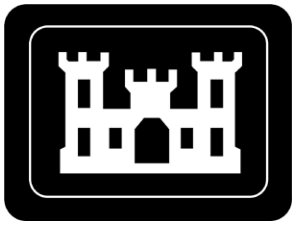
REVISION 0

IOWA ARMY AMMUNITION PLANT OPERABLE UNIT 8 ANNUAL ENVIRONMENTAL MONITORING DATA AND ANALYSIS REPORT FOR CALENDAR YEAR 2018

MIDDLETOWN, IOWA

AUGUST 7, 2019



U.S. Army Corps of Engineers
St. Louis District Office
Formerly Utilized Sites Remedial Action Program

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prepared by
U.S. Army Corps of Engineers St. Louis District Office
Formerly Utilized Sites Remedial Action Program

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ACRONYMS AND ABBREVIATIONS

AEC	U.S. Atomic Energy Commission
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
COC	contaminant of concern
CY	calendar year
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DQO	data quality objective
DU	depleted uranium
EDE	effective dose equivalent
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
EMDAR	Environmental Monitoring Data and Analysis Report
ER	Engineer Regulation
FS	firing site
FUSRAP	Formerly Utilized Sites Remedial Action Program
GIS	geographic information system
IAAAP	Iowa Army Ammunition Plant
IDA	Inert Disposal Area
LAP	load, assemble, and pack
MARSSIM	*Multi-Agency Radiation Survey and Site Investigation Manual*
MDA	minimum detectable activity
MDC	minimum detectable concentration
MED	Manhattan Engineer District
NAD	normalized absolute difference
NRC	U.S. Nuclear Regulatory Commission
OU	operable unit
PDI	pre-design investigation
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
QSM	*Department of Defense (DoD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*
RA	remedial action
RG	remediation goal
RI WP	*Remedial Investigation Work Plan for Line 1, Firing Sites Area, Yards C, G, and L, Warehouse 3-01 and the West Burn Pads Area South of the Road*
Rn	radon
ROD	*FUSRAP Record of Decision for the Iowa Army Ammunition Plant*
RPD	relative percent difference
SOP	standard operating procedure
SU	survey unit
SW-846	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*
TEDE	total effective dose equivalent
U	uranium

ACRONYMS AND ABBREVIATIONS (Continued)

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VQ	validation qualifier

UNIT ABBREVIATIONS

Both English and metric units are used in this report. The units used in a specific situation are based on common unit usage or regulatory language (e.g., depths are given in feet, and areas are given in square meters). Units included in the following list are not defined at first use in this report.

°C	degrees Celsius (centigrade)
µCi/cm^3	microcurie(s) per cubic centimeter
µCi/mL	microcurie(s) per milliliter
Ci	curie(s)
cm	centimeter(s)
cm^3	cubic centimeter(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mL	milliliter(s)
mrem	millirem
pCi/g	picocurie(s) per gram
pCi/L	picocurie(s) per liter

EXECUTIVE SUMMARY

This annual Environmental Monitoring Data and Analysis Report (EMDAR) for calendar year (CY) 2018 applies to the Iowa Army Ammunition Plant (IAAAP) Operable Unit (OU)-8 (Figure 1-1), which is within the scope of the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the environmental monitoring conducted for IAAAP OU-8. IAAAP OU-8 consists of the Firing Sites Area (containing five subareas named for the buildings located within them, grouped by proximity: Firing Site (FS)-1 and FS-2 Area [FS-1 and FS-2]; FS-3, FS-4, and FS-5 Area [FS-3, FS-4, and FS-5]; FS-6 Area [FS-6, FS-7, FS-8, and FS-15]; FS-12 Area [FS-9, FS-10, FS-11, and FS-12]; and FS-14 Area [FS-14]); Line 1 Structures; Yards C, G, and L; and Warehouse 3-01. M-Yard is not included as part of OU-8 in *FUSRAP Record of Decision for the Iowa Army Ammunition Plant* (ROD) (USACE 2011); however, references to OU-8 include M-Yard for the purposes of this EMDAR. Environmental monitoring of various media at IAAAP OU-8 is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and under the commitments in the ROD (USACE 2011).

The U.S. Army Corps of Engineers (USACE) St. Louis District collects environmental monitoring data as a component of remedial action (RA). These data serve as a critical component in the evaluation of the current status of residual contaminants and in the assessment of the potential future migration of residual contaminants.

The collection and evaluation of environmental monitoring data for IAAAP OU-8 is used to demonstrate compliance with the applicable or relevant and appropriate requirements (ARARs).

Radiological air data collected at IAAAP OU-8 through airborne radioactive particulate monitoring were evaluated. In addition to environmental monitoring purposes, radiological air data were also used as inputs to calculate the total effective dose equivalent (TEDE) to the hypothetical maximally exposed individual from IAAAP OU-8.

The TEDE calculated for the hypothetical maximally exposed individual at IAAAP OU-8 was less than 0.1 mrem per year. The results of the radiological air monitoring conducted at IAAAP OU-8 demonstrate compliance with the ARARs for IAAAP OU-8.

Surface-water and sediment sampling was completed as a best management practice in April and November of CY 2018. Samples were collected from 10 surface-water and sediment sampling locations (Figure 4-1). The results of the sampling were used to evaluate the radiological conditions of Long Creek and its tributary downgradient of the FS-12 Area and running to the east and south of the FS-12 Area. The results of the surface-water and sediment sampling demonstrate no adverse impacts from the remedial activities at the FS-12 Area.

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1.0 HISTORICAL SITE BACKGROUND AND CURRENT SITE STATUS

1.1 INTRODUCTION

This annual Environmental Monitoring Data and Analysis Report (EMDAR) for calendar year (CY) 2018 applies to the Iowa Army Ammunition Plant (IAAAP) Operable Unit (OU)-8, which is within the scope of the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the environmental monitoring conducted for IAAAP OU-8. IAAAP OU-8 includes the Firing Sites Area (consisting of five subareas named for the buildings located within them, grouped for proximity: Firing Site [FS]-1 and FS-2 Area [FS-1 and FS-2]; FS-3, FS-4, and FS-5 Area [FS-3, FS-4, and FS-5]; FS-6 Area [FS-6, FS-7, FS-8, and FS-15]; FS-12 Area [FS-9, FS-10, FS-11, and FS-12]; and FS-14 Area [FS-14]); Line 1 Structures; Yards C, G, and L; and Warehouse 3-01 (Figure 1-1). M-Yard is not included as part of OU-8 in *FUSRAP Record of Decision for the Iowa Army Ammunition Plant* (ROD) (USACE 2011); however, references to OU-8 include M-Yard for the purposes of this EMDAR. Environmental monitoring of various media at IAAAP OU-8 is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and under the commitments in the ROD (USACE 2011).

1.2 PURPOSE

The primary purpose of this EMDAR is to calculate the total effective dose equivalent (TEDE) from radionuclide emissions (exclusive of radon) to the hypothetical maximally exposed individual and other receptors from IAAAP OU-8 at which a reasonable potential for radionuclide emissions due to FUSRAP activities exists. The results of these calculations demonstrate compliance with the applicable or relevant and appropriate requirements (ARARs) or other federal and state benchmarks. During CY 2018, the FS-12 Area and the loadout area at M-Yard had a reasonable potential for radionuclide emissions due to FUSRAP activities. The air emissions from the FS-12 Area and M-Yard are releases of particulate radionuclides in soil as a result of windblown action and remedial action (RA) in the form of excavation, stockpiling, on-site treatment (i.e., sorting), and loadout of soil.

This EMDAR additionally serves to enhance the reader's awareness of the current condition of IAAAP OU-8, summarize the data collection efforts for CY 2018, and provide analysis of the CY 2018 environmental monitoring data results. This EMDAR presents the following information:

- IAAAP OU-8 sample collection data and interpretation of CY 2018 results; and
- The status of IAAAP OU-8 regarding compliance with the ARARs or other federal and state benchmarks.

1.3 PROGRAM AND SITE HISTORY

FUSRAP was executed by the U.S. Atomic Energy Commission (AEC) in 1974 to identify, remediate, or otherwise control sites at which residual radioactivity remained from operations conducted for the Manhattan Engineer District (MED). FUSRAP was continued by the successor agencies to the AEC until 1997, when the U.S. Congress transferred responsibility for the execution aspect of FUSRAP from the U.S. Department of Energy (DOE) to the U.S. Army Corps of Engineers (USACE).

IAAAP is a government-owned, contractor-operated facility that occupies approximately 76,890,000 m^2 (19,000 acres) in Des Moines County near Middletown, Iowa, approximately 10 miles west of Burlington, Iowa, and the Mississippi River (Figure 1-1). The installation's mission is to load, assemble, and pack (LAP) ammunition items, including projectiles, mortar rounds, warheads, demolition charges, and munitions components such as fuses, primers, and boosters.

All IAAAP land is currently owned by and under the control of the U.S. Army. Approximately one-third of IAAAP property is occupied by active or formerly active munitions production or storage facilities. The remaining property is generally either forested (30,350,000 m^2 [7,500 acres]) or leased for agricultural use (31,160,000 m^2 [7,700 acres]).

Since operations began in 1941, IAAAP has used explosives and lead-based initiating compounds to produce a wide variety of ordnance items. During the summer of 1947, Mason & Hanger – Silas Mason Company, Inc., the operating contractor, entered into a contract with the Ordnance Department to assist in the design and engineering, to perform the construction, and to operate a facility for the purpose of supplying AEC with explosive components for nuclear weapons. From 1947 to 1975, IAAAP OU-8 areas were under the control of AEC or its successors for weapon assembly operations. Based on IAAAP project history reports, the first nuclear weapon assembly operations are believed to have begun in 1949. Throughout the remaining years of AEC control, IAAAP tested, assembled, conducted surveillance on, and disassembled a wide variety of nuclear weapons. Detailed descriptions and histories of IAAAP OU-8 areas are contained in the *Iowa Army Ammunition Plant FUSRAP Remedial Investigation Report for Firing Sites Area, Yards C, E, F, G, and L, Warehouse 3-01 and Area West of Line 5B* (USACE 2008) and the ROD (USACE 2011).

1.4 CALENDAR YEAR 2018 ACTIVITIES

1.4.1 IAAAP Operable Unit 8 Calendar Year 2018 Documents

During CY 2018, the *Iowa Army Ammunition Plant Operable Unit 8 Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017* (USACE 2018) was finalized.

1.4.2 IAAAP Operable Unit 8 Calendar Year 2018 Remedial Actions

During CY 2018, RA was performed at the FS-12 Area. The RA began at the FS-12 Area in the second quarter and continued through the fourth quarter. A total of 10,232 tons of soil was sorted following excavation from IAAAP OU-8, with 616 tons of the soil stockpiled as contaminated material after sorting at the FS-12 Area.

In CY 2018, contaminated material, including the 2018 soil stockpile, a soil stockpile remaining from 2017 activities, and additional bulky material collected during the 2018 activities (i.e., large material discharged from soil sorting, material from structures such as concrete and metal, tree and brush material, etc.) was transported from the FS-12 Area to M-Yard for loading into railcars for transport to an off-site disposal facility.

A total of 1,667 tons of contaminated material was loaded on railcars and shipped offsite for disposal at Energy Solutions in Clive, Utah.

During CY 2018, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (DOD 2000) Class 1 verifications were completed at the FS-12 Area (on survey unit [SU]-13, SU-14, SU-15, SU-20, SU-21, SU-22, SU-35, SU-36, SU-37, SU-41, SU-42, SU-43, SU-94,

SU-105, SU-114, and SU-115 [i.e., Areas G and H] and at the FS-12 Bunker). Verifications at the FS-12 Area were performed to confirm the remediation goals (RGs) of the ROD were achieved.

During CY 2018, characterizations/pre-design investigations (PDIs) were performed at the FS-12 Area (on SU-48, SU-49, SU-50, SU-51, SU-54, SU-55, SU-56, SU-57, SU-58, SU-59, SU-63, SU-64, SU-67, SU-68, SU-79, SU-81, SU-87, SU-88, SU-89, SU-90, SU-91, SU-93, SU-97, SU-100, SU-101, SU-102, SU-103, SU-104, SU-108, SU-109, SU-111, and SU-118).

No excavation or decontamination water was released in CY 2018.

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2.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS EVALUATION

Section 2.8.2 of the ROD lists two ARARs that are evaluated in this EMDAR. The first ARAR, from 10 *Code of Federal Regulations [CFR]* 20.1403(b), requires that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group not exceed 25 mrem per year. The second ARAR, from 10 *CFR* 20.1101(d), requires that emissions of radioactive material to the environment, excluding radon (Rn)-222 and its progeny, be maintained so the highest individual dose to the public does not exceed 10 mrem per year. For the purposes of the CY 2018 evaluation, the critical group is a current IAAAP employee not engaged in FUSRAP RA (i.e., an employee working at the Inert Disposal Area [IDA], located approximately 613 m east of the FS-12 Area, and an employee working at the FS-1 and FS-2 Area, located approximately 521 m northwest of M-Yard).

The evaluation for compliance with the 10 *CFR* 20.1101(d) ARAR is accomplished using the U.S. Environmental Protection Agency (USEPA) computer code CAP88-PC to determine dose from radioactive airborne emissions to members of the public located at specific distances and directions from the site. The evaluation for compliance with the 10 *CFR* 20.1403(b) ARAR is accomplished by calculating the total dose from contaminant exposures, resulting from soil excavation, sorting, and loadout activities at the FS-12 Area and M-Yard, to the closest onsite worker at the IDA and at the FS-1 and FS-2 Area, respectively, via the most significant migration pathway, which is airborne emissions. Consequently, both ARARs were evaluated against only the total dose from airborne emissions and all of the radiological exposure routes (i.e., ingestion, inhalation, air immersion, ground surface, internal and external radiation) associated with airborne emissions. Additionally, compliance with 10 *CFR* 20.1101(d) will automatically ensure compliance with 10 *CFR* 20.1403(b), because both are dose-based limits of 10 mrem per year and 25 mrem per year, respectively, to the same receptor.

Exposures to potential trespassers and recreational users (e.g., hunters) are considered infrequent and insignificant because of access restrictions to IAAAP property, as well as the physical characteristics of each area.

Although not required to be followed, 40 *CFR* 61, Appendix E, (the USEPA's equivalent regulation to 10 *CFR* 20.1101(d)), provides a procedure to determine compliance with radioactive airborne emissions. This procedure was followed to calculate dose to the potential receptors (e.g., residential, farm, business, and school receptors), and is described in the subsequent sections.

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3.0 EVALUATION OF RADIOLOGICAL AIR MONITORING DATA

3.1 METHOD

Emission rates for IAAAP OU-8 were modeled using guidance documents referenced in 40 *CFR* 61, Appendix E, *Compliance Procedures Methods for Determining Compliance with Subpart I* (USEPA 1989), and were measured by collection of environmental air samples for radioactive particles. Emission rates were input into the USEPA computer code CAP88-PC, Version 4.0.1.17 (USEPA 2014), along with appropriate meteorological data and distances to receptors[1], to obtain the effective dose equivalent (EDE) from the air emissions.

Although 40 *CFR* 61.103, *Determining Compliance,* requires the use of the USEPA computer code COMPLY, the USEPA no longer supplies technical support for COMPLY. Because the USEPA lists both COMPLY and CAP88-PC as "Atmospheric transport models for assessing dose and risk from radioactive air emissions" (USEPA 2015), CAP88-PC was used as a comparable and conservative method to demonstrate compliance with the ARARs.

3.1.1 Emission Rate

The method used to determine particulate radionuclide emission rates from IAAAP OU-8 was 40 *CFR* 61, Appendix D, *Methods for Estimating Radionuclide Emissions*. Emissions during excavations and waste loadout were evaluated using air sampling data at the excavation and waste loadout perimeters.

3.1.2 Effective Dose Equivalent

The EDE to receptors is obtained using the USEPA computer code CAP88-PC, Version 4.0.1.17 (USEPA 2014). CAP88-PC uses a Gaussian plume equation to estimate the dispersion of radionuclides. An area ground release at a height of 1 m is modeled for IAAAP OU-8.

The EDE is the dose from inhalation; exposures from ingestion, air immersion, and external ground surface are insignificant. CAP88-PC contains historical weather data libraries for major airports across the country, and the results can be modeled for receptors at multiple distances from the emission source.

3.2 METEOROLOGICAL DATA

Meteorological data were obtained from CAP88-PC for the Quad City International Airport in Moline, Illinois (wind file 14923.WND). The Quad City International Airport, located 60 miles northeast of IAAAP, is the closest airport to IAAAP with meteorological data. Data in the file were accumulated from 1988 through 1992.

- Average Annual Wind Velocity: 4.252 m per second
- Average Annual Precipitation Rate: 103 cm per year
- Average Annual Air Temperature: 11 ºC

Wind direction frequency was obtained from the CAP88-PC wind file, 14923.WND (Table 3-1).

[1] "Receptors," as used in this EMDAR, are the locations for the nearest residence, school, business, and farm.

Table 3-1. Quad City International Airport Wind Rose Frequency

Wind Direction		Wind Frequency (Percent)	Wind Direction		Wind Frequency (Percent)
Wind Toward	Wind From		Wind Toward	Wind From	
North	South	12.8	South	North	5.0
North-Northwest	South-Southeast	4.5	South-Southeast	North-Northwest	3.3
Northwest	Southeast	3.6	Southeast	Northwest	5.5
West-Northwest	East-Southeast	5.2	East-Southeast	West-Northwest	9.0
West	East	8.6	East	West	0.5
West-Southwest	East-Northeast	5.2	East-Northeast	West-Southwest	8.5
Southwest	Northeast	3.5	Northeast	Southwest	6.6
South-Southwest	North-Northeast	2.5	North-Northeast	South-Southwest	6.9

3.3 IAAAP OPERABLE UNIT 8 SITES UNDER ACTIVE REMEDIATION

3.3.1 Material Handling and Processing for Calendar Year 2018

At IAAAP OU-8 in CY 2018, remedial activities were performed at the FS-12 Area, and waste loadout activities were conducted at M-Yard. Excavated soil was placed at the FS-12 Area prior to treatment (i.e., soil sorting). The excavated soil (10,232 tons) was then sorted, with 616 tons of the soil diverted to a post-sorting contaminated soil pile. The post-sorting contaminated soil pile was covered when sorting activities were concluded. The clean soil piles were not covered. Verification data for the clean soil piles and the excavation surface are less than the RG. Contaminated soil, debris, and other materials from remedial activities during 2018 and previous years were transported to M-Yard via covered dump trucks, stockpiled, and loaded onto railcars for off-site disposal.

General area air samples were collected around active excavation perimeters, soil sorting activities, and loadout activities during CY 2018, with the results used to determine the site emissions. In-situ emissions from inactive areas of IAAAP OU-8 were not calculated because the ground surface soil at IAAAP is generally covered with vegetation that limits the potential for material to become airborne.

3.3.2 Source Description – Radionuclide Soil Concentrations

For an IAAAP OU-8 excavation area, the depleted uranium (DU) activity fractions listed in Section 2.5.7 of the ROD were used. Activity fractions for the contaminants of concern (COCs) are as follows:

- 90.14 percent (uranium [U]-238),
- 1.45 percent (U-235), and
- 8.40 percent (U-234).

The averaged total alpha air particulate concentrations at the FS-12 Area and M-Yard, along with the three uranium activity fractions, were used to calculate the emission rate for each area.

3.3.3 List of Assumed Air Releases for Calendar Year 2018

Wind erosion during periods of RA excavations and periods in which the FS-12 Area excavated soil pile, FS-12 Area post-sorting contaminated soil pile, and M-Yard loadout pile were uncovered is assumed for the particulate radionuclide emission determinations from IAAAP OU-8. Verification data for post-sorting clean soil piles and non-backfilled excavation surfaces are less than the RG. Therefore, the post-sorting clean soil piles and non-backfilled excavation surfaces

are protective of human health and the environment and do not contribute to the emission determinations. Unexcavated areas do not contribute to the emission determinations for periods of inactivity due to the low activity and vegetative cover.

The FS-12 Area excavation area, the FS-12 Area excavated soil pile, the FS-12 Area post-sorting contaminated soil pile, and M-Yard loadout pile were assumed to be contributing to air releases during the 2018 dates when the SUs were open and when the sorting and loadout piles were uncovered. Appendix A, Table A-1, lists the 2018 dates of potential air releases by location.

3.3.4 Distances to Receptors

The distances to receptors are listed in Table 3-2. Distances and directions to receptors are determined by using tools in a geographic information system (GIS). The location of the receptors is shown on Figure 3-1.

Table 3-2. IAAAP Operable Unit 8 Receptors for CY 2018

Sources	Resident		Farm		Business[a]		School	
	Distance (m)	Direction	Distance (m)	Direction	Distance (m)	Direction	Distance (m)	Direction
FS-12 Area	2,714	W	2,714	W	613	E	7,894	NW
M-Yard	3,498	NW	3,498	NW	521	NW	9,463	NW

[a] The business receptors, an IAAAP employee at the IDA and at the FS-1 and FS-2 Area, are average members of the critical group.

3.4 EMISSIONS DETERMINATION

3.4.1 Measured Airborne Radioactive Particulate Emissions

Particulate air samples were collected from several locations around the perimeter of the FS-12 Area excavation, FS-12 Area soil sorting area, FS-12 Area soil stockpile areas, and M-Yard loadout area to measure the radionuclide emissions from the RA, soil sorting, and soil loadout. The samples provide the basis for determining the radionuclide emission rates during CY 2018. Air sample data for particulate air samples were determined through the use of calibrated field instruments. Appendix B, Attachment B-1, contains the CY 2018 Air Sample Reports, and Table B-1 is a summary table of the particulate air sample data. One particulate air sample for each week was submitted to USACE St. Louis District FUSRAP Radioanalytical Laboratory for analysis to verify sample results from the calibrated field instruments (see Table B-2).

The average gross alpha concentration (in µCi/mL) for CY 2018 was determined for the FS-12 Area and M-Yard and is presented in Table 3-3. Gross alpha particulate results (Table B-1) less than zero indicate the result was less than the average background value for the instrument. When calculating an average airborne concentration, negative data points were rounded to a zero value.

Table 3-3. IAAAP Operable Unit 8 Average Gross Alpha Airborne Particulate Emissions for CY 2018

Sampler Location	Average Concentration (µCi/mL)
	Gross Alpha
FS-12 Area[a]	1.75E-15
M-Yard[b]	1.70E-15

[a] Includes the emission rates from the RA, soil sorting, and soil stockpiles.
[b] Includes the emission rates from the soil stockpile and loadout activities.

The activity fractions for DU at IAAAP OU-8 were determined as described in Section 3.3.2. The product of the DU activity fraction and the gross concentration provides the radionuclide

emission concentration (in μCi/mL) for that area. The gross average concentration (in μCi/mL) is converted to a release (i.e., emission) rate (in Ci per year) using Equations 1 and 2.

A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions from NRC-Licensed and Non-DOE Federal Facilities (USEPA 1989) provides Equation 1 for determination of the effective diameter of a non-circular stack or vent.

$$D = (1.3\ A)^{1/2} \qquad \textit{Equation 1}$$

where:

D = effective diameter of the release (in m)
A = area of the stack, vent, or release point (in m^2)

Table 3-4 provides (1) the effective surface area available for release of airborne radionuclides normalized to 1 year for the FS-12 Area and M-Yard and (2) the effective diameter for the FS-12 Area and M-Yard, at which excavation (Areas G and H) and/or soil stockpiling was conducted in CY 2018. Calculation of the effective surface area is presented in Appendix A.

Table 3-4. IAAAP Operable Unit 8 Excavation Effective Areas and Effective Diameters for CY 2018

IAAAP OU-8 Location	Effective Area (m^2)	Effective Diameter (m)
FS-12 Area	9,264	110
M-Yard	18	5

The average annual wind speed for the Quad City International Airport is provided in CAP88-PC as 4.252 m per second. Conversion of this wind speed to a flow rate through stacks with the listed effective diameters for each area is completed using Equation 2 from *A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions from NRC-Licensed and Non-DOE Federal Facilities* (USEPA 1989).

$$F = V\ \pi\ [(D)^2/4]*60 \qquad \textit{Equation 2}$$

where:

F = flow rate (in m^3 per minute)
V = wind velocity (in m per second)
π = mathematical constant
D = effective diameter of the release using Equation 1 (in m)
60 = time conversion (seconds to minute)

Converting the velocity of emissions from the FS-12 Area and M-Yard to an effective flow rate results in the following site release flow rates for IAAAP OU-8 areas, as listed in Table 3-5. The product of the flow rate, the activity fraction associated with each radionuclide, and the appropriate conversion factors provide the site emission rate for each radionuclide, as illustrated in Table 3-6. Appendix A contains flow rates and average radionuclide concentration data.

Table 3-5. IAAAP Operable Unit 8 Areas Release Flow Rate for CY 2018

IAAAP OU-8 Location	Site Release Flow Rate (m^3/minute)
FS-12 Area	2.4E+06
M-Yard	4.6E+03

3.4.2 IAAAP Operable Unit 8 Total Airborne Radioactive Particulate Emission Rates

The CY 2018 emission rates for the FS-12 Area and M-Yard are presented in Table 3-6 and are based on the air samples collected from the perimeter of the excavated area, soil sorting area, and stockpiled soil.

Table 3-6. IAAAP Operable Unit 8 Airborne Radioactive Particulate Emission Rates Based on Excavation Perimeter Air Samples for CY 2018

Radionuclide	Emission Rate (Ci/year)[a]	
	FS-12 Area	M-Yard
U-238	2.0E-03	3.7E-06
U-235	3.2E-05	5.9E-08
U-234	1.9E-04	3.4E-07

[a] Emission rate based on 365-day period at a respective flow rate (as presented in Table 3-5) as determined from the average annual wind speed (i.e., 4.252 m per second) and the effective site area (as presented in Table 3-4) for each location.

