REVISION 0

NORTH ST. LOUIS COUNTY SITES ANNUAL ENVIRONMENTAL MONITORING DATA AND ANALYSIS REPORT FOR CALENDAR YEAR 2017

ST. LOUIS, MISSOURI

JUNE 21, 2018

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

Ac	actinium
AEC	Atomic Energy Commission
Am	americium
amsl	above mean sea level
ARAR	applicable or relevant and appropriate requirement
ATD	alpha track detector
bgs	below ground surface
BOD	biological oxygen demand
BTOC	below top of casing
CEDE	committed effective dose equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	*Code of Federal Regulations*
COC	contaminant of concern
COD	chemical oxygen demand
Cs	cesium
CSR	*Code of State Regulations*
CWC	Coldwater Creek
CY	calendar year
DCF	dose conversion factor
DHSS	Department of Health and Senior Services
DL	detection limit
DO	dissolved oxygen
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DQO	data quality objective
EDE	effective dose equivalent
EE/CA	engineering evaluation/cost analysis
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
EMDAR	Environmental Monitoring Data and Analysis Report
EMG	*Environmental Monitoring Guide for the St. Louis Sites*
EMICY17	*Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2017*
EMP	Environmental Monitoring Program
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
HISS	Hazelwood Interim Storage Site
HZ	hydrostratigraphic zone
IA	investigation area
ICP	inductively coupled plasma
ICRP	International Commission on Radiation Protection
K	potassium
KPA	kinetic phosphorescence analysis
LCL_{95}	95 percent lower confidence limit

ACRONYMS AND ABBREVIATIONS (Continued)

MARSSIM	*Multi-Agency Radiation Survey and Site Investigation Manual*
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	method detection limit
MDNR	Missouri Department of Natural Resources
MED	Manhattan Engineer District
MSD	Metropolitan St. Louis Sewer District
NAD	normalized absolute difference
NC	North St. Louis County
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
ORNL	Oak Ridge National Laboratory
ORP	oxidation reduction potential
Pa	protactinium
PCB	polychlorinated biphenyl
PDI	pre-design investigation
QA	quality assurance
QAPP	quality assurance program plan
QC	quality control
QSM	*Department of Defense (DoD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*
Ra	radium
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RG	remediation goal
RL	reporting limit
RME	reasonably maximally exposed
Rn	radon
ROD	*Record of Decision for the North St. Louis County Sites*
RPD	relative percent difference
S	test statistic
SAG	*Sampling and Analysis Guide for the St. Louis Sites*
SLAPS	St. Louis Airport Site
SLS	St. Louis Sites
SOP	standard operating procedure
SOR	sum of ratios
SS	settleable solid
SU	survey unit
TEDE	total effective dose equivalent
Th	thorium
TLD	thermoluminescent dosimeter
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
TSS	total suspended solid

ACRONYMS AND ABBREVIATIONS (Continued)

U	uranium
UCL	upper confidence limit
UCL_{95}	95 percent upper confidence limit
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VQ	validation qualifier
VP	vicinity property
WRS	Wilcoxon Rank Sum

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/mL	microcurie(s) per milliliter
µg/L	microgram(s) per liter
µR	microRoentgen(s)
µS/cm	microSiemen(s) per centimeter
Ci	curie(s)
ft	foot/feet
g	gram(s)
L	liter(s)
m	meter(s)
m^2	square meter(s)
mg	milligram(s)
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MGD	million gallons per day
mL	milliliter(s)
mL/L/hour	milliliter(s) per liter per hour
mrem	millirem
mrem/pCi	millirem per picocurie
mV	millivolt(s)
NTU	nephelometric turbidity unit
pCi/µg	picocurie(s) per microgram
pCi/g	picocurie(s) per gram
pCi/L	picocurie(s) per liter
s.u.	standard unit
WL	working level
WLM	working level month

EXECUTIVE SUMMARY

This annual Environmental Monitoring Data and Analysis Report (EMDAR) for calendar year (CY) 2017 applies to the North St. Louis County (NC) Sites, which are within the St. Louis Sites (SLS) (Figure 1-1) and under the scope of the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the implementation of the Environmental Monitoring Program (EMP) for the NC Sites. The NC Sites consist of the St. Louis Airport Site (SLAPS), SLAPS vicinity properties (VPs) (Figure 1-2), and the Latty Avenue Properties (i.e., the Hazelwood Interim Storage Site [HISS], Futura Coatings Company [Futura], and eight Latty Avenue VPs) (Figure 1-3). Additional environmental data were collected along Coldwater Creek (CWC), which flows adjacent to the SLAPS, near the HISS, and north of U.S. Interstate Highway 270 to the Missouri River. Environmental monitoring of various media at each of the NC Sites is required in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the commitments in the *Record of Decision for the North St. Louis County Sites* (ROD) (USACE 2005).

The purpose of this EMDAR is:

1) to document the environmental monitoring activities, and
2) to assess whether remedial actions (RAs) had a measurable environmental impact by:
    a) reporting the current condition of the NC Sites,
    b) summarizing the data collection effort for CY 2017, and
    c) providing an analysis of the environmental monitoring data to date.

The U.S. Army Corps of Engineers (USACE) St. Louis District collects comprehensive environmental data for decision-making and planning purposes. Environmental monitoring, performed as a Best Management Practice or as a component of RAs, serves as a critical component in the evaluation of the current status and potential future migration of residual contaminants.

All environmental monitoring required through implementation of the *Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2017* (EMICY17) (USACE 2016) was conducted as planned during CY 2017. The evaluation of environmental monitoring data for all NC Sites demonstrates compliance with ROD (USACE 2005) goals and applicable or relevant and appropriate requirements (ARARs).

RADIOLOGICAL AIR MONITORING

Radiological air data were collected and evaluated at the NC Sites through airborne radioactive particulate, radon (indoor and outdoor), and gamma radiation monitoring, as required in the EMICY17 (USACE 2016). In addition to being used for environmental monitoring purposes, radiological air data were also used as inputs to calculate the total effective dose equivalent (TEDE) to the reasonably maximally exposed (RME) member of the public for the NC Sites.

Each TEDE calculated for the RME individual at each NC Site was 5.4 mrem or less per year. The calculated TEDEs are compliant with the 100 mrem per year limit provided in 10 *Code of Federal Regulations (CFR)* 20.1301.

The radiological air monitoring results conducted at the NC Sites demonstrate compliance with all ARARs for the NC Sites. The ARARs are described in Tables 2-1 through 2-4 of the EMICY17 (USACE 2016).

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MONITORING

Discharge requirements for the NC Sites are currently set by the Missouri Department of Natural Resources (MDNR) National Pollutant Discharge Elimination System (NPDES) ARARs (permit-equivalent) document dated October 2, 1998 (MDNR 1998), and amended in a letter from the MDNR dated February 19, 2002 (MDNR 2002).

The storm-water sampling results for the NC Sites demonstrate compliance with the discharge limits described in Section 2.2.2 of the EMICY17 (USACE 2016).

EXCAVATION-WATER DISCHARGE MONITORING AT THE NORTH ST. LOUIS COUNTY SITES

CY 2017 was the 16th year excavation water was treated and discharged from the NC Sites. Excavation water discharged from the NC Sites to the sanitary sewer system is subject to the requirements stated in the July 23, 2001, Metropolitan St. Louis Sewer District (MSD) authorization letter (MSD 2001) and the selenium discharge variance letter for the SLAPS dated February 10, 2005 (MSD 2005). This authorization was extended for 2 years through the issuance of a letter dated July 18, 2016, from Mr. Steve Grace to Mr. Bruce Munholand. This authorization expires on July 23, 2018 (MSD 2016a). The selenium discharge variance for the SLAPS was not utilized in CY 2017 (MSD 2005 and 2012). There is no longer a requirement to analyze for barium, lead, or selenium after the first two batches from new investigative areas (MSD 2012).

Waste water from the USACE St. Louis District FUSRAP Radioanalytical Laboratory is discharged in accordance with the MSD discharge authorization letter dated February 2, 2016 (MSD 2016b). The special discharge authorization was extended to February 7, 2018.

The data collected at the NC Sites were compared to discharge limits described in Section 2.2.2 of the EMICY17 (USACE 2016). During CY 2017, no exceedances of the discharge limits occurred at the USACE St. Louis FUSRAP laboratory or the NC Sites.

COLDWATER CREEK MONITORING

The CY 2017 CWC surface-water and sediment sampling events, which were completed in March and October of 2017, evaluated the physical, radiological, and chemical conditions in the creek. During the March and October sampling events, samples were collected at each of the eight surface-water and sediment sampling locations (C002 through C009). These sampling locations are shown on Figure 3-3. The data collected were compared to the monitoring guidelines and/or remediation goals (RGs) described in Section 2.2.3 of the EMICY17 (USACE 2016).

The results of the surface-water and sediment sampling conducted in CWC demonstrate compliance with ARARs for the NC Sites.

GROUND-WATER MONITORING

Ground water was sampled during CY 2017 at the NC Sites following a protocol for individual wells and analytes. Ground water was analyzed for various radiological constituents and for inorganic parameters. Static ground-water elevations for all NC Site wells were measured quarterly.

The environmental sampling requirements and ground-water monitoring guidelines for each analyte are consistent with the EMICY17 (USACE 2016) and were used for comparison and discussion purposes. The ROD ground-water monitoring guidelines (henceforth referred to as ROD guidelines) for assessing ground-water sampling data at the NC Sites (Latty Avenue Properties and the SLAPS and SLAPS VPs) are presented in Section 2.2.4 of the EMICY17 (USACE 2016) and in Section 4.0 and Appendix F of this EMDAR. For those wells at which an analyte exceeded the ROD guidelines at least once during CY 2017 and sufficient data were available to evaluate trends, Mann-Kendall Trend Test were completed to assess whether analyte concentrations were increasing or decreasing through time.

LATTY AVENUE PROPERTIES

Ground-water sampling was conducted at six hydrostratigraphic zone (HZ)-A ground-water monitoring wells at the Latty Avenue Properties during CY 2017. Contaminant of concern (COC) concentrations in one well (molybdenum in HISS-10) exceeded the ROD guideline in HZ-A ground water at the Latty Avenue Properties during CY 2017. Because a significant degradation of CWC surface water has not occurred, no findings currently indicate significantly degraded ground-water conditions in HZ-A ground water.

Ground-water samples were collected from one HZ-C well (HW23) during CY 2017. Concentrations of all inorganic and radiological soil COCs were below the ROD ground-water guidelines in CY 2017 ground-water samples from the HZ-C well HW23 when measurement error is taken into account.

The Mann-Kendall Trend Test was performed for one COC in one HZ-A well (molybdenum in HISS-10) during CY 2017. A statistically significant increasing trend was identified for molybdenum concentrations in HISS-10.

Concentrations of all soil COCs were below the NC ROD ground-water criteria in CY 2017 ground-water samples from the HZ-C well HW23 when measurement error is taken into account. Therefore, a trend analysis was not conducted for HZ-C ground water.

The potentiometric data indicate some mounding of HZ-A ground water at the HISS and Futura. Wells HISS-01, HISS-10, and HISS-17S have the highest potentiometric surface elevations, with lower ground-water elevations measured in the surrounding wells. At the western edge of the HISS and Futura, ground water in HZ-A flows to the west toward CWC.

The potentiometric surface of the HZ-C ground water at the Latty Avenue Properties is not well defined due to the limited data available for the deeper HZs. Based on measured ground-water elevations in the HZ-C monitoring well HW23 at the Latty Avenue Properties and several HZ-C wells located to the southwest at the SLAPS and SLAPS VPs, the flow direction in HZ-C ground water beneath the Latty Avenue Properties is generally toward the east-northeast.

ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES

At the SLAPS and SLAPS VPs, 10 ground-water wells were sampled for various parameters during CY 2017. Six (6) wells, screened in HZ-A, were sampled at the SLAPS and the adjacent SLAPS VP ballfields. Three inorganic analytes (barium, chromium, and nickel) and one radiological contaminant (total uranium [U]) were detected in HZ-A ground water at concentrations in excess of the ROD guidelines. A comparison of the data indicates that only total U concentrations in PW46 exceeded the ROD guidelines for a period of at least 12 months. Because a significant degradation of CWC surface water has not occurred, no findings currently indicate significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and

SLAPS VPs in CY 2017. However, because total U levels exceeded the ROD guidelines for a period of at least 12 months, monitoring will continue subject to subsequent 5-year reviews.

During CY 2017, four wells screened across the deeper HZs (HZ-C through HZ-E) were sampled at the SLAPS and SLAPS VPs. No soil COCs from ground-water samples collected from these four wells in CY 2017 exceeded the ROD guidelines if the associated measurement error is taken into account. Therefore, the CY 2017 HZ-C through HZ-E ground-water data from the SLAPS and SLAPS VPs indicate that significant degradation of lower ground water is not occurring.

The Mann-Kendall Trend Test was performed for barium (B53W01S), chromium (B53W09S), nickel (B53W09S and PW43), and total U (PW46). Statistically significant increasing trends were observed for chromium and nickel in B53W09S. No trend was observed for barium in B53W01S, nickel in PW43, or total U in PW46.

Potentiometric surface maps were created from ground-water elevations measured in May and November to illustrate ground-water flow conditions in wet and dry seasons. The potentiometric data indicate ground-water flow northwesterly toward CWC in the HZ-A at the SLAPS. The flow direction in the HZ-C ground water at the SLAPS is generally east or northeast.

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) 2017 applies to the North St. Louis County (NC) Sites, which are within the St. Louis Sites (SLS) (Figure 1-1), and under the scope of the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the implementation of the Environmental Monitoring Program (EMP) for the NC Sites. The NC Sites consist of the St. Louis Airport Site (SLAPS), SLAPS vicinity properties (VPs) (Figure 1-2), and the Latty Avenue Properties (i.e., the Hazelwood Interim Storage Site [HISS], the Futura Coatings Company [Futura], and eight Latty Avenue VPs) (Figure 1-3). Additional environmental data were collected along Coldwater Creek (CWC), which flows adjacent to the SLAPS, near the HISS, and north of U.S. Interstate Highway 270 to the Missouri River. Environmental monitoring of various media at each of the NC Sites is required in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the *Record of Decision for the North St. Louis County Sites* (ROD) (USACE 2005).

1.2 PURPOSE

The purpose of this EMDAR is to document the environmental monitoring activities and to assess whether remedial actions (RAs) at the NC Sites had a measurable environmental impact. In addition, this EMDAR serves to enhance the reader's awareness of the current condition of the NC Sites, summarize the data collection efforts for CY 2017, and provide analysis of the CY 2017 environmental monitoring data results. This EMDAR presents the following information:

- Sample collection data for various media at each site and interpretation of CY 2017 EMP results;
- The compliance status of each site with federal and state applicable or relevant and appropriate requirements (ARARs) or other benchmarks (e.g., *Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2017* [EMICY17] [USACE 2016]);
- Dose assessments for radiological contaminants as appropriate;
- A summary of trends based on changes in contaminant concentration, to support RAs, ensure public safety, and maintain surveillance monitoring requirements at each site; and
- The identification of data gaps and future EMP needs.

