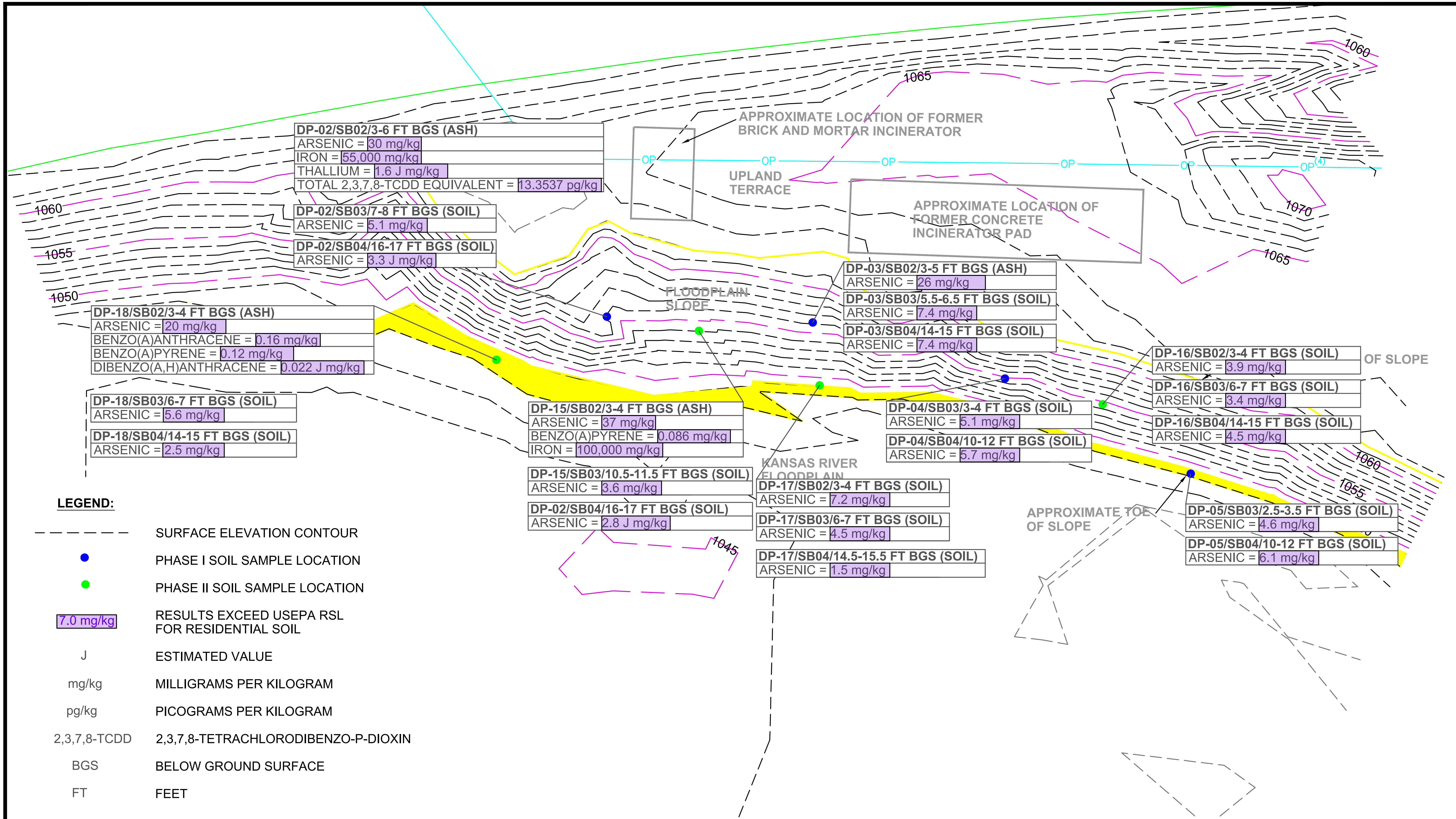
Figure 4-6

UPLAND TERRACE SUBSURFACE SOIL SAMPLE EXCEEDANCES CFI SITE FORT RILEY, KANSAS



LEGEND:

— — — —	SURFACE ELEVATION CONTOUR
●	PHASE I SOIL SAMPLE LOCATION
●	PHASE II SOIL SAMPLE LOCATION
7.0 mg/kg	RESULTS EXCEED USEPA RSL FOR RESIDENTIAL SOIL
J	ESTIMATED VALUE
mg/kg	MILLIGRAMS PER KILOGRAM
pg/kg	PICOGRAMS PER KILOGRAM
2,3,7,8-TCDD	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
BGS	BELOW GROUND SURFACE
FT	FEET

NOTES:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.
2. 2,3,7,8-TCDD IS REPRESENTATIVE OF TOTAL 2,3,7,8-TCDD EQUIVALENT.