3.4.3 CAP88-PC Results

The CAP88-PC report is contained in Appendix C. The effective area factor input was taken from Table 3-4. The individual dose results for the FS-12 Area and M-Yard were summed for the resident, school, and farm receptors. As shown in Table 3-7, this evaluation demonstrates that all IAAAP OU-8 receptors, including the hypothetical maximally exposed individuals at IAAAP OU-8 (i.e., the business receptors, an IAAAP employee at the IDA and at the FS-1 and FS-2 Area, who are average members of the critical group), receive less than the dose standards prescribed in 10 *CFR* 20.1101(d) (i.e., 10 mrem per year) and 10 *CFR* 20.1403(b) (i.e., 25 mrem per year).

Table 3-7. IAAAP Operable Unit 8 CAP88-PC Results for Receptors for CY 2018

Source	Dose (mrem/year)			
	Resident[a]	School[b]	Business[b,c]	Farm[a]
FS-12 Area	<0.1	<0.1	<0.1	<0.1
M-Yard	<0.1	<0.1	<0.1	<0.1

[a] 100 percent occupancy factor.
[b] Corrected for the 23 percent occupancy factor (i.e., 40 hours per week for 50 weeks per year).
[c] The business receptors, an IAAAP employee at the IDA and at the FS-1 and FS-2 Area, are average members of the critical group.

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4.0 SURFACE-WATER, SEDIMENT, AND STORMWATER MONITORING

4.1 SURFACE-WATER AND SEDIMENT MONITORING

Surface-water and sediment monitoring in Long Creek and its tributary, downgradient of the FS-12 Area and running to the east and south of the FS-12 Area, was performed as a best management practice. The purpose of the monitoring was to determine if RA is having a negative effect on Long Creek.

Surface water and sediment were sampled for the uranium isotopes to evaluate/determine if runoff from the FS-12 Area affects the quality of surface water and sediment in Long Creek and its tributary. Surface-water and sediment sampling was conducted during April and November of CY 2018. Grab samples were collected and analyzed according to the protocol defined in Appendix D of the *Remedial Investigation Work Plan for Line 1, Firing Sites Area, Yards C, G, and L, Warehouse 3-01 and the West Burn Pads Area South of the Road* (RI WP) (USACE 2007).

The sampling events were conducted at 10 monitoring stations. Of these 10 stations, 8 stations were established in 2007 during the remedial investigation, and the remaining 2 stations (i.e., IAAP177509 and IAAP177517) were established in December 2014. Locations of the 10 surface-water and sediment monitoring stations are shown on Figure 4-1.

4.2 SURFACE-WATER MONITORING RESULTS

The radiological monitoring results for the CY 2018 surface-water sampling events are summarized in Table 4-1. FUSRAP surface-water monitoring analysis included unfiltered water samples for radionuclides associated with DU (i.e., U-234, U-235, and U-238). The monitoring results are presented in Appendix D, Table D-1, of this EMDAR.

Table 4-1. Radiological Results for CY 2018 Surface-Water Monitoring

Monitoring Station	Collection Date	Monitoring Parameters (pCi/L)		
		U-234	U-235	U-238
IAAP100153	04/16/18	0.83	0.55[a]	0.79
IAAP100153	11/27/18	1.17	0.57[a]	1.81
IAAP100154	04/16/18	1.22	0.44[a]	0.50[a]
IAAP100154	11/27/18	1.28	0.72[a]	0.46
IAAP100155	04/17/18	1.09	0.51[a]	0.50
IAAP100155	11/27/18	0.61	0.55[a]	0.46[a]
IAAP100164	[b]	[b]	[b]	[b]
IAAP100164	[b]	[b]	[b]	[b]
IAAP100165	04/17/18	0.63	0.52[a]	0.48[a]
IAAP100165	11/27/18	0.72	0.40[a]	0.72
IAAP100178	04/17/18	0.58[a]	0.72[a]	0.42[a]
IAAP100178	11/28/18	0.50	0.66[a]	0.45[a]
IAAP100180	04/17/18	0.71	0.66[a]	0.83
IAAP100180	11/28/18	0.40	0.63[a]	0.51[a]
IAAP100187	04/17/18	0.56[a]	0.65[a]	0.76
IAAP100187	11/28/18	0.33[a]	0.49[a]	0.46[a]
IAAP177509	04/17/18	0.89	0.69[a]	0.56
IAAP177509	11/28/18	0.55	0.45[a]	0.68
IAAP177517	04/16/18	0.76	0.64[a]	0.83
IAAP177517	11/27/18	0.87	0.41[a]	0.33[a]

[a] Reported result is less than the minimum detectable concentration (MDC) and is therefore set equal to the MDC.

[b] No surface water was present at the sample location due to seasonal weather conditions. No surface-water sample was collected.

The historical radiological surface-water monitoring data for all monitoring stations are summarized in Table 4-2.

Table 4-2. Comparison of Historical Radiological Surface-Water Results

Stations	Radionuclide	Units	December 2014	August 2015	December 2015	April 2016	November 2016	April 2017	November 2017	April 2018	November 2018
IAAP100153	U-234	pCi/L	0.59	0.92	0.36	0.64	1.28	1.28	1.46	0.83	1.17
	U-235	pCi/L	0.16[a]	0.18[a]	0.63[a]	0.63[a]	0.20[a]	0.18[a]	0.23[a]	0.55[a]	0.57[a]
	U-238	pCi/L	0.67	0.18	0.65	0.30	0.91	1.31	1.36	0.79	1.81
IAAP100154	U-234	pCi/L	0.63	0.56	0.52	0.48[a]	0.83	1.29	0.80	1.22	1.28
	U-235	pCi/L	0.20[a]	0.22[a]	0.44[a]	0.22[a]	0.23[a]	0.19[a]	0.57[a]	0.44[a]	0.72[a]
	U-238	pCi/L	0.64	0.33	0.38	0.52	1.07	0.95	0.62	0.50[a]	0.46
IAAP100155	U-234	pCi/L	0.95	0.54[a]	0.70	0.71[a]	0.62	1.65	1.23	1.09	0.61
	U-235	pCi/L	0.14[a]	0.22[a]	0.47[a]	0.23[a]	0.24[a]	0.18[a]	0.21[a]	0.51[a]	0.55[a]
	U-238	pCi/L	0.34	0.75	0.54[a]	0.42[a]	0.44[a]	1.26	1.17	0.5	0.46[a]
IAAP100164	U-234	pCi/L	1.12	0.72	0.31[a]	0.37	[b]	[b]	[b]	[b]	[b]
	U-235	pCi/L	0.16[a]	0.58[a]	0.47[a]	0.19[a]	[b]	[b]	[b]	[b]	[b]
	U-238	pCi/L	1.44	0.64	0.13[a]	0.45	[b]	[b]	[b]	[b]	[b]
IAAP100165	U-234	pCi/L	0.68	0.24	0.45	0.61[a]	0.74	0.78	0.51	0.63	0.72
	U-235	pCi/L	0.16[a]	0.59	0.17[a]	0.48[a]	0.25[a]	0.41[a]	0.50[a]	0.52[a]	0.40[a]
	U-238	pCi/L	0.58	0.16[a]	0.36	0.68	0.20[a]	0.31	0.25	0.48[a]	0.72
IAAP100178	U-234	pCi/L	0.39	0.36	0.67	0.60	0.42[a]	1.02	1.01	0.58[a]	0.50
	U-235	pCi/L	0.16[a]	0.39[a]	0.42[a]	0.22[a]	0.52[a]	0.20[a]	0.52[a]	0.72[a]	0.66[a]
	U-238	pCi/L	0.37[a]	0.20[a]	0.41	0.49	0.80	0.74	0.54	0.42[a]	0.45[a]
IAAP100180	U-234	pCi/L	0.77	0.36	0.42	0.62	0.35[a]	0.67	0.82	0.71	0.40
	U-235	pCi/L	0.16[a]	0.20[a]	0.15[a]	0.24[a]	0.20[a]	0.20[a]	0.19[a]	0.66[a]	0.63[a]
	U-238	pCi/L	0.48[a]	0.38[a]	0.40	0.58	0.35[a]	0.47	0.53	0.83	0.51[a]
IAAP100187	U-234	pCi/L	1.07	0.52	0.34[a]	0.43	0.39	0.43	0.61	0.56[a]	0.33[a]
	U-235	pCi/L	0.20[a]	0.55[a]	0.52[a]	0.21[a]	0.71[a]	0.16[a]	0.21[a]	0.65[a]	0.49[a]
	U-238	pCi/L	0.45	0.33	0.42	0.43	0.29	0.44	0.43	0.76	0.46[a]
IAAP177509	U-234	pCi/L	0.90	1.79	0.48	0.43[a]	1.06	1.08	0.55	0.89	0.55
	U-235	pCi/L	0.17[a]	0.21[a]	0.19[a]	0.24[a]	0.20[a]	0.39[a]	0.18[a]	0.69[a]	0.45[a]
	U-238	pCi/L	0.43	1.17	0.29	0.19[a]	0.72	1.03	0.40	0.56	0.68
IAAP177517	U-234	pCi/L	0.71	0.54[a]	0.63	0.47	0.93	0.16[a]	0.41[a]	0.76	0.87
	U-235	pCi/L	0.16[a]	0.22[a]	0.17[a]	0.65[a]	0.57[a]	0.19[a]	0.41[a]	0.64[a]	0.41[a]
	U-238	pCi/L	0.52	0.43[a]	0.51	0.68	0.50	0.46[a]	0.51	0.83	0.33[a]

[a] Reported result is less than the MDC and is therefore set equal to the MDC.
[b] No surface water was present at the sample location due to seasonal weather conditions. No surface-water sample was collected.

4.3 SEDIMENT MONITORING RESULTS

Sediment samples were collected in depositional environments near each of the 10 previously described surface-water locations (Figure 4-1). Sediment samples were evaluated for the radiological constituents associated with DU (i.e., U-234, U-235, and U-238). The analytical results from these monitoring activities are presented in Appendix D, Table D-2, of this EMDAR.

The radiological results for CY 2018 sediment sampling events are summarized in Table 4-3. The ROD (USACE 2011) established a soil RG for DU which uses U-238 as a surrogate. Therefore, sediment sampling results for U-238 were compared against the corresponding soil

RG of 150 pCi/g established in the ROD. All sediment monitoring results for U-238 were less than the soil RG.

Table 4-3. Radiological Results for CY 2018 Sediment Monitoring

Monitoring Station	Collection Date	Monitoring Parameters (pCi/g)		
		U-234	U-235	U-238
IAAP100153	04/16/18	0.22	0.22[a]	0.17
IAAP100153	11/27/18	0.20	0.16[a]	0.23
IAAP100154	04/16/18	0.92	0.21[a]	0.55
IAAP100154	11/27/18	0.73	0.17[a]	1.05
IAAP100155	04/17/18	0.31	0.18[a]	0.62
IAAP100155	11/27/18	0.45	0.26 [a]	0.50
IAAP100164	04/17/18	0.85	0.17[a]	0.91
IAAP100164	11/28/18	0.40	0.20[a]	0.66
IAAP100165	04/17/18	0.37	0.16[a]	0.21[a]
IAAP100165	11/27/18	0.11[a]	0.34[a]	0.33
IAAP100178	04/17/18	0.71	0.21[a]	0.55
IAAP100178	11/28/18	0.42	0.28[a]	0.57
IAAP100180	04/17/18	0.31	0.20[a]	0.21
IAAP100180	11/28/18	0.43	0.18[a]	0.23
IAAP100187	04/17/18	0.35	0.17[a]	0.23[a]
IAAP100187	11/28/18	0.75	0.17[a]	0.64
IAAP177509	04/17/18	0.33	0.31[a]	0.31
IAAP177509	11/28/18	0.22	0.22[a]	0.51
IAAP177517	04/16/18	0.29	0.16[a]	0.27
IAAP177517	11/27/18	0.90	0.20[a]	1.22

[a] Reported result is less than the MDC and is therefore set equal to the MDC.

The historical radiological sediment monitoring data for all monitoring stations are summarized in Table 4-4.

Table 4-4. Comparison of Historical Radiological Sediment Results

Stations	Radionuclide	Units	April 2007	December 2014	August 2015	December 2015	April 2016	November 2016	April 2017	November 2017	April 2018	November 2018
IAAP100153	U-234	pCi/g	[a]	0.56	0.51	0.43	0.99	0.42	0.75	0.37	0.22	0.20
	U-235	pCi/g	0.11[b]	0.05[b]	0.58[b]	0.13[b]	0.17[b]	0.21[b]	0.18[b]	0.10[b]	0.22[b]	0.16[b]
	U-238	pCi/g	0.50	0.43	1.00	0.20[b]	0.85	0.31[b]	1.02	0.50	0.17	0.23
IAAP100154	U-234	pCi/g	[a]	0.37	0.53[b]	0.46	0.82	0.36[b]	0.54	0.20	0.92	0.73
	U-235	pCi/g	0.17[b]	0.13[b]	0.55[b]	0.28[b]	0.36[b]	0.44[b]	0.26[b]	0.04[b]	0.21[b]	0.17[b]
	U-238	pCi/g	0.49	0.50	0.44[b]	0.45	1.08	0.75	0.31	0.14	0.55	1.05
IAAP100155	U-234	pCi/g	[a]	0.19	0.61[b]	0.61	0.76	0.40	0.67	0.18	0.31	0.45
	U-235	pCi/g	0.17[b]	0.12[b]	0.61[b]	0.24[b]	0.18[b]	0.20[b]	0.19[b]	0.04	0.26[b]	0.18[b]
	U-238	pCi/g	0.37	0.24	0.49	0.83	0.86	0.30[b]	0.85	0.19	0.50	0.62
IAAP100164	U-234	pCi/g	[a]	0.79	0.52[b]	0.94	0.74	0.52	1.04	0.67	0.85	0.40
	U-235	pCi/g	0.22[b]	0.12[b]	0.57[b]	0.33[b]	0.14[b]	0.40[b]	0.31[b]	0.10[b]	0.17[b]	0.20[b]
	U-238	pCi/g	0.87	0.84	0.59	1.01	0.47	0.84	0.84	0.81	0.91	0.66
IAAP100165	U-234	pCi/g	[a]	0.17	0.20[b]	0.59	0.38	0.26	0.28	0.32	0.37	0.15[b]
	U-235	pCi/g	0.13[b]	0.05[b]	0.24[b]	0.37[b]	0.26[b]	0.33[b]	0.13[b]	0.09[b]	0.16[b]	0.34[b]
	U-238	pCi/g	0.29	0.14	0.43	1.07	0.41	0.35	0.31	0.20	0.21[b]	0.33

Table 4-4. Comparison of Historical Radiological Sediment Results (Continued)

Stations	Radionuclide	Units	April 2007	December 2014	August 2015	December 2015	April 2016	November 2016	April 2017	November 2017	April 2018	November 2018
IAAP100178	U-234	pCi/g	[a]	0.33	0.53	0.30[b]	0.62	0.39	0.41	0.50	0.71	0.42
	U-235	pCi/g	0.11[b]	0.13[b]	0.49[b]	0.17[b]	0.15[b]	0.19[b]	0.11[b]	0.10[b]	0.21[b]	0.28[b]
	U-238	pCi/g	0.23[b]	0.37	0.33	0.30[b]	0.18	0.29	0.44	0.38	0.55	0.57
IAAP100180	U-234	pCi/g	[a]	0.26	0.23[b]	0.39	0.31[b]	0.40	0.36	0.23	0.31	0.43
	U-235	pCi/g	0.16[b]	0.13[b]	0.52[b]	0.27[b]	0.21[b]	0.28[b]	0.23[b]	0.09[b]	0.20[b]	0.18[b]
	U-238	pCi/g	0.41	0.19	0.23[b]	0.59	0.49	0.39	0.37	0.33	0.21	0.23
IAAP100187	U-234	pCi/g	[a]	0.34	0.39	0.34	0.29[b]	0.58	0.29	0.35	0.35	0.75
	U-235	pCi/g	0.14[b]	0.16[b]	0.36[b]	0.27[b]	0.27[b]	0.15[b]	0.16[b]	0.03[b]	0.17[b]	0.17[b]
	U-238	pCi/g	0.30	0.37	0.29[b]	0.64	0.25	0.31	0.36	0.34	0.23[b]	0.64
IAAP177509[c]	U-234	pCi/g	[d]	0.17	0.14[b]	0.62	0.32[b]	0.39	0.09 [b]	0.32	0.33	0.22
	U-235	pCi/g	[d]	0.04[b]	0.33[b]	0.15[b]	0.21[b]	0.17[b]	0.10[b]	0.22[b]	0.31[b]	0.22[b]
	U-238	pCi/g	[d]	0.27	0.32[b]	0.68	0.81	0.25	0.31	0.71	0.31	0.51
IAAP177517[c]	U-234	pCi/g	[d]	0.27	0.41	0.40	0.32	0.47	0.13	0.17	0.29	0.90
	U-235	pCi/g	[d]	0.04[b]	0.23[b]	0.17[b]	0.16[b]	0.16[b]	0.21[b]	0.04	0.16[b]	0.20[b]
	U-238	pCi/g	[d]	0.18	0.41	0.54	0.28	0.28[b]	0.24	0.28	0.27	1.22

[a] Sample was not analyzed for U-234.
[b] Reported result is less than the MDC and is therefore set equal to the MDC.
[c] Stations IAAP177509 and IAAP177517 were established and initially sampled in December 2014.
[d] Sample not collected in 2007.

4.4 STORMWATER MONITORING

No stormwater monitoring samples were collected in CY 2018.

4.5 CONCLUSION

Surface-water and sediment sampling results from CY 2018 indicate that RA at the FS-12 Area is not having a negative effect on Long Creek.

5.0 ENVIRONMENTAL QUALITY ASSURANCE PROGRAM

5.1 PROGRAM OVERVIEW

The environmental quality assurance (QA) program includes management of the QA/quality control (QC) programs, plans, and procedures governing environmental monitoring activities at IAAAP and at a USACE subcontracted vendor QA laboratory. The environmental monitoring standards of FUSRAP and the goals for these programs, plans, and procedures are described in this section.

The environmental QA program provides FUSRAP with reliable, accurate, and precise monitoring data. The program furnishes guidance and directives to detect and prevent problems from the time a sample is collected until the associated data are evaluated.

Key elements in achieving the goals of this program are personnel training; compliance assessments; use of QC samples; documentation of field activities and laboratory analyses; and a review of data documents for precision, accuracy, and completeness.

General objectives of the program follow.

- Provide data of sufficient quality and quantity to support ongoing remedial efforts.
- Ensure samples were collected using approved techniques and are representative of existing site conditions.

5.2 QUALITY ASSURANCE PROJECT PLAN

The quality assurance project plan (QAPP) for environmental monitoring activities performed at IAAAP OU-8 is contained in Appendix D of the RI WP (USACE 2007). The QAPP provides the organization, objectives, functional activities, and specific QA/QC activities associated with environmental monitoring activities at IAAAP OU-8.

QA/QC procedures are performed in accordance with applicable professional technical standards, USEPA requirements, government regulations and guidelines, and specific project goals and requirements. The QAPP was prepared in accordance with USEPA and USACE guidance documents, including *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans* (USEPA 1991), *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (USEPA 1994), and Engineer Manual (EM) 200-1-3, *Requirements for the Preparation of Sampling and Analysis Plans* (USACE 2001).

The QAPP summarizes standard operating procedures (SOPs) and data quality requirements for collecting and analyzing environmental data. The QAPP integrates protocols and methodologies identified under various USACE and regulatory guidance. This plan documents administrative procedures for managing environmental data and governs sampling plan preparation; data review, evaluation, and validation; database administration; and data archiving.

5.3 FIELD SAMPLE COLLECTION AND MEASUREMENT

Prior to beginning field sampling, field personnel were trained, as necessary, and participated in a project-specific readiness review. These activities ensured standard procedures were followed in sample collection and in completion of field logbooks, chain-of-custody forms, labels, and custody seals. Documentation of training and readiness was retained in the project file.

The master field investigation documents are the site field logbooks. The primary purpose of these documents is to record daily field activities; personnel on each sampling team; and any administrative occurrences, conditions, or activities that may have affected the field work or data quality of any environmental samples for a given day. Guidance for documenting specific types of field sampling activities in field logbooks or on log sheets is contained in Appendix C of EM 200-1-3, *Requirements for the Preparation of Sampling and Analysis Plans* (USACE 2001).

At any point in the process of sample collection or data and document review, a non-conformance report may be initiated if non-conformances are identified (Leidos 2015a). Data entered into the database may be flagged accordingly.

5.4 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits of both field and laboratory activities were conducted to verify that sampling and analysis activities were performed in accordance with the procedures established in the QAPP.

5.4.1 Field Assessments

Internal assessments (i.e., audits or surveillances) of field activities (i.e., sampling and measurements) were conducted by the QA/QC representative (or designee) for FUSRAP. Assessments included an examination of field sampling records, field instrument operating records, sample collection, handling and packaging procedures, maintenance of QA procedures, and chain-of-custody forms. These assessments (i.e., system audits) occurred at the onset of the project to verify all established procedures were followed.

Performance assessments followed the system audits to ensure deficiencies had been corrected and to verify that QA practices/procedures were being maintained throughout the duration of the project. These assessments involved reviewing field measurement records, instrumentation calibration records, and sample documentation.

External assessments may be conducted at the discretion of USACE, the USEPA Region 7, or the State of Iowa.

5.4.2 Laboratory Audits

USACE St. Louis FUSRAP laboratory is subject to periodic review(s) (i.e., system audits) by the local USACE chemist to demonstrate compliance with the *Department of Defense (DoD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories* (QSM) (DOD and DOE 2017). Accordingly, USACE St. Louis FUSRAP laboratory participates in blind, third-party performance evaluation studies (i.e., performance audits) at least twice per year, with results reported to the local USACE point(s) of contact. In addition, contract laboratories are required to be accredited under the U.S. Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP). The DOD ELAP requires an annual audit and re-accreditation every 3 years.

System audits include examining laboratory documentation of sample receipt, sample log-in, sample storage, chain-of-custody procedures, sample preparation and analysis, and instrument operating records. Performance audits consist of USACE laboratories receiving performance evaluation samples from an outside vendor for an ongoing assessment of laboratory precision and accuracy. The analytical results of the analysis of performance evaluation samples are

evaluated by USACE Hazardous, Toxic, and Radioactive Waste – Center of Expertise and/or a local oversight chemist to ensure laboratories maintain acceptable performance.

Internal performance and system audits of laboratories were conducted by the Laboratory QA Manager as directed in the *Laboratory Quality Assurance Plan for the FUSRAP St. Louis Radiological Laboratory* (USACE 2013). Internal system audits included an examination of laboratory documentation of sample receipt, sample log-in, sample storage, chain-of-custody procedures, sample preparation and analysis, and instrument operating records against the requirements of the laboratory SOPs. Internal performance audits were also conducted on a regular basis. Single-blind performance samples were prepared along with project samples and submitted to the laboratory for analysis. The Laboratory QA Manager evaluated the analytical results of these single-blind performance samples to ensure the laboratory maintained acceptable performance. Quarterly QA/QC reports are generated and provided to the local USACE authority; these reports document the ongoing QC elements and allow further monitoring of quality processes/status. In addition, QA plans and methodology are to follow the guidance presented in the QSM (DOD and DOE 2017).

5.5 SUBCONTRACTED LABORATORY PROGRAMS

All samples collected during environmental monitoring activities were analyzed by USACE-approved laboratories. The QA samples collected for surface water and sediment were analyzed by the designated USACE-subcontracted QA laboratory. The laboratory supporting this work maintained statements of qualifications, including an organizational structure, QA manual, and SOPs. Additionally, the subcontracted laboratory is an accredited laboratory under the DOD ELAP.

Samples collected during these investigations were analyzed by the USEPA methods contained in USEPA Publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) (USEPA 1993), and by other documented USEPA or nationally recognized methods. Laboratory SOPs are based on USEPA SW-846 methods.

5.6 QUALITY ASSURANCE AND QUALITY CONTROL SAMPLES

The QA/QC samples were analyzed for the purpose of assessing the quality of the sampling effort and the reported analytical data. The QA/QC samples include duplicate samples (–1) and split samples (–2). The equations utilized for accuracy and precision are presented in Section 5.8.

5.6.1 Duplicate Samples

These samples, which measure precision, were collected by the sampling teams and were submitted for analysis to the USACE St. Louis FUSRAP laboratory. The purpose of these samples is to provide activity-specific, field-originated information regarding the homogeneity of the sampled matrix and the consistency of the sampling effort. These samples were collected concurrently with the primary environmental samples and equally represent the medium at a given time and location. Duplicate samples were collected from each medium addressed by this project and were submitted to the USACE St. Louis FUSRAP laboratory for analysis. One duplicate sample was collected for approximately every 20 field samples of each matrix and analyte. Precision is measured by the relative percent difference (RPD) or the normalized absolute difference (NAD) for radiological analyses.

The RPDs and NADs for radiological analyses are presented in Tables 5-1 and 5-2. The overall precision for CY 2018 environmental monitoring sampling activities was acceptable. See Section 5.8 for the evaluation process.

Table 5-1. Radiological Duplicate Sample Alpha Analysis for CY 2018 – Surface Water

Surface-Water Sample Name[a]	U-234[b]		U-235[b]		U-238[b]	
	RPD	NAD	RPD	NAD	RPD	NAD
IAAP201053 / IAAP201053-1	0.92	NA	NC	NA	50.97	0.52

[a] Samples ending in "-1" are duplicate samples.
[b] RPD criterion for water matrix samples is less than or equal to 30 percent. If the RPD is greater than 30 percent, then the NAD shall be less than or equal to 1.96 to remain within the control limits.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

Table 5-2. Radiological Duplicate Sample Alpha Analysis for CY 2018 – Sediment

Sediment Sample Name[a]	U-234[b]		U-235[b]		U-238[b]	
	RPD	NAD	RPD	NAD	RPD	NAD
IAAP208777 / IAAP208777-1	27.59	NA	NC	NA	38.85	NA

[a] Samples ending in "-1" are duplicate samples.
[b] RPD criterion for solid matrix samples is less than or equal to 50 percent. If the RPD is greater than 50 percent, then the NAD shall be less than or equal to 1.96 to remain within the control limits.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

5.6.2 Split Samples

Split samples measure accuracy and were collected by the sampling team and sent to a USACE-subcontracted QA laboratory for analysis to provide an independent assessment of contractor and subcontractor laboratory performance. One split sample was collected for approximately every 20 field samples of each matrix for radiological analytes.