1.3 ST. LOUIS SITE PROGRAM AND SITE BACKGROUND

The FUSRAP was executed by the U.S. Atomic Energy Commission (AEC) in 1974 to identify, remediate, or otherwise control sites at which residual radioactivity remains from operations conducted for the Manhattan Engineer District (MED) and AEC during the early years of the nation's atomic energy program. The FUSRAP was continued by the follow-on agencies to the AEC until 1997, when the U.S. Congress transferred responsibility for the FUSRAP to the U.S. Army Corps of Engineers (USACE).

On October 4, 1989, the SLAPS, the HISS, and Futura were placed on the U.S. Environmental Protection Agency (USEPA) National Priorities List (NPL) under the site name "St. Louis

Airport/Hazelwood Interim Storage/Futura Coatings Co." (Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] No. MOD980633176). The three NPL sites have been involved with: refinement of uranium ores, production of uranium metal and compounds, uranium recovery from residues and scrap, and the storage and disposal of associated process byproducts.

Detailed descriptions and histories for each site can be found in the *Remedial Investigation Report for the St. Louis Site* (U.S. Department of Energy [DOE] 1994), *Remedial Investigation Addendum for the St. Louis Site* (DOE 1995), *St. Louis Airport Site (SLAPS) Interim Action Engineering Evaluation/Cost Analysis (EE/CA)* (DOE 1997), *Engineering Evaluation/Cost Analysis (EE/CA) and Responsiveness Summary for the St. Louis Airport Site (SLAPS)* (USACE 1998a), *Environmental Evaluation/Cost Analysis (EE/CA) for the Hazelwood Interim Storage Site (HISS)* (USACE 1998b), the *Environmental Monitoring Guide for the St. Louis Sites* (EMG) (USACE 1999a), and the ROD (USACE 2005).

During CY 2017, the following USACE documents were finalized for the NC Sites:

- *CY 2016 Fourth Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories, St. Louis, Missouri* (February);
- *CY 2017 First Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories, St. Louis, Missouri* (May);
- *Pre-Design Investigation Report and Final Status Survey Evaluation for Coldwater Creek (CWC)-Floodplain Properties CWC-1, CWC 4 through CWC 8, CWC 13 through CWC 28, CWC 156, and Willow Lane, St. Louis, Missouri* (June 19);
- *North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for CY 2016, St. Louis, Missouri* (July 21);
- *Pre-Design Investigation Work Plan for St. Louis Airport Site Vicinity Property 38, St. Louis, Missouri* (July 28);
- *Pre-Design Investigation Summary Report for Vicinity Property 40A (partial), St. Louis, Missouri* (July 28);
- *CY 2017 Second Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories, St. Louis, Missouri* (August);
- *Pre-Design Investigation Summary Report and Final Status Survey Evaluation for Coldwater Creek (CWC)-Floodplain Properties CWC-34 through CWC-44, CWC-46 through CWC-51, CWC-53 through CWC-55, CWC-56 (partial), CWC-59 through CWC-64, Foxtree Drive, Alma Drive, and St. Cin Lane, St. Louis, Missouri* (October 9);
- *CY 2017 Third Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories, St. Louis, Missouri* (November);
- *Remedial Design/Remedial Action Work Description Chez Paree Properties, Supplement No. 7 to the Remedial Action Work Plan Coldwater Creek Properties, FUSRAP North St. Louis County Sites, St. Louis, Missouri* (December 14);

- *Environmental Monitoring Implementation Plan for the North St. Louis Sites for Calendar Year 2018, St. Louis, Missouri* (December 15); and
- *Pre-Design Investigation Summary Report St. Louis Airport Site Vicinity Property Latty Avenue, FUSRAP North St. Louis County Sites, St. Louis, Missouri.* (December 21)

1.3.1 Latty Avenue Properties Calendar Year 2017 Remedial Actions

No RAs or *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (DOD 2000) Class 1, Class 2, or Class 3 verifications were performed at the Latty Avenue Properties in CY 2017. Verifications are performed to confirm the ROD remediation goals (RGs) were achieved. No characterization/pre-design investigation (PDI) was performed on Latty Avenue in CY 2017.

1.3.2 St. Louis Airport Site and St. Louis Airport Site Vicinity Properties Calendar Year 2017 Remedial Actions

In CY 2017, RAs were performed at the following SLAPS-related VPs and investigation areas (IAs) (Figure 1-2): Duchesne Park, Palm Drive Properties, and IA-09 Ballfields. RAs at Duchesne Park were performed and completed in the first quarter. RAs at Palm Drive Properties started in the second quarter and completed in the third quarter. RAs at IA-09 started in the third quarter and continued through the fourth quarter. During these RAs, 8,474 yd^3 of contaminated material were shipped from the SLAPS IAs and VPs via railcar to US Ecology in Idaho and Michigan for proper disposal.

During CY 2017, MARSSIM Class 1 verifications were performed at Duchesne Park (survey unit [SU]-3), Palm Drive Properties (SU-1 and SU-2), and IA-09 (SU-11). MARSSIM Class 2 verifications were performed at Palm Drive Properties during 2017. No MARSSIM Class 3 verifications were performed. Verifications were performed to confirm that ROD RGs were achieved.

Characterizations/PDIs were performed at the following SLAPS IAs and VPs in CY 2017: IA-09; VP-40A and VP-56; Pershall Road Properties; Foxmont Drive Properties (formerly Elm Grove Properties); and the Jana School Property.

In CY 2017, no Resource Conservation and Recovery Act (RCRA) hazardous waste was shipped, and no monitoring wells were decommissioned.

In accordance with the Metropolitan St. Louis Sewer District (MSD) authorization letter, 999,126 gallons of excavation water were discharged from the NC Sites in CY 2017. Since the beginning of the project, 31,493,747 gallons have been treated and released to MSD from the NC Sites.

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2.0 EVALUATION OF RADIOLOGICAL AIR MONITORING DATA

This section documents environmental monitoring activities related to radiological air data. The radiological air monitoring conducted at the NC Sites is part of the EMP. Radiological air data are collected to evaluate the compliance status of each site with ARARs, to evaluate trends, and to perform dose assessments for radiological contaminants as appropriate at each site. Section 2.1 includes a description of the types of radiological air monitoring conducted at the NC Sites, potential sources of the contaminants to be measured (including natural background), and measurement techniques employed during CY 2017.

All radiological air monitoring required through implementation of the EMICY17 (USACE 2016) was conducted as planned in CY 2017. The evaluations of radiological air monitoring data for all NC Sites demonstrate compliance with ARARs.

A total effective dose equivalent (TEDE) for the reasonably maximally exposed (RME) member of the public at each of the NC Sites was calculated by summing the dose due to gamma radiation, radiological air particulates, and radon, as applicable. The TEDE calculated for the RME individual at each of the NC Sites was less than or equal to 5.4 mrem per year. The calculated TEDE is compliant with the 100 mrem per year limit prescribed in 10 *Code of Federal Regulations (CFR)* 20.1301. Details of the radiological dose assessment (TEDE calculation) are presented in Section 6.0.

2.1 RADIOLOGICAL AIR MEASUREMENTS

The three types of radiological air monitoring conducted at the NC Sites in CY 2017 were gamma radiation, airborne radioactive particulates, and airborne radon. Sections 2.2 and 2.3 provide details of the air monitoring conducted at the Latty Avenue Properties and the SLAPS and SLAPS VPs.

2.1.1 Gamma Radiation

Gamma radiation is emitted from natural, cosmic, and manmade sources. The earth naturally contains gamma radiation-emitting substances, such as the uranium decay series, the thorium decay series, and potassium (K)-40. Cosmic radiation originates in outer space and filters through the atmosphere to the earth. Together, these two sources comprise the majority of natural gamma background radiation. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) estimates that the total naturally occurring background radiation dose equivalent due to gamma exposure is 65 mrem per year, 35 mrem per year of which originates from sources on earth and 30 mrem per year of which originates from cosmic sources (UNSCEAR 1982). The background monitoring location for the NC Sites (Figure 2-1) is reasonably representative of background gamma radiation for the St. Louis metropolitan area.

Gamma radiation was measured at the NC Sites in CY 2017 using thermoluminescent dosimeters (TLDs). TLDs were placed at site boundaries in order to provide input for calculation of TEDE.

The TLDs were placed at the monitoring location approximately 5 ft above the ground surface inside a housing shelter. The TLDs were collected quarterly and sent to a properly certified, off-site laboratory for analysis.

2.1.2 Airborne Radioactive Particulates

2.1.2.1 Air Sampling

Airborne radioactive particulates result from radionuclides in soil that becomes suspended in the air. The radionuclides in soil normally become airborne as a result of wind erosion of the surface soil or as a result of soil disturbance (e.g., excavation). This airborne radioactive material includes naturally occurring background concentrations (Appendix B, Table B-1), as well as above background concentrations of radioactive materials present at the NC Sites.

Airborne radioactive particulates were measured at the NC Sites by drawing air through a filter membrane with an air sampling pump placed approximately 3 ft above the ground and then analyzing the material contained on the filter. The results of the analysis, when compared to the amount of air drawn through the filter, were reported as radioactive contaminant concentrations (i.e., µCi/mL). Particulate air monitors were located at excavation and loadout area perimeter locations, as appropriate, to provide input for the National Emissions Standards for Hazardous Air Pollutants (NESHAP) Report and calculation of TEDE to the critical receptor. Air particulate samples were typically collected weekly or at more frequent intervals.

2.1.2.2 Estimation of Emissions in Accordance with the National Emission Standard for Hazardous Air Pollutants

The NC Sites CY 2017 NESHAP report (Appendix A) presents calculation of the effective dose equivalent (EDE) from radionuclide emissions to critical receptors in accordance with the NESHAP. The report is prepared in accordance with the requirements and procedures contained in 40 *CFR* 61, Subpart I.

Emission rates calculated using air sampling data, activity fractions, and other site-specific information were used as inputs to the USEPA CAP88-PC Version 4.0 modeling code (USEPA 2014) to demonstrate compliance with the 10 mrem per year ARAR prescribed in 40 *CFR* 61, Subpart I.

2.1.3 Airborne Radon

Uranium (U)-238 is a naturally occurring radionuclide commonly found in soil and rock. Radon (Rn)-222 is a naturally occurring radioactive gas found in the uranium decay series. A fraction of the radon produced from the radioactive decay of naturally occurring U-238 diffuses from soil and rock into the atmosphere, accounting for natural background airborne radon concentrations. In addition to this natural source, radon is produced from the above background concentrations of radioactive materials present at the NC Sites.

Outdoor airborne radon concentration is governed by the emission rate and dilution factors, both of which are strongly affected by meteorological conditions. Surface soil is the largest source of radon. Secondary contributors include oceans, natural gas, geothermal fluids, volcanic gases, ventilation from caves and mines, and coal combustion. Radon levels in the atmosphere have been observed to vary with height above the ground, season, time of day, and location. The primary meteorological parameter governing airborne radon concentration is atmospheric stability; however, the largest variations in atmospheric radon occur spatially (USEPA 1987).

Radon alpha track detectors (ATDs) were used at the NC Sites to measure alpha particles emitted from radon and its associated decay products. Radon ATDs were co-located with environmental TLDs approximately 5 ft above the ground surface in housing shelters at the site boundaries or at locations representative of areas accessible to the public. Outdoor ATDs were collected approximately every 6 months and sent to an off-site laboratory for analysis. Recorded radon concentrations are listed in pCi/L and are used to provide input for calculation of TEDE.

At the NC Sites, ATDs were also placed in locations within applicable structures to monitor for indoor radon exposure. The ATDs were placed in areas that represent the highest likely exposure from indoor radon. ATD locations were chosen with consideration given to known radium (Ra)-226 concentrations under applicable buildings and occupancy time at any one location within each building. Annual average indoor radon data in each applicable building were compared to the 40 *CFR* 192.12(b)(1) ARAR value of 0.02 working level (WL). In accordance with 40 *CFR* 192.12(b)(1), reasonable effort shall be made to achieve, in each habitable or occupied building, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration shall not exceed 0.03 WL. Background indoor radon monitors were not necessary, because the regulatory standard of 0.02 WL includes background. Indoor ATDs were also collected approximately every 6 months and sent to an off-site laboratory for analysis.

CY 2017 monitoring results for the NC Sites demonstrate compliance with the 0.02 WL ARAR prescribed by 40 *CFR* 192.12(b)(1). See Section 2.2.4 for further details.

2.2 LATTY AVENUE PROPERTIES

Radiological air monitoring was conducted at an area on VP-40A in CY 2017.

2.2.1 Evaluation of Gamma Radiation Data

Two new radiological monitoring stations were added to monitor gamma radiation on VP-40A in CY 2017. External gamma radiation exposure from Latty Avenue Properties other than the VP-40A is considered negligible; therefore, environmental TLD monitoring was not conducted at Latty Avenue Properties other than the VP-40A in 2017. Gamma radiation monitoring was performed at two locations along the railroad tracks on VP-40A (see Figure 2-2) and at the background location to compare on-site/off-site exposure and to provide input for calculation of TEDE to the critical receptor (Section 6.0) in CY 2017. A summary of TLD monitoring data for CY 2017 at VP-40A is shown in Table 2-1. TLD data is located in Appendix B, Table B-3, of this EMDAR.

Table 2-1. Summary of VP-40A Gamma Radiation Data for CY 2017

Monitoring Location	Monitoring Station	First Quarter TLD Data (mrem/quarter) Reported/ Corrected		Second Quarter TLD Data (mrem/quarter) Reported/ Corrected		Third Quarter TLD Data (mrem/quarter) Reported/ Corrected		Fourth Quarter TLD Data (mrem/quarter) Reported/ Corrected		CY 2017 Net TLD Data (mrem/year)
		Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	
VP-40A	FA-2[c]	9.4	0.0	24.7	5.3	9.4	0.0	24.7	4.4	10.1
	FA-3[c]	7.2	0.0	19.6	0.2	7.2	0.0	19.6	0.0	0.2
Background	BA-1	19.8	---	19.4	---	20.1	---	20.3	---	---

[a] All quarterly data reported from the vendor have been normalized to exactly one quarter's exposure above background.
[b] CY 2017 net TLD data are corrected for background, shelter absorption (s/a = 1.075), and fade.
[c] Monitoring stations at FA-2 and FA-3 were not set up until the third quarter 2017. Monitoring results from last 2 quarters were assumed to be equal to the first two quarters for the purposes of assessing annual exposure.
--- Result calculation not required for background data.
Cor. – Corrected
Rpt. – Reported

2.2.2 Evaluation of Airborne Radioactive Particulate Data

No excavation or loadout activities for the Latty Avenue Properties occurred in CY 2017. Therefore, radioactive particulate emissions were considered negligible, and air sampling for particulate radionuclides was not required.