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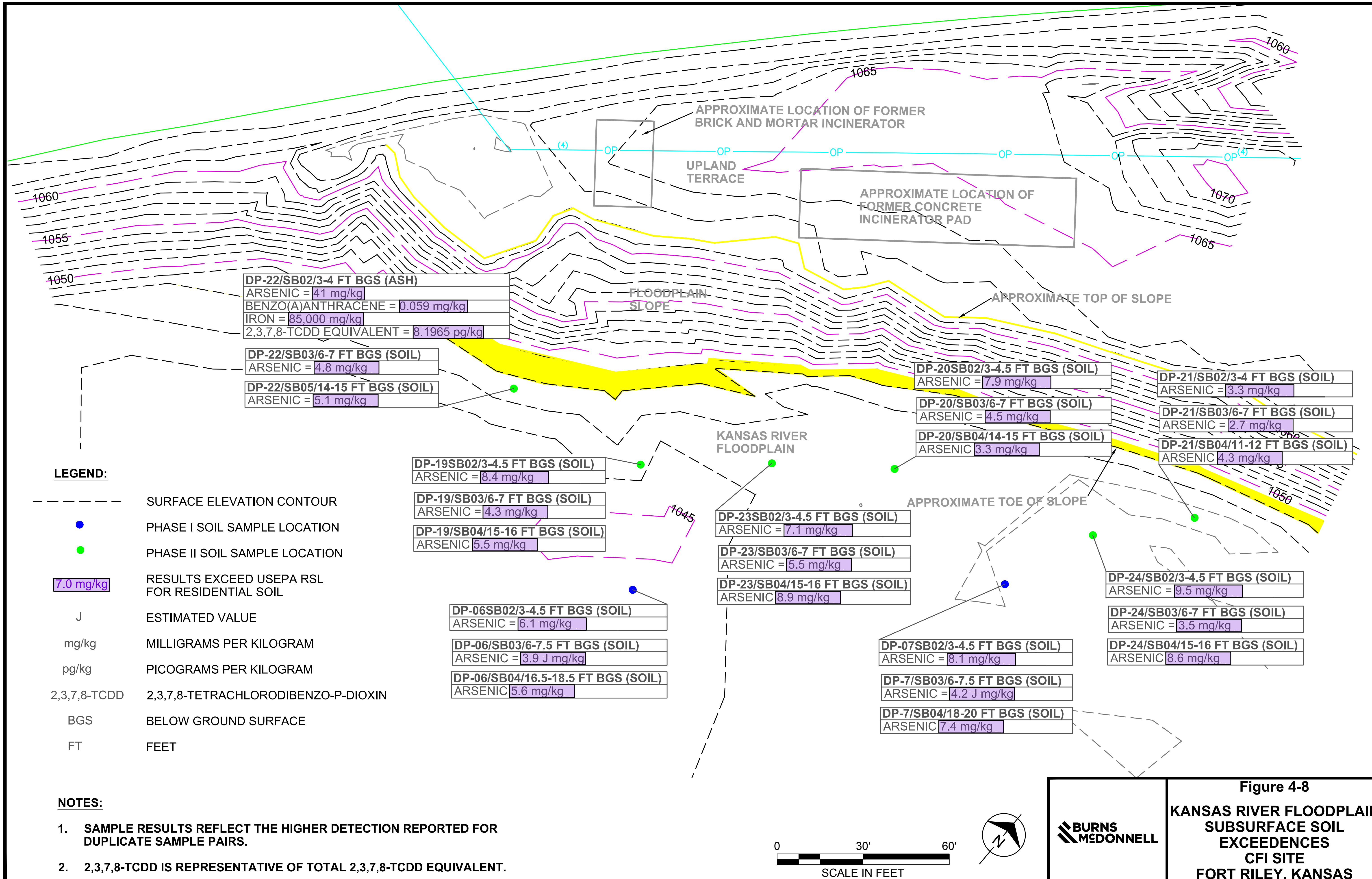
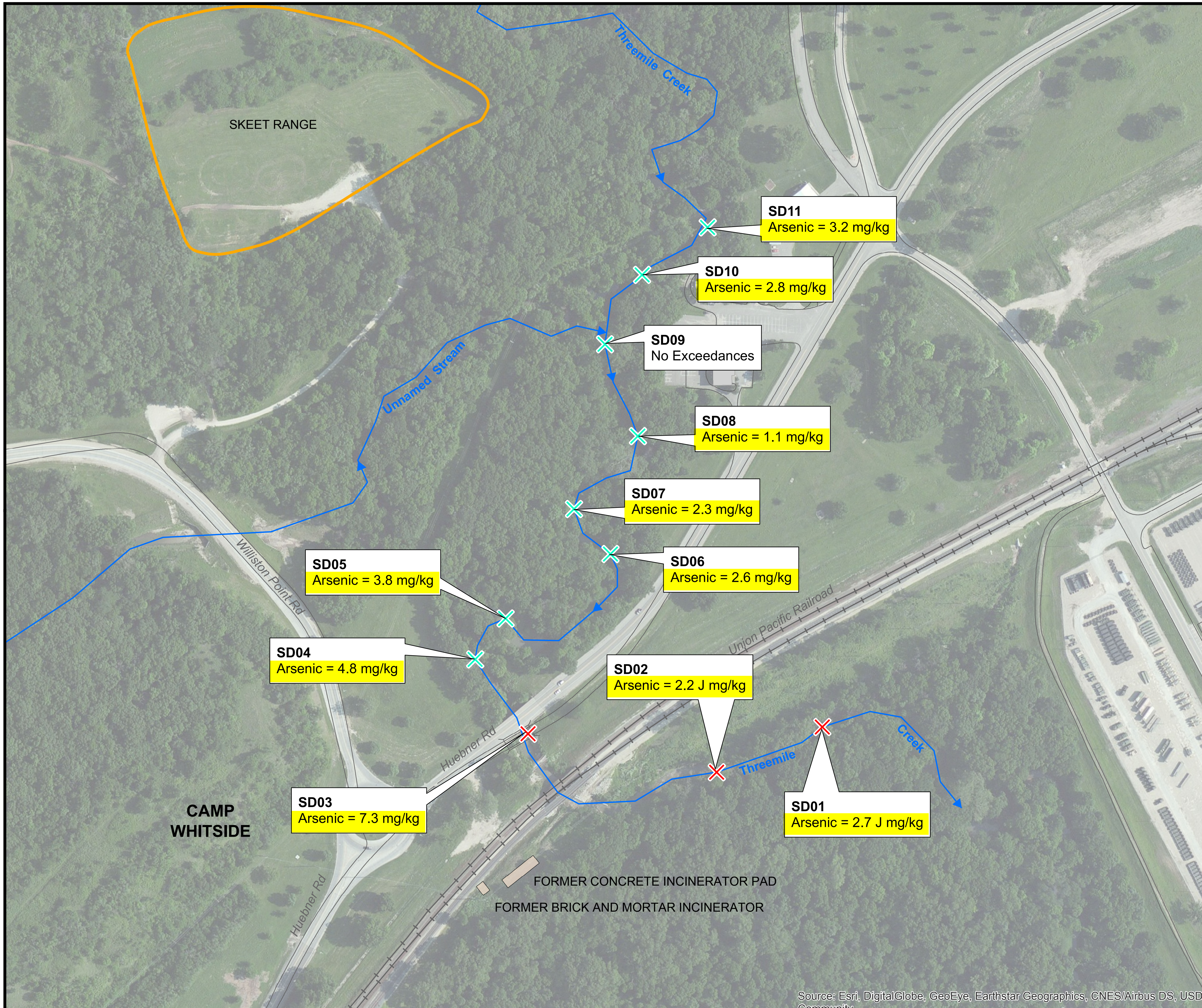
Figure 4-7