The RPDs and NADs for radiological analyses are presented in Tables 5-3 and 5-4. The overall accuracy for the CY 2018 environmental monitoring sampling activities was acceptable. See Section 5.8 for the evaluation process.

Table 5-3. Radiological Split Sample Alpha Analysis for CY 2018 – Surface Water

Surface-Water Sample Name[a]	U-234[b]		U-235[b]		U-238[b]	
	RPD	NAD	RPD	NAD	RPD	NAD
IAAP201053 / IAAP201053-2	59.22	0.86	NC	NA	35.12	0.51

[a] Samples ending in "-2" are split samples.
[b] RPD criterion for water matrix samples is less than or equal to 30 percent. If the RPD is greater than 30 percent, then the NAD shall be less than or equal to 1.96 to remain within the control limits.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

Table 5-4. Radiological Split Sample Alpha Analysis for CY 2018 – Sediment

Sediment Sample Name[a]	U-234[b]		U-235[b]		U-238[b]	
	RPD	NAD	RPD	NAD	RPD	NAD
IAAP208777 / IAAP208777-2	11.27	NA	NC	NA	18.25	NA

[a] Samples ending in "-2" are split samples.
[b] RPD criterion for solid matrix samples is less than or equal to 50 percent. If the RPD is greater than 50 percent, then the NAD shall be less than or equal to 1.96 to remain within the control limits.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

5.6.3 Equipment Rinsate Blanks

Equipment rinsate blank samples are typically taken from the rinsate water collected from equipment decontamination activities. These samples consist of analyte-free water that has been rinsed over sampling equipment for the purposes of evaluating the effectiveness of equipment decontamination.

Sediment samples are collected from each station using a clean sampling spoon. These spoons are segregated after use and decontaminated according to Field Technical Procedure 400, *Equipment Decontamination* (Leidos 2015b). Because the process of collecting sediment occurs below the surface of the water, a rinsate blank would not represent the wetted surface of the sampling spoon at the time of sample collection and, therefore, would not apply. The surface-water samples are collected using new nitrile gloves and new laboratory sample containers. Equipment rinsate blanks for these samples are also not required because no potential for contamination exists.

5.7 DATA REVIEW, EVALUATION, AND VALIDATION

All data packages received from the analytical laboratory were reviewed and either evaluated or validated by data management personnel. Data validation is the systematic process of ensuring that the precision and accuracy of the analytical data are adequate for their intended use. Validation was performed in accordance with *Data Verification and Validation* (Leidos 2015c), and/or with project-specific guidelines. General chemical data quality management guidance found in Engineer Regulation (ER)-1110-1-263, *Engineering and Design – Chemical Data Quality Management for Hazardous, Toxic, and Radioactive Waste Activities* (USACE 1998), was also used when planning for chemical data management and evaluation. Additional details of data review, evaluation, and validation are provided in *FUSRAP Laboratory Data Management Process for the St. Louis Site* (USACE 1999). Data assessment guidance to determine the usability of data from hazardous, toxic, and radioactive waste projects is provided in EM-200-1-6, *Chemical Quality Assurance for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects* (USACE 1997).

One hundred (100) percent of the data generated from all analytical laboratories was independently reviewed and either evaluated or validated. The data review process documents the possible effects on the data from various QC failures; it does not determine data usability, nor does it include assignment of data validation qualifier (VQ) flags. The data evaluation process uses the results of the data review to determine the usability of the data. The process of data evaluation summarizes the potential effects of QA/QC failures on the data, and a USACE District Chemist or District Health Physicist assesses their impact on the attainment of the project-specific data quality objectives (DQOs). Consistent with the data quality requirements, as defined in the DQOs, approximately 10 percent of all project data were validated.

5.8 PRECISION, ACCURACY, REPRESENTATIVENESS, COMPARABILITY, COMPLETENESS, AND SENSITIVITY

The data evaluation process considers precision, accuracy, representativeness, comparability, completeness, and sensitivity. The following subsections detail the particular parameters and the data evaluation method for each.

Accuracy and precision can be measured by the RPD or the NAD using the following equations:

$$RPD = \left(\frac{[S - D]}{\frac{S + D}{2}} \right) x\ 100$$

$$NAD = \frac{|S - D|}{\sqrt{U_S^2 + U_D^2}}$$

where:

S = Parent Sample Result
D = Duplicate/Split Sample Result
U_S = Parent Sample Uncertainty
U_D = Duplicate/Split Sample Uncertainty

The RPD is calculated for all samples for which a detectable result is reported for both the parent and the QA field split or field duplicate. For surface-water radiological samples when the RPD is greater than 30 percent, the NAD is used to determine the accuracy or precision of the method. The RPD criterion for sediment samples is greater than 50 percent. The NAD accounts for uncertainty in the results; the RPD does not. The NAD should be equal to or less than a value of 1.96. Neither equation is used when the analyte in one or both of the samples is not detected. In cases in which neither equation can be used, the comparison is counted as acceptable in the overall number of comparisons.

Precision is a measure of mutual agreement among individual measurements performed under the same laboratory controls. To evaluate for precision, a field duplicate is submitted to the same laboratory as the original sample to be analyzed under the same laboratory conditions.

The RPD and NAD between the two results was calculated and used as an indication of the precision of the analyses performed (Tables 5-1 and 5-2). Sample collection precision was evaluated in the laboratory by the analyses of duplicates. The overall precision for the CY 2018 environmental monitoring sampling activities was acceptable.

Accuracy provides a gauge or measure of the agreement between an observed result and the true value for an analysis. The RPD and NAD between the two results was calculated and used as an indication of the accuracy of the analyses performed (Tables 5-3 and 5-4). For this EMDAR, accuracy is evaluated through the use of the field split samples through a comparison of the prime laboratory results versus the results of an independent laboratory. The overall accuracy for CY 2018 environmental monitoring sampling activities was acceptable.

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter that depends upon the proper design of the sampling program and proper laboratory protocols. Representativeness is satisfied through proper design of the sampling network, use of proper sampling techniques, following proper analytical procedures, and not exceeding holding times of the samples.

Representativeness was determined by assessing the combined aspects of the QA program, QC measures, and data evaluations. The sampling protocol from the RI WP QAPP was followed, and analytical procedures were conducted in accordance with the QAPP. The overall representativeness of the CY 2018 environmental monitoring sampling activities was acceptable for the media and sampling described in this EMDAR.

Comparability expresses the confidence with which one dataset can be compared with another. The extent to which analytical data will be comparable depends upon the similarity of sampling and analytical methods, as well as sample-to-sample and historical comparability. Standardized and consistent procedures used to obtain analytical data are expected to provide comparable results. Some sample media (e.g., radiological monitoring) have values that are primarily useful in the present, thus the comparison to historical data is not as relevant. The overall comparability of the applicable environmental monitoring sampling data met the project DQOs.

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions. Laboratories are expected to provide data meeting QC acceptance criteria for all samples tested. For the CY 2018 environmental monitoring sampling activities, the data completeness was 100 percent (i.e., FUSRAP DQO for completeness is 90 percent).

Sensitivity is the determination of MDC values that allows the investigation to assess the relative confidence that can be placed in an analytical result in comparison to the magnitude or level of analyte concentration observed. For this report, MDC is a term generically used to represent the minimum detectable activity (MDA) for radiological analytes. The closer a measured value to the MDC, the lower the established confidence and the greater the variation in the measured value. Project sensitivity goals were expressed as quantitation level goals in the RI WP QAPP. These levels were achieved or exceeded throughout the analytical process.

The MDC is reported for each result obtained by laboratory analysis. These very low MDCs are achieved through the use of alpha spectroscopy. Variations in MDCs for the same radiological analyte reflect variability in the detection efficiencies and conversion factors due to factors such as individual sample aliquot, sample density, and variations in analyte background radioactivity for alpha spectroscopy at the laboratory. To complete the data evaluation (i.e. precision, accuracy, representativeness, and comparability), analytical results that exceed the MDC of the analyte are desired.

5.9 DATA QUALITY ASSESSMENT SUMMARY

The overall quality of the data meets the established project objectives. Through proper implementation of the project data review, evaluation, validation, and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable, but estimated when necessary. Data that have been estimated have concentrations/activities that are below the quantitation limit or are indicative of accuracy, precision, or sensitivity being less than desired but adequate for interpretation.

These data can withstand scientific scrutiny, are appropriate for the intended purpose, and are technically defensible. Confidence in the presented environmental information has been established, allowing the information to be utilized for the project objectives and providing data for future needs.

5.10 RESULTS FOR PARENT SAMPLES AND THE ASSOCIATED DUPLICATE AND SPLIT SAMPLES

A summary of the QA parent sample results and associated duplicate and/or split sample results are presented in Tables 5-5 and 5-6.

Table 5-5. Radiological Parent Samples and Associated Duplicate and Split Samples for CY 2018 – Surface Water

Surface-Water Sample Name[a]	U-234[b,c]				U-235[b,c]				U-238[b,c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
IAAP201053	1.09	0.54	0.45	=	0.02	0.15	0.51	UJ	0.50	0.35	0.30	J
IAAP201053-1	1.08	0.62	0.57	J	0.17	0.27	0.50	UJ	0.84	0.55	0.56	J
IAAP201053-2	0.59	0.21	0.13	=	0.04	0.06	0.10	UJ	0.71	0.23	0.12	=

[a] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[b] Results are expressed in pCi/L.
[c] Results from alpha spectroscopy.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" for analyte was identified as estimated quantity, and "UJ" for analyte was not detected and had QC deficiencies.

Table 5-6. Radiological Parent Samples and Associated Duplicate and Split Samples for CY 2018 – Sediment

Sediment Sample Name[a]	U-234[b,c]				U-235[b,c]				U-238[b,c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
IAAP208777	0.45	0.24	0.13	J	-0.01	0.07	0.18	UJ	0.62	0.28	0.14	=
IAAP208777-1	0.59	0.31	0.17	J	-0.01	0.09	0.19	UJ	0.91	0.40	0.14	=
IAAP208777-2	0.40	0.13	0.06	=	0.02	0.03	0.06	UJ	0.51	0.14	0.04	=

[a] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[b] Results are expressed in pCi/g.
[c] Results from alpha spectroscopy.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" for analyte was identified as estimated quantity, and "UJ" for analyte was not detected and had QC deficiencies.

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40 *CFR* 61, Appendix E. *Compliance Procedures Methods for Determining Compliance with Subpart I.*

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FIGURES

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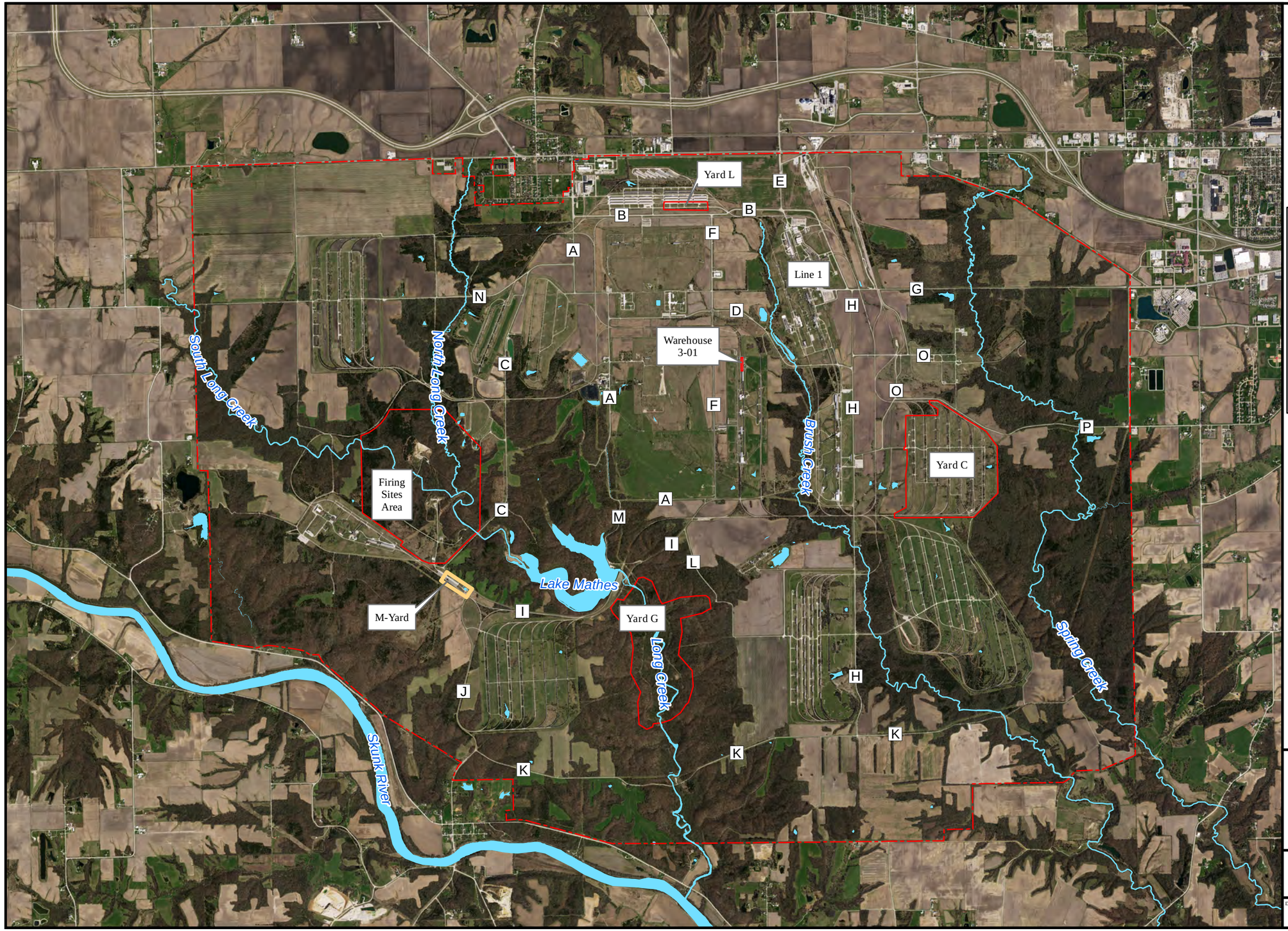
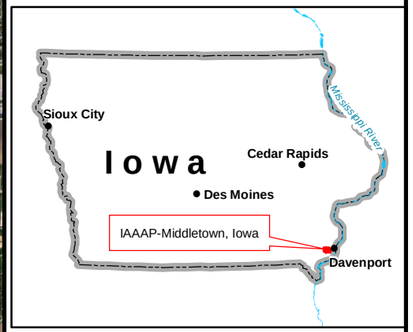


LEGEND:

- OU-8 Site
- M-Yard
- Stream/Surface Water
- IAAAP Boundary



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Iowa-South State Plane
(NAD 83, Meters)

0 500 1,000 Meters

Iowa Army Ammunition Plant
Operable Unit 8 Annual
Environmental Monitoring
Data and Analysis Report for
Calendar Year 2018

FUSRAP

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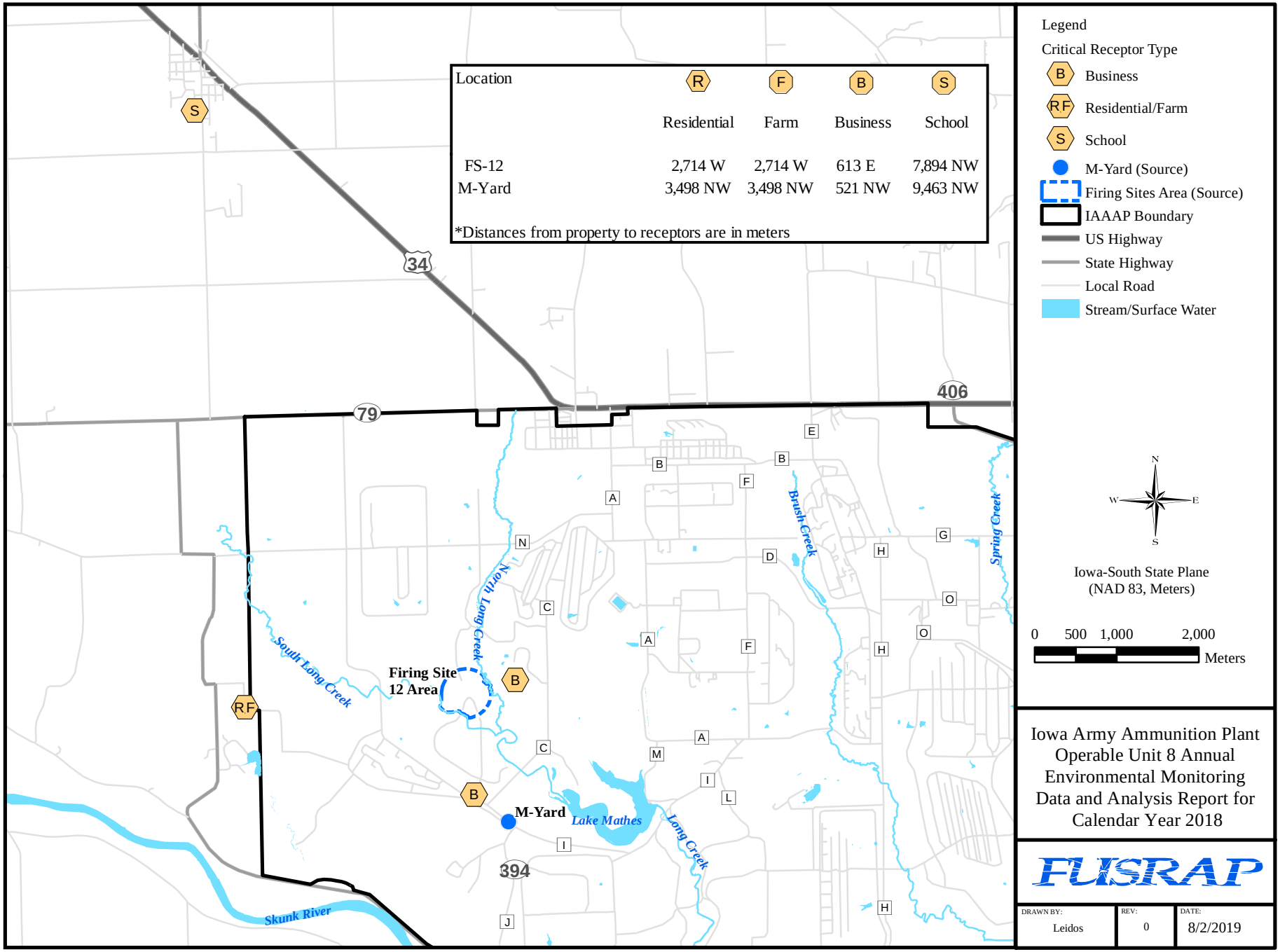
Figure 1-1.
FUSRAP Areas at IAAAP



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Iowa Army Ammunition Plant
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Data and Analysis Report for
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Figure 3-1. IAAAP
Firing Sites Area Receptors

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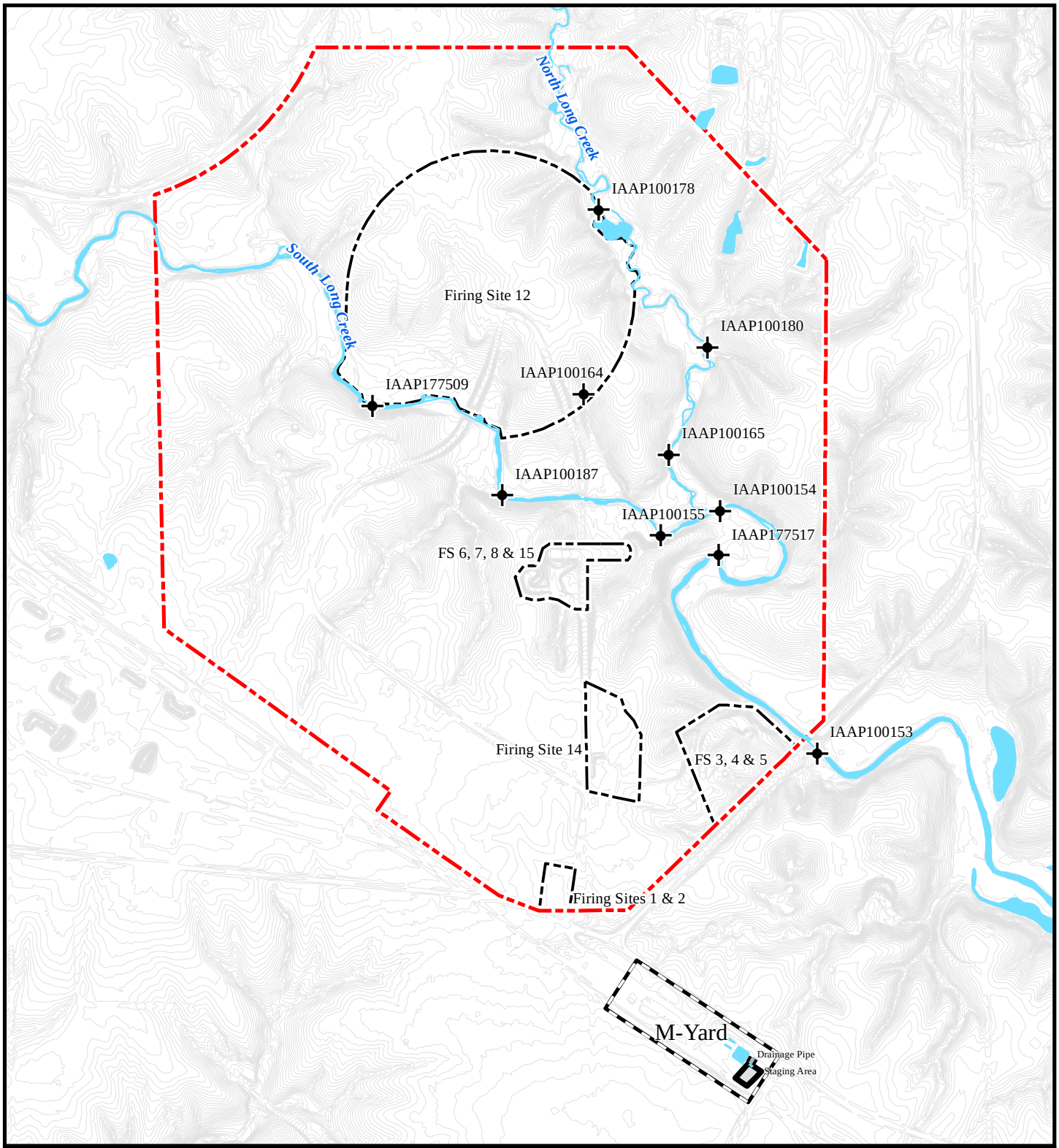

LEGEND:

- Environmental Monitoring Sample Locations
- Firing Sites Area
- Firing Site Boundaries
- M-Yard
- M-Yard Staging Area
- Drainage Pipe
- 2ft Contour

N
W E
S

IA-South State Plane
(NAD 83, Meters)

0 500 1,000 Feet

Iowa Army Ammunition Plant
Operable Unit 8 Annual
Environmental Monitoring
Data and Analysis Report for
Calendar Year 2018

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Figure 4-1. Surface-Water and Sediment Monitoring Locations

APPENDIX A

CALCULATED EMISSION RATES FROM IAAAP OPERABLE UNIT 8 AREAS

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Table A-1. Total Days for CY 2018

Location	Open Date	Close Date	Total Days
FS-12 Area SUs (Areas G and H)	05/25/18	11/30/18	190
FS-12 Area Pre-Sorting Pile	05/25/18	11/08/18	168
FS-12 Area Post-Sorting Contaminated Pile	06/02/18	12/12/18	194
M-Yard Post-Sorting Contaminated Pile	11/29/18	12/14/18	16

Table A-2. FS-12 Area Average Surface Area and Flow Rate Per Location for CY 2018

Location	Surface Area (m^2)	Total Days[a]	Surface Area × Total Days	Average Surface Area/Year (A)[c] (m^2)	Diameter of Stack D = $(1.3\ A)^{1/2}$ (m)	Flow Rate[d] $F = V\ \pi\ [(D)^2 / 4]*60$ (m^3/minute)
FS-12 Area						
SUs (Areas G and H)	15,620	190	2,967,800			
Pre-Sorting Pile[b]	2,000	168	336,000			
Post-Sorting Contaminated Pile[b]	400	194	77,600			
		Total	**3,381,400**	**9,264**	**110**	**2.4E+06**
M-Yard						
Post-Sorting Contaminated Pile[b]	400	16	**6,400**	**18**	**5**	**4.6E+03**

[a] Total days were based on the 2018 dates in which potential wind-erosion occurred, as listed in Table A-1.

[b] No data identifying the area associated with the pre- and post-sorting piles existed. Therefore, the pre-sorting contaminated pile area was set at 2,000 m^2 (conservative value selected based on previous years' area values). The post-sorting contaminated piles at both the FS-12 Area and M-Yard were set at 400 m^2, which corresponds to 20 percent of the pre-sorting pile. The average volume ratio of post-sorting contaminated pile to pre-sorting pile is 11 percent.

[c] Average surface area/year (A) = [Σ(surface area x total days)]/365

[d] V = 4.252 m per second

Table A-3. Airborne Radioactive Particulate Emissions Based on Excavation Perimeter Air Samples

Radionuclide	Gross Alpha Concentration (µCi/cm^3)	Activity Fraction[a]	Emission Concentration (µCi/cm^3)[b]	Emission Rate (Ci/year)[c]
FS-12 Area				
U-238	1.75E-15	0.9014	1.6E-15	2.0E-03
U-235	1.75E-15	0.0145	2.5E-17	3.2E-05
U-234	1.75E-15	0.0840	1.5E-16	1.9E-04
M-Yard				
U-238	1.70E-15	0.9014	1.5E-15	3.7E-06
U-235	1.70E-15	0.0145	2.5E-17	5.9E-08
U-234	1.70E-15	0.0840	1.4E-16	3.4E-07

[a] As listed in the ROD (USACE 2011).