2.2.3 Evaluation of Outdoor Airborne Radon Data

Three new radiological monitoring stations were added to monitor outdoor exposure to Rn-222 on VP-40A in CY 2017. Outdoor exposure from Rn-222 from Latty Avenue Properties other than the VP-40A is considered negligible. Therefore, outdoor environmental Rn-222 monitoring was not conducted at Latty Avenue Properties other than the VP-40A in 2017. For the Latty Avenue Properties, outdoor airborne radon monitoring was performed using ATDs placed along the railroad tracks on VP-40A. Two detectors were co-located with TLDs and an additional ATD was located just north of the other two ATDs, as identified in Figure 2-2. Background ATDs were used to compare on-site exposure and off-site background exposure. Outdoor airborne radon data was used as an input for calculation of TEDE to the critical receptor (Section 6). A summary of CY 2017 outdoor radon data at VP-40A is shown in Table 2-2. Outdoor ATD data is located in Appendix B, Table B-2 of this EMDAR.

Table 2-2. Summary of VP-40A Outdoor Airborne Radon (Rn-222) Data for CY 2017

Monitoring Location	Monitoring Station	Average Annual Concentration (pCi/L)		
		01/04/17 to 08/30/17 [a] (uncorrected)	08/30/17 to 01/09/18[a] (uncorrected)	Average Annual Concentration[b]
VP-40A	FA-1	--	0.2	0.2
	FA-2	--	0.3	0.3
	FA-3	--	0.2	0.2
Background	BA-1	0.2	0.2	---

[a] Detectors were installed and removed on the dates listed. Data are as reported from the vendor (gross data including background).
[b] Results reported from the vendor are typically time-weighted and averaged to estimate an annual average radon concentration (pCi/L) above background. Because in 2017 there is only data from a single monitoring event for each station, averaging is not necessary and the data will only be time-weighted to estimate the annual average radon concentrations above background.
-- Monitoring stations at FA-1, FA-2, and FA-3 were not set up until the third quarter 2017.
--- Average annual concentration calculation not required for background.

2.2.4 Evaluation of Indoor Airborne Radon Data

Indoor radon monitoring was performed at Futura buildings using ATDs placed at several locations in each Futura building at a height of 5 ft (to approximate breathing zone conditions) to measure radon concentrations. The detectors were located as shown on Figure 2-2. The ATDs were installed in January of CY 2017 at each monitoring location, collected for analysis after approximately 6 months of exposure, and replaced with another set that represent radon exposure for the remainder of the year. Recorded radon concentrations (listed in pCi/L) were converted to a radon WL, and an indoor radon equilibrium factor of 0.4 (NCRP 1988) was applied.

The results (including background) were evaluated based on the criteria contained in 40 *CFR* 192.12(b)(1). The average annual radon concentration was less than the 40 *CFR* 192.12(b)(1) criterion of 0.02 WL in each building (Leidos 2018a). Table 2-1 includes additional details of the data and calculation methodology used to determine the indoor radon WL in the Futura buildings. Indoor ATD data are contained in Appendix B, Table B-2, of this EMDAR.

Table 2-3. Summary of Futura Indoor Airborne Radon (Rn-222) Data for CY 2017

Monitoring Location	Monitoring Station	Average Annual Concentration (pCi/L)				WL[d]
		01/04/17 to 07/05/17[a]	07/05/17 to 01/09/18[a]	Annual Average[b]	Building Average[c]	
Futura Building 1	HF-1	1.5	2.4	1.95	2.9	0.012
	HF-2	6	6.2	6.1		
	HF-3	0.2	1	0.6		
Futura Building 2/3	HF-4	0.7	1	0.85	1.0	0.004
	HF-5	0.8	1.1	0.95		
	HF-6	0.7	1.1	0.9		
	HF-7	1	1.3	1.15		
Futura Building 4	HF-8	0.8	1	0.9	1.0	0.004
	HF-9	0.9	1.1	1		
	HF-10	0.8	1.1	0.95		

[a] Detectors were installed and removed on the dates listed. Data are as reported from the vendor.
[b] Results reported from the vendor for two periods are averaged to estimate an annual average radon concentration (in pCi/L) above background.
[c] In each building, the average annual result for each monitoring station within the building was used to calculate a building average.
[d] The average annual WL is calculated by dividing the average pCi/L by 100 pCi/L per WL and multiplying by 0.4. The average annual WL must be less than 0.02 (40 *CFR* 192.12(b)).

2.3 SLAPS AND SLAPS VICINITY PROPERTIES

Radiological air monitoring was conducted at Duchesne Park, Palm Drive Properties, the Ballfields (IA-09), and the SLAPS in CY 2017.

2.3.1 Evaluation of Gamma Radiation Data

External gamma radiation exposure from the SLAPS VPs is considered negligible; therefore, environmental TLD monitoring was not conducted. Gamma radiation monitoring was performed at the SLAPS in CY 2017 at four site locations surrounding the loadout area (Figure 2-3) and at the background location (Figure 2-1) to compare on-site/off-site exposure and to provide input for calculation of TEDE to the critical receptor (Section 6.0). The EMP uses two TLDs at monitoring station PA-2 (for each monitoring period) to provide additional quality control (QC) of the monitoring data.

A summary of TLD monitoring results for CY 2017 at the SLAPS is shown in Table 2-2. TLD data are contained in Appendix B, Table B-3, of this EMDAR.

Table 2-2. Summary of SLAPS Gamma Radiation Data for CY 2017

Monitoring Location	Monitoring Station	First Quarter TLD Data		Second Quarter TLD Data		Third Quarter TLD Data		Fourth Quarter TLD Data		CY 2017 Net TLD Data (mrem/year)
		(mrem/quarter)								
		Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	
SLAPS Perimeter	PA-1	19.4	0.0	20.3	1.0	19.8	0.0	22.2	1.9	2.9
	PA-2	24.4	5.1	23	3.8	24	4.4	24.6	4.3	17.6
	PA-2[c]	22.8	3.3	22.9	3.7	23.4	3.7	22.6	2.3	13.0
	PA-3	21.6	2.0	19.7	0.3	20.4	0.3	21.5	1.2	3.8
	PA-4	24.8	5.5	24.2	5.1	23.7	4.0	26.3	6.1	20.7
Background	BA-1	19.8	---	19.4	---	20.1	---	20.3	---	---

[a] All quarterly data reported from the vendor have been normalized to exactly one quarter's exposure.
[b] CY 2017 net TLD data are corrected for background, shelter absorption (s/a = 1.075), and fade.
[c] A QC duplicate is collected at the same time and location, and is analyzed by the same method for evaluating precision in sampling and analysis. Duplicate sample results were not included in calculations.
--- Result calculations are not required.
Cor. – Corrected
Rpt. – Reported

2.3.2 Evaluation of Airborne Radioactive Particulate Data

For the SLAPS and SLAPS VPs, air sampling for particulate radionuclides was conducted at the perimeter of each active excavation and loadout area throughout CY 2017. Air particulate data were used as inputs to the NESHAP report (Appendix A) and calculation of TEDE to the critical receptor (Section 6.0).

A summary of air particulate monitoring data for the SLAPS and SLAPS VPs is shown in Table 2-3. Airborne radioactive particulate data are contained in Appendix B, Table B-4, of this EMDAR.

Table 2-3. Summary of SLAPS Airborne Radioactive Particulate Data for CY 2017

Monitoring Location	Average Concentration (μCi/mL)[a]	
	Gross Alpha	Gross Beta
Duchesne Park	7.46E-15	3.18E-14
Palm Drive Properties	4.01E-15	2.33E-14
Ballfields (IA-09)	3.89E-15	3.21E-14
SLAPS Loadout	3.38E-15	3.22E-14
Background Concentration[b]	4.93E-15	2.13E-14

[a] Average concentration values for the sampling period by location.
[b] These concentrations are provided for informational purposes only.

2.3.3 Evaluation of Outdoor Airborne Radon Data

Exposure to Rn-222 from the SLAPS VPs is considered negligible; therefore, outdoor environmental Rn-222 monitoring was not conducted. Outdoor airborne radon monitoring was performed at the SLAPS using ATDs placed around the loadout area to measure radon emissions from the site. Four detectors were co-located with TLDs, as identified on Figure 2-3. One additional detector was located at monitoring station PA-2 as a QC duplicate. A background ATD was used to compare on-site exposure and off-site background exposure. Outdoor airborne radon data were used as an input for calculation of TEDE to the critical receptor (Section 6.0).

A summary of CY 2017 outdoor radon data at the SLAPS is shown in Table 2-4. Outdoor ATD data are contained in Appendix B, Table B-2, of this EMDAR.

Table 2-4. Summary of SLAPS Outdoor Airborne Radon (Rn-222) Data for CY 2017

Monitoring Location	Monitoring Station	Average Annual Concentration (pCi/L)		
		01/04/16 to 07/07/16[a] (Uncorrected)	07/07/16 to 01/04/17[a] (Uncorrected)	Average Annual Concentration[b]
SLAPS Perimeter	PA-1	0.2	0.2	0.0
	PA-2	0.2	0.3	0.05
	PA-2[c]	0.2	0.4	---
	PA-3	0.2	0.2	0.0
	PA-4	0.2	0.3	0.05
Background	BA-1	0.2	0.2	---

[a] Detectors were installed and removed on the dates listed. Data are as reported from the vendor (gross data including background).
[b] Results reported from vendor for two periods are time-weighted and averaged to estimate an annual average radon concentration (pCi/L) above background.
[c] A QC duplicate is collected at the same time and location, and is analyzed by the same method for evaluating precision in sampling and analysis.
--- Result calculations are not required.

3.0 EVALUATION OF EXCAVATION-WATER, STORM-WATER, SURFACE-WATER, AND SEDIMENT MONITORING DATA

This section provides a description of the excavation-water, storm-water, surface-water, and sediment monitoring activities conducted at the NC Sites, including the monitoring of CWC, in CY 2017. The results obtained from these monitoring activities are presented and evaluated with respect to historical data and the appropriate discharge limits as described in the EMICY17 (USACE 2016).

Section 2.2.2 of the EMICY17 outlines the discharge limits for the storm-water and excavation-water discharged at each site (USACE 2016). The MSD has issued discharge authorization letters for the NC Sites that established discharge-limit-based criteria (MSD 1998, 2001, 2006, 2008, 2010, 2012, 2014 and 2016a). The pollutants addressed for all NC Sites are identified in Table 2-5 of the EMICY17 (USACE 2016). The pollutants addressed in the National Pollutant Discharge Elimination System (NPDES) permit equivalent for the SLAPS will be applied at all NC Sites and are identified in Table 2-6 of the EMICY17 (USACE 2016). For cases in which the regulatory authorities have not provided radiological contaminant of concern (COC) discharge limits, the 10 *CFR* 20, Appendix B, water effluent values are used to calculate the sum of ratios (SOR) value for each discharge. Additionally, the SOR aids in the establishment of water management protocols. The Missouri Department of Natural Resources (MDNR) has also issued an ARAR document outlining limits for the storm-water outfalls at the SLAPS (MDNR 1998).

3.1 LABORATORY DISCHARGE, EXCAVATION-WATER, AND STORM-WATER DISCHARGE MONITORING

This section provides a description of the laboratory discharge water, excavation-water, and storm-water monitoring activities conducted at the NC Sites in CY 2017. The monitoring results obtained from these activities are presented and compared with the various authorization letters or permit-equivalent limits as presented in the EMICY17 (USACE 2016). The purpose of discharge monitoring at the NC Sites is to maintain compliance with the specific discharge requirements for each respective site.

3.1.1 Metropolitan St. Louis Sewer District Special Discharge Approval for the On-Site USACE St. Louis District FUSRAP Radioanalytical Laboratory

The USACE owns the on-site laboratory located at 8945 Latty Avenue in Hazelwood, Missouri. The laboratory operates in accordance with an MSD special discharge approval. The USACE St. Louis FUSRAP laboratory waste-water is discharged to MSD manhole 10K2-075S, which is shown on Figure 3-1. The MSD special discharge approval requires compliance with applicable discharge regulations (Ordinance 8472) (MSD 1991). The current special discharge approval extension was renewed on February 2, 2016, and expires February 7, 2018 (MSD 2016b).

3.1.2 Evaluation of Storm-Water Discharge Monitoring Results

In CY 2017, storm-water monitoring at the SLAPS was conducted to verify compliance with NPDES permit-equivalent requirements. There is one NPDES outfall located at the SLAPS. This outfall has been assigned the station identification PN02 for Outfall 002. PN02 is located at the termination of a drainage feature that conveys storm water along the north side of James S. McDonnell Boulevard to CWC (Figure 3-2).

In conjunction with the construction of a sedimentation basin during CY 1998, the MDNR issued discharge sampling requirements for three outfalls (PN01 [now terminated], PN02, and PN03 [now terminated]). The ARAR permit-equivalent document (MDNR 1998) requires monthly monitoring for flow, oil and grease, total petroleum hydrocarbons (TPHs), pH, settleable solids (SSs), and polychlorinated biphenyls (PCBs), as well as total recoverable arsenic, chromium, and cadmium. In addition, effluent monitoring for gross alpha, gross beta, protactinium (Pa)-231, actinium (Ac)-227, total Ra, total thorium (Th), and total U is required for each discharge event. Effluent monitoring for radon is required twice per year, but only one monitoring event was performed in CY 2017. As outlined in a letter from the USACE to the MDNR dated November 18, 2003, chemical oxygen demand (COD) monitoring has been modified from quarterly to annually (USACE 2003).

On February 19, 2002, the MDNR issued a letter to the USACE conditionally agreeing with a request to reduce the sampling frequency at PN02 to once per year, effective February of 2002 until the drainage area becomes affected by soil disturbance such as excavation (MDNR 2002). The condition of the agreement is that the MDNR be notified prior to the soil in the area being disturbed. The USACE increased the sampling frequency at PN02 from annually (MDNR 2002) to monthly, as established in the original permit equivalent agreement, as of August 30, 2017. Sampling frequency at PN02 was temporary reduced to annually, per USACE email on October 31, 2017. On December 4, 2017, USACE notified MDNR that the sampling frequency at PN02 was increased from annually (MDNR 2002) to monthly because remediation resumed at IA-09 (Ballfields). These emails are contained in Appendix C.