FLOODPLAIN SLOPE SUBSURFACE SOIL SAMPLE EXCEEDANCES CFI SITE FORT RILEY, KANSAS



Z:\CLIENTS\ENV\LOUISBERGER\63525_CFINCINERATOR\DESIGN\CADD\DWGS\63525-FIG-CFI-4-8 KANSAS RIVER FLOODPLAIN SUBSURFACE.DWG 5/11/2016 10:08 AM TDUCKER



LEGEND

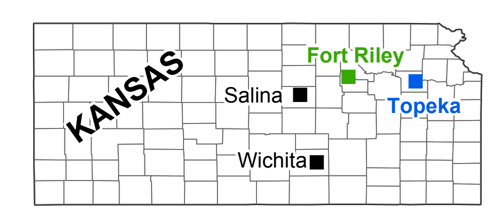
- PHASE I SEDIMENT SAMPLE
- PHASE II SEDIMENT SAMPLE
- FLOW DIRECTION
- RAILROAD
- SKEET RANGE
- FORMER FOUNDATIONS
- 2.7 J — RESULT EXCEEDS USEPA RSL FOR RESIDENTIAL SOIL
- J — RESULT QUALIFIED AS ESTIMATED
- mg/kg — MILLIGRAMS PER KILOGRAM

NOTES

1. SAMPLE RESULT REFLECTS THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.
2. UP-GRADIENT LEVEL FOR ARSENIC IN STREAM SEDIMENT IS 7.244 mg/kg.