[b] Emission concentration is equal to the activity fraction multiplied by the gross alpha airborne particulate concentrations.

[c] Emission rate is based on a 365-day period calculated flow rate (as presented in Table A-2) for each site as determined from the average annual wind speed (i.e., 4.252 m per second) and calculated site area (as presented in Table A-2). (Note: 1 mL = 1 cm^3.)

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APPENDIX B

CALENDAR YEAR 2018 AIR MONITORING DATA

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Table B-1. CY 2018 IAAAP Air Sample Summary Table

Date	Sample ID	Area	Gross Alpha Concentration (µCi/mL)		
			1st Count	2nd Count	3rd Count
05/23/18	20180515-001	FS-12 Wood Soil Sort Area	4.04E-15	-	-
05/23/18	20180515-002	FS-12 SCA Boundary	0.00E+00	-	-
05/25/18	20180517-003	FS-12 SCA Boundary	1.68E-15	-	-
05/29/18	20180515-004	FS-12 Wood Soil Sort Area	0.00E+00	-	-
05/31/18	20180522-005	FS-12 SCA Boundary	-1.47E-15	-	-
05/31/18	20180522-006	FS-12 Wood Soil Sort Area	4.00E-15	-	-
06/05/18	20180524-007	FS-12 SCA Boundary	3.28E-15	-	-
06/07/18	20180524-008	FS-12 Wood Soil Sort Area	4.75E-15	-	-
06/07/18	20180529-009	FS-12 SCA Boundary	5.40E-15	-	-
06/07/18	20180529-010	FS-12 Wood Soil Sort Area	5.84E-15	-	-
06/08/18	20180531-011	FS-12 SCA Boundary	3.94E-15	-	-
06/08/18	20180531-012	FS-12 Wood Soil Sort Area	1.09E-15	-	-
06/12/18	20180601-013	FS-12 SCA Boundary	5.47E-15	-	-
06/12/18	20180601-014	FS-12 Wood Soil Sort Area	1.75E-15	-	-
06/20/18	20180608-015	FS-12 SCA Boundary	4.38E-15	-	-
06/20/18	20180608-016	FS-12 Wood Soil Sort Area	3.28E-15	-	-
06/25/18	20180614-017	FS-12 SCA Boundary	2.80E-15	-	-
06/25/18	20180614-018	FS-12 Wood Soil Sort Area	3.52E-15	-	-
06/27/18	20180619-019	FS-12 SCA Boundary	3.59E-16	-	-
06/27/18	20180619-020	FS-12 Wood Soil Sort Area	3.98E-15	-	-
07/09/18	20180625-021	FS-12 SCA Boundary	1.45E-15	-	-
07/09/18	20180625-022	FS-12 Wood Soil Sort Area	1.27E-15	-	-
07/10/18	20180628-023	FS-12 SCA Boundary	1.23E-15	-	-
07/10/18	20180628-024	FS-12 Wood Soil Sort Area	1.63E-15	-	-
07/16/18	20180709-025	FS-12 SCA Boundary	0.00E+00	-	-
07/16/18	20180709-026	FS-12 Wood Soil Sort Area	2.50E-15	-	-
07/19/18	20180711-027	FS-12 SCA Boundary	3.59E-16	-	-
07/19/18	20180711-028	FS-12 Wood Soil Sort Area	3.26E-16	-	-
07/23/18	20180713-029	FS-12 SCA Boundary	3.35E-15	-	-
07/23/18	20180713-030	FS-12 Wood Soil Sort Area	1.74E-15	-	-
07/25/18	20180717-031	FS-12 SCA Boundary	2.76E-15	-	-
07/25/18	20180717-032	FS-12 Wood Soil Sort Area	1.17E-15	-	-
07/27/18	20180720-033	FS-12 SCA Boundary	1.96E-15	-	-
07/27/18	20180720-034	FS-12 Wood Soil Sort Area	2.50E-15	-	-
07/31/18	20180724-035	FS-12 SCA Boundary	1.83E-15	-	-
07/31/18	20180724-036	FS-12 Wood Soil Sort Area	2.18E-15	-	-
08/06/18	20180724-037	FS-12 SCA Boundary	2.11E-15	-	-
08/06/18	20180724-038	FS-12 Wood Soil Sort Area	3.48E-15	-	-
08/06/18	20180730-039	FS-12 SCA Boundary	1.12E-15	-	-
08/06/18	20180730-040	FS-12 Wood Soil Sort Area	1.26E-15	-	-
08/08/18	20180802-041	FS-12 SCA Boundary	2.29E-15	-	-
08/08/08	20180802-042	FS-12 Wood Soil Sort Area	2.53E-15	-	-
08/10/18	20180803-043	FS-12 SCA Boundary	2.78E-15	-	-

Table B-1. CY 2018 IAAAP Air Sample Summary Table

Date	Sample ID	Area	Gross Alpha Concentration (µCi/mL)		
			1st Count	2nd Count	3rd Count
08/10/18	20180803-044	FS-12 Wood Soil Sort Area	3.24E-15	-	-
08/13/18	20180806-045	FS-12 SCA Boundary	1.10E-15	-	-
08/13/18	20180806-046	FS-12 Wood Soil Sort Area	8.99E-16	-	-
08/15/18	20180808-047	FS-12 SCA Boundary	4.89E-16	-	-
08/15/18	20180808-048	FS-12 Wood Soil Sort Area	1.33E-15	-	-
08/23/18	20180810-049	FS-12 SCA Boundary	2.78E-15	-	-
08/23/18	20180810-050	FS-12 Wood Soil Sort Area	1.45E-16	-	-
08/27/18	20180816-051	FS-12 SCA Boundary	-4.28E-16	-	-
08/28/18	20180816-052	FS-12 Wood Soil Sort Area	1.77E-15	-	-
08/23/18	20180814-053	FS-12 SCA Boundary	3.36E-16	-	-
08/23/18	20180814-054	FS-12 Wood Soil Sort Area	4.35E-16	-	-
09/05/18	20180823-055	FS-12 SCA Boundary	1.25E-15	-	-
09/05/18	20180823-056	FS-12 Wood Soil Sort Area	1.19E-15	-	-
09/11/18	20180827-057	FS-12 SCA Boundary	1.86E-15	-	-
09/11/18	20180827-058	FS-12 Wood Soil Sort Area	5.31E-16	-	-
09/11/18	20180903-059	FS-12 SCA Boundary	9.43E-16	-	-
09/11/18	20180903-060	FS-12 Wood Soil Sort Area	1.27E-15	-	-
09/20/18	20180911-061	FS-12 SCA Boundary	1.71E-15	-	-
09/20/18	20180911-062	FS-12 Wood Soil Sort Area	2.93E-15	-	-
09/22/18	20180914-063	FS-12 SCA Boundary	8.38E-16	-	-
09/22/18	20180914-064	FS-12 Wood Soil Sort Area	2.32E-15	-	-
09/22/18	20180914-065	FS-12 Block House (Boundary)	1.32E-15	-	-
09/28/18	20180920-066	FS-12 SCA Boundary	1.56E-15	-	-
09/28/18	20180920-067	FS-12 Wood Soil Sort Area	2.21E-15	-	-
09/28/18	20180920-068	FS-12 Block House (Boundary)	3.36E-16	-	-
10/02/18	20180927-069	FS-12 SCA Boundary	8.93E-16	-	-
10/02/18	20180927-070	FS-12 Wood Soil Sort Area	1.74E-15	-	-
10/02/18	20180927-071	FS-12 Block House (Boundary)	9.16E-16	-	-
10/04/18	20180922-072	FS-12 SCA Boundary	5.65E-16	-	-
10/04/18	20180922-073	FS-12 Wood Soil Sort Area	8.86E-16	-	-
10/04/18	20180922-074	FS-12 Block House (Boundary)	1.50E-15	-	-
10/09/18	20180925-075	FS-12 Block House (Boundary)	1.86E-15	-	-
10/09/18	20180925-076	FS-12 SCA Boundary	1.37E-15	-	-
10/09/18	20180925-077	FS-12 Wood Soil Sort Area	1.86E-15	-	-
10/10/18	20181001-078	FS-12 Block House (Boundary)	1.86E-15	-	-
10/10/18	20181001-079	FS-12 Wood Soil Sort Area	6.41E-16	-	-
10/10/18	20181001-080	FS-12 SCA Boundary	7.74E-16	-	-
10/11/18	20131003-081	FS-12 SCA Boundary	7.33E-16	-	-
10/11/18	20181003-082	FS-12 Wood Soil Sort Area	1.19E-15	-	-
10/11/18	20181003-083	FS-12 Block House (Boundary)	1.19E-15	-	-
10/17/18	20181010-084	FS-12 SCA Boundary	1.71E-15	-	-
10/17/18	20181010-085	FS-12 Wood Soil Sort Area	2.63E-15	-	-
10/17/18	20181010-086	FS-12 Block House (Boundary)	2.02E-15	-	-

Table B-1. CY 2018 IAAAP Air Sample Summary Table

Date	Sample ID	Area	Gross Alpha Concentration (µCi/mL)		
			1st Count	2nd Count	3rd Count
10/14/18	20181012-087	FS-12 SCA Boundary	1.99E-15	-	-
10/14/18	20181012-088	FS-12 Wood Soil Sort Area	2.44E-15	-	-
10/23/18	20181014-089	FS-12 SCA Boundary	2.44E-15	-	-
10/23/18	20181014-090	FS-12 Wood Soil Sort Area	1.22E-15	-	-
10/23/18	20181014-091	FS-12 Block House (Boundary)	1.37E-15	-	-
10/29/18	20181017-092	FS-12 SCA Boundary	1.68E-15	-	-
10/29/18	20181017-093	FS-12 Wood Soil Sort Area	1.07E-15	-	-
10/29/18	20181017-094	FS-12 Block House (Boundary)	1.53E-16	-	-
10/30/18	20181019-095	FS-12 SCA Boundary	4.89E-16	-	-
10/30/18	20181019-096	FS-12 Wood Soil Sort Area	7.94E-16	-	-
10/30/18	20181019-097	FS-12 Block House (Boundary)	6.41E-16	-	-
11/01/18	20181023-098	FS-12 SCA Boundary	1.86E-15	-	-
11/01/18	20181014-099	FS-12 Wood Soil Sort Area	3.36E-16	-	-
11/01/18	20181023-100	FS-12 Block House (Boundary)	1.86E-15	-	-
11/01/18	20181025-101	FS-12 SCA Boundary	3.05E-15	-	-
11/01/18	20181025-102	FS-12 Wood Soil Sort Area	2.29E-15	-	-
11/01/18	20181025-103	FS-12 Block House (Boundary)	2.60E-15	-	-
11/06/18	20181029-104	FS-12 SCA Boundary	6.72E-16	-	-
11/06/18	20181029-105	FS-12 Wood Soil Sort Area	6.72E-16	-	-
11/06/18	20181029-106	FS-12 (Boundary)	1.59E-15	-	-
11/09/18	20181031-107	FS-12 SCA Boundary	1.40E-15	-	-
11/09/18	20181031-108	FS-12 Wood Soil Sort Area	4.89E-16	-	-
11/09/18	20181031-109	FS-12 (Boundary)	1.86E-15	-	-
11/12/18	20181105-110	FS-12 Wood Soil Sort Area	-1.53E-16	-	-
11/12/18	20181105-111	FS-12 (Boundary)	1.53E-16	-	-
12/03/18	20181109-112	FS-12 Wood Soil Sort Area	2.17E-15	-	-
12/03/18	20181109-113	FS-12 (Boundary)	3.36E-16	-	-
12/03/18	20181113-114	FS-12 Wood Soil Sort Area	1.40E-15	-	-
12/03/18	20181113-116	FS-12 (Boundary)	2.14E-15	-	-
12/03/18	20181115-115	FS-12 (Boundary)	7.64E-16	-	-
12/03/18	20181115-117	FS-12 Wood Soil Sort Area	0.00E+00	-	-
12/10/18	20181116-118	FS-12 Wood Soil Sort Area	3.78E-15	-	-
12/10/18	20181116-119	FS-12 (Boundary)	5.91E-15	-	-
12/10/18	20181130-120	M-Yard Boundary	1.70E-15	-	-
12/10/18	20181130-121	FS-12 (Boundary)	1.84E-15	-	-
12/10/18	20181204-122	FS-12 SCA Boundary	5.33E-16	-	-
01/08/19	20181206-123	FS-12 SCA Boundary	1.28E-15	-	-
01/08/19	20181206-124	FS-12 (Boundary)	1.71E-15	-	-
01/08/19	20181210-125	FS-12 (Boundary)	1.68E-15	-	-
01/08/19	20181210-126	FS-12 SCA Boundary	2.04E-15	-	-
01/08/19	20181212-127	FS-12 (Boundary)	9.16E-16	-	-
01/08/19	20181212-128	FS-12 SCA Boundary	3.52E-15	-	-

Negative results indicate result was less than the average background value for the instrument.

- Count not performed.

Table B-2. CY 2018 IAAAP Air Sample Laboratory Analysis Summary Table

Field Sample ID	Station Name	Sample Name	Collect Date	Analyte	Result	Error	Detection Limit	Units	VQ
AS 20180515-002	FS12 SCA Boundary	IAAP209483	05/15/18	Gross Alpha	1.305E-14	5.312E-15	4.211E-15	µCi/mL	J
				Gross Beta	4.09E-14	8.484E-15	6.685E-15	µCi/mL	J
AS 20180517-003	FS12 SCA Boundary	IAAP209484	05/17/18	Gross Alpha	4.997E-15	3.621E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.189E-14	7.658E-15	6.685E-15	µCi/mL	J
AS 20180522-005	FS12 SCA Boundary	IAAP209485	05/22/18	Gross Alpha	8.578E-15	4.444E-15	4.211E-15	µCi/mL	J
				Gross Beta	4.033E-14	8.433E-15	6.685E-15	µCi/mL	J
AS 20180524-007	FS12 SCA Boundary	IAAP209486	05/24/18	Gross Alpha	1.122E-14	4.753E-15	3.888E-15	µCi/mL	J
				Gross Beta	4.139E-14	8.156E-15	6.171E-15	µCi/mL	J
AS 20180529-009	FS12 SCA Boundary	IAAP209487	05/29/18	Gross Alpha	1.619E-14	5.853E-15	4.211E-15	µCi/mL	J
				Gross Beta	5.441E-14	9.668E-15	6.685E-15	µCi/mL	J
AS 20180531-011	FS12 SCA Boundary	IAAP209488	05/31/18	Gross Alpha	9.92E-15	4.719E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.048E-14	7.525E-15	6.685E-15	µCi/mL	J
AS 20180601-013	FS12 SCA Boundary	IAAP209489	06/04/18	Gross Alpha	1.305E-14	5.312E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.273E-14	7.737E-15	6.685E-15	µCi/mL	J
AS 20180608-015	FS12 SCA Boundary	IAAP209490	06/08/18	Gross Alpha	1.216E-14	5.149E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.611E-14	8.049E-15	6.685E-15	µCi/mL	J
AS 20180614-017	FS12 SCA Boundary	IAAP209491	06/14/18	Gross Alpha	1.171E-14	5.066E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.47E-14	7.92E-15	6.685E-15	µCi/mL	J
AS 20180619-019	FS12 SCA Boundary	IAAP209492	06/19/18	Gross Alpha	4.55E-15	3.506E-15	4.211E-15	µCi/mL	J
				Gross Beta	2.766E-14	7.257E-15	6.685E-15	µCi/mL	J
AS 20180625-021	FS12 SCA Boundary	IAAP209493	06/25/18	Gross Alpha	7.235E-15	4.153E-15	4.211E-15	µCi/mL	J
				Gross Beta	1.95E-14	6.449E-15	6.685E-15	µCi/mL	J
AS 20180628-023	FS12 SCA Boundary	IAAP209494	06/28/18	Gross Alpha	9.025E-15	4.538E-15	4.211E-15	µCi/mL	J
				Gross Beta	3.724E-14	8.152E-15	6.685E-15	µCi/mL	J
AS 20180709-025	FS12 SCA Boundary	IAAP209495	07/09/18	Gross Alpha	5.22E-16	2.233E-15	4.211E-15	µCi/mL	UJ
				Gross Beta	1.978E-14	6.478E-15	6.685E-15	µCi/mL	J
AS 20180711-027	FS12 SCA Boundary	IAAP209496	07/11/18	Gross Alpha	3.588E-14	8.623E-15	4.211E-15	µCi/mL	J
				Gross Beta	8.988E-14	1.258E-14	6.685E-15	µCi/mL	J
AS 20180713-029	FS12 SCA Boundary	IAAP209497	07/13/18	Gross Alpha	1.118E-14	6.185E-15	6.126E-15	µCi/mL	J
				Gross Beta	6.071E-14	1.245E-14	9.724E-15	µCi/mL	J
AS 20180717-031	FS12 SCA Boundary	IAAP209498	07/17/18	Gross Alpha	7.683E-15	4.252E-15	4.211E-15	µCi/mL	J
				Gross Beta	4.23E-14	8.61E-15	6.685E-15	µCi/mL	J

Table B-2. CY 2018 IAAAP Air Sample Laboratory Analysis Summary Table

Field Sample ID	Station Name	Sample Name	Collect Date	Analyte	Result	Error	Detection Limit	Units	VQ
AS 20180720-033	FS12 SCA Boundary	IAAP209499	07/20/18	Gross Alpha	6.788E-15	4.052E-15	4.211E-15	µCi/mL	J
				Gross Beta	2.738E-14	7.229E-15	6.685E-15	µCi/mL	J
AS 20180724-035	FS12 SCA Boundary	IAAP209500	07/24/18	Gross Alpha	7.578E-15	3.703E-15	3.369E-15	µCi/mL	J
				Gross Beta	3.091E-14	6.624E-15	5.348E-15	µCi/mL	J
AS 20180726-037	FS12 SCA Boundary	IAAP209501	07/26/18	Gross Alpha	5.072E-15	3.159E-15	3.369E-15	µCi/mL	J
				Gross Beta	2.821E-14	6.377E-15	5.348E-15	µCi/mL	J
AS 20180730-039	FS12 SCA Boundary	IAAP209502	07/30/18	Gross Alpha	4.442E-15	3.219E-15	3.744E-15	µCi/mL	J
				Gross Beta	3.11E-14	7.063E-15	5.943E-15	µCi/mL	J
AS 20180802-041	FS12 SCA Boundary	IAAP209503	08/01/18	Gross Alpha	1.42E-14	5.304E-15	3.706E-15	µCi/mL	=
				Gross Beta	3.493E-14	7.011E-15	5.882E-15	µCi/mL	=
AS 20180806-045	FS12 SCA Boundary	IAAP209504	08/06/18	Gross Alpha	5.834E-15	3.986E-15	3.912E-15	µCi/mL	J
				Gross Beta	2.711E-14	6.477E-15	6.209E-15	µCi/mL	=
AS 20180808-047	FS12 SCA Boundary	IAAP209505	08/08/18	Gross Alpha	4.774E-15	3.618E-15	3.706E-15	µCi/mL	J
				Gross Beta	2.9E-14	6.457E-15	5.882E-15	µCi/mL	=
AS 20180810-049	FS12 SCA Boundary	IAAP209506	08/10/18	Gross Alpha	1.721E-14	5.756E-15	3.706E-15	µCi/mL	=
				Gross Beta	5.034E-14	8.376E-15	5.882E-15	µCi/mL	=
AS 20180816-051	FS12 SCA Boundary	IAAP209507	08/16/18	Gross Alpha	2.512E-15	3.099E-15	3.706E-15	µCi/mL	UJ
				Gross Beta	1.644E-14	5.195E-15	5.882E-15	µCi/mL	=
AS 20180823-055	FS12 SCA Boundary	IAAP209508	08/22/18	Gross Alpha	1.759E-15	2.907E-15	3.706E-15	µCi/mL	UJ
				Gross Beta	1.905E-14	5.469E-15	5.882E-15	µCi/mL	=
AS 20180827-057	FS12 SCA Boundary	IAAP209509	08/27/18	Gross Alpha	1.582E-14	5.822E-15	4.024E-15	µCi/mL	=
				Gross Beta	4.797E-14	8.513E-15	6.386E-15	µCi/mL	=
AS 20180903-059	FS12 SCA Boundary	IAAP209510	09/03/18	Gross Alpha	1.591E-15	3.232E-15	4.268E-15	µCi/mL	UJ
				Gross Beta	2.166E-14	6.27E-15	6.773E-15	µCi/mL	=
AS 20180911-061	FS12 SCA Boundary	IAAP209511	09/11/18	Gross Alpha	1.08E-14	4.756E-15	3.706E-15	µCi/mL	=
				Gross Beta	5.58E-14	8.84E-15	5.882E-15	µCi/mL	=
AS 20180914-064	FS12 Wood Soil Sort Area	IAAP209512	09/14/18	Gross Alpha	7.225E-15	4.188E-15	3.806E-15	µCi/mL	J
				Gross Beta	6.802E-14	9.97E-15	6.041E-15	µCi/mL	=
AS 20180920-066	FS12 SCA Boundary	IAAP209513	09/20/18	Gross Alpha	4.893E-15	3.513E-15	3.521E-15	µCi/mL	J
				Gross Beta	7.35E-14	1.008E-14	5.588E-15	µCi/mL	=
AS 20180927-069	FS12 SCA Boundary	IAAP209514	09/27/18	Gross Alpha	5.569E-15	4.479E-15	4.695E-15	µCi/mL	J
				Gross Beta	7.848E-14	1.185E-14	7.451E-15	µCi/mL	=

Table B-2. CY 2018 IAAAP Air Sample Laboratory Analysis Summary Table

Field Sample ID	Station Name	Sample Name	Collect Date	Analyte	Result	Error	Detection Limit	Units	VQ
AS 20180922-072	FS12 SCA Boundary	IAAP209515	09/22/18	Gross Alpha	2.081E-15	2.927E-15	3.611E-15	µCi/mL	UJ
				Gross Beta	1.579E-14	5.037E-15	5.731E-15	µCi/mL	=
AS 20180925-075	FS12 Block House (Boundary)	IAAP209516	09/25/18	Gross Alpha	3.292E-15	4.061E-15	4.856E-15	µCi/mL	UJ
				Gross Beta	5.447E-14	9.972E-15	7.708E-15	µCi/mL	=
AS 20181001-078	FS12 Block House (Boundary)	IAAP209517	10/01/18	Gross Alpha	1.082E-14	5.522E-15	4.695E-15	µCi/mL	J
				Gross Beta	7.188E-14	1.13E-14	7.451E-15	µCi/mL	=
AS 20181003-081	FS12 SCA Boundary	IAAP209518	10/03/18	Gross Alpha	2.228E-15	3.683E-15	4.695E-15	µCi/mL	UJ
				Gross Beta	4.275E-14	8.742E-15	7.451E-15	µCi/mL	=
AS 20181010-084	FS12 SCA Boundary	IAAP209519	10/09/18	Gross Alpha	4.137E-15	4.155E-15	4.695E-15	µCi/mL	UJ
				Gross Beta	2.383E-14	6.897E-15	7.451E-15	µCi/mL	=
AS 20181012-087	FS12 SCA Boundary	IAAP209520	10/12/18	Gross Alpha	-4.09E-16	2.446E-15	2.018E-15	µCi/mL	UJ
				Gross Beta	9.34E-16	2.111E-15	3.587E-15	µCi/mL	UJ
AS 20181014-089	FS12 SCA Boundary	IAAP209521	10/14/18	Gross Alpha	3.182E-15	3.925E-15	4.695E-15	µCi/mL	UJ
				Gross Beta	4.695E-14	9.127E-15	7.451E-15	µCi/mL	=
AS 20181017-092	FS12 SCA Boundary	IAAP209522	10/17/18	Gross Alpha	5.569E-15	4.479E-15	4.695E-15	µCi/mL	J
				Gross Beta	6.257E-14	1.051E-14	7.451E-15	µCi/mL	=
AS 20181019-095	FS12 SCA Boundary	IAAP209523	10/19/18	Gross Alpha	3.7E-15	3.461E-15	4.186E-15	µCi/mL	UJ
				Gross Beta	5.775E-14	1.188E-14	1.019E-14	µCi/mL	=
AS 20181023-098	FS12 SCA Boundary	IAAP209524	10/23/18	Gross Alpha	1.682E-15	2.803E-15	4.186E-15	µCi/mL	UJ
				Gross Beta	5.16E-14	1.14E-14	1.019E-14	µCi/mL	=
AS 20181025-101	FS12 SCA Boundary	IAAP209525	10/25/18	Gross Alpha	2.691E-15	3.149E-15	4.186E-15	µCi/mL	UJ
				Gross Beta	6.648E-14	1.256E-14	1.019E-14	µCi/mL	=
AS 20181029-104	FS12 SCA Boundary	IAAP209526	10/29/18	Gross Alpha	4.204E-15	3.608E-15	4.186E-15	µCi/mL	J
				Gross Beta	3.315E-14	9.918E-15	1.019E-14	µCi/mL	=
AS 20181031-107	FS12 SCA Boundary	IAAP209527	10/31/18	Gross Alpha	1.076E-14	5.169E-15	4.186E-15	µCi/mL	=
				Gross Beta	4.933E-14	1.122E-14	1.019E-14	µCi/mL	=

Negative results are less than the laboratory system's background level.

VQs:

= Indicates that the data met all QA/QC requirements, and that the parameter has been positively identified and the associated concentration value is accurate.

J Indicates that the parameter was positively identified; the associated numerical value is the approximate concentration of the parameter in the sample.

U Indicates that the data met all QA/QC requirements, and that the parameter was analyzed for but was not detected above the reported sample quantitation limit.

UJ Indicates that the parameter was not detected above the reported sample quantitation limit and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. However, the reported quantitation limit is approximate.