During 2017, un-named moving pumping outfalls were utilized during excavation activities at Duchesne Park and Palm Drive Properties for the management of storm water with regard to sediment control and pumped excavation water. Moving outfalls are necessary to pump excess excavation water, which cannot be contained due to geographic conditions, to CWC. The excess excavation water is pumped to CWC in accordance with agreements made during a March 12, 2007, meeting with Mr. Tom Siegel of the MDNR, and as described in a subsequent letter from the USACE dated April 20, 2007 (USACE 2007). Excavation water sampling is conducted to verify compliance with the NPDES permit-equivalent requirements. The discharge parameters for the un-named outfalls follow the same NPDES parameters as Outfall 002.

Analytical results for the NC Sites are contained in Appendix C, Table C-1. Quarterly summaries of the CY 2017 storm-water monitoring events for the NC Sites are presented in the following subsections. NC Site storm-water monitoring results for CY 2017 are contained in Tables 3-1, through 3-3.

During CY 2017, rainfall data were obtained for the National Weather Service Lambert – St. Louis International Weather Station (Weather Underground, Inc. 2017), which is located adjacent to the NC Sites. Daily flow and rainfall data are contained in Appendix C, Table C-2.

First Quarter

During the first quarter (January, February, and March) of CY 2017, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-1). During the first quarter, one sampling event was conducted at Un-Named Outfall Duchesne Park.

Second Quarter

During the second quarter (April, May, and June) of CY 2017, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-2). During the second quarter, two sampling events were conducted at Un-Named Outfall Palm Drive Properties.

Table 3-1. First Quarter CY 2017 NPDES Sampling Event[a]

Monitoring Parameter	Final Effluent Limitations		Units	Analytical Results					
				Outfall 002			Un-Named Outfall – Duchesne Park		
				Chemical Parameters					
	Daily Maximum	Monthly Average		January	February	March	January	February	March
Flow	Monitor only	Monitor only	MGD	[e]	[e]	[e]	0.006	[f]	[f]
Oil and Grease	15	10	mg/L	[e]	[e]	[e]	<1.8	[f]	[f]
TPHs	10	10	mg/L	[e]	[e]	[e]	<3.1	[f]	[f]
pH-Units	6.0-9.0	NA	s.u.	[e]	[e]	[e]	7.8	[f]	[f]
COD[b]	120	90	mg/L	[e]	[e]	[e]	[b]	[f]	[f]
SSs[c]	1.5	1.0	mL/L/hour	[e]	[e]	[e]	<0.1	[f]	[f]
Arsenic, Total Recoverable	100	100	µg/L	[e]	[e]	[e]	<4	[f]	[f]
Lead, Total Recoverable[d]	190	190	µg/L	[e]	[e]	[e]	[d]	[f]	[f]
Chromium, Total Recoverable	280	280	µg/L	[e]	[e]	[e]	<4	[f]	[f]
Copper, Total Recoverable[d]	84	84	µg/L	[e]	[e]	[e]	[d]	[f]	[f]
Cadmium, Total Recoverable	94	94	µg/L	[e]	[e]	[e]	<0.2	[f]	[f]
PCBs	No release	No release	µg/L	[e]	[e]	[e]	<0.25	[f]	[f]
				Radiological Parameters[g,h,i]					
Event Sampling Date				Event 1			Event 1		
				NA			01/18/17		
Total U[j,k]	Monitor only	Monitor only	µg/L	[e]			-4.E-01		
Total Ra[j,k]	Monitor only	Monitor only	µg/L	[e]			8.E-08		
Total Th[j,k]	Monitor only	Monitor only	µg/L	[e]			6.E-05		
Gross Alpha[j]	Monitor only	Monitor only	pCi/L	[e]			-7.E-02		
Gross Beta[j]	Monitor only	Monitor only	pCi/L	[e]			2.E+01		
Pa-231[j]	Monitor only	Monitor only	pCi/L	[e]			4.E+00		
Ac-227[j]	Monitor only	Monitor only	pCi/L	[e]			-4.E+00		
Radon (semi-annual monitoring)	Monitor only	Monitor only	pCi/L	[e]			[l]		

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period that may also exceed the duration of 24 hours; two events experienced within 48 hours may be reported together.
[b] Per the USACE letter dated November 18, 2003, the COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[c] Detection limit (DL) = 0.1 mL/L/hour.
[d] Lead and copper sampling are no longer necessary per the ROD.
[e] Per the USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.
[f] No sample is required, because no rain events producing measurable flow offsite occurred, and no pumping activities were performed.
[g] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[h] Negative results are less than the laboratory system's background level.
[i] Ra-228 and Th-228 are assumed to be in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[j] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit-specified.
[k] Total nuclide values (in µg/L) were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[l] Semi-annual reporting requirement only.
NA – not applicable

Table 3-2. Second Quarter CY 2017 NPDES Sampling Events[a]

Monitoring Parameter	Final Effluent Limitations		Units	Analytical Results					
	Daily Maximum	Monthly Average		Outfall 002			Un-Named Outfall – Palm Drive Properties[b]		
				Chemical Parameters					
				April	May	June	April	May	June
Flow	Monitor only	Monitor only	MGD	[g]	[g]	[g]	[h]	[i]	[h]
Oil and Grease	15	10	mg/L	[g]	[g]	[g]	[h]	[i]	[h]
TPHs	10	10	mg/L	[g]	[g]	[g]	[h]	[i]	[h]
pH-Units	6.0-9.0	NA	s.u.	[g]	[g]	[g]	[h]	[i]	[h]
COD[c]	120	90	mg/L	[g]	[g]	[g]	[h]	[i]	[h]
SSs[d]	1.5	1.0	mL/L/hour	[g]	[g]	[g]	[h]	[i]	[h]
Arsenic, Total Recoverable	100	100	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
Lead, Total Recoverable[e]	190	190	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
Chromium, Total Recoverable	280	280	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
Copper, Total Recoverable[e]	84	84	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
Cadmium, Total Recoverable	94	94	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
PCBs[f]	No release	No release	µg/L	[g]	[g]	[g]	[h]	[i]	[h]
				Radiological Parameters[j,k,l]					
Event Sampling Date				Event 1			Event 1	Event 2	
				NA			05/04/17	05/08/17	
Total U[m,n]	Monitor only	Monitor only	µg/L	[g]			1.E-01	1.E-01	
Total Ra[m,n]	Monitor only	Monitor only	µg/L	[g]			8.E-07	1.E-06	
Total Th[m,n]	Monitor only	Monitor only	µg/L	[g]			6.E-05	1.E+00	
Gross Alpha[m]	Monitor only	Monitor only	pCi/L	[g]			-3.E+00	3.E+00	
Gross Beta[m]	Monitor only	Monitor only	pCi/L	[g]			-8.E+00	-1.E+00	
Pa-231[m]	Monitor only	Monitor only	pCi/L	[g]			4.E+01	1.E+01	
Ac-227[m]	Monitor only	Monitor only	pCi/L	[g]			-1.E+00	-1.E+00	
Radon (semi-annual monitoring)	Monitor only	Monitor only	pCi/L	[g]			[o]	[o]	

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period that may also exceed the duration of 24 hours; two events experienced within 48 hours may be reported together.
[b] Remediation activities started at the Palm Drive Properties on May 1, 2017, and were completed on August 15, 2017.
[c] Per the USACE letter dated November 18, 2003, the COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[d] DL = 0.1 mL/L/hour.
[e] Lead and copper sampling are no longer necessary per the ROD.
[f] DL = 0.5 µg/L.
[g] Per the USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.
[h] No sample is required, because no rain events producing measurable flow offsite occurred, and no pumping activities were performed.
[i] No chemical sample was collected in May due to government funding constraints.
[j] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[k] Negative results are less than the laboratory system's background level.
[l] Ra-228 and Th-228 are assumed to be in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[m] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit-specified.
[n] Total nuclide values (in µg/L) were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[o] Semi-annual reporting requirement only.
NA – not applicable

Table 3-3. Fourth Quarter CY 2017 NPDES Sampling Events[a]

Monitoring Parameter	Final Effluent Limitations		Units	Analytical Results		
				Outfall 002		
				Chemical Parameters		
	Daily Maximum	Monthly Average		October	November	December
Flow	Monitor only	Monitor only	MGD	0.017	[e]	[e]
Oil and Grease	15	10	mg/L	<1.5	[e]	[e]
TPHs	10	10	mg/L	<2.6	[e]	[e]
pH-Units	6.0-9.0	NA	s.u.	7.21	[e]	[e]
COD[b]	120	90	mg/L	45	[e]	[e]
SSs[c]	1.5	1.0	mL/L/hour	<0.1	[e]	[e]
Arsenic, Total Recoverable	100	100	µg/L	8.6	[e]	[e]
Lead, Total Recoverable[d]	190	190	µg/L	[d]	[e]	[e]
Chromium, Total Recoverable	280	280	µg/L	21	[e]	[e]
Copper, Total Recoverable[d]	84	84	µg/L	[d]	[e]	[e]
Cadmium, Total Recoverable	94	94	µg/L	0.51	[e]	[e]
PCBs	No release	No release	µg/L	<0.29	[e]	[e]
Event Sampling Date				Radiological Parameters[f,g,h]		
				Event 1	Event 2	
				10/10-12/17	10/16/17	
Total U[i,j]	Monitor only	Monitor only	µg/L	3.E-01	3.E-01	
Total Ra[i,j]	Monitor only	Monitor only	µg/L	4.E-07	9.E-07	
Total Th[i,j]	Monitor only	Monitor only	µg/L	2.E+00	3.E+00	
Gross Alpha[i]	Monitor only	Monitor only	pCi/L	-3.E+00	6.E-01	
Gross Beta[i]	Monitor only	Monitor only	pCi/L	4.E+00	1.E+01	
Pa-231[i]	Monitor only	Monitor only	pCi/L	1.E+01	-2.E+01	
Ac-227[i]	Monitor only	Monitor only	pCi/L	-1.E+01	-7.E+01	
Radon (semi-annual monitoring)	Monitor only	Monitor only	pCi/L	non-detect[k]	[l]	

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period that may also exceed the duration of 24 hours; two events experienced within 48 hours may be reported together.
[b] Per the USACE letter dated November 18, 2003, the COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[c] DL = 0.1 mL/L/hour.
[d] Lead and copper sampling are no longer necessary per the ROD.
[e] No sample is required, because no rain events producing measurable flow offsite occurred, and no pumping activities were performed.
[f] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[g] Negative results are less than the laboratory system's background level.
[h] Ra-228 and Th-228 are assumed to be in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[i] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit-specified.
[j] Total nuclide values (in µg/L) were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[k] DL = 0.8 pCi/L
[l] Semi-annual reporting requirement only.
NA – not applicable

Third Quarter

During the third quarter (July, August, and September) of CY 2017, no NPDES samples were collected as no water was pumped.

Fourth Quarter

During the fourth quarter (October, November, and December) of CY 2017, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-3). During the fourth quarter, two sampling events were conducted at Outfall PN02.

3.1.3 Evaluation of Excavation-Water Monitoring Results at the North St. Louis County Sites

On July 23, 2001, the MSD conditionally approved the discharge of treated excavation water to an MSD sanitary sewer manhole located at the SLAPS (MSD 2001). The current extension to the special discharge approval expires on July 23, 2018 (MSD 2016a). The primary condition of the approval requires a treatment system be installed, maintained, and operated to produce an effluent meeting the following standards: MSD ordinances 8472, 10177, and 10082 (MSD 1991, 1994, 1997); the U.S. Nuclear Regulatory Commission (NRC) requirements prescribed in 10 *CFR* 20, Appendix B; and the Missouri Department of Health and Senior Services (DHSS) requirements prescribed in 19 *Code of State Regulations (CSR)* 20-10. In addition, the MSD limits the annual allocation for radioactivity from the NC Sites to the MSD CWC treatment plant. The MSD establishes the maximum volume of excavation water discharge allowed in a 24-hour period and requires that the analytical results of the treated excavation water comply with applicable standards and limits prior to discharge. The evaluation of monitoring data results demonstrates that all ARARs have been met. The selenium discharge variance for the SLAPS was not utilized in CY 2017 (MSD 2005, 2008, 2010, 2012, 2014, 2016a). There is no longer a requirement to analyze for barium, lead, or selenium after the first two batches from new investigative areas (MSD 2012). Analytical results of the treated water are contained in Appendix C, Table C-3.

In CY 2017, approximately 999,126 gallons of treated excavation water from 6 treatment batches were released to MSD manhole 10L3-043S (Table 3-4). The discharge location is illustrated on Figure 3-2. Batches of treated excavation water were sampled and analyzed for MSD effluent criteria (Appendix C, Table C-3).

Table 3-4. Excavation Water Discharged at the NC Sites in CY 2017

Quarter	Number of Discharges	Number of Gallons Discharged[a]	Total Activity (Ci)		
			Thorium[b]	Uranium (KPA)[c]	Radium[d]
1	1	233,398	1.26E-06	1.09E-06	1.07E-06
2	3	765,328	5.44E-06	3.53E-06	2.08E-06
3	2	400	1.64E-09	3.71E-09	1.06E-09
4	0	0	NA	NA	NA
Total	6	999,126	6.70E-06	4.62E-06	3.15E-06

[a] Quantities based on actual quarterly discharges from NC Sites.
[b] Calculated value based on the addition of isotopic analyses: Th-228 and Th-230.
[c] Value based on total U results (kinetic phosphorescence analysis [KPA]).
[d] Calculated value based on the addition of isotopic analyses: Ra-226 and Ra-228.
NA – Not applicable

3.2 COLDWATER CREEK MONITORING

RA monitoring of surface water and sediment in CWC is required until the creek has been remediated. The purpose of the monitoring is to document that RAs are having a positive effect on the creek and to provide additional data to assess whether CWC is being measurably affected by COC migration from hydrostratigraphic zone (HZ)-A.

The EMP for CWC evaluates the water quality and the radiological and chemical parameters present in surface water and sediment. Surface water and sediment are monitored for the radiological and chemical parameters specified as List 2 of Table 3-3 of the EMICY17 (USACE 2016). The water quality parameters are measured for surface water only.

The water quality parameters measured include pH, temperature, dissolved oxygen (DO), specific conductivity, oxidation reduction potential (ORP), and turbidity. The objectives of the EMP are:

- to assess the quality of surface water and sediment in CWC;
- to compare the results with monitoring guidelines and/or ROD RGs as established for these media in the EMICY17 (USACE 2016); and,
- to evaluate/determine if runoff from the SLAPS, the HISS, the SLAPS VPs, and the Latty Avenue Properties affects the quality of surface water and sediment in CWC.