0 250 500
SCALE IN FEET

N



Not to Scale

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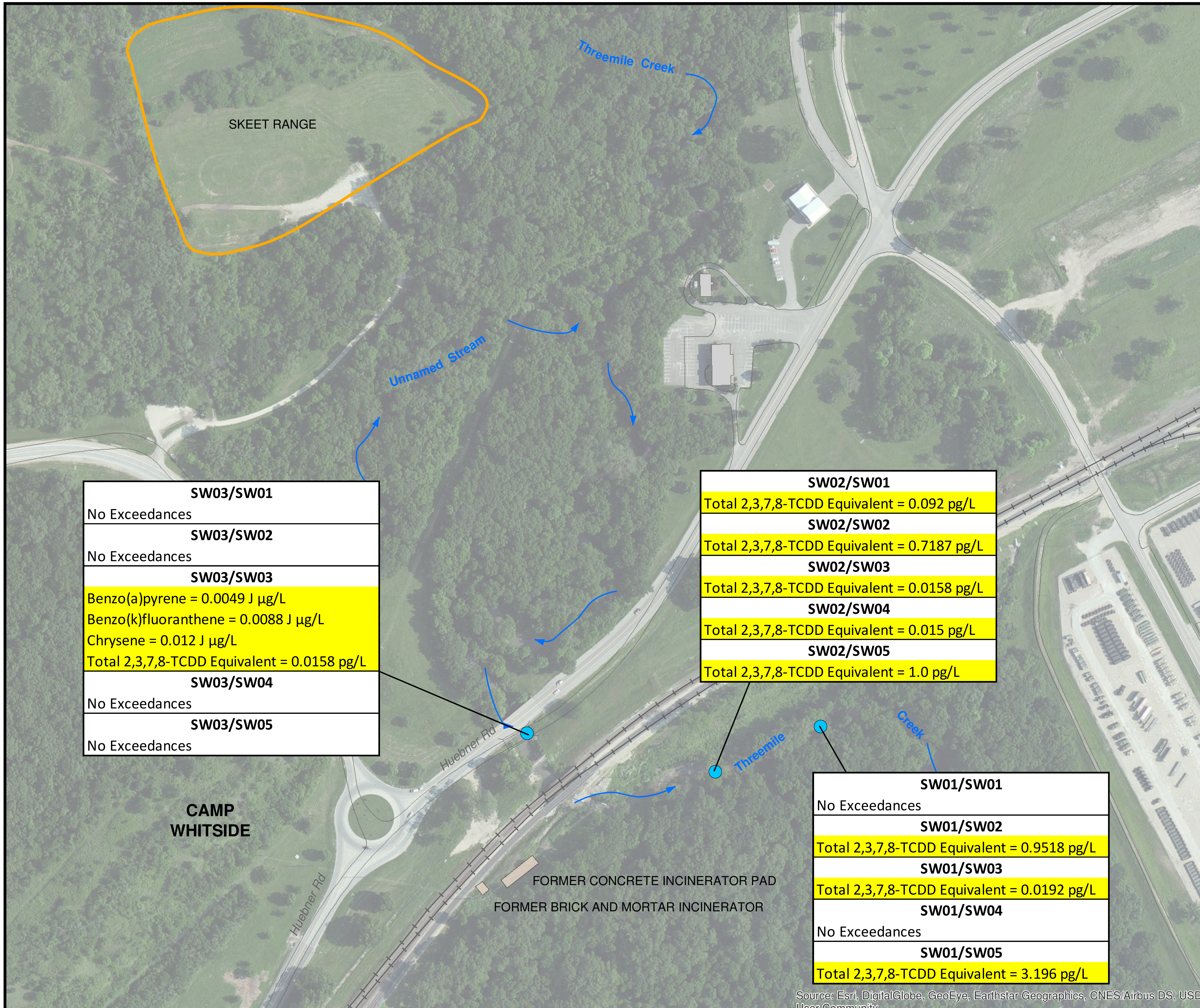
Figure 4-9
STREAM SEDIMENT SAMPLE EXCEEDANCES
CFI SITE
FORT RILEY, KANSAS

Document Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig4-9_Surface_Water_Sed_Sample_Results_Map.mxd

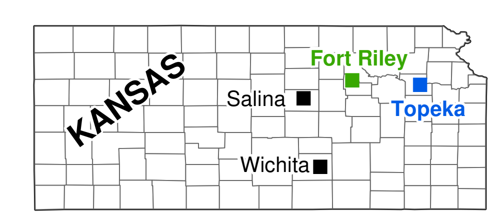


LEGEND

- PHASE I & III SURFACE WATER SAMPLE
- RAILROAD
- SKEET RANGE
- FORMER FOUNDATIONS
- FLOW DIRECTION
- 0.012 RESULT EXCEEDS KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT SURFACE WATER QUALITY STANDARDS
- J RESULT QUALIFIED AS ESTIMATED
- pg/L PICOGRAMS PER LITER
- ug/L MICROGRAMS PER LITER