ATTACHMENT B-1

CALENDAR YEAR 2018 AIR SAMPLE REPORTS

(On the CD-ROM on the Back Cover of this Report)

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AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/23/2018 Sample ID: 20180515-001 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml]

Location: FS12 Wood Soil Sort Area Radionuclides: DU (Depleted Uranium)

Wearer: NA Sampled By: Stephen Beames

Monitored Workers: NA Activity Performed: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/14/2018	7:00	15:00	480	65.0	65.0
5/15/2018	7:00	15:00	480	65	65
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	65.0

Minimum Air Sample Volume: 3.0E+01 Liters

Sample Volume: 65 (lpm) x 960 (minutes) = 6.2E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		5/23/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	6.2E+04	6.2E+04	6.2E+04
Net count rate (B)	cpm	0.20		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.56		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	4.04E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	4.03E-15		
DAC (or AE) Fraction = (F2)/(I)		0.02%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.80E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.02%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 5-23-18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/23/2018 Sample ID: 20180515-002 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/14/2018	7:00	15:00	480	65.0	65.0
5/15/2018	7:00	15:00	480	65	65
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	65.0

Minimum Air Sample Volume: 1.0E+04 Liters

Sample Volume: 65 (lpm) x 960 (minutes) = 6.2E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		5/23/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	6		
Sample Count Rate	cpm	0.10		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	6.2E+04	6.2E+04	6.2E+04
Net count rate (B)	cpm	0.00		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.00		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	0.00E+00		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	-7.31E-18		
DAC (or AE) Fraction = (F2)/(I)		-0.01%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.80E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		7.99%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres Date: 5-23-18

Reviewed By: _____ Date: _____

AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/29/2018 Sample ID: 20180515-004 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (1) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/16/2018	7:00	15:00	480	60.0	60.0
5/17/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 3.2E+01 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		5/29/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	7		
Sample Count Rate	cpm	0.12		
Background Count Rate	cpm	0.12		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.00		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.00		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.71		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	0.00E+00		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	-7.31E-18		
DAC (or AE) Fraction = (F2)/(I)		0.00%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	5.53E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.03%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 5-29-18

Reviewed By: [signature] Date: 5-29-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/25/2018 Sample ID: 20180517-003 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (1) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/16/2018	7:00	15:00	480	65.0	65.0
5/17/2018	7:00	15:00	480	65	65
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	65.0

Minimum Air Sample Volume: 1.0E+04 Liters

Sample Volume: 65 (lpm) x 960 (minutes) = 6.2E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		5/25/2018		
Count Time (e.g., noon, 1300, etc.)		13:00:00 PM		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	11		
Sample Count Rate	cpm	0.18		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	6.2E+04	6.2E+04	6.2E+04
Net count rate (B)	cpm	0.08		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.23		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	1.68E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	1.68E-15		
DAC (or AE) Fraction = (F2)/(I)		2.79%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.80E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		7.99%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Dan Be Date: 5-25-18

Reviewed By: Siemens S Date: 5-29-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/31/2018 Sample ID: 20180522-005 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/18/2018	7:00	15:00	480	60.0	60.0
5/22/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.0E+04 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		5/31/2018		
Count Time (e.g., noon, 1300, etc.)		13:00:00 PM		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	2		
Sample Count Rate	cpm	0.03		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	-0.07		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	-0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	-1.47E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	-1.47E-15		
DAC (or AE) Fraction = (F2)/(I)		-2.46%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		8.66%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 5-31-18

Reviewed By: [signature] Date: 5-31-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 5/31/2018 Sample ID: 20180522-006 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/18/2018	7:00	15:00	480	60.0	60.0
5/22/2018	7:00	15:00	480	60	60
		Total Time (Te):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 3.0E+01 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		Efficiency (α)
Instrument Type	Meter	Detector	Meter	Detector	0.361
L-2929	158817	164736	12/13/2018	12/13/2018	N/A
N/A	N/A	N/A	N/A	N/A	

Variables, Calculations, Results		Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date			5/31/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	17		
Sample Count Rate		cpm	0.28		
Background Count Rate		cpm	0.10		
Air Volume (liters)	(A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate	(B)	cpm	0.18		
Counter Efficiency	(C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency	(D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D)	(E)	cpm/dpm	0.99	0.36	0.36
Activity (dpm) = (B)/(E)	(F)	dpm	0.36		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	(G)	dpm	0.51		
Concentration = (F)/(2.22E9 x (A))	(H)	µCi/ml	0.66		
Background "Strip" value (F.1) Date Updated: 4/20-4/21		uCi/ml	4.00E-15		
NET Concentration Value = (H) - (F1);	(F2)	uCi/ml	7.31E-18		
DAC (or AE) Fraction = (F2)/(I)			4.00E-15		
MDC = MDA/V = (G)/(A)	(J)	µCi/ml	0.02%		
MDC Fraction of DAC (or AE) = (J)/(I)	(Goal<10%)		5.20E-15		
Final Count?		Yes/No	0.03%		
			Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 5-31-18

Reviewed By: [signature] Date: 5-31-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/5/2018 Sample ID: 20180524-007 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/23/2018	7:00	15:00	480	60.0	60.0
5/24/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.0E+04 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/5/2018		
Count Time (e.g., noon, 1300, etc.)		13:00:00 PM		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.15		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.42		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	3.28E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	3.27E-15		
DAC (or AE) Fraction = (F2)/(I)		5.46%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		8.66%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beams Date: 6-7-18

Reviewed By: Ed Stevens Date: 6-7-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/7/2018 Sample ID: 20180524-008 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/23/2018	7:00	15:00	480	60.0	60.0
5/24/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 2.8E+01 Liters

Sample Volume: 60 (lpm) × 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		5/31/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.08		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.22		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.61		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.62		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	4.75E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	4.74E-15		
DAC (or AE) Fraction = (F2)/(I)		0.02%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.83E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.02%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-7-18

Reviewed By: EJ Siemers Date: 6-7-18

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AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/7/2018 Sample ID: 20180529-009 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (1) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/25/2018	7:00	15:00	480	60.0	60.0
5/29/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 9.3E+03 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		6/7/2018		
Count Time (e.g., noon, 1300, etc.)		13:00:00 PM		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.08		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.25		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.69		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.62		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	5.40E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	5.40E-15		
DAC (or AE) Fraction = (F2)/(I)		9.00%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.83E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		8.05%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Berres Date: 6-7-18

Reviewed By: Ed Siemers Date: 6-7-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/7/2018 Sample ID: 20180529-010 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/25/2018	7:00	15:00	480	60.0	60.0
5/29/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 2.8E+01 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/7/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	21		
Sample Count Rate	cpm	0.35		
Background Count Rate	cpm	0.08		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.27		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.75		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.62		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	5.84E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	5.84E-15		
DAC (or AE) Fraction = (F2)/(I)		0.03%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	4.83E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.02%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-7-18

Reviewed By: Date:

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AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/8/2018 Sample ID: 20180531-011 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/30/2018	7:00	15:00	480	60.0	60.0
5/31/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.0E+04 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/8/2018		
Count Time (e.g., noon, 1300, etc.)		13:00:00 PM		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.18		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.50		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	3.94E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	3.93E-15		
DAC (or AE) Fraction = (F2)/(I)		6.55%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		8.66%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beamon Date: 6-8-18

Reviewed By: Date:

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AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/8/2018 Sample ID: 20180531-012 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
5/30/2018	7:00	15:00	480	60.0	60.0
5/31/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 3.0E+01 Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/8/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	9		
Sample Count Rate	cpm	0.15		
Background Count Rate	cpm	0.10		
Air Volume (liters) (A)	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate (B)	cpm	0.05		
Counter Efficiency (C)	cpm/dpm	0.36	0.36	0.36
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = (B)/(E) (F)	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.66		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	1.09E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	1.09E-15		
DAC (or AE) Fraction = (F2)/(I)		0.01%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.03%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-8-18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/12/2018 Sample ID: 20180601-013 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/1/2018	7:00	15:00	480	60.0	60.0
6/4/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.0E+04** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/12/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	21		
Sample Count Rate	cpm	0.35		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.25		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.70		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.66		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	5.47E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	5.46E-15		
DAC (or AE) Fraction = **(F2)/(I)**		9.11%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		8.66%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beamas Date: 6-12-18

Reviewed By: EJ Stevens Date: 6-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/12/2018 Sample ID: 20180601-014 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/1/2018	7:00	15:00	480	60.0	60.0
6/4/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.0E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		6/12/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	11		
Sample Count Rate	cpm	0.18		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.08		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.22		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.66		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.75E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.74E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	5.20E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.03%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-12-18

Reviewed By: Ed Stevens Date: 6-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/20/2018 Sample ID: 20180608-015 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/5/2018	7:00	15:00	480	60.0	60.0
6/8/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.0E+04** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		6/18/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.56		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.66		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**4.38E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**4.37E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**7.28%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**5.20E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**8.66%**		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 6-20-18

Reviewed By: [signature] Date: 6-20-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/20/2018 Sample ID: 20180608-016 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/5/2018	7:00	15:00	480	60.0	60.0
6/8/2018	7:00	15:00	480	60	60
		Total Time (Te):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.0E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		6/18/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.15		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.42		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.66		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**3.28E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	**3.27E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.02%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**5.20E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.03%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: [signature] Date: 6-20-18

Reviewed By: Ed Siemers [signature] Date: 6-20-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/25/2018 Sample ID: 20180614-017 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/11/2018	7:00	15:00	480	60.0	60.0
6/14/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.8E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = **5.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		6/25/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.01		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.36		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.26		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**2.80E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**2.79E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**4.66%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**2.00E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.34%**		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-25-18

Reviewed By: EE Siemens Date: 6.25.18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/25/2018 Sample ID: 20180614-018 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/11/2018	7:00	15:00	480	60.0	60.0
6/14/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.2E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = **5.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.361
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		6/25/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	10		
Sample Count Rate	cpm	0.17		
Background Count Rate	cpm	0.01		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.16		
Counter Efficiency **(C)**	cpm/dpm	0.36	0.36	0.36
Collection Efficiency **(D)**		0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.36	0.36	0.36
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.45		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.26		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**3.52E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**3.52E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.02%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**2.00E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-25-18

Reviewed By: Ed Siemers Date: 6-25-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/27/2018 Sample ID: 20180619-019 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/18/2018	7:00	15:00	480	60.0	60.0
6/19/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/27/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.03		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	3.59E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	3.52E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.59%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.58E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.31%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 6-27-18

Reviewed By: Ed Siemens Date: 6-27-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 6/27/2018 Sample ID: 20180619-020 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/18/2018	7:00	15:00	480	60.0	60.0
6/19/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		6/27/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	28		
Sample Count Rate	cpm	0.47		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.37		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.51		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	3.98E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	3.97E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.02%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.58E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames 4 8 hr Date: 6-27-18

Reviewed By: Ed Sizemore Date: 6-22-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/9/2018 Sample ID: 20180625-021 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/20/2018	7:00	15:00	480	60.0	60.0
6/25/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/9/2018		
Count Time (e.g., noon, 1300, etc.)		13:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.45E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.44E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		2.40%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.58E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.31%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Reames Date: 7-9-18

Reviewed By: Ed Siemers Date: 7-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/9/2018 Sample ID: 20180625-022 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/20/2018	7:00	15:00	480	60.0	60.0
6/25/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/9/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	13		
Sample Count Rate	cpm	0.22		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.12		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.16		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.27E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	**1.27E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.58E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-9-18

Reviewed By: Ed Clemens Date: 7-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/10/2018 Sample ID: 20180628-023 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/27/2018	7:00	15:00	480	60.0	60.0
6/28/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.3E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/10/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.11		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.16		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.23E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.22E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		2.04%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.78E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.63%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-10-18

Reviewed By: Ed Siemers Date: 7-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/10/2018 Sample ID: 20180628-024 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/27/2018	7:00	15:00	480	60.0	60.0
6/28/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.6E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/9/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	16		
Sample Count Rate	cpm	0.27		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.15		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.21		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.63E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.62E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.78E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-10-18

Reviewed By: Ed Siemers Date: 7-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/16/2018 Sample ID: 20180709-025 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/29/2018	7:00	15:00	480	60.0	60.0
7/9/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.3E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		7/16/2018		
Count Time (e.g., noon, 1300, etc.)		13:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	4		
Sample Count Rate	cpm	0.07		
Background Count Rate	cpm	0.07		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.00		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.00		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.29		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**0.00E+00**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	**-7.31E-18**		
DAC (or AE) Fraction = **(F2)/(I)**		**-0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.25E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**3.75%**		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beares Date: 7-16-18

Reviewed By: Ed Sizemore Date: 7-16-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/16/2018 Sample ID: 20180709-026 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
6/29/2018	7:00	15:00	480	60.0	60.0
7/9/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.3E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/9/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.07		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.23		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.32		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.29		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.50E-15		
Background "Strip" value (F.1) Date Updated: 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	2.50E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.25E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-16-18

Reviewed By: Ed Siemers Date: 7-16-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/19/2018 Sample ID: 20180711-027 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/10/2018	7:00	15:00	480	60.0	60.0
7/11/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **2.4E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			7/18/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	27		
Sample Count Rate		cpm	0.05		
Background Count Rate		cpm	0.01		
Air Volume (liters)	**(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate	**(B)**	cpm	0.03		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.16		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**3.59E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	**3.52E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**			**0.59%**		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	**1.25E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			**2.08%**		
Final Count?		Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beamer Date: 7-19-18

Reviewed By: Ed Siemens Date: 7-19-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/19/2018 Sample ID: 20180711-028 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/10/2018	7:00	15:00	480	60.0	60.0
7/11/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.6E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/18/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	9		
Sample Count Rate	cpm	0.15		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.03		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.04		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**3.26E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	**3.19E-16**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.00%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.78E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-19-18

Reviewed By: Ed Siemers Date: 7-19-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/23/2018 Sample ID: 20180713-029 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
7/12/2018	7:00	15:00	480		60.0	60.0
7/13/2018	7:00	15:00	480		60	60
		Total Time (Tc):	960		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **2.4E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			7/23/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	19		
Sample Count Rate		cpm	0.32		
Background Count Rate		cpm	0.01		
Air Volume (liters)	**(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate	**(B)**	cpm	0.31		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.43		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.16		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**3.35E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	**3.34E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**			**5.57%**		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	**1.25E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			**2.08%**		
Final Count?		Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-23-18

Reviewed By: Ed Sjeenes Date: 7-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/23/2018 Sample ID: 20180713-030 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/12/2018	7:00	15:00	480	60.0	60.0
7/13/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.6E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/23/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.16		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.22		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.74E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	1.73E-15		
DAC (or AE) Fraction = **(F2)/(I)**		0.01%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.78E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-23-18

Reviewed By: Ed Siemens Date: 7-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/25/2018 Sample ID: 20180717-031 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/16/2018	7:00	17:00	600	60.0	60.0
7/17/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.3E+03** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/24/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	21		
Sample Count Rate	cpm	0.35		
Background Count Rate	cpm	0.03		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.32		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.44		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.22		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.76E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	2.75E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		4.59%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.37E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		2.28%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-25-18

Reviewed By: Ed Siemers Date: 7-25-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/25/2018 Sample ID: 20180717-032 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/16/2018	7:00	17:00	600	60.0	60.0
7/17/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **9.9E+00** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/24/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	10		
Sample Count Rate	cpm	0.17		
Background Count Rate	cpm	0.03		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.22		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.17E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	1.16E-15		
DAC (or AE) Fraction = **(F2)/(I)**		0.01%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.37E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-25-18

Reviewed By: Ed Siemers Date: 7-25-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/27/2018 Sample ID: 20180720-033 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/18/2018	7:00	15:00	480	60.0	60.0
7/20/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/27/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.18		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.25		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.96E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.95E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		3.25%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.58E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.31%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beams Date: 7-28-18

Reviewed By: Ed Stevens Date: 7-28-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/27/2018 Sample ID: 20180720-034 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/18/2018	7:00	15:00	480	60.0	60.0
7/20/2018	7:00	15:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		7/27/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.23		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.32		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**2.50E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**2.50E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.01%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**2.58E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-27-18

Reviewed By: EJ Simmons Date: 7-27-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/31/2018 Sample ID: 20180724-035 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/23/2018	7:00	17:00	600	60.0	60.0
7/24/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.3E+03** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			7/31/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	20		
Sample Count Rate		cpm	0.33		
Background Count Rate		cpm	0.12		
Air Volume (liters)	**(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate	**(B)**	cpm	0.21		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.29		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**1.83E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	**1.82E-15**		
DAC (or AE) Fraction = **(F2)/(I)**			**3.03%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	**2.22E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**3.70%**		
Final Count?		Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beamer Date: 7-31-18

Reviewed By: Ed Siemers Date: 8-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/31/2018 Sample ID: 20180724-036 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/23/2018	7:00	17:00	600	60.0	60.0
7/24/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.6E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/31/2018		
Count Time (e.g., noon, 1300, etc.)		15:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	22		
Sample Count Rate	cpm	0.37		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.25		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.35		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**2.18E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**2.17E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.01%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**2.22E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Steve Beames Date: 7-31-18

Reviewed By: Ed Siemers Date: 8-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/6/2018 Sample ID: 20180724-037 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/25/2018	7:30	17:00	570	60.0	60.0
7/26/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/6/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.23		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.32		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.11E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	2.10E-15		
DAC (or AE) Fraction = **(F2)/(I)**		3.50%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.63%		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 8-6-18

Reviewed By: Ed Sizemore / Ed Date: 8-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/6/2018 Sample ID: 20180724-038 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
7/26/2018	7:30	17:00	570		60.0	60.0
7/26/2018	7:30	17:00	570		60	60
		Total Time (Tc):	1140		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			8/6/2018		
Count Time (e.g., noon, 1300, etc.)			15:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	29		
Sample Count Rate		cpm	0.48		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.38		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.53		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	3.48E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	3.47E-15		
DAC (or AE) Fraction = **(F2)/(I)**			0.02%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 8-6-18

Reviewed By: Ed Stevens / S Date: 8-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/6/2018 Sample ID: 20180730-039 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/27/2018	7:00	15:00	480	60.0	60.0
7/26/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1080	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1080 (minutes) = 6.5E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/6/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	13		
Sample Count Rate	cpm	0.22		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.5E+04	6.5E+04	6.5E+04
Net count rate **(B)**	cpm	0.12		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.16		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.12E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.11E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		1.86%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.30E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.83%		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 8-6-18

Reviewed By: Ed Siemers / Date: 8-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/6/2018 Sample ID: 20180730-40 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/27/2018	7:00	15:00	480	60.0	60.0
7/30/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1080	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1080 (minutes) = 6.5E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			7/31/2018		
Count Time (e.g., noon, 1300, etc.)			15:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	14		
Sample Count Rate		cpm	0.23		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.5E+04	6.5E+04	6.5E+04
Net count rate	**(B)**	cpm	0.13		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C) x (D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.18		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.26E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.25E-15		
DAC (or AE) Fraction = **(F2)/(I)**			0.01%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.30E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 8-3-18

Reviewed By: Ed Stevens / E Date: 8-3-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/8/2018 Sample ID: 20180802-041 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/31/2018	7:30	17:00	570	60.0	60.0
8/1/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/8//18		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts (Gross)	counts	21		
Sample Count Rate	cpm	0.35		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.25		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.35		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.29E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	2.28E-15		
DAC (or AE) Fraction = **(F2)/(I)**		3.81%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.63%		
Final Count?	Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 8-8-18

Reviewed By: Ed Siemers / E Date: 8-8-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/8/2008 Sample ID: 20180802-042 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
7/31/2018	7:00	17:00	600	60.0	60.0
8/1/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1170	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1170 (minutes) = 7.0E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results	**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date		7/31/2018		
Count Time (e.g., noon, 1300, etc.)		15:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	23		
Sample Count Rate	cpm	0.38		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	7.0E+04	7.0E+04	7.0E+04
Net count rate **(B)**	cpm	0.28		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.39		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.53E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	2.52E-15		
DAC (or AE) Fraction = **(F2)/(I)**		0.01%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.12E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres/Dave Be Date: 8-8-18

Reviewed By: Ed Stevens /S Date: 8-8-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/10/2018 Sample ID: 20180803-043 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/2/2018	7:30	17:00	570	60.0	60.0
8/3/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/10/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts (Gross)	counts	23		
Sample Count Rate	cpm	0.38		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.30		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.42		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.78E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	2.77E-15		
DAC (or AE) Fraction = **(F2)/(I)**		4.62%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.32%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Ed Siemens / Ed Siemens Date: 8-10-18

Reviewed By: David Berres / David Berres Date: 8-10-18

AIR SAMPLE REPORT

Section I - Collection Data 2018-0803-044

Date: 8/10/2018 Sample ID: ~~2018080803-044~~ 2018-0803-044 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/2/2018	7:30	17:00	570	60.0	60.0
8/3/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.4E+01 Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

		Alpha		
Variables, Calculations, Results	Units	1st Count	2nd Count	3rd Count
Count Date		8/10/2018		
Count Time (e.g., noon, 1300, etc.)		15:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	26		
Sample Count Rate	cpm	0.43		
Background Count Rate	cpm	0.08		
Air Volume (liters) (A)	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate (B)	cpm	0.35		
Counter Efficiency (C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E) (F)	dpm	0.49		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.30		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	3.24E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	3.23E-15		
DAC (or AE) Fraction = (F2)/(I)		0.02%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Ed Siemers / [signature] Date: 8-15-18

Reviewed By: David Berres / [signature] Date: 8-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/13/2018 Sample ID: 20180806-045 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time				Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
8/4/2018	7:30	17:00	570		60.0	60.0
8/6/2018	7:30	17:00	570		60	60
		Total Time (Tc):	1140		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		8/13/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.12		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.17		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.10E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	1.09E-15		
DAC (or AE) Fraction = **(F2)/(I)**		1.82%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		4.03%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Michael Dansard / Michael Dansard Date: 08/13/18

Reviewed By: Ed Siemon / Ed Siemon Date: 8-13-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/13/2018 | Sample ID: ~~8/15/18 201806-040 00~~ 20180806-046 | RWP: 2018-001

Occupational (DAC): ☑ | Limit: 2.00E-11 µCi/ml (I) | Breathing Zone: ☐ | General Area: ☐ | Work Area: ☑

Non-Occupational (EC): ☐ | [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area | Sampled By: Stephen Beames

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2773 | Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/4/2018	7:00	17:00	600	60.0	60.0
8/6/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.7E+01 Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		7/31/2018		
Count Time (e.g., noon, 1300, etc.)		15:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.13		
Air Volume (liters) (A)	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate (B)	cpm	0.10		
Counter Efficiency (C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E) (F)	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.37		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	8.99E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	8.92E-16		
DAC (or AE) Fraction = (F2)/(I)		0.00%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	2.30E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Michael Dansard / Michael Dansard Date: 8-13-18

Reviewed By: Ed Stevens / S Date: 8-13-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/15/2018 Sample ID: 20180808-047 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/7/2018	7:30	17:00	570	60.0	60.0
8/8/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			8/15/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	8		
Sample Count Rate		cpm	0.13		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.05		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.07		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	4.89E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	4.81E-16		
DAC (or AE) Fraction = **(F2)/(I)**			0.80%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			3.32%		
Final Count?		Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 8-15-18

Reviewed By: Ed Stevens / E Date: 8-15-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 7/31/2018 Sample ID: 20180808-048 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/7/2018	7:00	17:00	600	60.0	60.0
8/8/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			7/31/2018		
Count Time (e.g., noon, 1300, etc.)			15:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	14		
Sample Count Rate		cpm	0.23		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate	**(B)**	cpm	0.15		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.21		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.33E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.33E-15		
DAC (or AE) Fraction = **(F2)/(I)**			0.01%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.89E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan Be Date: 8-15-18

Reviewed By: Ed Siemon Date: 8-15-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/23/2018 Sample ID: 20180810-049 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/9/2018	7:30	17:00	570	60.0	60.0
8/10/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.2E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha 1st Count**	**2nd Count**	**3rd Count**
Count Date		8/23/2018		
Count Time (e.g., noon, 1300, etc.)		9:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.03		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.30		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.42		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.21		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.78E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	2.77E-15		
DAC (or AE) Fraction = **(F2)/(I)**		4.62%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.40E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		2.33%		
Final Count?	Yes/No	No	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dwd Be Date: 8-23-18

Reviewed By: Ed Siemers / ES Date: 8-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/23/2018 Sample ID: 20180810-050 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
8/9/2018	7:00	17:00	600		60.0	60.0
8/10/2018	7:00	17:00	600		60	60
		Total Time (Tc):	1200		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **2.4E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		8/23/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	19		
Sample Count Rate	cpm	0.32		
Background Count Rate	cpm	0.30		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.02		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.02		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.52		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.45E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.38E-16		
DAC (or AE) Fraction = **(F2)/(I)**		0.00%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	3.26E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.02%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 8/23/18

Reviewed By: Ed Siemens / E Date: 8-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/23/2018 Sample ID: 20180814-053 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/13/2018	7:30	17:00	570	60.0	60.0
8/14/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.2E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			8/23/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	4		
Sample Count Rate		cpm	0.07		
Background Count Rate		cpm	0.03		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.04		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.21		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**3.36E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	**3.29E-16**		
DAC (or AE) Fraction = **(F2)/(I)**			**0.55%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	**1.40E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**2.33%**		
Final Count?		Yes/No	**No**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 8-23-18

Reviewed By: Ed Siemers / E Date: 8-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/23/2018 Sample ID: 20180814-054 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Stephen Beames

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/13/2018	7:00	17:00	600	60.0	60.0
8/14/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **2.4E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

		Alpha		
Variables, Calculations, Results	**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date		8/23/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	21		
Sample Count Rate	cpm	0.35		
Background Count Rate	cpm	0.30		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.05		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.07		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.52		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**4.35E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**4.28E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.00%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**3.26E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**0.02%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 8/23/18

Reviewed By: Ed Siemers /S Date: 8-23-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/27/2018 | Sample ID: 20180816-051 | RWP: 2018-001

Occupational (DAC): ☐ | Limit: 6.00E-14 µCi/ml (I) | Breathing Zone: ☐ | General Area: ☑ | Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: DU (Depleted Uranium)

Location: FS12 SCA Boundary | Sampled By: David Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2591 | Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/15/2018	7:30	17:00	570	60.0	60.0
8/16/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 5.5E+03 Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/28/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	5		
Sample Count Rate	cpm	0.08		
Background Count Rate	cpm	0.13		
Air Volume (liters) (A)	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate (B)	cpm	-0.05		
Counter Efficiency (C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E) (F)	dpm	-0.06		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.37		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	-4.28E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	-4.35E-16		
DAC (or AE) Fraction = (F2)/(I)		-0.72%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		4.03%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 8-28-18