The MDNR has designated CWC as a metropolitan no-discharge stream. Therefore, discharges are prohibited, except as specifically permitted under the water quality standard (10 *CSR* 20-7.031) and non-contaminated storm-water flows (10 *CSR* 20-7.015.1.A.4). CWC, from its crossing of U.S. Highway 67 (i.e., Lindbergh Boulevard) to its mouth at the Missouri River (a distance of roughly 5.5 miles), is a Class C stream. Class C streams may cease flow during dry periods but maintain permanent pools that support aquatic life (10 *CSR* 20-7.031.1.F.6). The upper reach of CWC south of U.S. Highway 67, which includes the SLAPS/HISS reach, is an unclassified water of the state.

Surface-water and sediment samples are collected from CWC on a semi-annual basis as part of the EMP (USACE 2016). The sampling events are conducted at eight CWC monitoring stations (C002 through C009). Locations of the eight monitoring stations are shown on Figure 3-3. Monitoring station C004, located between the SLAPS and the HISS, is used to monitor the potential water quality impacts from the SLAPS to CWC. Monitoring station C005 is used to monitor water quality downstream from the HISS and the Latty Avenue VPs. Monitoring station C009, located just upstream from the St. Denis Bridge in Coldwater Commons Park, is the farthest downstream monitoring station on CWC.

Note that other non-FUSRAP industrial discharges are relatively common along the sampled reaches of CWC; therefore, sample parameters could be influenced by existing industrial sources other than former MED/AEC operations.

3.2.1 Coldwater Creek Surface-Water Monitoring Results

Sampling of surface water at CWC was conducted at or below base flow elevation during the months of March and October in CY 2017. The base flow elevation for CWC at the McDonnell Boulevard Bridge is 508.2 ft above mean sea level (amsl). The base flow also may be approximated by a depth measurement of 3.2 ft or less at an "average cross section." CWC surface-water monitoring included obtaining water quality parameters, as well as obtaining samples for metals and radionuclides listed in Table 3-3 of the EMICY17 (USACE 2016). Grab samples were collected and analyzed according to the protocol defined in the *Sampling and*

Analysis Guide for the St. Louis Sites (SAG) (USACE 2000). In addition, isotopic U results were used to evaluate total U concentrations in surface water for comparison to the 30 µg/L monitoring guideline described in the ROD (USACE 2005).

All surface-water monitoring required through implementation of the EMICY17 was conducted as planned during CY 2017 (USACE 2016). The evaluation of monitoring data demonstrates that all applicable ARARs have been met. The sample results are contained in Appendix D, Table D-1, of this EMDAR.

Water Quality Parameters

Water quality data are collected as part of the routine performance of surface-water sampling and are used as part of the overall evaluation of water quality. The water quality results for each surface-water monitoring station are summarized in Table 3-4. The average surface-water temperatures during the March and October sampling events were 5.77 and 17.7 °C, respectively. The average surface-water pH values were 7.00 and 7.28, respectively. The average pH values for both sampling events were within the acceptance range (6.0 to 9.0) and thus provide suitable conditions for aquatic life.

Table 3-4. Water Quality Results for CY 2017 CWC Surface-Water Sampling

Monitoring Parameter	Unit	Monitoring Station								Average
		C002	C003	C004	C005	C006	C007	C008	C009	
First Sampling Event (03/16/17)										
Temperature	°C	6.96	8.10	7.10	6.10	4.90	4.40	3.90	4.70	5.77
pH	s.u.	7.54	7.45	7.25	7.09	7.01	6.85	6.58	6.24	7.00
DO	mg/L	6.39	10.87	12.18	10.87	9.43	9.9	13.00	8.60	10.16
Specific Conductivity	µS/cm	0.134	0.129	0.139	0.144	0.138	0.145	0.136	0.137	0.138
ORP	mV	208	206	218	221	222	229	236	258	225
Turbidity	NTU	23.0	6.9	7.5	7.4	8.8	29.6	20.5	8.8	13.1
Second Sampling Event (10/12/17)										
Temperature	°C	19.1	18.4	17.8	17.4	16.9	17.2	17.1	17.8	17.7
pH	s.u.	7.70	7.75	7.75	7.53	7.18	7.02	6.87	6.42	7.28
DO	mg/L	11.29	11.34	10.94	10.47	8.45	7.53	7.44	8.90	9.55
Specific Conductivity	µS/cm	89.5	75.8	72.9	69.2	68.0	63.1	54.6	45.9	67.4
ORP	mV	190	204	211	209	215	219	224	239	214
Turbidity	NTU	5.8	18.0	21.3	24.3	26.4	27.6	18.3	15.8	19.7

[a] Turbidity value not collected due to an error with the water quality meter.
Note: Water quality data are used as part of the overall evaluation of water quality, but no ROD-defined monitoring criteria exist.

Average DO levels were 10.16 mg/L in March and 9.55 mg/L in October. Specific conductivity values were higher for the October event compared to the March event. The average specific conductivity for the March sampling event was 0.138 µS/cm, and the average specific conductivity for the October sampling event was 67.4 µS/cm. The average ORP value during the March sampling event (225 mV) was higher than that of the October sampling event (214 mV). The average turbidity value during the March sampling event (13.1 NTUs) was less than the October sampling event (19.7 NTUs).

Radiological Parameters

The radiological monitoring results for the CY 2017 CWC surface-water sampling events are summarized in Table 3-5. Historically, FUSRAP surface-water analysis has included unfiltered water samples for the following radiological parameters: Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238. Unfiltered surface-water samples from CWC were not analyzed for Ra-228 during CY 2017, because Ra-228 rapidly achieves equilibrium with Th-228, such that their concentrations are equal.

Table 3-5. Radiological Results for CY 2017 CWC Surface-Water Sampling

Monitoring Parameter	Monitoring Stations							
	C002	C003	C004	C005	C006	C007	C008	C009
Radionuclide Concentration (pCi/L)								
First Sampling Event (03/16/17)								
Ra-226	<1.84[a]	<0.38[a]	<1.09[a]	<1.23[a]	<1.11[a]	<0.85[a]	<0.95[a]	<1.02[a]
Th-228[b]	<0. 30[a]	<0.41[a]	<0.32[a]	<0.53[a]	<0.34[a]	<0.35[a]	<0.45[a]	0.32
Th-230	0.42	<0.29[a]	0.69	<0.53[a]	0.26	<0.44[a]	<0.39 [a]	0.51
Th-232	<0.13[a]	<0.29[a]	<0.32[a]	<0.48[a]	<0.14[a]	<0.15[a]	<0.13[a]	<0.34[a]
U-234	0.994	0.897	1.04	1.28	1.39	1.22	1.47	0.562
U-235	<0.20[a]	<0.17[a]	<0.18[a]	<0.19[a]	<0.46[a]	<0.20[a]	<0.45[a]	<0.17[a]
U-238	1.05	1.01	1.17	1.06	0.52	0.98	0.55	0.46
Second Sampling Event (10/12/17)								
Ra-226	1.33	<0.38[a]	<0.40[a]	<1.32[a]	<0.94[a]	<1.50[a]	<1.06[a]	<1.02[a]
Th-228[b]	<0.42[a]	<0.19[a]	<0.60[a]	<0.64[a]	<0.36[a]	<0.50[a]	<0.58[a]	<0.51[a]
Th-230	<0.42[a]	<0.19[a]	0.50	<0.57[a]	<0.16[a]	<0.61[a]	0.50	0.87
Th-232	<0.19[a]	<0.19[a]	<0.15[a]	<0.21[a]	<0.36[a]	<0.23[a]	<0.17[a]	<0.18[a]
U-234	0.85	0.47	0.93	0.58	0.51	<0.66[a]	0.63	<0.51[a]
U-235	<0.55[a]	<0.21[a]	<0.23[a]	<0.71[a]	<0.24[a]	<0.66[a]	<0.26[a]	<0.51[a]
U-238	0.78	0.62	0.34	0.46	<0.43[a]	<0.53[a]	0.51	<0.19[a]

[a] Reported result is less than the minimum detectable concentration (MDC) and is therefore set equal to the MDC.
[b] Ra-228 rapidly achieves equilibrium with Th-228, such that their concentrations are equal.
Note: Total U (30 µg/L) is the only ROD monitoring guideline for surface water. Radiological monitoring parameter data are collected to monitor COC migration and to calculate total U.

Surface-water data for U-234, U-235, and U-238 (reported in pCi/L) were converted to µg/L and compared to the 30 µg/L criterion for total U described in the ROD. The total U concentrations in surface water were significantly less than the 30 µg/L ROD criterion. A summary of the surface-water radiological data collected from CWC since March of 2007 is presented in Table 3-6.