NOTES

1. SAMPLE RESULT REFLECTS THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.



Not to Scale

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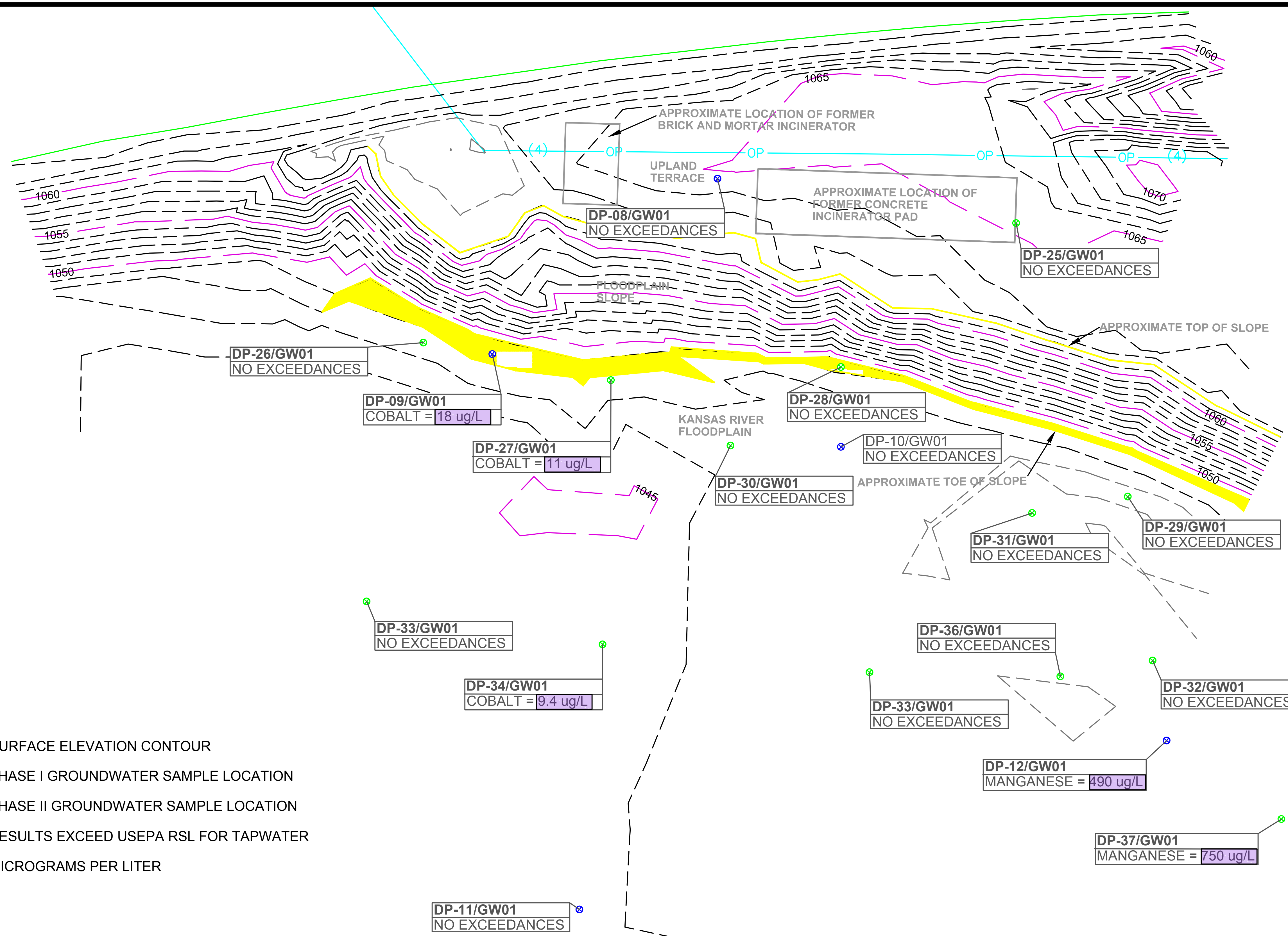
Figure 4-10

SURFACE WATER SAMPLE EXCEEDANCES
CFI SITE
FORT RILEY, KANSAS

Document Path: Z:\Clients\ENV\LouisBerger\63525_CFIncinerator\Studies\Geospatial\ArcDocs\2016\Fig4-10_Surface_Water_Sample_Results_Map.mxd



LEGEND:

— — —	SURFACE ELEVATION CONTOUR
⊕ (blue)	PHASE I GROUNDWATER SAMPLE LOCATION
⊕ (green)	PHASE II GROUNDWATER SAMPLE LOCATION
490 ug/L	RESULTS EXCEED USEPA RSL FOR TAPWATER
ug/L	MICROGRAMS PER LITER

NOTE:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.

N

0 20' 40' 80'