Reviewed By: Ed Stamus / Ed Stamus Date: 8-28-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 8/28/2018 Sample ID: 20180816-052 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/15/2018	7:00	17:00	600	60.0	60.0
8/16/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.7E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		8/28/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.77E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.76E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.30E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 8-28-18

Reviewed By: Ed Sievers /S Date: 8-28-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/5/2018 Sample ID: 20180823-055 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/21/2018	7:30	17:00	570	60.0	60.0
8/22/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/4/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	16	P	
Sample Count Rate		cpm	0.27		
Background Count Rate		cpm	0.13		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.14		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.25E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.24E-15		
DAC (or AE) Fraction = **(F2)/(I)**			2.07%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			4.03%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 9-4-18

Reviewed By: Ed Siemers /S Date: 9-5-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/5/2018 Sample ID: 20180823-056 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/21/2018	7:00	17:00	600	60.0	60.0
8/22/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.7E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/4/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	16		
Sample Count Rate		cpm	0.27		
Background Count Rate		cpm	0.13		
Air Volume (liters)	**(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate	**(B)**	cpm	0.14		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**1.19E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	**1.18E-15**		
DAC (or AE) Fraction = **(F2)/(I)**			**0.01%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	**2.30E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**0.01%**		
Final Count?		Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Berres Date: 9/4/18

Reviewed By: Ed Siemers / Ed Siemers Date: 9-5-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/11/2018 Sample ID: 20180827-057 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/23/2018	7:30	17:00	570	60.0	60.0
8/27/2018	7:30	15:30	480	60	60
		Total Time (Te):	1050	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1050 (minutes) = 6.3E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/11/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	16		
Sample Count Rate	cpm	0.27		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.3E+04	6.3E+04	6.3E+04
Net count rate **(B)**	cpm	0.19		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	1.85E-15		
DAC (or AE) Fraction = **(F2)/(I)**		3.08%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.16E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.61%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dand Be Date: 9-11-18

Reviewed By: Ed Siemons /E Date: 9-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/11/2018 Sample ID: 20180827-058 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
8/23/2018	7:30	17:00	570		60.0	60.0
8/27/2018	7:30	15:30	480		60	60
		Total Time (Tc):	1050		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1050 (minutes) = 6.3E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/11/2018		
Count Time (e.g., noon, 1300, etc.)			15:00		
Sample Count Time (Ts, Tb) = T		minutes	60	P	
Total Counts		counts	8		
Sample Count Rate		cpm	0.13	#VALUE!	
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	6.3E+04	6.3E+04	6.3E+04
Net count rate	**(B)**	cpm	0.05		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.07		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.30	#VALUE!	
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	5.31E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	5.23E-16		
DAC (or AE) Fraction = **(F2)/(I)**			0.00%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.16E-15	#VALUE!	
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%	#VALUE!	
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 9-11-18

Reviewed By: Ed Siemers / Date: 9-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/11/2018 Sample ID: 20180903-059 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/28/2018	11:00	17:00	360	60.0	60.0
8/29/2018	7:30	17:30	600	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/11/2018		
Count Time (e.g., noon, 1300, etc.)			9:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	10		
Sample Count Rate		cpm	0.17		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate	**(B)**	cpm	0.09		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.12		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	9.43E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	9.36E-16		
DAC (or AE) Fraction = **(F2)/(I)**			1.56%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.37E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			3.95%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 9-11-18

Reviewed By: Ed Siemos / E Date: 9-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/11/2018 Sample ID: 20180903-060 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/28/2018	11:00	17:00	360	60.0	60.0
9/29/2018	7:00	17:30	630	60	60
		Total Time (Tc):	990	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 990 (minutes) = 5.9E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		9/11/2018		
Count Time (e.g., noon, 1300, etc.)		11:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	12		
Sample Count Rate	cpm	0.20		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	5.9E+04	5.9E+04	5.9E+04
Net count rate **(B)**	cpm	0.12		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.17		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.27E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.26E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.30E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 9-11-18

Reviewed By: Ed Stamps / Date: 9-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/20/2018 Sample ID: 20180911-061 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/5/2018	7:30	17:00	570	60.0	60.0
9/11/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/20/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	16		
Sample Count Rate		cpm	0.27		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.19		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.71E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	1.70E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**			2.84%		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			3.32%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan Berres Date: 9-20-18

Reviewed By: Ed Siemers / S Date: 9-20-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/20/2018 Sample ID: 20180911-062 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/5/2018	7:00	17:00	600	60.0	60.0
9/11/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/20/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	25		
Sample Count Rate	cpm	0.42		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.34		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.47		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**2.93E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	**2.92E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**1.89E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 9-20-18

Reviewed By: Ed Siemers / [signature] Date: 9-20-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/22/2018 Sample ID: 20180914-063 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: Mike Dansard

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-i Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/13/2018	7:30	18:00	630	60.0	60.0
8/16/2018	7:30	15:00	450	60	60
		Total Time (Tc):	1080	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1080 (minutes) = 6.5E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/22/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	10		
Sample Count Rate	cpm	0.17		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.5E+04	6.5E+04	6.5E+04
Net count rate **(B)**	cpm	0.09		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.12		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	8.38E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	8.31E-16		
DAC (or AE) Fraction = **(F2)/(I)**		1.38%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.10E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.51%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Michael Dansard / Michael Dansard Date: 09-22-18

Reviewed By: Ed Siemers / ES Date: 9-22-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/22/2018 Sample ID: 20180914-064 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml (I) Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Wood Soil Sort Area Sampled By: Mike Dansard

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/15/2018	7:00	18:00	660	60.0	60.0
8/16/2018	7:00	15:00	480	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 1.4E+01 Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/22/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.08		
Air Volume (liters) (A)	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate (B)	cpm	0.25		
Counter Efficiency (C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E) (F)	dpm	0.35		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.30		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	2.32E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1); (F2)	uCi/ml	2.31E-15		
DAC (or AE) Fraction = (F2)/(I)		0.01%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Michael Dansard / Michael Dansard Date: 09-22-18

Reviewed By: Ed Siemers / S Date: 9-22-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/22/2018 Sample ID: 20180914-065 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Block House (Boundry) Sampled By: Mike Dansard

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
8/15/2018	7:30	18:00	630	60.0	60.0
8/16/2018	7:30	15:00	450	60	60
		Total Time (Tc):	1080	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 4.5E+03 Liters

Sample Volume: 60 (lpm) x 1080 (minutes) = 6.5E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		Units	1st Count	2nd Count	3rd Count
Count Date			9/22/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	13		
Sample Count Rate		cpm	0.22		
Background Count Rate		cpm	0.08		
Air Volume (liters)	(A)	liters	6.5E+04	6.5E+04	6.5E+04
Net count rate	(B)	cpm	0.14		
Counter Efficiency	(C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	(D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D)	(E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E)	(F)	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	(G)	dpm	0.30		
Concentration = (F)/(2.22E9 x (A))	(H)	µCi/ml	1.32E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1);	(F2)	uCi/ml	1.31E-15		
DAC (or AE) Fraction = (F2)/(I)			2.19%		
MDC = MDA/V = (G)/(A)	(J)	µCi/ml	2.10E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)			3.51%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Michael Dansard / Michael Dansard Date: 09-22-18

Reviewed By: Ed Stevens / Ed Stevens Date: 9-22-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/28/2018 Sample ID: 20180920-066 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/17/2018	7:30	17:00	570	60.0	60.0
9/20/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			9/28/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	15		
Sample Count Rate		cpm	0.25		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.17		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.24		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.56E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.55E-15		
DAC (or AE) Fraction = **(F2)/(I)**			2.58%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			3.32%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 9-28-18

Reviewed By: ES / Skemer / S Date: 10-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/28/2018 Sample ID: 20180920-067 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/17/2018	7:00	17:00	600	60.0	60.0
9/20/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1200	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = 7.2E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/28/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.25		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.35		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.21E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	2.20E-15		
DAC (or AE) Fraction = **(F2)/(I)**		0.01%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.89E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: Dave Be / David Berres Date: 9-28-18

Reviewed By: Ed Stevens / S Date: 10-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 9/28/2018 Sample ID: 20180920-068 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/17/2018	7:30	17:00	570	60.0	60.0
9/20/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		9/28/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	7		
Sample Count Rate	cpm	0.12		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.04		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**3.36E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	**3.29E-16**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.55%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**1.99E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**3.32%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 9-28-18

Reviewed By: Ed Siemers / E Date: 10-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/4/2018 | Sample ID: 20180922-072 | RWP: 2018-001

Occupational (DAC): ☐ | Limit: 6.00E-14 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☑ | Work Area: ☐

Non-Occupational (EC): ☑ | [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary | Sampled By: David Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2591 | Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/22/2018	7:30	17:00	570	60.0	60.0
9/22/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1170	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.3E+03** Liters

Sample Volume: 60 (lpm) x 1170 (minutes) = 7.0E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/4/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.07		
Air Volume (liters) **(A)**	liters	7.0E+04	7.0E+04	7.0E+04
Net count rate **(B)**	cpm	0.06		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.09		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.29		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**5.65E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**5.58E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.93%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**1.85E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.08%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dand Ber Date: 10-4-18

Reviewed By: Ed Sieman / E Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/4/2018 Sample ID: 20180922-073 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/21/2018	7:30	17:00	570	60.0	60.0
9/22/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.3E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/4/2018		
Count Time (e.g., noon, 1300, etc.)			10:45		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	10		
Sample Count Rate		cpm	0.17		
Background Count Rate		cpm	0.07		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.10		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.13		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.29		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**8.86E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	**8.78E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**			**0.00%**		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	**1.89E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			**0.01%**		
Final Count?		Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 10-4-18

Reviewed By: Ed Siemers /E Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/4/2018 Sample ID: 20180922-074 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/21/2018	7:30	17:00	570	60.0	60.0
9/22/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.3E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		10/4/2018		
Count Time (e.g., noon, 1300, etc.)		9:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.07		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.16		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.23		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.29		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.50E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**1.49E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**2.48%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**1.89E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.16%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / DavBe Date: 10-4-18

Reviewed By: Ed Siemens / ES Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/9/2018 | Sample ID: 20180925-075 | RWP: 2018-001

Occupational (DAC): ☐ | Limit: 6.00E-14 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☑ | Work Area: ☐

Non-Occupational (EC): ☑ | [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) | Sampled By: David Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 3666 | Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/24/2018	7:30	17:00	570	60.0	60.0
9/25/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/9/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.86E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		3.09%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.32%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan B — Date: 10-9-18

Reviewed By: Ed Siemers / ES — Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/9/2018 Sample ID: 20180925-076 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/24/2018	7:30	17:00	570	60.0	60.0
9/25/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1170	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1170 (minutes) = **7.0E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		10/9/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	7.0E+04	7.0E+04	7.0E+04
Net count rate **(B)**	cpm	0.15		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.21		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.37E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**1.36E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**2.27%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**1.94E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.24%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 10-9-18

Reviewed By: Ed Sievers / ES Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/9/2018 Sample ID: 20180925-077 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/24/2018	7:30	17:00	570	60.0	60.0
9/25/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/9/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.86E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**1.86E-15**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.01%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**1.99E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Berres Date: 10-9-18

Reviewed By: Ed Siemers / ES Date: 10-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/2/2018 Sample ID: 20180927-069 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/26/2018	7:30	17:00	570	60.0	60.0
9/27/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1170	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1170 (minutes) = 7.0E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha** 1st Count	2nd Count	3rd Count
Count Date		10/1/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	12		
Sample Count Rate	cpm	0.20		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	7.0E+04	7.0E+04	7.0E+04
Net count rate **(B)**	cpm	0.10		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	8.93E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	8.85E-16		
DAC (or AE) Fraction = **(F2)/(I)**		1.48%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.12E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.53%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dav Bee Date: 10-2-18

Reviewed By: Ed Siemers / S Date: 10-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/2/2018 Sample ID: 20180927-070 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
9/26/2018	7:00	17:00	600		60.0	60.0
9/27/2018	7:00	17:00	600		60	60
		Total Time (Tc):	1200		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1200 (minutes) = **7.2E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha** 1st Count	2nd Count	3rd Count
Count Date		10/1/2018		
Count Time (e.g., noon, 1300, etc.)		12:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	7.2E+04	7.2E+04	7.2E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.74E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	**1.73E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.07E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 10-2-18

Reviewed By: Ed Siemers / Date: 10-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/2/2018 Sample ID: 20180927-071 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/26/2018	7:30	17:00	570	60.0	60.0
9/27/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/2/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	12		
Sample Count Rate		cpm	0.20		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.10		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**9.16E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	**9.09E-16**		
DAC (or AE) Fraction = **(F2)/(I)**			**1.51%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	**2.18E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**3.63%**		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 10-2-18

Reviewed By: Ed Siemers / ES Date: 10-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/10/2018 Sample ID: 20181001-078 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/28/2018	7:30	17:00	570	60.0	60.0
10/10/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		10/10/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	1.86E-15		
DAC (or AE) Fraction = **(F2)/(I)**		3.09%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.32%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Ber Date: 10-10-18

Reviewed By: Ed Stevens / ES Date: 10-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/10/2018 Sample ID: 20181001~~078~~ 079 minutes RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/28/2018	7:30	17:00	570	60.0	60.0
10/1/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/10/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	9		
Sample Count Rate		cpm	0.15		
Background Count Rate		cpm	0.08		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.07		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.10		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	6.41E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	6.34E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**			0.00%		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres/David Be Date: 10-10-18

Reviewed By: Ed Siemers /E Date: 10-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/10/2018 Sample ID: 20181001-080 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(1)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
9/28/2018	7:30	17:00	570	60.0	60.0
10/1/2018	7:00	17:00	600	60	60
		Total Time (Tc):	1170	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1170 (minutes) = 7.0E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/10/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	10		
Sample Count Rate	cpm	0.17		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	7.0E+04	7.0E+04	7.0E+04
Net count rate **(B)**	cpm	0.09		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.12		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	7.74E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	7.66E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**		1.28%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.94E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.24%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dav Be Date: 10-10-18

Reviewed By: Ed Sievers / Date: 10-10-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/11/2018 Sample ID: 20131003-081 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/2/2018	7:30	17:00	570	60.0	60.0
10/3/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.3E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/11/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	12		
Sample Count Rate		cpm	0.20		
Background Count Rate		cpm	0.12		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.08		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.11		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	**7.33E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	**7.26E-16**		
DAC (or AE) Fraction = **(F2)/(I)**			**1.21%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	**2.34E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**3.90%**		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres/Dand Be Date: 10-11-18

Reviewed By: Ed Stevens/S Date: 10-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/11/2018 Sample ID: 20181003-082 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/2/2018	7:30	17:00	570	60.0	60.0
10/3/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.6E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		10/11/2018		
Count Time (e.g., noon, 1300, etc.)		14:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.18		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.19E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	**1.18E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.34E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /David Ber Date: 10-11-18

Reviewed By: Ed Siemers /ES Date: 10-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/11/2018 Sample ID: 20181003-083 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/2/2018	7:30	17:00	570	60.0	60.0
10/3/2018	7:30	17:00	570	60	60
		Total Time (Te):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.3E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/11/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.12		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.18		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.36		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**1.19E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	**1.18E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**1.97%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**2.34E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**3.90%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 10-11-18

Reviewed By: Ed Siemers / ES Date: 10-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/17/2018 Sample ID: 20181010-084 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/4/2018	7:30	17:00	570	60.0	60.0
10/10/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.2E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/17/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	13		
Sample Count Rate		cpm	0.22		
Background Count Rate		cpm	0.03		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.19		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.21		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.71E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.70E-15		
DAC (or AE) Fraction = **(F2)/(I)**			2.84%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.40E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			2.33%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres/David Be Date: 10-17-18

Reviewed By: Ed Siemens/ES Date: 10-18-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/17/2018 Sample ID: 20181010-085 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/4/2018	7:30	17:00	570	60.0	60.0
10/10/2018	7:30	17:00	570	60	60
		Total Time (Te):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **9.6E+00** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/17/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	19		
Sample Count Rate		cpm	0.32		
Background Count Rate		cpm	0.03		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.29		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.40		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.21		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	2.63E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	2.62E-15		
DAC (or AE) Fraction = **(F2)/(I)**			0.01%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.40E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Ber Date: 10-17-18

Reviewed By: Ed Siemers /S Date: 10-18-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/17/2018 Sample ID: 20181010-086 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml (I) Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: DU (Depleted Uranium)

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No: NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No: 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/4/2018	7:30	17:00	570	60.0	60.0
10/10/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: 3.2E+03 Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters (A)

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		10/17/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.03		
Air Volume (liters) (A)	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate (B)	cpm	0.22		
Counter Efficiency (C)	cpm/dpm	0.73	0.73	0.73
Collection Efficiency (D)	0.99	0.99	0.99	0.99
Efficiency = (C) x (D) (E)	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = (B)/(E) (F)	dpm	0.31		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) (G)	dpm	0.21		
Concentration = (F)/(2.22E9 x (A)) (H)	µCi/ml	2.02E-15		
Background "Strip" value (F1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = (H) - (F1): (F2)	uCi/ml	2.01E-15		
DAC (or AE) Fraction = (F2)/(I)		3.35%		
MDC = MDA/V = (G)/(A) (J)	µCi/ml	1.40E-15		
MDC Fraction of DAC (or AE) = (J)/(I) (Goal<10%)		2.33%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 3-27-19

Reviewed By: Ed Siemers / ES Date: 3-27-19

correction made on form

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/14/2018 Sample ID: 20181012-087 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/11/2018	7:30	17:00	570	60.0	60.0
10/12/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	2nd Count	3rd Count
Count Date		~~10/12/2018~~ 10/14/18		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	16		
Sample Count Rate	cpm	0.27		
Background Count Rate	cpm	0.05		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.22		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.30		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.25		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.99E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.98E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		3.30%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.67E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		2.79%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan Be Date: 10.14.18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/14/2018 Sample ID: 20181012-088 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/11/2018	7:30	17:00	570	60.0	60.0
10/12/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.1E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/14/2018		
Count Time (e.g., noon, 1300, etc.)			14:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	19		
Sample Count Rate		cpm	0.32		
Background Count Rate		cpm	0.05		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.27		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.37		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.25		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	2.44E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	2.44E-15		
DAC (or AE) Fraction = **(F2)/(I)**			0.01%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.67E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 10-14-18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/23/2018 Sample ID: 20181014-089 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/13/2018	7:30	17:00	570	60.0	60.0
10/14/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/23/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	25		
Sample Count Rate	cpm	0.42		
Background Count Rate	cpm	0.15		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.27		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.37		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.44E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	2.44E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		4.06%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.56E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.27%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 10-23-18

Reviewed By: Ed Siemers / S Date: 10-24-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/23/2018 Sample ID: 20181014-090 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/13/2018	7:30	17:00	570	60.0	60.0
10/14/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.8E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results	**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date		~~10/13/2018~~ 10/23/18 JD		
Count Time (e.g., noon, 1300, etc.)		~~16:00~~		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.15		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.13		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**		0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.19		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.22E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**: **(F2)**	uCi/ml	1.21E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.56E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 10-23-18

Reviewed By: Ed Siemers / ES Date: 10-24-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/23/2018 Sample ID: 20181014-091 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/13/2018	7:30	17:00	570	60.0	60.0
10/14/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/23/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.15		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	p		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	#VALUE!		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	#VALUE!		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	#VALUE!		
DAC (or AE) Fraction = **(F2)/(I)**		#VALUE!		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.56E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		4.27%		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 10-23-18

Reviewed By: Ed Siemers / Date: 10-24-18

AIR SAMPLE REPORT

Section I - Collection Data

11/1/18

Date: 11/1/2018 Sample ID: 20181014-0905099 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/22/2018	7:30	17:00	570	60.0	60.0
10/23/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.7E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha 1st Count**	**2nd Count**	**3rd Count**
Count Date		10/31/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	10		
Sample Count Rate	cpm	0.17		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.04		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	3.36E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	3.29E-16		
DAC (or AE) Fraction = **(F2)/(I)**		0.00%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Ber Date: 10-31-18

Reviewed By: Ed Stevens / S Date: 11-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/29/2018 Sample ID: 20181017-092 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/16/2017	7:30	17:00	570	60.0	60.0
10/17/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			~~10/19/2018~~ 10/29/18 JB		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	17		
Sample Count Rate		cpm	0.28		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.18		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.68E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.67E-15		
DAC (or AE) Fraction = **(F2)/(I)**			2.79%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			3.63%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 10-29-18

Reviewed By: EJ Stevens / ES Date: 10/30/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/29/2018 Sample ID: 10181017-093 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/16/2018	7:30	17:00	570	60.0	60.0
10/17/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/29/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	13		
Sample Count Rate	cpm	0.22		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.12		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.16		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.07E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.06E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan Be Date: 10-29-18

Reviewed By: Ed Stamets / S Date: 10/30/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/29/2018 Sample ID: 20181017-094 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/16/2017	7:30	17:00	570	60.0	60.0
10/17/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/29/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	7		
Sample Count Rate		cpm	0.12		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.02		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.02		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.53E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.45E-16		
DAC (or AE) Fraction = **(F2)/(I)**			0.24%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			3.63%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 10-29-18

Reviewed By: _____ Date: _____

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/30/2018 Sample ID: 20181019-095 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/18/2018	7:30	17:00	570	60.0	60.0
10/19/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

		Alpha		
Variables, Calculations, Results	**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date		10/30/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	11		
Sample Count Rate	cpm	0.18		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.05		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.07		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	4.89E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	4.81E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.80%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.03%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 10-30-18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/30/2018 Sample ID: 20181019-096 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/18/2018	7:30	17:00	570	60.0	60.0
10/19/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.7E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/30/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	13		
Sample Count Rate	cpm	0.22		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.09		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.12		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	7.94E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	7.87E-16		
DAC (or AE) Fraction = **(F2)/(I)**		0.00%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 10-30-18

Reviewed By: Date:

AIR SAMPLE REPORT

Section I - Collection Data

Date: 10/30/2018 Sample ID: 20181019-097 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/18/2018	7:30	17:00	570	60.0	60.0
10/19/2018	7:30	17:00	570	60	60
		Total Time (Te):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		10/30/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	12		
Sample Count Rate	cpm	0.20		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.07		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.10		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	6.41E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	6.34E-16		
DAC (or AE) Fraction = **(F2)/(I)**		1.06%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		4.03%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 10-30-18

Reviewed By: _____ Date: _____

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/1/2018 | Sample ID: 20181023-098 | RWP: 2018-001

Occupational (DAC): ☐ | Limit: 6.00E-14 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☑ | Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary | Sampled By: David Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2591 | Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/22/2018	7:30	17:00	570	60.0	60.0
10/23/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/31/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	20		
Sample Count Rate		cpm	0.33		
Background Count Rate		cpm	0.13		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.20		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.86E-15		
DAC (or AE) Fraction = **(F2)/(I)**			3.09%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			4.03%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 10-31-18

Reviewed By: Ed Sicmon /E Date: 11-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/1/2018 Sample ID: 20181023-100 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/13/2018	7:30	17:00	570	60.0	60.0
10/14/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			10/31/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	20		
Sample Count Rate		cpm	0.33		
Background Count Rate		cpm	0.13		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.20		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.86E-15		
DAC (or AE) Fraction = **(F2)/(I)**			3.09%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			4.03%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 10-31-18

Reviewed By: Ed Stevens /S Date: 11-1-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/1/2018 Sample ID: 20181025-101 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/24/2018	7:30	17:00	570	60.0	60.0
10/25/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/1/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	23		
Sample Count Rate	cpm	0.38		
Background Count Rate	cpm	0.05		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.33		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.46		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.25		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	3.05E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	3.05E-15		
DAC (or AE) Fraction = **(F2)/(I)**		5.08%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.67E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		2.79%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dav Be Date: 11-1-18

Reviewed By: Ed Siemers / S Date: 11-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/1/2018 | Sample ID: 20181025-102 | RWP: 2018-001

Occupational (DAC): ☑ | Limit: 2.00E-11 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☐ | Work Area: ☑

Non-Occupational (EC): ☐ | [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area | Sampled By: Dave Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2773 | Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/24/2018	7:30	17:00	570	60.0	60.0
10/25/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.1E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		11/1/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	18		
Sample Count Rate	cpm	0.30		
Background Count Rate	cpm	0.05		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.25		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.35		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.25		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.29E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	2.28E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.01%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.67E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Berres Date: 11-1-18

Reviewed By: Ed Siemers / ES Date: 11-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/1/2018 Sample ID: 20181025-103 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Block House (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/24/2025	7:30	17:00	570	60.0	60.0
10/25/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **3.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			11/1/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	20		
Sample Count Rate		cpm	0.33		
Background Count Rate		cpm	0.05		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.28		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.39		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.25		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	2.60E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	2.59E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**			4.31%		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	1.67E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			2.79%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dwd Ber Date: 11-1-2018

Reviewed By: Ed Siemers /S Date: 11-2-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/6/2018 Sample ID: 20181029-104 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/26/2018	7:30	17:00	570	60.0	60.0
10/29/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/5/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.06		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.07		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.10		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	6.72E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	6.65E-16		
DAC (or AE) Fraction = **(F2)/(I)**		1.11%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.79E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		2.98%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /David Berres Date: 11-6-18

Reviewed By: Ed Spencer /ES Date: 11-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/6/2018 Sample ID: 20181029-105 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/26/2018	7:30	17:00	570	60.0	60.0
10/29/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.2E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			11/5/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	8		
Sample Count Rate		cpm	0.13		
Background Count Rate		cpm	0.06		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.07		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.10		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	6.72E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	6.65E-16		
DAC (or AE) Fraction = **(F2)/(I)**			0.00%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.79E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			0.01%		
Final Count?		Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 11-5-18