Table 3-6. Comparison of Historical Radiological Surface-Water Results for CWC

Stations	Radionuclide	Units	03/07	10/07	04/08	11/08	04/09	10/09	03/10	10/10	03/11	10/11	03/12	10/12	04/13	10/13	03/14	10/14	03/15	10/15	03/16	10/16	03/17	10/17
C002	Total U[a]	µg/L	2.3	2.2	3.2	2.2	1.6	3.3	2.4	2.3	2.3	3.8	1.9	2.0	2.43	2.64	4.11	1.53	3.33	2.04	3.15	3.96	3.23	2.40
	Ra-226	pCi/L	0.52	<0.67[b]	0.81	0.34	<0.39[b]	<0.48[b]	<0.17[b]	<1.51[b]	<2.14[b]	0.87	<1.47[b]	<1.44[b]	2.15	<2.50[b]	<2.04[b]	<1.30[b]	<1.21[b]	<1.11[b]	<1.35[b]	<1. 25[b]	<1.84[b]	1.33
	Th-228[c]	pCi/L	0.25	<0.53[b]	<0.20[a]	<0.40[a]	<0.59[b]	0.21	0.46	<0.78[b]	<0.52[b]	<0.55[b]	<0.59[b]	<0.45[b]	<0.87[b]	<0.53[b]	<0.55[b]	0.25	<0. 46[b]	<0.51[b]	<0.55[b]	<0.45[b]	<0. 30[b]	<0.42[b]
	Th-230	pCi/L	0.38	1.3	0.59	<0.40[a]	0.69	0.41	0.28	<0.68[b]	<0.52[b]	0.37	0.46	<0.45[b]	1.19	<0.65[b]	0.40	<0.38[b]	<0.46[b]	0.63	0.45	0.37	0.42	<0.42[b]
	Th-232	pCi/L	<0.17[b]	<0.38[b]	<0.20[a]	<0.18[a]	<0.59[b]	<0.41[b]	<0.19[b]	<0.68[b]	<0.17[b]	<0.20[b]	<0.42[b]	<0.20[b]	<0.32[b]	<0.24[b]	<0.18[b]	<0.17[b]	<0.21[b]	<0.19[b]	<0.20[b]	<0.20[b]	<0.13[b]	<0.19[b]
C003	Total U[a]	µg/L	3.1	2.1	4.4	3.6	3.9	3.4	5.4	2.3	6.0	3.4	2.8	2.8	4.09	1.97	2.49	1.68	1.80	2.95	4.91	1.82	2.91	1.71
	Ra-226	pCi/L	0.20	<0.54[b]	1.32	<0.49[a]	0.29	<.0.65[b]	<0.54[b]	<1.8[b]	<1.3[a]	<1.3[b]	<1.09[b]	<1.50[b]	1.62	<1.41[b]	<2.03[b]	<0.89[b]	<1.23[b]	<1.63[b]	<1.48[b]	<1.55[b]	<0.38[b]	<0.38[b]
	Th-228[c]	pCi/L	<0.54[b]	<0.42[b]	<0.44[a]	<0.33[a]	<0.50[b]	<0.48[b]	<0.63[b]	<0.60[b]	<0.53[a]	<0.50[b]	0.43	<0.54[b]	<0.38[b]	<0.44[b]	<0.26[b]	<0.56[b]	0.43	<0.41[b]	<0.73[b]	<0.54[b]	<0.41[b]	<0.19[b]
	Th-230	pCi/L	0.44	1.3	1.32	0.58	<0.41[b]	<0.67[b]	0.60	<0.61[b]	0.52	0.48	<0.23[b]	0.70	<0.38[b]	0.70	0.85	0.50	0.36	<0.18[b]	0.39	0.44	<0.29[b]	<0.19[b]
	Th-232	pCi/L	<0.16[b]	<0.19[b]	<0.20[a]	<0.15[a]	0.20	<0.48[b]	<0.23[b]	<0.22[b]	<0.43[b]	<0.18[b]	<0.51[b]	<0.20[b]	<0.38[b]	<0.54[b]	<0.26[b]	<0.18[b]	<0.53[b]	<0.50[b]	<0.58[b]	<0.20[b]	<0.29[b]	<0.19[b]
C004	Total U[a]	µg/L	2.7	2.1	2.4	2.6	3.4	2.1	6.4	3.0	3.0	2.3	3.4	2.2	1.17	2.48	3.13	1.19	2.48	2.58	2.81	2.61	3.26	1.88
	Ra-226	pCi/L	0.41	<0.61[b]	<0.63[a]	<0.71[a]	0.64	<0.52[b]	<0.49[b]	<1.5[b]	<1.9[b]	0.64	<1.59[b]	<1.98[b]	<1.93[b]	<1.93[b]	1.52	<1.46[b]	<1.22[b]	<1.47[b]	1.7	<1.34[b]	<1.09 [b]	<0.40[b]
	Th-228[c]	pCi/L	<0.53[b]	<0.17[b]	0.31	<0.50[a]	<0.51[b]	0.32	0.52	<0.65[b]	<0.52[b]	<0.49[b]	0.65	<0.18[b]	<0.65[b]	<0.18[b]	<0.97[b]	<0.52[b]	<0.55[b]	<0.64[b]	<0.22[b]	<0.62[b]	<0.32[b]	<0.60[b]
	Th-230	pCi/L	<0.38[b]	<0.45[b]	0.79	<0.50[a]	<0.51[b]	0.83	0.55	0.58	0.43	<0.49[b]	0.65	0.67	<0.65[b]	0.33	0.68	<0.42[b]	<0.48[b]	0.76	0.91	<0.44[b]	0.69	0.50
	Th-232	pCi/L	0.19	<0.19[b]	<0.21[a]	<0.18[a]	<0.51[b]	<0.38[b]	<0.20[b]	<0.24[b]	<0.20[b]	0.25	<0.49[b]	<0.18[b]	<0.29[b]	<0.39[b]	<0.63[b]	<0.42[b]	<0.18[b]	<0.46[b]	<0.49[b]	<0.44[b]	<0.32[b]	<0.15[b]
C005	Total U[a]	µg/L	4.8	1.4	4.0	3.2	1.8	3.9	3.1	3.0	2.1	2.6	1.7	1.8	2.31	1.42	2.51	1.14	3.15	2.23	2.99	1.71	3.56	1.83
	Ra-226	pCi/L	<0.51[b]	<0.64[b]	<0.74[a]	<0.20[a]	<0.42[b]	<0.40[b]	0.26	<0.64[b]	<1.8[b]	0.68	<1.48[b]	<2.39[b]	<1.60[b]	<1.76[b]	<1.84[b]	<1.19[b]	<1.05[b]	<0.74[b]	<1.81[b]	<1.18[b]	<1.23[b]	<1.32[b]
	Th-228[c]	pCi/L	<0.39[b]	0.23	<0.46[a]	<0.68[a]	0.21	<0.72[b]	0.33	<0.19[b]	<0.39[b]	0.32	<0.44[b]	<0.41[b]	<0.69[b]	<0.42[b]	<0.72[b]	0.37	<0.64[b]	<0.64[b]	<0.79[b]	<0.44[b]	<0.53[b]	<0.64[b]
	Th-230	pCi/L	<0.39[b]	0.99	1.7	0.32	0.41	<0.23[b]	0.27	0.42	<0.39[b]	<0.64[b]	0.44	0.76	0.69	0.63	0.65	<0.55[b]	<0.64[b]	0.69	<0.58[b]	<0.54[b]	<0.53[b]	<0.57[b]
	Th-232	pCi/L	<0.39[b]	<0.56[b]	<0.21[a]	<0.17[a]	0.34	<0.23[b]	<0.18[b]	<0.51[b]	<0.18[b]	<0.3[b]	<0.20[b]	<0.41[b]	<0.31[b]	<0.42[b]	<0.23[b]	<0.25[b]	<0.45[b]	<0.38[b]	<0.66[b]	<0.44[b]	<0.48[b]	<0.21[b]
C006	Total U[a]	µg/L	3.5	2.2	2.9	3.2	3.2	2.5	2.8	2.6	2.8	1.9	2.8	1.2	1.29	3.11	2.09	1.44	2.77	1.73	4.65	1.68	2.85	1.46[b]
	Ra-226	pCi/L	0.51	<0.46[b]	<0.66[a]	0.91	5.26	<0.56[b]	<0.42[b]	<0.64[b]	<1.82[b]	<1.26[a]	<2.00[b]	<0.57[b]	<1.20[b]	<1.44[b]	0.95	<1.39[b]	<1.09[b]	<1.67[b]	<0.80[b]	0.98	<1.11[b]	<0.94[b]
	Th-228[c]	pCi/L	<0.43[b]	<0.36[b]	<0.56[a]	<0.39[a]	0.56	<0.42[b]	<0.42[b]	<0.19[b]	<0.44[b]	<0.57[b]	<0.24[b]	<0.46[b]	<0.25[b]	<0.17[b]	<0.70[b]	<0.41[b]	<0.20[b]	<0.84[b]	<0.53[b]	<0.45[b]	<0.34[b]	<0.36[b]
	Th-230	pCi/L	<0.16[b]	0.36	0.60	0.53	<0.48[b]	0.50	0.35	0.42	0.45	0.38	<0.54[b]	<0.53[b]	0.74	<0.17[b]	0.53	<0.33[b]	<0.67[b]	<0.62[b]	0.65	0.48	0.26	<0.16[b]
	Th-232	pCi/L	<0.16[b]	<0.16[b]	<0.20[a]	<0.39[a]	<0.22[b]	<0.19[b]	<0.42[b]	<0.51[b]	<0.21[b]	<0.26[b]	<0.24[b]	<0.17[b]	<0.25[b]	<0.17[b]	<0.45[b]	<0.15[b]	<0.43[b]	<0.20[b]	<0.43[b]	<0.20[b]	<0.14[b]	<0.36 [b]
C007	Total U[a]	µg/L	3.1	1.7	2.7	1.8	2.3	3.0	2.5	2.8	2.6	1.6	1.9	1.3	2.15	5.65	2.06	1.84	4.29	1.69	2.39	2.25	3.25	1.59
	Ra-226	pCi/L	0.55	<0.46[b]	<0.81[a]	<0.18[a]	<0.51[b]	0.22	<0.19[b]	<2.24[b]	<1.2[b]	<1.4[b]	<1.53[b]	<1.61[b]	1.42	<2.01[b]	<1.54[b]	<0.98[b]	<1.35[b]	0.61	<1.52[b]	<1.06[b]	<0.85[b]	<1.50[b]
	Th-228[c]	pCi/L	<0.17[b]	<0.47[b]	0.51	0.18	<0.23[b]	<0.46[b]	<0.47[b]	0.53	<0.43[b]	<0.40[b]	<0.20[b]	<0.37[b]	<0.80[b]	<0.19[b]	<0.42[b]	<0.89[b]	<0.63[b]	<0.42[b]	<0.49[b]	<0.55[b]	<0.35[b]	<0.50[b]
	Th-230	pCi/L	<0.17[b]	0.99	1.03	0.47	0.25	<0.46[b]	0.51	<0.49[b]	0.59	0.40	0.59	0.59	<0.29[b]	0.90	0.67	<0.57[b]	<0.20[b]	<0.42[b]	<0.49[b]	<0.16[b]	<0.44[b]	<0.61[b]
	Th-232	pCi/L	<0.17[b]	<0.38[b]	<0.41[a]	<0.16[a]	<0.23[b]	<0.21[b]	<0.21[b]	<0.40[b]	<0.20[b]	<0.18[b]	<0.19[b]	<0.37[b]	<0.29[b]	<0.51[b]	<0.19[b]	<0.26[b]	<0.45[b]	<0.34[b]	<0.49[b]	<0.16[b]	<0.15[b]	<0.23[b]
C008[d]	Total U[a]	µg/L																1.32	2.82	1.79	3.07	1.71	3.02	1.82
	Ra-226	pCi/L																<0.83[b]	<1.28[b]	0.61	<0.95[b]	<2.15[b]	<0.95[b]	<1.06[b]
	Th-228[c]	pCi/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.54[b]	0.64	<0.42[b]	0.50	<0.17[b]	<0.45[b]	<0.58[b]
	Th-230	pCi/L																0.22	<0.50[b]	<0.42[b]	0.47	0.53	<0.39 [b]	0.50
	Th-232	pCi/L																<0.20[b]	<0.40[b]	<0.36[b]	<0.46[b]	<0.48[b]	<0.13[b]	<0.17[b]
C009[d]	Total U[a]	µg/L																1.92	3.53	2.47	1.16	2.17	1.60	1.13
	Ra-226	pCi/L																<0.90[b]	<1.04[b]	0.81	<1.4[b]	<1.27[b]	<1.02[b]	<1.02[b]
	Th-228[c]	pCi/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.40[b]	<0.45[b]	<0.46[b]	<0.44[b]	<0.53[b]	0.32	<0.51[b]
	Th-230	pCi/L																<0.49[b]	<0.45[b]	<0.51[b]	<0.36[b]	0.86	0.51	0.87
	Th-232	pCi/L																<0.18[b]	3.33	2.04	3.15	3.96	<0.34[b]	<0.18[b]

[a] Total U is equal to the sum of the concentrations of U isotopes (in pCi/L) divided by 0.677, where 0.677 microgram per picocurie is the specific activity for total U, assuming secular equilibrium.
[b] Reported result is less than the MDC and is therefore set equal to the MDC.
[c] Ra-228 rapidly achieves equilibrium with Th-228, such that their concentrations are equal.
[d] Stations C008 and C009 were established and initially sampled during the second semi-annual event of CY 2014.

Note: Total U (30 µg/L) is the only ROD monitoring guideline for surface water. The other radiological monitoring parameter data are collected to monitor COC migration.
NA – not applicable. (No sample was collected during this event, because this station was established in 2014.)

Chemical Parameters

No chemical-specific ROD monitoring guidelines exist for surface water. Chemical monitoring parameter data are collected to monitor COC migration. The chemical monitoring results for the CY 2017 CWC surface-water sampling events are presented in Table 3-7.

Table 3-7. Chemical Results for CY 2017 CWC Surface-Water Sampling

Monitoring Parameter[a]	Monitoring Stations							
	C002	C003	C004	C005	C006	C007	C008	C009
Target Analyte List Metals Concentration (μg/L)								
First Sampling Event (03/16/17)								
Antimony	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]
Arsenic	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]
Barium	120	110	120	130	120	120	110	95
Cadmium	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]
Chromium	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]
Molybdenum	7.9	8.9	9.0	9.2	8.2	8.4	8.6	7.0
Nickel	<2.0[b]	<2.0[b]	2.0	2.0	2.3	2.2	2.0	<2.0[b]
Selenium	<2.0[b]	2.4	2.3	2.0	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]
Thallium	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]
Vanadium	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]
Second Sampling Event (10/12/17)								
Antimony	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]
Arsenic	4.0	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]
Barium	100	93	93	92	98	90	78	73
Cadmium	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]	<0.2[b]
Chromium	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]	<4.0[b]
Molybdenum	23	32	29	25	23	19	15	14
Nickel	2.8	4.6	4.3	4.1	4.0	3.7	3.1	2.9
Selenium	2.7	3.0	2.2	2.2	<2.0[b]	<2.0[b]	<2.0[b]	<2.0[b]
Thallium	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]	<0.9[b]
Vanadium	<4.0[b]	<4.0[b]	<4.0[b]	4.1	4.3	4.4	<4.0[b]	<4.0[b]

[a] No chemical-specific ROD monitoring guidelines exist for surface water.
[b] Reported result is less than the MDC and is therefore set equal to the MDC.

3.2.2 Coldwater Creek Sediment Monitoring Results

CY 2017 sediment sampling at CWC was conducted during the months of March and October as part of the EMP. Sediment samples were collected in depositional environments near each of the eight previously described surface-water locations (C002 through C009) (Figure 3-3) and analyzed according to the methods described in the SAG (USACE 2000). Sediment samples collected for the EMP were evaluated for the radiological and metal constituents listed in Table 3-3 of the EMICY17 (USACE 2016).

All sediment monitoring required through implementation of the EMICY17 was conducted as planned during CY 2017 (USACE 2016). The evaluation of monitoring data demonstrates that all applicable ARARs have been met. The analytical results from these monitoring activities are contained in Appendix D, Table D-2, of this EMDAR.

Radiological Parameters

The radiological results for CY 2017 CWC sediment sampling events are presented in Table 3-8. The ROD established sediment RGs for Ra-226, Th-230, and U-238 at the NC Sites (USACE 2005). Therefore, sediment sampling results for those radionuclides were compared against their corresponding RGs. Sediment samples from CWC were not analyzed for U-234 during CY 2017, because U-234 is assumed to be in equilibrium with U-238.

Table 3-8. Radiological Results for CY 2017 CWC Sediment Sampling

Monitoring Parameter	RGs[a]	Monitoring Stations							
		C002	C003	C004	C005	C006	C007	C008	C009
Radionuclide Concentration (pCi/g)									
First Sampling Event (03/16/17)									
Ac-227	No RG	<0.16[b]	<0.11[b]	<0.17[b]	<0.14[b]	<0.18[b]	<0.12[b]	<0.15[b]	<0.19[b]
Pa-231	No RG	<0.94[b]	<0.65[b]	<0.91[b]	<0.77[b]	<1.18[b]	<0.73[b]	<0.87[b]	<1.08[b]
Ra-226	15	1.30	1.10	1.12	1.08	1.21	0.95	1.13	1.10
Ra-228	No RG	0.89	0.76	0.87	0.91	0.87	0.66	1.06	0.86
Th-228[c]	No RG	0.52	1.33	1.14	1.31	1.84	1.18	1.22	0.82
Th-230[c]	43	2.26	2.85	3.27	2.48	6.62	5.79	2.68	2.95
Th-232[c]	No RG	0.89	1.11	1.24	1.22	1.38	1.02	1.26	0.88
U-235	No RG	<0.39[b]	<0.24[b]	<0.31[b]	<0.27[b]	<0.39[b]	<0.23[b]	<0.31[b]	<0.32[b]
U-238[d]	150	2.62	0.83	0.82	<0.51[b]	1.40	0.73	0.93	0.83
Second Sampling Event (10/12/17)									
Ac-227	No RG	<0.11[b]	<0.34[b]	<0.17[b]	<0.13[b]	<0.17[b]	<0.12[b]	<0.20[b]	<0.11[b]
Pa-231	No RG	<0.53[b]	<1.41[b]	<0.73[b]	<0.59[b]	<0.73[b]	<0.48[b]	<0.84[b]	<0.50[b]
Ra-226	15	1.22	1.29	1.14	1.60	1.19	1.33	1.30	1.27
Ra-228	No RG	0.51	0.64	0.85	0.99	0.85	0.63	0.94	0.64
Th-228[c]	No RG	0.53	1.01	1.19	1.25	1.21	1.29	0.99	0.86
Th-230[c]	43	1.26	1.29	2.30	2.24	3.84	2.98	1.82	2.28
Th-232[c]	No RG	0.41	0.68	1.05	0.78	1.33	0.88	0.80	0.53
U-235	No RG	<0.24[b]	<0.59[b]	<0.32[b]	<0.26[b]	<0.31[b]	<0.24[b]	<0.36[b]	<0.22[b]
U-238[d]	150	0.76	<1.09[b]	0.89	0.81	0.89	0.67	0.77	0.91

[a] RGs presented in the ROD (USACE 2005).
[b] Reported result is less than the MDC and is therefore set equal to the MDC.
[c] Both gamma spectroscopy and alpha spectroscopy results are produced; alpha spectroscopy results are reported.
[d] U-238 and U-234 are assumed to be in equilibrium.

All sediment data results were below the RGs established by the ROD. The historical radiological sediment sampling data for all monitoring stations since March of 2007 are summarized in Table 3-9.

Chemical Parameters

Chemical monitoring results for CY 2017 CWC sediment sampling events are presented in Table 3-10.