SCALE IN FEET

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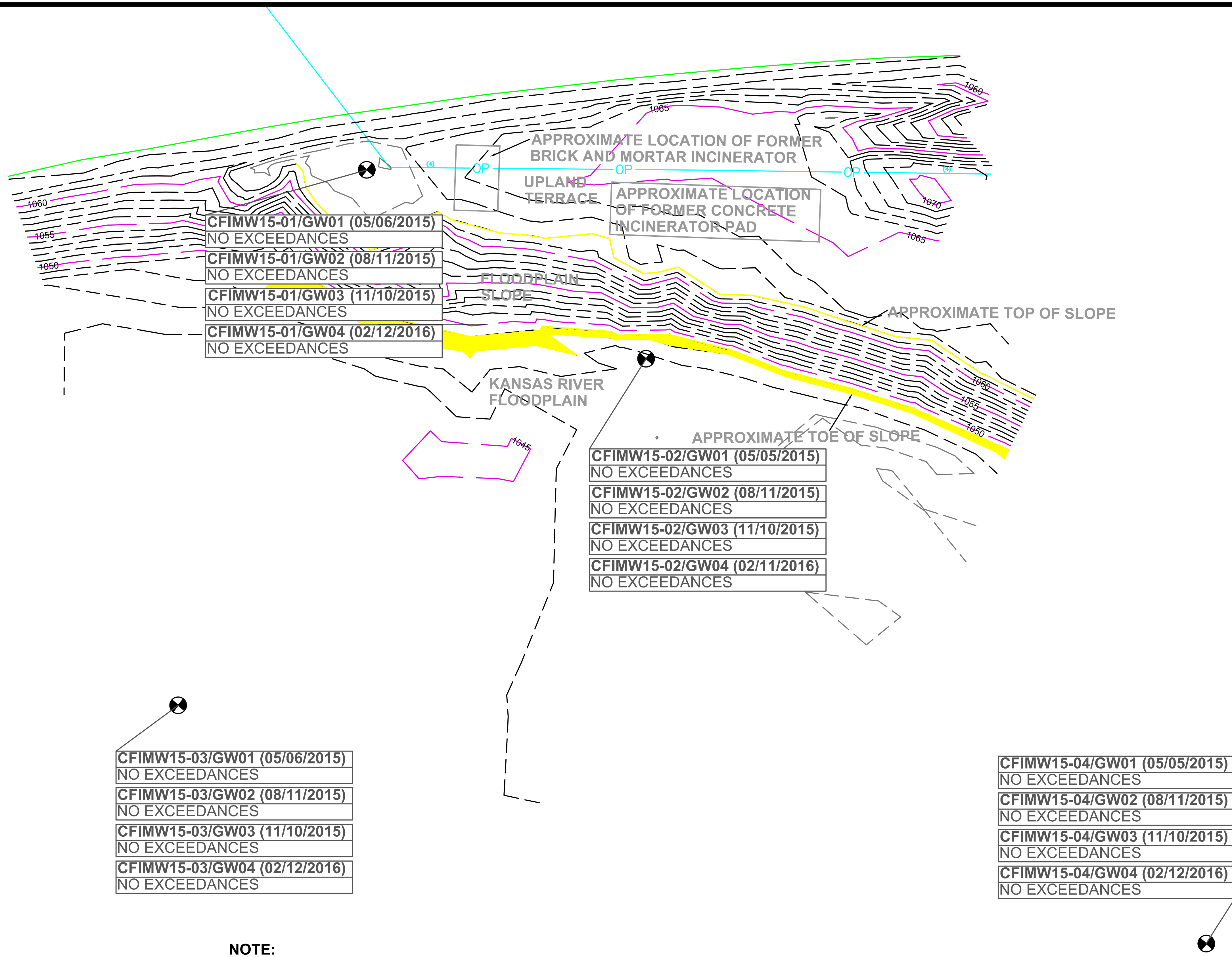
Figure 4-11

DIRECT-PUSH GROUNDWATER SAMPLE EXCEEDANCE MAP
CFI SITE
FORT RILEY, KANSAS



LEGEND:

— — — — —	SURFACE ELEVATION CONTOUR
⊕	MONITORING WELL LOCATION
7.0 ug/L	RESULTS EXCEED USEPA RSL FOR TAPWATER
ug/L	MICROGRAMS PER LITER

NOTE:

1. SAMPLE RESULTS REFLECT THE HIGHER DETECTION REPORTED FOR DUPLICATE SAMPLE PAIRS.

0 50' 100'
SCALE IN FEET

N

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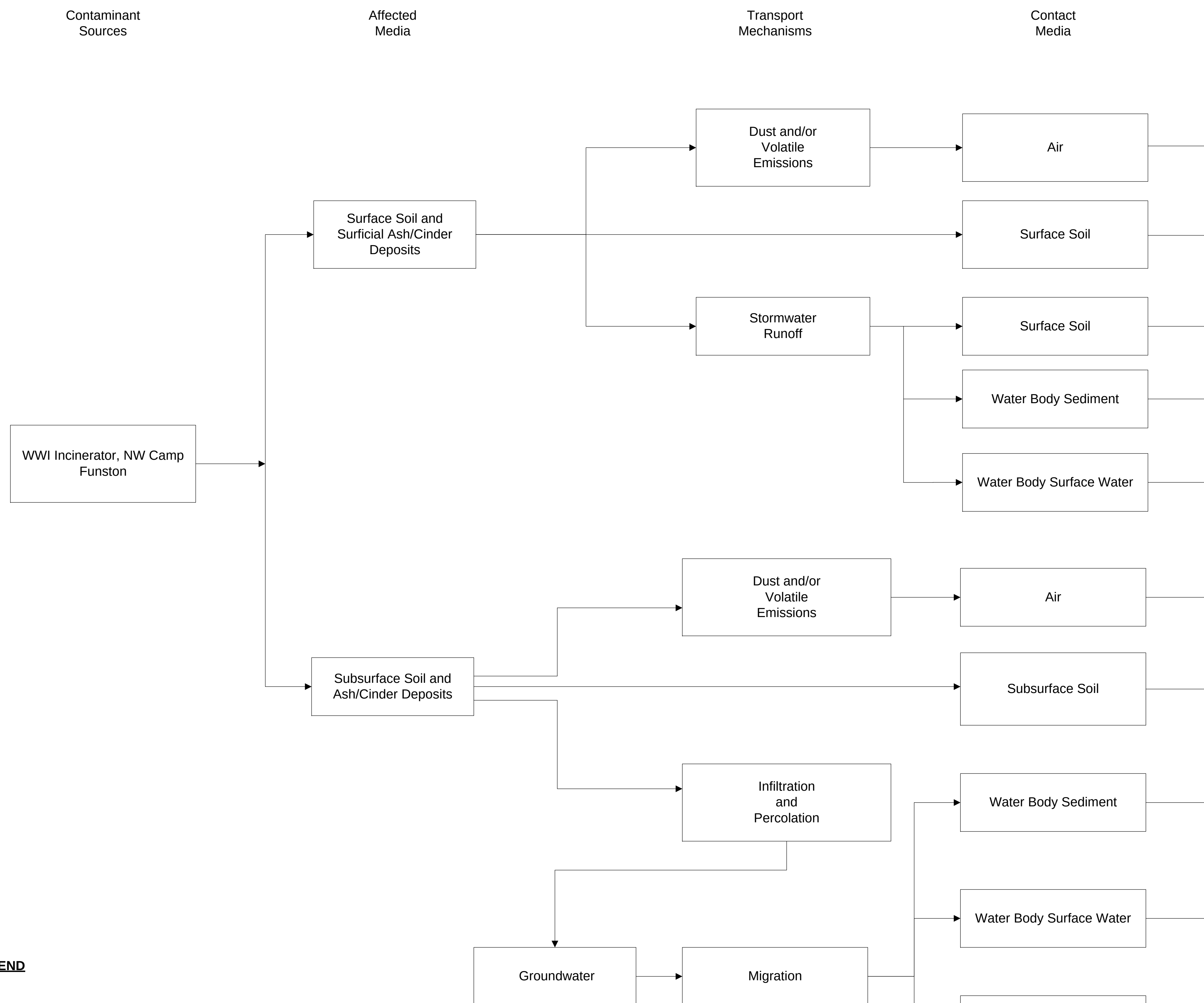
Figure 4-12
MONITORING WELL GROUNDWATER SAMPLE EXCEEDANCES
CFI SITE
FORT RILEY, KANSAS