Reviewed By: Ed Siemers / Ed Siemers Date: 11-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/6/2018 Sample ID: 20181029-106 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/26/2018	7:30	17:00	570	60.0	60.0
10/29/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			11/5/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	14		
Sample Count Rate		cpm	0.23		
Background Count Rate		cpm	0.06		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.17		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.24		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.59E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	1.58E-15		
DAC (or AE) Fraction = **(F2)/(I)**			2.63%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	1.79E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			2.98%		
Final Count?		Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 11-5-18

Reviewed By: Ed Stamos / S Date: 11-6-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/9/2018 Sample ID: 20181031-107 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/30/2018	7:30	17:00	570	60.0	60.0
10/31/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/9/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	I4		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.15		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.21		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.40E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.40E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		2.33%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.32%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave B Date: 11-9-18

Reviewed By: Ed Siemers / ES Date: 11-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/9/2018 Sample ID: 20181031-108 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/30/2018	7:30	17:00	570	60.0	60.0
10/31/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/9/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.05		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.07		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	4.89E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	4.81E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.00%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 11-9-18

Reviewed By: Ed Siemaszko / ES Date: 11-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/9/2018 Sample ID: 20181031-109 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
10/30/2018	7:30	17:00	570	60.0	60.0
10/31/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha 1st Count**	**2nd Count**	**3rd Count**
Count Date		11/9/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.20		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.28		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.86E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.86E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		3.09%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.32%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres /Dave Be Date: 11-9-18

Reviewed By: Ed Siemaszko /E Date: 11-9-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/12/2018 | Sample ID: 20181105-110 | RWP: 2018-001

Occupational (DAC): ☑ | Limit: 2.00E-11 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☐ | Work Area: ☑

Non-Occupational (EC): ☐ | [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area | Sampled By: Dave Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2773 | Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/1/2018	7:30	17:00	570	60.0	60.0
11/5/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.8E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/12/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	8		
Sample Count Rate	cpm	0.13		
Background Count Rate	cpm	0.15		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	-0.02		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	-0.02		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	-1.53E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	-1.60E-16		
DAC (or AE) Fraction = **(F2)/(I)**		0.00%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.56E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 11-12-18

Reviewed By: Ed Siemers / S Date: 11-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 11/12/2018 Sample ID: 20181105-111 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/1/2018	7:30	17:00	570	60.0	60.0
11/5/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.8E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			11/12/2018		
Count Time (e.g., noon, 1300, etc.)			12:30		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	10		
Sample Count Rate		cpm	0.17		
Background Count Rate		cpm	0.15		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.02		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.02		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T)	**(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	1.53E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	1.45E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**			0.24%		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	2.56E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			4.27%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 11-12-18

Reviewed By: Ed Siemers / ES Date: 11-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 Sample ID: 20181109-112 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
11/8/2018	7:30	17:00	570		60.0	60.0
11/9/2018	7:30	17:00	570		60	60
		Total Time (Tc):	1140		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha 1st Count**	**2nd Count**	**3rd Count**
Count Date		11/30/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	19		
Sample Count Rate	cpm	0.32		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.24		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.33		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**2.17E-15**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	**2.16E-15**		
DAC (or AE) Fraction = **(F2)/(I)**		**0.01%**		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	**1.99E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		**0.01%**		
Final Count?	Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 11/30/18

Reviewed By: Ed Siemers / ES Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 | Sample ID: 20181109-113 | RWP: 2018-001

Occupational (DAC): ☐ | Limit: 6.00E-14 µCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☑ | Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml]

Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) | Sampled By: David Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 3666 | Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/8/2018	7:30	17:00	570	60.0	60.0
11/9/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/30/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	7		
Sample Count Rate	cpm	0.12		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.04		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.05		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**3.36E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**3.29E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**0.55%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**1.99E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.32%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dand Be Date: 11/30/18

Reviewed By: Ed Siemers / S Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 Sample ID: 20181113-114 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/12/2018	7:30	17:00	570	60.0	60.0
11/13/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.4E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/30/2018		
Count Time (e.g., noon, 1300, etc.)		10:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.08		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.15		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.21		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.30		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.40E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	1.40E-15		
DAC (or AE) Fraction = **(F2)/(I)**		0.01%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	1.99E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		0.01%		
Final Count?	Yes/No	Yes		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 11/30/18

Reviewed By: Ed Siemens / ES Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 Sample ID: 20181113~~-115~~ 116 12/3/18 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/12/2018	7:30	17:00	570	60.0	60.0
11/13/2018	7:30	17:00	570	60	60
		Total Time (Te):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		11/30/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	20		
Sample Count Rate	cpm	0.33		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.23		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.32		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	2.14E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	2.13E-15		
DAC (or AE) Fraction = **(F2)/(I)**		3.55%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.63%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 11/30/18

Reviewed By: Ed Siemers / E Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 Sample ID: 20181115-115 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/14/2018	7:30	17:00	570	60.0	60.0
11/15/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

		Alpha		
Variables, Calculations, Results	**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date		12/3/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	11		
Sample Count Rate	cpm	0.18		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.08		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.12		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	**7.64E-16**		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	**7.56E-16**		
DAC (or AE) Fraction = **(F2)**/**(I)**		**1.26%**		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	**2.18E-15**		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		**3.63%**		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dan Be Date: 12/3/18

Reviewed By: Ed Siemos / S Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/3/2018 | Sample ID: 20181115-117 | RWP: 2018-001

Occupational (DAC): ☑ | Limit: 2.00E-11 μCi/ml **(I)** | Breathing Zone: ☐ | General Area: ☐ | Work Area: ☑

Non-Occupational (EC): ☐ | [DAC = 2.0E-11μCi/ml (U-238), EC= 6.0E-14μCi/ml] | Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area | Sampled By: Dave Berres

Wearer: NA | Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA | Serial No. NA | Calibration Due Date: NA

Air Pump Model: LV-1 | Serial No. 2773 | Calibration Due Date: 3/27/2019

Sample Information	Time				**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
11/14/2018	7:30	17:00	570		60.0	60.0
11/15/2018	7:30	17:00	570		60	60
		Total Time (Tc):	1140		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.5E+01** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results		**Units**	**Alpha** 1st Count	2nd Count	3rd Count
Count Date			12/3/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	6		
Sample Count Rate		cpm	0.10		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate	**(B)**	cpm	0.00		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.00		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	μCi/ml	**0.00E+00**		
Background "Strip" value (F.1) Date Updated	4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	**-7.31E-18**		
DAC (or AE) Fraction = **(F2)/(I)**			**0.00%**		
MDC = MDA/V = **(G)/(A)**	**(J)**	μCi/ml	**2.18E-15**		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			**0.01%**		
Final Count?		Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be[signature] Date: 12/3/18

Reviewed By: Ed Sieanus / S[signature] Date: 12-4-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/10/2018 Sample ID: 20181116-118 RWP: 2018-001

Occupational (DAC): ☑ Limit: 2.00E-11 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☐ Work Area: ☑

Non-Occupational (EC): ☐ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 Wood Soil Sort Area Sampled By: Dave Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2773 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/16/2018	7:30	17:00	570	60.0	60.0
11/16/2018	7:30	7:31	1	60	60
		Total Time (Tc):	571	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **1.2E+01** Liters

Sample Volume: 60 (lpm) x 571 (minutes) = 3.4E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	12/13/2018	12/13/2018	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			12/10/2018		
Count Time (e.g., noon, 1300, etc.)			10:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	16		
Sample Count Rate		cpm	0.27		
Background Count Rate		cpm	0.06		
Air Volume (liters)	**(A)**	liters	3.4E+04	3.4E+04	3.4E+04
Net count rate	**(B)**	cpm	0.21		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)**	**(F)**	dpm	0.29		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	3.78E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**;	**(F2)**	uCi/ml	3.77E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**			0.02%		
MDC = MDA/V = **(G)**/**(A)**	**(J)**	µCi/ml	3.57E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)			0.02%		
Final Count?		Yes/No	**Yes**		

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 12-10-18

Reviewed By: Ed Siemon / [signature] Date: 12-12-18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/10/2018 Sample ID: 20181116-119 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/16/2018	7:30	17:00	570	60.0	60.0
	7:30	7:31	1	60	60
		Total Time (Tc):	571	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 571 (minutes) = 3.4E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		12/10/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	23		
Sample Count Rate	cpm	0.38		
Background Count Rate	cpm	0.06		
Air Volume (liters) **(A)**	liters	3.4E+04	3.4E+04	3.4E+04
Net count rate **(B)**	cpm	0.32		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.45		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	5.91E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	5.91E-15		
DAC (or AE) Fraction = **(F2)/(I)**		9.85%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	3.57E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		5.95%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 12/10/18

Reviewed By: Ed Siemers / [signature] Date: 12/12/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/10/2018 Sample ID: 20181130-120 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: M-Yard Boundry Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/29/2018	9:00	17:00	480	60.0	60.0
10/14/2018	9:00	17:00	480	60	60
		Total Time (Tc):	960	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 960 (minutes) = 5.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		12/10/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	13		
Sample Count Rate	cpm	0.22		
Background Count Rate	cpm	0.06		
Air Volume (liters) **(A)**	liters	5.8E+04	5.8E+04	5.8E+04
Net count rate **(B)**	cpm	0.16		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.22		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.70E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	1.70E-15		
DAC (or AE) Fraction = **(F2)/(I)**		2.83%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.12E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.54%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 12/10/18

Reviewed By: Ed Siemers / Ed Siemers Date: 12/12/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/10/2018 Sample ID: 20181130-121 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
11/29/2018	8:00	17:00	540	60.0	60.0
10/14/2018	8:00	17:00	540	60	60
		Total Time (Tc):	1080	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 1080 (minutes) = **6.5E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	**Units**	**Alpha**		
		1st Count	**2nd Count**	**3rd Count**
Count Date		12/10/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	15		
Sample Count Rate	cpm	0.25		
Background Count Rate	cpm	0.06		
Air Volume (liters) **(A)**	liters	6.5E+04	6.5E+04	6.5E+04
Net count rate **(B)**	cpm	0.19		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.84E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.83E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		3.05%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.89E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.14%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres Date: 12/10/18

Reviewed By: E Esgrenas / S Date: 12/12/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 12/10/2018 Sample ID: 20181204-122 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/3/2018	7:30	17:00	570	60.0	60.0
12/4/2018	8:00	17:00	540	60	60
		Total Time (Tc):	1110	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **4.1E+03** Liters

Sample Volume: 60 (lpm) x 1110 (minutes) = 6.7E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha		
		1st Count	2nd Count	3rd Count
Count Date		12/10/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	7		
Sample Count Rate	cpm	0.12		
Background Count Rate	cpm	0.06		
Air Volume (liters) **(A)**	liters	6.7E+04	6.7E+04	6.7E+04
Net count rate **(B)**	cpm	0.06		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.08		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.27		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	5.33E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	5.26E-16		
DAC (or AE) Fraction = **(F2)**/**(I)**		0.88%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	1.84E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		3.06%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 12-10-18

Reviewed By: Ed Siemas / S Date: 12/12/18

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181206-123 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/5/2018	8:00	15:00	420	60.0	60.0
12/6/2018	8:00	15:00	420	60	60
		Total Time (Tc):	840	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 840 (minutes) = **5.0E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		12/14/2018		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	14		
Sample Count Rate	cpm	0.23		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	5.0E+04	5.0E+04	5.0E+04
Net count rate **(B)**	cpm	0.10		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.28E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);** **(F2)**	uCi/ml	1.28E-15		
DAC (or AE) Fraction = **(F2)/(I)**		2.13%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	3.28E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		5.47%		
Final Count?	Yes/No	**YES**	**Yes**	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Berres Date: 1-8-2019

Reviewed By: Ed Siemens / ES Date: 1-8-19

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181206-124 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/5/2018	7:30	17:00	570	60.0	60.0
12/6/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.5E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		12/14/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	19		
Sample Count Rate	cpm	0.32		
Background Count Rate	cpm	0.13		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.19		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.37		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.71E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	1.70E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		2.84%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	2.42E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		4.03%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dand Be Date: 1-8-2019

Reviewed By: Ed Siemens / E Date: 1-8-19

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181210-125 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time				Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)		Start	Stop
12/7/2018	7:30	17:00	570		60.0	60.0
12/10/2018	7:30	17:00	570		60	60
		Total Time (Tc):	1140		Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = **6.8E+04** Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		12/17/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	17		
Sample Count Rate	cpm	0.28		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.18		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	1.68E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1); (F2)**	uCi/ml	1.67E-15		
DAC (or AE) Fraction = **(F2)/(I)**		2.79%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.63%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / Dave Be Date: 1-8-2019

Reviewed By: Ed Siemers / S Date: 1-8-19

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181210-126 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	**Time**			**Flow Rate (lpm)**	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/7/2018	7:30	15:20	470	60.0	60.0
12/10/2018	7:30	15:20	470	60	60
		Total Time (Tc):	940	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 940 (minutes) = 5.6E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

			Alpha		
Variables, Calculations, Results		**Units**	**1st Count**	**2nd Count**	**3rd Count**
Count Date			12/17/2018		
Count Time (e.g., noon, 1300, etc.)			8:00		
Sample Count Time (Ts, Tb) = T		minutes	60		
Total Counts		counts	17		
Sample Count Rate		cpm	0.28		
Background Count Rate		cpm	0.10		
Air Volume (liters)	**(A)**	liters	5.6E+04	5.6E+04	5.6E+04
Net count rate	**(B)**	cpm	0.18		
Counter Efficiency	**(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency	**(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)**	**(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)**	**(F)**	dpm	0.26		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**		dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**)	**(H)**	µCi/ml	2.04E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21		uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1);**	**(F2)**	uCi/ml	2.03E-15		
DAC (or AE) Fraction = **(F2)/(I)**			3.38%		
MDC = MDA/V = **(G)/(A)**	**(J)**	µCi/ml	2.64E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)			4.40%		
Final Count?		Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 1/8/2019

Reviewed By: E.L Stevens Date: 1-8-19

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181212-127 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 (Boundry) Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 3666 Calibration Due Date: 8/22/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/11/2018	7:30	17:00	570	60.0	60.0
12/12/2018	7:30	17:00	570	60	60
		Total Time (Tc):	1140	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.0E+03** Liters

Sample Volume: 60 (lpm) x 1140 (minutes) = 6.8E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		12/17/2018		
Count Time (e.g., noon, 1300, etc.)		12:30		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	12		
Sample Count Rate	cpm	0.20		
Background Count Rate	cpm	0.10		
Air Volume (liters) **(A)**	liters	6.8E+04	6.8E+04	6.8E+04
Net count rate **(B)**	cpm	0.10		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)/(E)** **(F)**	dpm	0.14		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.33		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	9.16E-16		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H) - (F1)**; **(F2)**	uCi/ml	9.09E-16		
DAC (or AE) Fraction = **(F2)/(I)**		1.51%		
MDC = MDA/V = **(G)/(A)** **(J)**	µCi/ml	2.18E-15		
MDC Fraction of DAC (or AE) = **(J)/(I)** (Goal<10%)		3.63%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 1-8-2019

Reviewed By: Ed Siemens / S Date: 1-8-19

AIR SAMPLE REPORT

Section I - Collection Data

Date: 1/8/2019 Sample ID: 20181212-128 RWP: 2018-001

Occupational (DAC): ☐ Limit: 6.00E-14 µCi/ml **(I)** Breathing Zone: ☐ General Area: ☑ Work Area: ☐

Non-Occupational (EC): ☑ [DAC = 2.0E-11µCi/ml (U-238), EC= 6.0E-14µCi/ml] Radionuclides: **DU (Depleted Uranium)**

Location: FS12 SCA Boundary Sampled By: David Berres

Wearer: NA Activity Performed: NA

Monitored Workers: NA

Lapel Pump Model: NA Serial No. NA Calibration Due Date: NA

Air Pump Model: LV-1 Serial No. 2591 Calibration Due Date: 3/27/2019

Sample Information	Time			Flow Rate (lpm)	
Collection Date	Start	Stop	Total (minutes)	Start	Stop
12/11/2018	7:30	15:20	470	60.0	60.0
12/12/2018	7:30	15:20	470	60	60
		Total Time (Tc):	940	Avg. Flow Rate (lpm)	60.0

Minimum Air Sample Volume: **5.8E+03** Liters

Sample Volume: 60 (lpm) x 940 (minutes) = 5.6E+04 Liters **(A)**

Remarks: Minimum sample volumes identified are necessary to achieve 10% of DAC or AE value.

Section II - Analysis Data

Instrument Information	Serial Number		Calibration Due Date		
Instrument Type	Meter	Detector	Meter	Detector	Efficiency (α)
L-2929	158817	164736	1/10/2019	1/10/2019	0.726
N/A	N/A	N/A	N/A	N/A	N/A

Variables, Calculations, Results	Units	Alpha 1st Count	Alpha 2nd Count	Alpha 3rd Count
Count Date		1/7//19		
Count Time (e.g., noon, 1300, etc.)		8:00		
Sample Count Time (Ts, Tb) = T	minutes	60		
Total Counts	counts	28		
Sample Count Rate	cpm	0.47		
Background Count Rate	cpm	0.15		
Air Volume (liters) **(A)**	liters	5.6E+04	5.6E+04	5.6E+04
Net count rate **(B)**	cpm	0.32		
Counter Efficiency **(C)**	cpm/dpm	0.73	0.73	0.73
Collection Efficiency **(D)**	0.99	0.99	0.99	0.99
Efficiency = **(C)** x **(D)** **(E)**	cpm/dpm	0.72	0.72	0.72
Activity (dpm) = **(B)**/**(E)** **(F)**	dpm	0.44		
Minimum Detectable Activity (dpm) = (3+4.65*SQRT(Cb))/(E*T) **(G)**	dpm	0.39		
Concentration = **(F)**/(2.22E9 x **(A)**) **(H)**	µCi/ml	3.52E-15		
Background "Strip" value (F.1) Date Updated 4/20-4/21	uCi/ml	7.31E-18		
NET Concentration Value = **(H)** - **(F1)**; **(F2)**	uCi/ml	3.51E-15		
DAC (or AE) Fraction = **(F2)**/**(I)**		5.85%		
MDC = MDA/V = **(G)**/**(A)** **(J)**	µCi/ml	3.11E-15		
MDC Fraction of DAC (or AE) = **(J)**/**(I)** (Goal<10%)		5.18%		
Final Count?	Yes/No	YES	Yes	

Note: Unexpected DAC or AE fraction > 100% requires immediate RSO notification.

Performed By: David Berres / David Be Date: 1-8-2019

Reviewed By: Ed Sanders Date: 1-8-19

APPENDIX C

CAP88-PC OUTPUT REPORT FOR IAAAP OPERABLE UNIT 8 AREAS

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D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Wed Jul 31 12:58:06 2019

Facility: FS-12 IAAAP
Address: Iowa Army Ammunition Plant
City: Middletown
State: IA Zip: 52638

Source Category: Area
Source Type: Area
Emission Year: 2018
DOSE Age Group: Adult

Comments: FS-12 Emissions
FS-12 Emissions

Dataset Name: FS12 Emissions 2
Dataset Date: Jul 31, 2019 12:57 PM
Wind File: C:\Users\finkenbinec\Documents\CAP88\Wind Files\Wind Files\14923.WND

Wed Jul 31 12:58:06 2019 SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	3.09E-03
UB_Wall	3.14E-03
Bone_Sur	7.56E-02
Brain	3.11E-03
Breasts	3.42E-03
St_Wall	3.16E-03
SI_Wall	3.17E-03
ULI_Wall	3.57E-03
LLI_Wall	4.44E-03
Kidneys	2.76E-02
Liver	1.07E-02
Muscle	3.33E-03
Ovaries	3.10E-03
Pancreas	3.08E-03
R_Marrow	8.24E-03
Skin	9.83E-02
Spleen	3.14E-03
Testes	3.38E-03
Thymus	3.13E-03
Thyroid	3.20E-03
GB_Wall	3.09E-03
Ht_Wall	3.12E-03
Uterus	3.10E-03
ET_Reg	7.05E-02
Lung_66	3.00E-01
Effectiv	4.17E-02

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.20E-03
INHALATION	3.89E-02
AIR IMMERSION	9.15E-09
GROUND SURFACE	1.58E-03
INTERNAL	4.01E-02
EXTERNAL	1.58E-03
TOTAL	4.17E-02

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NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-234	3.67E-02
Th-230	2.15E-08
Ra-226	2.61E-09
Rn-222	1.45E-10
Po-218	2.60E-15
Pb-214	9.50E-08
At-218	9.78E-15
Bi-214	5.55E-07
Rn-218	5.66E-17
Po-214	3.08E-11
Tl-210	2.17E-10
Pb-210	3.64E-10
Bi-210	5.88E-09
Hg-206	4.74E-16
Po-210	1.51E-12
Tl-206	1.37E-14
U-235	7.76E-04
Th-231	2.58E-05
Pa-231	4.28E-08
Ac-227	1.44E-10
Th-227	6.85E-08
Fr-223	6.46E-10
Ra-223	7.66E-08
Rn-219	3.32E-08
At-219	0.00E+00
Bi-215	1.49E-13
Po-215	1.01E-10
Pb-211	6.52E-08
Bi-211	2.69E-08
Tl-207	3.38E-08
Po-211	1.29E-11
U-238	2.89E-03
Th-234	8.24E-05
Pa-234m	1.13E-03
Pa-234	2.22E-05
TOTAL	4.17E-02

Wed Jul 31 12:58:06 2019 SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	3.51E-10
INHALATION	1.34E-08
AIR IMMERSION	4.84E-15
GROUND SURFACE	4.24E-10
INTERNAL	1.37E-08
EXTERNAL	4.24E-10
TOTAL	1.42E-08

Wed Jul 31 12:58:06 2019 SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-234	1.26E-08
Th-230	9.12E-15
Ra-226	1.42E-15
Rn-222	7.94E-17
Po-218	1.16E-21
Pb-214	5.08E-14
At-218	1.20E-21
Bi-214	2.93E-13
Rn-218	3.10E-23
Po-214	1.69E-17
Tl-210	1.16E-16
Pb-210	1.63E-16
Bi-210	6.51E-16
Hg-206	2.10E-22
Po-210	8.28E-19
Tl-206	1.54E-21
U-235	3.11E-10
Th-231	1.18E-11
Pa-231	2.23E-14
Ac-227	5.37E-17
Th-227	3.71E-14
Fr-223	2.41E-16
Ra-223	4.14E-14
Rn-219	1.82E-14
At-219	0.00E+00
Bi-215	6.67E-20
Po-215	5.56E-17
Pb-211	2.33E-14
Bi-211	1.47E-14
Tl-207	4.34E-15
Po-211	7.08E-18
U-238	9.64E-10
Th-234	4.27E-11
Pa-234m	1.97E-10
Pa-234	1.21E-11
TOTAL	1.42E-08

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INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	613	2714	7894	
N	4.2E-02	3.7E-03	1.4E-03	
NNW	1.6E-02	1.9E-03	1.1E-03	
NW	1.3E-02	1.7E-03	1.0E-03	School
WNW	2.3E-02	2.4E-03	1.1E-03	
W	3.9E-02	3.5E-03	1.3E-03	Residence; Farm
WSW	1.8E-02	2.1E-03	1.1E-03	
SW	9.3E-03	1.5E-03	9.7E-04	
SSW	7.0E-03	1.3E-03	9.4E-04	
S	1.1E-02	1.6E-03	1.0E-03	
SSE	8.3E-03	1.4E-03	9.6E-04	
SSE	1.0E-02	1.6E-03	1.0E-03	
ESE	1.7E-02	2.1E-03	1.1E-03	
E	3.0E-02	2.9E-03	1.2E-03	Business
ENE	3.6E-02	3.3E-03	1.3E-03	
NE	2.5E-02	2.5E-03	1.2E-03	
NNE	2.3E-02	2.4E-03	1.1E-03	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in Section 3.3.4 of this report taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy.