Table 3-9. Comparison of Historical Radiological Sediment Results for CWC

Station	Radionuclide	Units	03/07	10/07	04/08	11/08	03/09	10/09	03/10	10/10	03/11	10/11	03/12	10/12	04/13	10/13	03/14	10/14	03/15	10/15	03/16	10/16	03/17	10/17
C002	Total U[a]	pCi/g	0.97	1.1[b]	1.7	0.73	0.80	0.89	1.3	1.3	1.4	1.1	0.84	1.21	1.49	1.02	0.75	0.90	1.35	1.89	3.89	5.74	5.50	1.55
	Ra-226	pCi/g	0.97	<0.37[b,c]	1.0	0.85	0.75	1.07	0.71	0.95	0.87	0.85	0.89	0.911	0.91	1.01	0.94	0.88	0.78	1.26	1.34	2.01	1.30	1.22
	Ra-228	pCi/g	0.20	0.18	0.20	0.17	0.20	0.24	0.30	0.33	0.27	0.28	0.24	0.372	0.30	0.28	0.26	0.36	0.18	1.01	1.11	1.08	0.89	0.51
	Th-228	pCi/g	0.26	0.24[b]	0.53	0.41	0.50	0.35	0.46	0.44	0.26	0.37	0.37	0.37	0.30	<0.16[c]	<0.26[c]	0.69	<0.18[b]	1.52	1.74	1.61	0.52	0.53
	Th-230	pCi/g	1.2	0.84[b]	0.92	1.1	0.51	1.2	0.67	1.2	1.5	1.1	0.52	0.64	1.06	1.20	0.69	0.55	0.56	1.53	1.99	2.10	2.26	1.26
	Th-232	pCi/g	0.46	<0.24[b,c]	0.24	<0.26[c]	0.28	0.31	0.53	0.21	<0.29[c]	0.39	0.35	0.47	0.36	<0.44[c]	0.26	0.55	0.26	1.36	1.39	0.57	0.89	0.41
C003	Total U[a]	pCi/g	1.2	2.0[b]	1.9	2.3	1.2	2.9	0.72	1.7	1.4	1.5	1.20	1.78	1.80	1.01	0.90	2.04	2.68	0.99	1.22	2.27	1.90	1.44
	Ra-226	pCi/g	1.5	1.7[b]	1.1	1.1	0.79	1.4	0.98	1.1	0.73	1.2	1.07	1.33	1.41	1.03	1.42	1.22	1.00	0.92	1.11	1.41	1.10	1.29
	Ra-228	pCi/g	0.68	0.49	0.49	0.57	0.40	1.0	0.44	0.36	0.39	0.79	0.81	0.78	0.91	0.36	0.91	0.63	0.82	0.22	0.66	0.98	0.76	0.64
	Th-228	pCi/g	0.97	0.53[b]	0.70	0.66	0.64	1.1	0.85	0.42	0.55	1.79	1.69	1.23	1.01	0.94	1.21	0.68	0.84	0.44	1.28	1.35	1.33	1.01
	Th-230	pCi/g	1.2	1.5[b]	2.1	2.3	1.2	1.5	1.0	1.1	0.89	1.9	1.81	1.19	3.92	1.90	1.67	1.04	2.57	0.57	2.55	3.71	2.85	1.29
	Th-232	pCi/g	0.38	0.46[b]	0.51	0.57	0.34	0.73	0.43	0.17	0.64	1.22	1.28	1.18	0.99	<0.35[c]	0.95	0.89	0.84	0.25	0.87	1.14	1.11	0.68
C004	Total U[a]	pCi/g	2.7	7.3[b,d]	2.0	2.3	2.0	3.3	1.8	2.6	1.8	2.0	2.84	3.09	1.97	2.14	1.84	1.20	1.67	2.14	2.71	2.00	1.74	1.87
	Ra-226	pCi/g	1.3	1.6[b]	1.0	1.0	0.97	1.3	1.3	1.5	1.1	1.3	1.13	1.28	1.16	1.25	1.62	1.36	1.00	1.21	1.39	1.44	1.12	1.14
	Ra-228	pCi/g	0.80	0.81	0.70	1.0	0.73	0.85	0.62	0.81	0.85	0.96	0.85	0.86	0.72	0.62	0.80	0.89	0.90	1.01	0.95	1.03	0.87	0.85
	Th-228	pCi/g	1.7	1.3[b]	1.2	1.4	0.83	1.1	0.90	1.2	1.4	1.3	1.72	1.24	0.74	1.09	0.94	0.73	1.81	1.31	1.64	1.17	1.14	1.19
	Th-230	pCi/g	2.6	2.2[b]	2.0	1.0	1.7	2.0	2.2	1.6	2.7	3.8	2.41	1.28	2.37	2.15	3.11	1.82	1.7	3.02	2.77	2.11	3.27	2.30
	Th-232	pCi/g	0.79	0.97[b]	1.3	0.80	0.82	1.0	0.77	1.0	0.85	1.1	1.45	1.13	0.84	1.42	0.57	1.50	1.32	0.81	1.30	0.94	1.24	1.05
C005	Total U[a]	pCi/g	0.94	2.0[b]	2.0	3.6	1.6	2.8	1.6	3.6	1.8	2.5	4.36	2.5	1.86	1.20	2.10	1.55	1.58	2.44	2.58	2.50	0.98	1.62
	Ra-226	pCi/g	1.7	1.6[b]	1.1	5.4	1.0	1.4	1.5	2.5	1.2	1.5	1.47	1.33	1.28	1.01	1.59	1.62	1.12	1.05	1.44	1.74	1.08	1.60
	Ra-228	pCi/g	0.98	0.58	0.78	1.1	0.31	0.86	0.73	0.88	0.56	0.94	0.92	0.90	0.87	0.47	1.00	0.99	0.94	0.81	1.06	0.99	0.91	0.99
	Th-228	pCi/g	1.5	0.68[b]	0.98	1.7	0.50	1.3	0.92	0.96	0.61	0.61	1.05	1.30	0.64	0.82	1.35	1.19	1.27	1.50	1.70	1.26	1.31	1.25
	Th-230	pCi/g	4.7	3.7[b]	6.6	82.6	4.2	9.6	2.2	19.6	3.9	3.4	4.3	5.42	4.65	3.26	1.53	1.58	2.13	2.28	2.23	1.83	2.48	2.24
	Th-232	pCi/g	1.6	0.45[b]	0.98	1.4	0.50	0.87	0.65	1.1	0.63	0.87	1.01	1.23	1.08	0.49	1.16	0.69	0.88	0.97	1.30	1.43	1.22	0.78
C006	Total U[a]	pCi/g	2.9	2.3[b]	1.7	1.8	2.1	0.75	1.9	2.2	2.0	1.0	2.35	1.97	1.53	1.87	0.19	2.60	2.77	1.70	1.85	2.33	2.80	1.78
	Ra-226	pCi/g	1.4	0.94[b]	1.0	1.4	1.0	1.1	1.7	1.7	1.3	0.90	1.16	1.02	1.13	1.37	1.38	1.36	1.06	1.28	1.27	1.47	1.21	1.19
	Ra-228	pCi/g	0.97	0.93	0.88	0.98	0.82	0.99	0.88	0.88	0.86	0.48	1.06	0.94	0.99	0.91	1.01	1.05	0.85	0.90	0.85	1.14	0.87	0.85
	Th-228	pCi/g	0.99	1.6[b]	1.7	0.94	1.5	1.6	1.0	0.82	1.9	0.54	1.38	1.03	0.97	1.07	0.60	1.18	1.20	0.88	1.49	1.23	1.84	1.21
	Th-230	pCi/g	1.8	2.7[b]	3.4	2.2	2.2	2.6	2.0	4.1	9.7	1.2	3.39	1.78	2.18	1.57	2.30	2.39	1.52	2.12	3.89	2.31	6.62	3.84
	Th-232	pCi/g	1.1	1.4[b]	1.1	1.2	1.1	0.97	0.80	0.71	1.6	0.82	1.00	1.30	1.31	0.88	0.85	1.04	0.74	1.27	0.95	1.45	1.38	1.33
C007	Total U[a]	pCi/g	2.0	2.3[b]	1.4	2.3	1.9	2.6	2.2	1.7	1.9	2.4	2.45	3.08	2.13	1.79	0.49	3.35	1.55	1.32	1.91	1.49	1.52	1.41
	Ra-226	pCi/g	1.9	1.1[b]	1.1	1.4	1.1	1.3	1.4	1.4	1.3	1.4	1.23	1.06	1.32	1.20	1.55	2.12	1.10	1.08	1.14	1.28	0.95	1.33
	Ra-228	pCi/g	0.79	0.84	0.69	0.89	0.77	0.77	0.82	0.73	0.87	0.81	0.89	0.80	0.85	0.54	0.77	1.01	0.87	0.64	0.67	0.59	0.66	0.63
	Th-228	pCi/g	1.2	1.5[b]	0.73	0.67	1.1	0.66	1.0	0.78	1.4	1.3	2.07	0.96	0.86	0.94	0.74	0.80	1.06	1.24	0.47	0.62	1.18	1.29
	Th-230	pCi/g	19	4.6[b]	3.8	3.6	3.6	2.3	2.6	4.4	3.3	2.8	3.51	2.73	3.25	4.50	3.19	6.81	3.89	3.91	3.77	4.75	5.79	2.98
	Th-232	pCi/g	1.2	0.83[b]	0.55	0.72	1.00	0.57	1.04	0.72	0.93	0.95	1.14	0.70	0.62	0.69	1.21	0.85	0.66	0.87	1.04	0.87	1.02	0.88
C008[e]	Total U[a]	pCi/g	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.60	1.81	1.37	3.24	3.11	1.93	1.73
	Ra-226	pCi/g																1.22	1.17	1.23	1.27	1.71	1.13	1.30
	Ra-228	pCi/g																0.72	0.81	0.76	0.90	1.27	1.06	0.94
	Th-228	pCi/g																0.82	1.18	0.86	1.16	1.26	1.22	0.99
	Th-230	pCi/g																2.80	2.48	3.36	2.30	1.93	2.68	1.82
	Th-232	pCi/g																0.56	1.19	0.55	1.19	1.06	1.26	0.80

Table 3-9. Comparison of Historical Radiological Sediment Results for CWC (Continued)

Station	Radionuclide	Units	03/07	10/07	04/08	11/08	03/09	10/09	03/10	10/10	03/11	10/11	03/12	10/12	04/13	10/13	03/14	10/14	03/15	10/15	03/16	10/16	03/17	10/17
C009[e]	Total U[a]	pCi/g	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.79	1.72	1.63	1.10	1.45	1.76	1.89
	Ra-226	pCi/g																1.43	1.26	1.19	1.43	1.48	1.10	1.27
	Ra-228	pCi/g																0.80	0.94	0.81	0.83	0.88	0.86	0.64
	Th-228	pCi/g																0.86	1.16	1.06	1.30	1.26	0.82	0.86
	Th-230	pCi/g																3.96	2.27	2.99	2.46	3.54	2.95	2.28
	Th-232	pCi/g																1.06	1.22	0.63	1.26	0.98	0.88	0.53

[a] Total U is equal to the sum of the concentrations of U isotopes (Office of the Federal Register, NARA 1998).
[b] Both gamma spectroscopy and alpha spectroscopy results were produced; gamma spectroscopy results are reported.
[c] Reported result is less than the MDC and is therefore set equal to the MDC.
[d] The 7.3 pCi/g value for total U obtained in 10/07 from C004 was a typographical error. The result should be reported as 1.3.
[e] Stations C008 and C009 were established and initially sampled during the second semi-annual event of CY 2014.

Note: The sediment RGs for Ra-226, Th-230, and U-238 are 15 pCi/g, 43 pCi/g, and 150 pCi/g, respectively. The other radiological monitoring parameter data are collected to monitor COC migration.

NA – not applicable. (No sample was collected during this event, because this station was established in 2014.)

Table 3-10. Chemical Results for CY 2017 CWC Sediment Sampling

Monitoring Parameter	Monitoring Stations							
	C002	C003	C004	C005	C006	C007	C008	C009
Target Analyte List Metals Concentration (mg/kg)								
First Sampling Event (03/16/17)								
Antimony	<0.74[a]	<0.66[a]	<0.79[a]	<0.75[a]	<0.70[a]	<0.61[a]	<0.74[a]	0.91
Arsenic	5.3	5.9	6.3	6.1	7.4	6.8	4.7	4.6
Barium	180	150	180	210	170	100	170	120
Cadmium	0.40	0.58	0.88	0.44	0.89	0.71	0.35	0.48
Chromium	16	20	22	16	22	24	14	18
Molybdenum	1.1	0.97	0.97	<0.75[a]	1.2	0.88	<0.74[a]	<0.80[a]
Nickel	17	17	19	21	19	15	18	16
Selenium	<1.2[a]	3.4	<1.3[a]	1.3	<1.1[a]	<0.98[a]	<1.2[a]	<1.3[a]
Thallium	<0.74[a]	<0.66[a]	<0.79[a]	<0.75[a]	<0.70[a]	<0.61[a]	<0.74[a]	<0.80[a]
Vanadium	19	20	21	24	22	20	19	18
Second Sampling Event (10/12/17)								
Antimony	<0.58[a]	<0.69[a]	<0.86[a]	<0.73[a]	<0.69[a]	<0.71[a]	<0.71[a]	<0.66[a]
Arsenic	7.7	6.8	6.0	6.4	5.1	7.7	4.2	3.7
Barium	220	150	200	170	140	170	150	90
Cadmium	0.63	0.63	0.57	0.50	0.58	0.97	0.34	0.35
Chromium	14	17	17	21	15	27	15	12
Molybdenum	2.9	1.6	1.2	0.97	0.71	1.3	<0.71[a]	<0.66[a]
Nickel	13	17	17	18	16	21	19	12
Selenium	1.1	1.1	1.6	1.2	1.1	1.4	1.1	<1.1[a]
Thallium	<0.58[a]	<0.69[a]	<0.86[a]	<0.73[a]	<0.69[a]	<0.71[a]	<0.71[a]	<0.66[a]
Vanadium	15	20	21	21	19	23	19	14

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

Note: There are no chemical-specific ROD RGs or monitoring guidelines for sediment. Chemical monitoring parameter data are collected to monitor COC migration.

3.2.3 Impact of FUSRAP Coldwater Creek Remedial Action on Total Uranium Concentrations in Coldwater Creek Surface Water and Sediment

As part of the FUSRAP RA at the SLAPS, sediment and soil were removed from the bed and banks of CWC near monitoring stations C002 and C003 during August of 2004. An evaluation was conducted to determine if the SLAPS RA resulted in increased levels of uranium in CWC. The concentrations of radionuclides in sediment and surface-water samples from various stations along CWC were assessed. Radionuclide data from surface-water and sediment samples collected from March of 2000 to March of 2004 were used to create a baseline for comparison with sample results collected after the RA.

Methodology

Total U results from CY 2017 surface-water and sediment samples from six monitoring stations (C002 through C007) were compared to the 2000 to 2004 dataset for this evaluation. Total U was selected for this evaluation, because it is among the most mobile of all the radionuclide COCs present at the SLAPS.

The total U concentration statistics for surface water and sediment at monitoring stations C002 through C007 for 2000 through 2004 are presented in Table 3-11.