Potential Receptors — On-Site

Contact Media	Exposure Routes	Cur/Fut Upland Terrace Worker	Future Floodplain Slope Worker	Future Kansas River Floodplain Worker	Fut. Kansas River Floodplain Const. Worker	Cur/Fut Site-Wide Child Visitor	Cur/Fut Site-Wide Youth Visitor	Cur/Fut Site-Wide Adult Visitor	Fut. Kansas River Floodplain Child Resident	Fut. Kansas River Floodplain Adult Resident
Air	Inhalation of Fugitive Dust	●	●	●	●	●	●	●	●	●
	Inhalation of Volatiles	●	●	●	●	●	●	●	●	●
Surface Soil	Ingestion	●	●	●	●	●	●	●	●	●
	Dermal Contact	●	●	●	●	●	●	●	●	●
Surface Soil	Ingestion									
	Dermal Contact									
Water Body Sediment	Ingestion	●	●	●	●	●	●	●	●	●
	Dermal Contact	●	●	●	●	●	●	●	●	●
Water Body Surface Water	Ingestion	●	●	●	●	●	●	●	●	●
	Dermal Contact	●	●	●	●	●	●	●	●	●
	Inhalation of Volatiles									
Air	Inhalation of Fugitive Dust				●					
	Inhalation of Volatiles	●	●	●	●	●	●	●	●	●
Subsurface Soil	Ingestion				●					
	Dermal Contact				●					
Water Body Sediment	Ingestion									
	Dermal Contact									
Water Body Surface Water	Ingestion									
	Dermal Contact									
	Inhalation of Volatiles									
Groundwater	Ingestion									
	Dermal Contact									
	Inhalation of Volatiles									