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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)		
Direction	613	2714	7894
N	1.4E-08	1.2E-09	4.3E-10
NNW	5.5E-09	6.1E-10	3.2E-10
NW	4.3E-09	5.3E-10	3.0E-10
WNW	7.9E-09	7.7E-10	3.4E-10
W	1.3E-08	1.1E-09	4.1E-10
WSW	6.2E-09	6.6E-10	3.2E-10
SW	3.1E-09	4.5E-10	2.9E-10
SSW	2.3E-09	4.0E-10	2.8E-10
S	3.9E-09	5.1E-10	3.0E-10
SSE	2.8E-09	4.3E-10	2.9E-10
SSE	3.5E-09	4.9E-10	3.0E-10
ESE	5.9E-09	6.6E-10	3.3E-10
E	1.0E-08	9.5E-10	3.8E-10
ENE	1.2E-08	1.1E-09	4.0E-10
NE	8.5E-09	8.1E-10	3.5E-10
NNE	7.8E-09	7.6E-10	3.4E-10

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Thu Apr 25 10:12:56 2019

```
         Facility:  M-Yard IAAAP
          Address:  Iowa Army Ammunition Plant
             City:  Middletown
            State:  IA          Zip:  52638


    Source Category:  Area
        Source Type:  Area
      Emission Year:  2018
     DOSE Age Group:  Adult

           Comments:  M-Yard Emissions
                      M-Yard Emissions


       Dataset Name:  M-Yard Emissions
       Dataset Date:  Apr 25, 2019 10:12 AM
          Wind File:  C:\Users\finkenbinec\Documents\CAP88\Wind Files\Wind
Files\14923.WND
```

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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	7.70E-06
UB_Wall	7.82E-06
Bone_Sur	1.89E-04
Brain	7.74E-06
Breasts	8.50E-06
St_Wall	7.87E-06
SI_Wall	7.89E-06
ULI_Wall	8.85E-06
LLI_Wall	1.10E-05
Kidneys	6.89E-05
Liver	2.67E-05
Muscle	8.29E-06
Ovaries	7.72E-06
Pancreas	7.66E-06
R_Marrow	2.05E-05
Skin	2.38E-04
Spleen	7.81E-06
Testes	8.40E-06
Thymus	7.78E-06
Thyroid	7.96E-06
GB_Wall	7.69E-06
Ht_Wall	7.76E-06
Uterus	7.71E-06
ET_Reg	1.78E-04
Lung_66	7.59E-04
Effectiv	1.05E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	2.91E-06
INHALATION	9.82E-05
AIR IMMERSION	2.31E-11
GROUND SURFACE	3.84E-06
INTERNAL	1.01E-04
EXTERNAL	3.84E-06
TOTAL	1.05E-04

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NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-234	9.29E-05
Th-230	5.38E-11
Ra-226	6.54E-12
Rn-222	3.64E-13
Po-218	6.50E-18
Pb-214	2.38E-10
At-218	2.44E-17
Bi-214	1.39E-09
Rn-218	1.42E-19
Po-214	7.69E-14
Tl-210	5.42E-13
Pb-210	9.09E-13
Bi-210	1.47E-11
Hg-206	1.19E-18
Po-210	3.77E-15
Tl-206	3.43E-17
U-235	1.95E-06
Th-231	6.43E-08
Pa-231	1.07E-10
Ac-227	3.58E-13
Th-227	1.71E-10
Fr-223	1.61E-12
Ra-223	1.91E-10
Rn-219	8.27E-11
At-219	0.00E+00
Bi-215	3.72E-16
Po-215	2.53E-13
Pb-211	1.62E-10
Bi-211	6.69E-11
Tl-207	8.41E-11
Po-211	3.22E-14
U-238	7.07E-06
Th-234	1.99E-07
Pa-234m	2.73E-06
Pa-234	5.37E-08
TOTAL	1.05E-04

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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	8.49E-13
INHALATION	3.38E-11
AIR IMMERSION	1.22E-17
GROUND SURFACE	1.04E-12
INTERNAL	3.47E-11
EXTERNAL	1.04E-12
TOTAL	3.57E-11

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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-234	3.19E-11
Th-230	2.28E-17
Ra-226	3.55E-18
Rn-222	1.98E-19
Po-218	2.90E-24
Pb-214	1.27E-16
At-218	3.01E-24
Bi-214	7.33E-16
Rn-218	7.74E-26
Po-214	4.22E-20
Tl-210	2.90E-19
Pb-210	4.07E-19
Bi-210	1.63E-18
Hg-206	5.26E-25
Po-210	2.07E-21
Tl-206	3.86E-24
U-235	7.81E-13
Th-231	2.94E-14
Pa-231	5.56E-17
Ac-227	1.34E-19
Th-227	9.25E-17
Fr-223	6.00E-19
Ra-223	1.03E-16
Rn-219	4.53E-17
At-219	0.00E+00
Bi-215	1.66E-22
Po-215	1.38E-19
Pb-211	5.80E-17
Bi-211	3.65E-17
Tl-207	1.08E-17
Po-211	1.76E-20
U-238	2.36E-12
Th-234	1.03E-13
Pa-234m	4.77E-13
Pa-234	2.92E-14
TOTAL	3.57E-11

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INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	521	3498	9463	
N	1.0E-04	5.5E-06	2.8E-06	
NNW	4.1E-05	3.3E-06	2.3E-06	
NW	3.2E-05	3.0E-06	2.3E-06	Business; Residence and Farm; School
WNW	5.9E-05	3.9E-06	2.4E-06	
W	9.8E-05	5.2E-06	2.7E-06	
WSW	4.6E-05	3.5E-06	2.4E-06	
SW	2.3E-05	2.8E-06	2.2E-06	
SSW	1.7E-05	2.6E-06	2.2E-06	
S	2.9E-05	3.0E-06	2.3E-06	
SSE	2.1E-05	2.7E-06	2.2E-06	
SSE	2.6E-05	2.9E-06	2.2E-06	
ESE	4.4E-05	3.5E-06	2.4E-06	
E	7.6E-05	4.6E-06	2.6E-06	
ENE	9.1E-05	5.0E-06	2.6E-06	
NE	6.3E-05	4.1E-06	2.5E-06	
NNE	5.8E-05	3.9E-06	2.4E-06	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in Section 3.3.4 of this report taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy.

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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)		
Direction	521	3498	9463
N	3.6E-11	1.8E-12	8.4E-13
NNW	1.4E-11	1.0E-12	6.9E-13
NW	1.1E-11	9.4E-13	6.7E-13
WNW	2.0E-11	1.2E-12	7.3E-13
W	3.3E-11	1.7E-12	8.2E-13
WSW	1.6E-11	1.1E-12	7.0E-13
SW	7.9E-12	8.5E-13	6.5E-13
SSW	5.8E-12	7.8E-13	6.4E-13
S	9.7E-12	9.1E-13	6.7E-13
SSE	7.0E-12	8.2E-13	6.5E-13
SSE	8.8E-12	8.9E-13	6.6E-13
ESE	1.5E-11	1.1E-12	7.1E-13
E	2.6E-11	1.5E-12	7.7E-13
ENE	3.1E-11	1.6E-12	8.0E-13
NE	2.2E-11	1.3E-12	7.4E-13
NNE	2.0E-11	1.2E-12	7.3E-13

APPENDIX D

CALENDAR YEAR 2018 SURFACE-WATER AND SEDIMENT DATA

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Table D-1. Surface-Water Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP100153	IAAP201047	04/16/18	ML-018	Gross Alpha	2.80	11.90	20.90	pCi/L	UJ
IAAP100153	IAAP201047	04/16/18	ML-018	Gross Beta	-5.46	15.70	27.30	pCi/L	UJ
IAAP100153	IAAP201047	04/16/18	ML-015	U-234	0.83	0.57	0.61	pCi/L	J
IAAP100153	IAAP201047	04/16/18	ML-015	U-235	-0.03	0.21	0.55	pCi/L	UJ
IAAP100153	IAAP201047	04/16/18	ML-015	U-238	0.79	0.55	0.53	pCi/L	J
IAAP100509	IAAP201049	04/17/18	ML-018	Gross Alpha	6.29	12.30	20.90	pCi/L	UJ
IAAP100509	IAAP201049	04/17/18	ML-018	Gross Beta	12.10	16.60	27.30	pCi/L	UJ
IAAP100509	IAAP201049	04/17/18	ML-015	U-234	0.89	0.58	0.70	pCi/L	J
IAAP100509	IAAP201049	04/17/18	ML-015	U-235	0.21	0.34	0.69	pCi/L	UJ
IAAP100509	IAAP201049	04/17/18	ML-015	U-238	0.56	0.45	0.55	pCi/L	J
IAAP100154	IAAP201051	04/16/18	ML-018	Gross Alpha	-2.10	11.30	20.90	pCi/L	UJ
IAAP100154	IAAP201051	04/16/18	ML-018	Gross Beta	5.46	16.20	27.30	pCi/L	UJ
IAAP100154	IAAP201051	04/16/18	ML-015	U-234	1.22	0.62	0.50	pCi/L	J
IAAP100154	IAAP201051	04/16/18	ML-015	U-235	0.06	0.17	0.44	pCi/L	UJ
IAAP100154	IAAP201051	04/16/18	ML-015	U-238	0.47	0.39	0.50	pCi/L	UJ
IAAP100155	IAAP201053	04/17/18	ML-018	Gross Alpha	6.29	12.30	20.90	pCi/L	UJ
IAAP100155	IAAP201053	04/17/18	ML-018	Gross Beta	15.60	16.80	27.30	pCi/L	UJ
IAAP100155	IAAP201053	04/17/18	ML-015	U-234	1.09	0.54	0.45	pCi/L	=
IAAP100155	IAAP201053	04/17/18	ML-015	U-235	0.02	0.15	0.51	pCi/L	UJ
IAAP100155	IAAP201053	04/17/18	ML-015	U-238	0.50	0.35	0.30	pCi/L	J
IAAP100155	IAAP201053-1	04/17/18	ML-018	Gross Alpha	4.19	12.00	20.90	pCi/L	UJ
IAAP100155	IAAP201053-1	04/17/18	ML-018	Gross Beta	3.12	16.10	27.30	pCi/L	UJ
IAAP100155	IAAP201053-1	04/17/18	ML-015	U-234	1.08	0.62	0.57	pCi/L	J
IAAP100155	IAAP201053-1	04/17/18	ML-015	U-235	0.17	0.27	0.50	pCi/L	UJ
IAAP100155	IAAP201053-1	04/17/18	ML-015	U-238	0.84	0.55	0.56	pCi/L	J
IAAP100155	IAAP201053-2	04/17/18	EML A-01-R MOD	U-234	0.59	0.21	0.13	pCi/L	=
IAAP100155	IAAP201053-2	04/17/18	EML A-01-R MOD	U-235	0.04	0.06	0.10	pCi/L	UJ
IAAP100155	IAAP201053-2	04/17/18	EML A-01-R MOD	U-238	0.71	0.23	0.12	pCi/L	=
IAAP100165	IAAP201057	04/17/18	ML-018	Gross Alpha	8.39	12.50	20.90	pCi/L	UJ
IAAP100165	IAAP201057	04/17/18	ML-018	Gross Beta	2.73	16.10	27.30	pCi/L	UJ
IAAP100165	IAAP201057	04/17/18	ML-015	U-234	0.63	0.43	0.42	pCi/L	J

Table D-1. Surface-Water Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP100165	IAAP201057	04/17/18	ML-015	U-235	0.04	0.17	0.52	pCi/L	UJ
IAAP100165	IAAP201057	04/17/18	ML-015	U-238	0.26	0.30	0.48	pCi/L	UJ
IAAP100178	IAAP201059	04/17/18	ML-018	Gross Alpha	0.70	11.60	20.90	pCi/L	UJ
IAAP100178	IAAP201059	04/17/18	ML-018	Gross Beta	-8.20	15.60	27.30	pCi/L	UJ
IAAP100178	IAAP201059	04/17/18	ML-015	U-234	0.56	0.46	0.58	pCi/L	UJ
IAAP100178	IAAP201059	04/17/18	ML-015	U-235	0.00	0.28	0.72	pCi/L	UJ
IAAP100178	IAAP201059	04/17/18	ML-015	U-238	0.30	0.32	0.42	pCi/L	UJ
IAAP100180	IAAP201061	04/17/18	ML-018	Gross Alpha	7.69	12.40	20.90	pCi/L	UJ
IAAP100180	IAAP201061	04/17/18	ML-018	Gross Beta	-4.29	15.80	27.30	pCi/L	UJ
IAAP100180	IAAP201061	04/17/18	ML-015	U-234	0.71	0.47	0.39	pCi/L	J
IAAP100180	IAAP201061	04/17/18	ML-015	U-235	0.09	0.25	0.66	pCi/L	UJ
IAAP100180	IAAP201061	04/17/18	ML-015	U-238	0.83	0.52	0.46	pCi/L	J
IAAP100187	IAAP201063	04/17/18	ML-018	Gross Alpha	5.59	12.20	20.90	pCi/L	UJ
IAAP100187	IAAP201063	04/17/18	ML-018	Gross Beta	1.17	16.00	27.30	pCi/L	UJ
IAAP100187	IAAP201063	04/17/18	ML-015	U-234	0.29	0.33	0.56	pCi/L	UJ
IAAP100187	IAAP201063	04/17/18	ML-015	U-235	0.00	0.25	0.65	pCi/L	UJ
IAAP100187	IAAP201063	04/17/18	ML-015	U-238	0.76	0.49	0.38	pCi/L	J
IAAP177517	IAAP201065	04/16/18	ML-018	Gross Alpha	5.59	12.20	20.90	pCi/L	UJ
IAAP177517	IAAP201065	04/16/18	ML-018	Gross Beta	-4.68	15.70	27.30	pCi/L	UJ
IAAP177517	IAAP201065	04/16/18	ML-015	U-234	0.76	0.49	0.38	pCi/L	J
IAAP177517	IAAP201065	04/16/18	ML-015	U-235	0.00	0.25	0.64	pCi/L	UJ
IAAP177517	IAAP201065	04/16/18	ML-015	U-238	0.83	0.51	0.37	pCi/L	J
IAAP100153	IAAP208772	11/27/18	ML-018	Gross Alpha	-0.35	9.40	16.50	pCi/L	UJ
IAAP100153	IAAP208772	11/27/18	ML-018	Gross Beta	12.30	10.20	16.50	pCi/L	UJ
IAAP100153	IAAP208772	11/27/18	ML-015	U-234	1.17	0.62	0.54	pCi/L	J
IAAP100153	IAAP208772	11/27/18	ML-015	U-235	-0.04	0.19	0.57	pCi/L	UJ
IAAP100153	IAAP208772	11/27/18	ML-015	U-238	1.81	0.78	0.53	pCi/L	=
IAAP177509	IAAP208774	11/28/18	ML-018	Gross Alpha	11.50	10.30	16.50	pCi/L	UJ
IAAP177509	IAAP208774	11/28/18	ML-018	Gross Beta	7.42	10.00	16.50	pCi/L	UJ
IAAP177509	IAAP208774	11/28/18	ML-015	U-234	0.55	0.42	0.51	pCi/L	J
IAAP177509	IAAP208774	11/28/18	ML-015	U-235	-0.02	0.18	0.45	pCi/L	UJ

Table D-1. Surface-Water Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP177509	IAAP208774	11/28/18	ML-015	U-238	0.68	0.46	0.50	pCi/L	J
IAAP100154	IAAP208776	11/27/18	ML-018	Gross Alpha	-0.70	9.38	16.50	pCi/L	UJ
IAAP100154	IAAP208776	11/27/18	ML-018	Gross Beta	15.40	10.40	16.50	pCi/L	UJ
IAAP100154	IAAP208776	11/27/18	ML-015	U-234	1.28	0.62	0.36	pCi/L	=
IAAP100154	IAAP208776	11/27/18	ML-015	U-235	-0.02	0.19	0.72	pCi/L	UJ
IAAP100154	IAAP208776	11/27/18	ML-015	U-238	0.46	0.37	0.36	pCi/L	J
IAAP100164	IAAP208778	11/27/18	ML-018	Gross Alpha	4.54	9.76	16.50	pCi/L	UJ
IAAP100164	IAAP208778	11/27/18	ML-018	Gross Beta	7.61	10.00	16.50	pCi/L	UJ
IAAP100164	IAAP208778	11/27/18	ML-015	U-234	0.61	0.40	0.33	pCi/L	J
IAAP100164	IAAP208778	11/27/18	ML-015	U-235	-0.06	0.17	0.55	pCi/L	UJ
IAAP100164	IAAP208778	11/27/18	ML-015	U-238	0.31	0.31	0.46	pCi/L	UJ
IAAP100165	IAAP208782	11/27/18	ML-018	Gross Alpha	0.00	9.43	16.50	pCi/L	UJ
IAAP100165	IAAP208782	11/27/18	ML-018	Gross Beta	6.44	9.97	16.50	pCi/L	UJ
IAAP100165	IAAP208782	11/27/18	ML-015	U-234	0.72	0.44	0.33	pCi/L	J
IAAP100165	IAAP208782	11/27/18	ML-015	U-235	-0.02	0.16	0.40	pCi/L	UJ
IAAP100165	IAAP208782	11/27/18	ML-015	U-238	0.72	0.43	0.33	pCi/L	J
IAAP100178	IAAP208784	11/28/18	ML-018	Gross Alpha	3.84	9.71	16.50	pCi/L	UJ
IAAP100178	IAAP208784	11/28/18	ML-018	Gross Beta	15.00	10.40	16.50	pCi/L	UJ
IAAP100178	IAAP208784	11/28/18	ML-015	U-234	0.50	0.39	0.50	pCi/L	J
IAAP100178	IAAP208784	11/28/18	ML-015	U-235	0.14	0.28	0.66	pCi/L	UJ
IAAP100178	IAAP208784	11/28/18	ML-015	U-238	0.27	0.29	0.45	pCi/L	UJ
IAAP100180	IAAP208786	11/28/18	ML-018	Gross Alpha	-3.14	9.19	16.50	pCi/L	UJ
IAAP100180	IAAP208786	11/28/18	ML-018	Gross Beta	10.50	10.20	16.50	pCi/L	UJ
IAAP100180	IAAP208786	11/28/18	ML-015	U-234	0.40	0.34	0.37	pCi/L	J
IAAP100180	IAAP208786	11/28/18	ML-015	U-235	0.00	0.24	0.63	pCi/L	UJ
IAAP100180	IAAP208786	11/28/18	ML-015	U-238	0.41	0.37	0.51	pCi/L	UJ
IAAP100187	IAAP208788	11/28/18	ML-018	Gross Alpha	4.89	9.79	16.50	pCi/L	UJ
IAAP100187	IAAP208788	11/28/18	ML-018	Gross Beta	4.49	9.89	16.50	pCi/L	UJ
IAAP100187	IAAP208788	11/28/18	ML-015	U-234	0.30	0.28	0.33	pCi/L	UJ
IAAP100187	IAAP208788	11/28/18	ML-015	U-235	0.04	0.16	0.49	pCi/L	UJ
IAAP100187	IAAP208788	11/28/18	ML-015	U-238	0.44	0.36	0.46	pCi/L	UJ

Table D-1. Surface-Water Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP177517	IAAP208790	11/27/18	ML-018	Gross Alpha	1.75	9.56	16.50	pCi/L	UJ
IAAP177517	IAAP208790	11/27/18	ML-018	Gross Beta	12.70	10.30	16.50	pCi/L	UJ
IAAP177517	IAAP208790	11/27/18	ML-015	U-234	0.87	0.49	0.34	pCi/L	J
IAAP177517	IAAP208790	11/27/18	ML-015	U-235	-0.02	0.16	0.41	pCi/L	UJ
IAAP177517	IAAP208790	11/27/18	ML-015	U-238	0.17	0.22	0.33	pCi/L	UJ

Negative results are less than the laboratory system's background level.

VQs:

= Indicates that the data met all QA/QC requirements, and that the parameter has been positively identified and the associated concentration value is accurate.

J Indicates that the parameter was positively identified; the associated numerical value is the approximate concentration of the parameter in the sample.

U Indicates that the data met all QA/QC requirements, and that the parameter was analyzed for but was not detected above the reported sample quantitation limit.

UJ Indicates that the parameter was not detected above the reported sample quantitation limit and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. However, the reported quantitation limit is approximate.

Table D-2. Sediment Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP100153	IAAP201046	04/16/18	ML-015	U-234	0.22	0.16	0.18	pCi/g	J
IAAP100153	IAAP201046	04/16/18	ML-015	U-235	0.00	0.09	0.22	pCi/g	UJ
IAAP100153	IAAP201046	04/16/18	ML-015	U-238	0.17	0.13	0.11	pCi/g	J
IAAP100509	IAAP201048	04/17/18	ML-015	U-234	0.33	0.23	0.18	pCi/g	J
IAAP100509	IAAP201048	04/17/18	ML-015	U-235	0.00	0.12	0.31	pCi/g	UJ
IAAP100509	IAAP201048	04/17/18	ML-015	U-238	0.31	0.22	0.25	pCi/g	J
IAAP100154	IAAP201050	04/16/18	ML-015	U-234	0.92	0.40	0.15	pCi/g	=
IAAP100154	IAAP201050	04/16/18	ML-015	U-235	-0.01	0.08	0.21	pCi/g	UJ
IAAP100154	IAAP201050	04/16/18	ML-015	U-238	0.55	0.30	0.15	pCi/g	J
IAAP100155	IAAP201052	04/17/18	ML-015	U-234	0.31	0.21	0.20	pCi/g	J
IAAP100155	IAAP201052	04/17/18	ML-015	U-235	-0.03	0.08	0.26	pCi/g	UJ
IAAP100155	IAAP201052	04/17/18	ML-015	U-238	0.50	0.27	0.17	pCi/g	J
IAAP100164	IAAP201054	04/17/18	ML-015	U-234	0.85	0.37	0.14	pCi/g	=
IAAP100164	IAAP201054	04/17/18	ML-015	U-235	0.07	0.11	0.17	pCi/g	UJ
IAAP100164	IAAP201054	04/17/18	ML-015	U-238	0.91	0.38	0.14	pCi/g	=
IAAP100165	IAAP201056	04/17/18	ML-015	U-234	0.37	0.23	0.21	pCi/g	J
IAAP100165	IAAP201056	04/17/18	ML-015	U-235	0.03	0.07	0.16	pCi/g	UJ
IAAP100165	IAAP201056	04/17/18	ML-015	U-238	0.20	0.17	0.21	pCi/g	UJ
IAAP100178	IAAP201058	04/17/18	ML-015	U-234	0.71	0.35	0.17	pCi/g	=
IAAP100178	IAAP201058	04/17/18	ML-015	U-235	0.03	0.08	0.21	pCi/g	UJ
IAAP100178	IAAP201058	04/17/18	ML-015	U-238	0.55	0.30	0.17	pCi/g	J
IAAP100180	IAAP201060	04/17/18	ML-015	U-234	0.31	0.22	0.23	pCi/g	J
IAAP100180	IAAP201060	04/17/18	ML-015	U-235	0.07	0.11	0.20	pCi/g	UJ
IAAP100180	IAAP201060	04/17/18	ML-015	U-238	0.21	0.17	0.14	pCi/g	J
IAAP100187	IAAP201062	04/17/18	ML-015	U-234	0.35	0.23	0.23	pCi/g	J
IAAP100187	IAAP201062	04/17/18	ML-015	U-235	0.00	0.08	0.17	pCi/g	UJ
IAAP100187	IAAP201062	04/17/18	ML-015	U-238	0.19	0.17	0.23	pCi/g	UJ
IAAP177517	IAAP201064	04/16/18	ML-015	U-234	0.29	0.20	0.13	pCi/g	J
IAAP177517	IAAP201064	04/16/18	ML-015	U-235	0.00	0.07	0.16	pCi/g	UJ
IAAP177517	IAAP201064	04/16/18	ML-015	U-238	0.27	0.19	0.22	pCi/g	J
IAAP100153	IAAP208771	11/27/18	ML-015	U-234	0.20	0.16	0.11	pCi/g	J

Table D-2. Sediment Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP100153	IAAP208771	11/27/18	ML-015	U-235	0.03	0.07	0.16	pCi/g	UJ
IAAP100153	IAAP208771	11/27/18	ML-015	U-238	0.23	0.17	0.13	pCi/g	J
IAAP177509	IAAP208773	11/28/18	ML-015	U-234	0.22	0.18	0.17	pCi/g	J
IAAP177509	IAAP208773	11/28/18	ML-015	U-235	-0.01	0.08	0.22	pCi/g	UJ
IAAP177509	IAAP208773	11/28/18	ML-015	U-238	0.51	0.27	0.14	pCi/g	J
IAAP100154	IAAP208775	11/27/18	ML-015	U-234	0.73	0.35	0.18	pCi/g	=
IAAP100154	IAAP208775	11/27/18	ML-015	U-235	0.00	0.09	0.17	pCi/g	UJ
IAAP100154	IAAP208775	11/27/18	ML-015	U-238	1.05	0.43	0.17	pCi/g	=
IAAP100155	IAAP208777	11/27/18	ML-015	U-234	0.45	0.24	0.13	pCi/g	J
IAAP100155	IAAP208777	11/27/18	ML-015	U-235	-0.01	0.07	0.18	pCi/g	UJ
IAAP100155	IAAP208777	11/27/18	ML-015	U-238	0.62	0.28	0.14	pCi/g	=
IAAP100155	IAAP208777-1	11/27/18	ML-015	U-234	0.59	0.31	0.17	pCi/g	J
IAAP100155	IAAP208777-1	11/27/18	ML-015	U-235	-0.01	0.09	0.19	pCi/g	UJ
IAAP100155	IAAP208777-1	11/27/18	ML-015	U-238	0.91	0.40	0.14	pCi/g	=
IAAP100155	IAAP208777-2	11/27/18	EML A-01-R MOD	U-234	0.40	0.13	0.06	pCi/g	=
IAAP100155	IAAP208777-2	11/27/18	EML A-01-R MOD	U-235	0.02	0.03	0.06	pCi/g	UJ
IAAP100155	IAAP208777-2	11/27/18	EML A-01-R MOD	U-238	0.51	0.14	0.04	pCi/g	=
IAAP100164	IAAP208779	11/28/18	ML-015	U-234	0.40	0.24	0.17	pCi/g	J
IAAP100164	IAAP208779	11/28/18	ML-015	U-235	-0.01	0.08	0.20	pCi/g	UJ
IAAP100164	IAAP208779	11/28/18	ML-015	U-238	0.66	0.32	0.17	pCi/g	=
IAAP100165	IAAP208781	11/27/18	ML-015	U-234	0.11	0.13	0.15	pCi/g	UJ
IAAP100165	IAAP208781	11/27/18	ML-015	U-235	0.00	0.13	0.34	pCi/g	UJ
IAAP100165	IAAP208781	11/27/18	ML-015	U-238	0.33	0.23	0.18	pCi/g	J
IAAP100178	IAAP208783	11/28/18	ML-015	U-234	0.42	0.24	0.16	pCi/g	J
IAAP100178	IAAP208783	11/28/18	ML-015	U-235	0.04	0.11	0.28	pCi/g	UJ
IAAP100178	IAAP208783	11/28/18	ML-015	U-238	0.57	0.29	0.22	pCi/g	J
IAAP100180	IAAP208785	11/28/18	ML-015	U-234	0.43	0.25	0.17	pCi/g	J
IAAP100180	IAAP208785	11/28/18	ML-015	U-235	0.04	0.08	0.18	pCi/g	UJ
IAAP100180	IAAP208785	11/28/18	ML-015	U-238	0.23	0.18	0.16	pCi/g	J
IAAP100187	IAAP208787	11/28/18	ML-015	U-234	0.75	0.36	0.16	pCi/g	=
IAAP100187	IAAP208787	11/28/18	ML-015	U-235	0.09	0.13	0.17	pCi/g	UJ

Table D-2. Sediment Data for CY 2018

Station Name	Sample Name	Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ
IAAP100187	IAAP208787	11/28/18	ML-015	U-238	0.64	0.33	0.26	pCi/g	J
IAAP177517	IAAP208789	11/27/18	ML-015	U-234	0.90	0.37	0.17	pCi/g	=
IAAP177517	IAAP208789	11/27/18	ML-015	U-235	0.03	0.08	0.20	pCi/g	UJ
IAAP177517	IAAP208789	11/27/18	ML-015	U-238	1.22	0.44	0.14	pCi/g	=

Negative results are less than the laboratory system's background level.

VQs:

= Indicates that the data met all QA/QC requirements, and that the parameter has been positively identified and the associated concentration value is accurate.

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