LEGEND

● Complete exposure pathway

Incomplete exposure pathway

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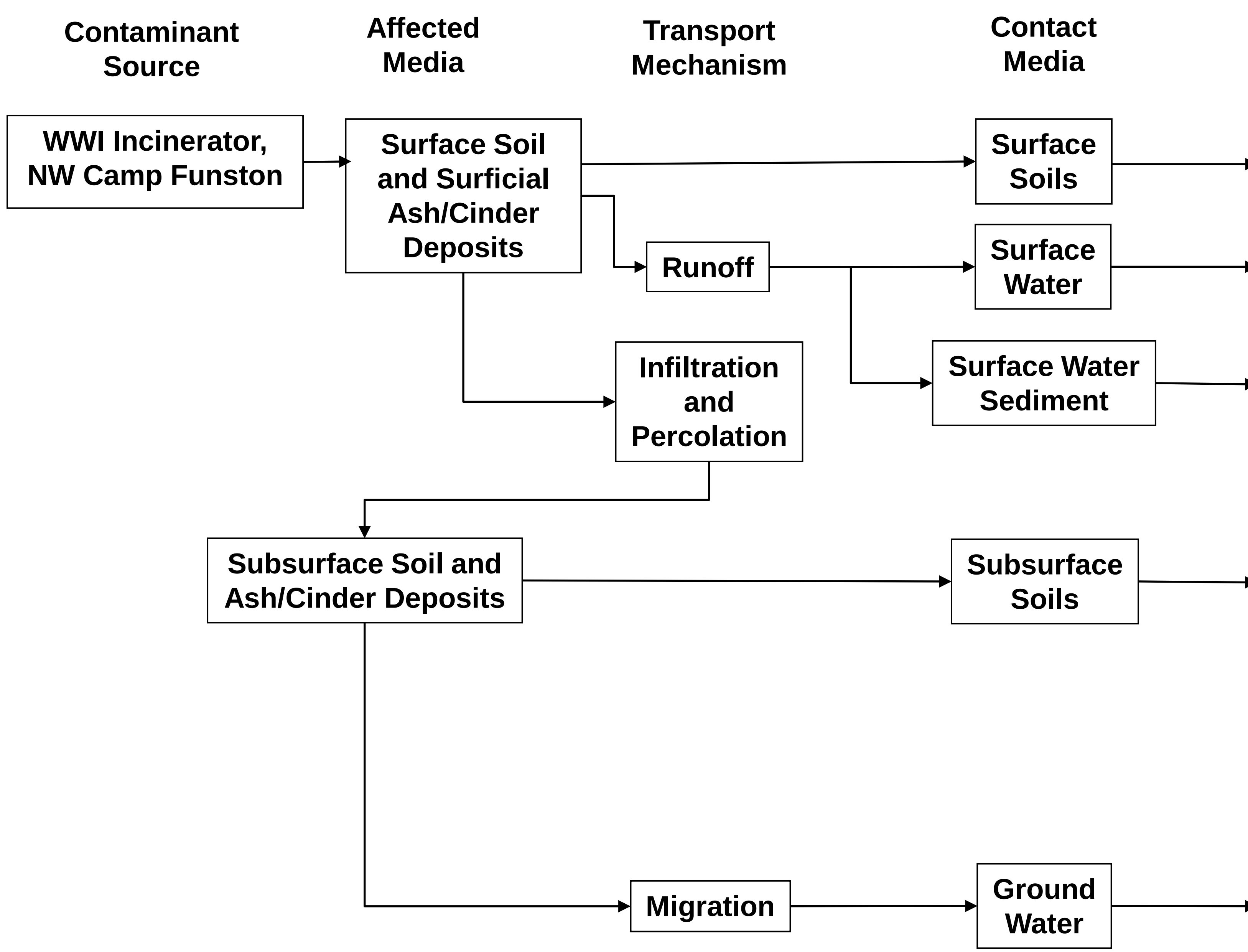
Figure 6-1
Human Health Conceptual Site Model
WWI Incinerator, NW Camp Funston (CFI) Site
Fort Riley, Kansas



Exposure Route	Soil Invertebrates	Terrestrial Plants	Aquatic Plants	Aquatic Invertebrate	Benthic Invertebrates	Fish	Short-tailed Shrew	White-footed Mouse	Meadow Vole	Cottontail Rabbit	Red Fox	Raccoon	White-tailed Deer	American Robin	Red-tailed Hawk
Ingestion or Uptake	●	●	○	○	○	○	●	●	●	●	●	○	●	●	●
Ingestion or Uptake	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●
Ingestion or Uptake	○	○	○	○	●	○	○	○	○	○	○	●	○	○	○
Ingestion or Uptake	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○
Ingestion or Uptake	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Completed Pathway
○ Incomplete Pathway

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Figure 7-1
ECOLOGICAL CONCEPTUAL SITE MODEL
CFI SITE
FORT RILEY, KANSAS

APPENDICES
(PROVIDED ON CD)

Appendix A – Historical Investigation Reports

Appendix B – ***Remedial Investigation/Feasibility Study Work Plan for the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas***

Appendix C – ***Technical Memorandum: Phase I Data Evaluation for Field Sampling Activities at the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas***

Appendix D – ***Technical Memorandum: Phase II Data Evaluation for Field Sampling Activities at the WWI Incinerator, NW Camp Funston (CFI) – Operable Unit 007 at Fort Riley, Kansas***

Appendix E – ***Installation-Wide Sampling and Analysis Plan (Including Uniform Federal Policy [UFP] - Quality Assuance Project Plan [QAPP]) for the Fort Riley CERCLA Process Support at Fort Riley, Kansas***

Appendix F – Daily Quality Control Summary Reports

Appendix G – Field Logbook

Appendix H – HTW Drill Logs, Monitoring Well Construction Diagrams, Well Development Forms, and KDHE WWC-5 Forms

Appendix I – In-Situ Slug Testing Data

Appendix J – Groundwater Sampling Forms

Appendix K – Survey Data

Appendix L – Quality Control Summary Reports for RI Sampling Activities

Appendix M – Screening Standards

Appendix N – USEPA 95Pro UCL Version 5.1 Outlier and UTL Output Tables for Background Soil

Appendix O – USEPA 95Pro UCL Version 5.1 Outlier and UTL Output Tables for Up-Gradient Stream Sediment

Appendix P – USEPA 95Pro UCL Version 5.1 Output Tables for Human Health Risk Assessment

Appendix Q – USEPA 95Pro UCL Version 5.1 Output Tables for Screening Level Ecological Risk Assessment

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