Table 3-11. Total Uranium Concentration Statistics for CWC (2000-2004)

Stations[a]	Statistics for Total U in Surface Water March 2000 to March 2004 Data (pCi/L)			Statistics for Total U in Sediment March 2000 to March 2004 Data (pCi/g)		
	UCL_{95}	Mean	LCL_{95}	UCL_{95}	Mean	LCL_{95}
C002	4.2	3.1	1.9	1.7	1.4	1.1
C003	3.8	3.3	2.7	1.9	1.5	1.0
C004	4.5	3.4	2.3	2.3	1.7	1.2
C005	4.1	3.0	1.9	2.8	2.4	2.0
C006	8.2[b]	5.0	[c]	3.0	2.4	1.8
C007	4.7	3.4	0.75	2.5	1.9	1.3

[a] Monitoring stations C008 and C009 were established in 2014.
[b] March 2000 to March 2004 data are gamma distributed. Therefore, approximate gamma upper confidence limit (UCL) is used.
[c] The 95 percent lower confidence limit (LCL_{95}) is not calculated due to gamma-distributed data.

Qualitative trend line graphs of total U results from surface-water and sediment samples collected at monitoring stations C002 through C007 from March of 2000 to October of 2017 are presented on Figures 3-4 and 3-5. The mean, 95 percent upper confidence limit (UCL_{95}), and 95 percent lower confidence limit (LCL_{95}) concentrations of total U calculated from the March 2000 to March 2004 dataset are also shown on Figures 3-4 and 3-5. Surface-water and sediment data for total U from monitoring stations C008 and C009 are also included on Figures 3-4 and 3-5.

Conclusion

The data fit two hypothetical scenarios. First, the post-RA sampling results were not significantly less than the pre-RA sampling results for downstream stations at the SLAPS (C003 through C007), so it is unlikely that total U from the SLAPS RA is causing a significant contribution to CWC. The RA over time should markedly reduce the total U load in CWC if the SLAPS were a significant contributor. While a time lag in the fate downstream could occur, the current total U concentrations are already low. Second, the RA within CWC did not adversely impact concentrations of total U in CWC surface water or sediment. Had the RA contributed adversely, an excessive short-term increase in total U concentrations would have been observed.

4.0 EVALUATION OF GROUND-WATER MONITORING DATA

During CY 2017, 17 ground-water monitoring wells were sampled at the NC Sites. Ground water was sampled following protocol for individual wells and analytes, and was analyzed for various radiological constituents and inorganic analytes. Static water levels were measured quarterly at the retained monitoring wells. In addition, field parameters were measured continuously during purging of the wells before sampling. The static water levels and other ground-water field parameter results for CY 2017 sampling are contained in Appendix E, Tables E-1 and E-2. Summary tables providing the NC Sites ground-water analytical sampling results for CY 2017 are contained in Appendix E, Tables E-3 and E-4.

Ground-Water Guidelines

The CY 2017 ground-water monitoring data for the NC Sites are compared to the ROD ground-water monitoring guidelines (henceforth referred to as ROD guidelines) listed in Tables F-1 and F-2 in Appendix F of this EMDAR. The ROD guidelines for the NC Sites are based on requirements specified in the ROD (USACE 2005) and are further explained in Sections 4.1.1 and 4.2.1.

Stratigraphy at the North St. Louis County Sites

The stratigraphic units present at the NC sites are shown in the stratigraphic column presented on Figure 4-1. Fill and topsoil (Unit 1) overlie Pleistocene loess (Unit 2) and glaciolacustrine deposits. The glaciolacustrine sediments consist of Subunit 3T (silty clay), Subunit 3M (moderately to highly plastic clay), Subunit 3B (silty clay), and Unit 4 (clayey and sandy gravel). Beneath these unconsolidated deposits, the bedrock is composed of Mississippian limestone (Unit 6). Stratigraphic Unit 5, Pennsylvanian shale bedrock, is not present at the HISS or Futura, but is found directly overlying Unit 6 under portions of the SLAPS.

4.1 LATTY AVENUE PROPERTIES

The Latty Avenue Properties include the HISS, Futura, and eight Latty Avenue VPs (VPs 01[L] through 06[L], VP-40A, and Parcel 10K530087). The ground-water monitoring wells at the Latty Avenue Properties are located on or immediately adjacent to the HISS and Futura.

Stratigraphy at the Latty Avenue Properties

Four HZs (HZ-A through HZ-C, and HZ-E) have been identified at the Latty Avenue Properties. The shallow ground-water zone, HZ-A, consists of the fine-grained silts and clays of Unit 1, Unit 2, and Subunit 3T. Underlying HZ-A is HZ-B, which consists of a highly impermeable clay (Subunit 3M). HZ-C consists of silty clay, clayey silt, and clayey gravel deposits that comprise the stratigraphic Subunit 3B and Unit 4. The Mississippian limestone bedrock is defined as HZ-E. HZ-E is the protected aquifer for the site. As a result of their very low permeability, Subunits 3M and 3B limit vertical ground-water movement between HZ-A and the deep ground-water zones (HZ-C and HZ-E) at the Latty Avenue Properties.

Summary of Calendar Year 2017 Ground-Water Monitoring Results at the Latty Avenue Properties

Based on an evaluation of the ground-water data at the Latty Avenue Properties, one inorganic soil COC (molybdenum) was detected at concentrations in excess of the ROD guidelines in HZ-A ground water at the Latty Avenue Properties in CY 2017. Molybdenum was detected above its ROD guideline in HZ-A well HISS-10 during the third-quarter sampling event in CY 2017. Molybdenum was also above the ROD guideline in the previous sampling event conducted in the first quarter of CY 2015. Therefore, molybdenum concentrations in HISS-10 have exceeded the ROD guideline for more than 12 months. The Mann-Kendall Trend Test results indicate a statistically significant increasing trend for molybdenum in HISS-10. Because a significant degradation of CWC surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water. However, because molybdenum levels in HISS-10 have exceeded the ROD guideline for a period of at least 12 months, ground-water monitoring will continue subject to subsequent CERCLA 5-year reviews.

Based on the CY 2017 results for HW23, one inorganic soil COC (vanadium) was detected at concentrations in excess of the ROD guidelines in HZ-C ground water at the Latty Avenue Properties in CY 2017. However, vanadium does not exceed its ROD guideline at HW23 when measurement error is taken into account. No radiological COCs exceeded the ROD guidelines in HZ-C ground water in CY 2017. Therefore, no findings currently indicate significantly degraded ground-water conditions in HZ-C ground water. An evaluation of potential response actions is therefore not required.

4.1.1 Evaluation of Ground-Water Monitoring Data at the Latty Avenue Properties

The ground-water monitoring data for the Latty Avenue Properties are evaluated against the requirements for ground-water monitoring identified in the ROD (USACE 2005). The ROD specifies two types of ground-water monitoring guidelines: (1) response-action monitoring guidelines and (2) a total U monitoring guideline (which is used for both response-action and long-term monitoring). Response-action monitoring of HZ-A and HZ-C is being conducted to ensure that the RA does not degrade current ground-water conditions. Another purpose of the response-action ground-water monitoring of HZ-C is to document protection of the limestone aquifer (HZ-E) during the RA.

The response-action monitoring guideline is two times the UCL_{95}, based on historical concentrations of the analyte in a particular well before RAs were initiated under the ROD. The response-action monitoring guidelines have been developed for the ROD soil COCs for each of the wells at the Latty Avenue Properties. The methodology for the development of the response-action monitoring guidelines is detailed in Appendix F of this EMDAR. The total U guideline is defined in the ROD to be equal to the total U maximum contaminant level of 30 µg/L (USACE 2005). If total U levels exceed 30 µg/L, monitoring would continue subject to a CERCLA 5-year review.

In addition to the previous requirements, an evaluation of concentration trends over time is conducted for the COCs detected above the ROD guidelines in ground water to support assessment of the effectiveness of the RA in the CERCLA 5-year reviews.

Monitoring Well Network at the Latty Avenue Properties

The CY 2017 EMP well network for the Latty Avenue Properties is shown on Figure 4-2. With the exception of monitoring well HW23, which is screened in HZ-C, the monitoring wells are screened in HZ-A. The screened HZs for the ground-water monitoring wells at the Latty Avenue Properties are identified in Table 4-1. Appendix G provides the well maintenance checklists for the annual inspection of the ground-water monitoring wells at the Latty Avenue Properties, conducted in March 2017.

Table 4-1. Screened HZs for Ground-Water Monitoring Wells at the Latty Avenue Properties in CY 2017

Well ID	Screened HZs
HISS-01[a]	HZ-A
HISS-06A [a]	HZ-A
HISS-10 [a]	HZ-A
HISS-11A[a]	HZ-A
HISS-17S	HZ-A
HISS-19S[a]	HZ-A
HW22[a]	HZ-A
HW23[a]	HZ-C

[a] Wells sampled in CY 2017.

Ground-water sampling was conducted at seven ground-water monitoring wells at the Latty Avenue Properties in CY 2017. First-quarter sampling was conducted on February 14, 2017; second-quarter sampling was conducted on May 23, 2017; and third-quarter sampling was conducted on August 14 and 17, 2017. No ground-water sampling was conducted at the Latty Avenue Properties during the fourth quarter of CY 2017.

HZ-A Ground Water

Ground-water samples were collected from six HZ-A wells in CY 2017. A summary table presenting the CY 2017 analytical data for all analytes is included in Appendix E (Table E-3).

For response-action monitoring, the CY 2017 ground-water data were evaluated to determine if ground-water conditions have significantly degraded. Continued monitoring of HZ-A could be required long term if significantly degraded ground-water conditions are found. Based on the ROD, a significantly degraded ground-water condition requires all of the following:

1) that soil COC concentrations have statistically increased in ground water (relative to the well’s historical data and accounting for uncertainty) for more than a 12-month period. Significantly increased concentrations are defined as doubling of an individual COC concentration above the upper confidence limit (UCL) of the mean (based on the historical concentration before RA) for a period of 12 months;
2) that the degraded well is close enough to impact CWC; and
3) that a significant degradation of CWC surface water is anticipated.

The CY 2017 results were compared to the guidelines for the soil COCs identified in the ROD (i.e., antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238). The ROD guideline for total U (30 µg/L) is used for both response-action and long-term monitoring of ground water at the Latty Avenue Properties. Total U concentrations were compared to the 30 µg/L monitoring guideline. Total U concentrations (in µg/L) were calculated as follows from the isotopic results (in pCi/L) and the specific activities (in pCi/µg) for each radionuclide.

$$TotalU\left(\mu g/L\right) = \left[\frac{U^{234}\left(pCi/L\right)}{6240\left(pCi/\mu g\right)}\right] + \left[\frac{U^{235}\left(pCi/L\right)}{2.16\left(pCi/\mu g\right)}\right] + \left[\frac{U^{238}\left(pCi/L\right)}{0.335\left(pCi/\mu g\right)}\right]$$

Those soil COCs with concentrations above the ROD guidelines in HZ-A ground-water samples at the Latty Avenue Properties during CY 2017 are listed in Table 4-2. Because no ground-water sampling data are available for HISS-11A prior to CY 2011, the ROD guidelines for HISS-11A were developed using the pre-2006 data from the well previously at this location (HISS-11).

Table 4-2. Analytes Exceeding ROD Guidelines in HZ-A Ground Water at the Latty Avenue Properties in CY 2017

Analyte	Units	Station	ROD Guidelines[a]	Minimum Detected	Maximum Detected	Mean Detected	No. Detects > ROD Guidelines[a]	Frequency of Detection
Molybdenum	µg/L	HISS-10	5.6	27	27	27	1	1/1

[a] ROD guidelines include the response-action monitoring guidelines and the total U monitoring guideline of 30 µg/L. Response-action monitoring guideline = 2 x UCL_{95}, based on historical concentrations before RAs were initiated (USACE 2005). Results are reported to two significant digits.

One inorganic COC, molybdenum, was detected above its ROD guideline in HZ-A ground water at the Latty Avenue Properties in CY 2017. Molybdenum was detected in HISS-10 at levels above the ROD guideline of 5.6 µg/L in the third-quarter sample (27 µg/L) and was above the ROD guideline in the previous sampling event conducted in the first quarter of CY 2015 (19 µg/L). Therefore, molybdenum concentrations in HISS-10 have exceeded the ROD guideline for more than 12 months. No radiological soil COCs were detected at concentrations above the ROD guidelines in HZ-A ground water at the Latty Avenue Properties in CY 2017.

In summary, comparison of the data to the ROD guidelines indicates that one COC, molybdenum, exceeded the ROD guidelines in HZ-A ground water in CY 2017. Because a significant degradation of CWC surface water has not occurred, no finding currently indicates significantly degraded ground-water conditions in HZ-A ground water.

HZ-C Ground Water

Ground-water samples were collected from one HZ-C well (HW23) in CY 2017. This well was sampled for both radionuclides and inorganics during the second quarter. One inorganic soil COC, vanadium, was detected at concentrations in excess of the ROD guidelines in HZ-C ground water at the Latty Avenue Properties in CY 2017. Vanadium was detected in HW23 at levels above the ROD guideline of 6.4 µg/L in the second-quarter sample (7.1 µg/L). However, vanadium does not exceed its ROD guideline when measurement error is taken into account. Concentrations of all radiological soil COCs were below the ROD ground-water guidelines in HW23 during CY 2017. Therefore, no findings currently indicate significantly degraded ground-water conditions in HZ-C ground water. An evaluation of potential response actions is not required.

In summary, the CY 2017 HZ-C ground-water data from the Latty Avenue Properties indicate that no analytes were detected at concentrations above ROD ground-water criteria in HZ-C ground water when measurement error is taken into account. Therefore, there is currently no finding of significantly degraded ground-water conditions in HZ-C ground water.

4.1.2 Comparison of Historical Ground-Water Data at the Latty Avenue Properties

Ground-water sampling has been conducted at the Latty Avenue Properties from CY 1984 to the present. The most comprehensive ground-water monitoring program, involving sampling from 18 monitoring wells, was conducted at the site in the summer of CY 1997. Results from subsequent sampling events were used to evaluate contaminant trends at the Latty Avenue Properties during the period from the first quarter of CY 1999 to the fourth quarter of CY 2017. Statistical analysis was used to assist with identifying trends for those contaminants that exceeded the ROD guidelines in CY 2017.

Statistical Method and Trend Analysis

Several statistical methods are available to evaluate contaminant trends in ground water. These include the Mann-Kendall Trend Test, the Wilcoxon Rank Sum (WRS) Test, and the Seasonal Kendall Test (USEPA 2000). The latter two tests are applicable to data that may or may not exhibit seasonal behavior, but generally require larger sample sizes than the Mann-Kendall Trend Test. The Mann-Kendall Trend Test was selected for this project, because this test can be used with small sample sizes (as few as four data points), and because a seasonal variation in concentrations was not indicated by the time-versus-concentration plots at the NC Sites. The Mann-Kendall Trend Test is a non-parametric test and, as such, is not dependent upon assumptions of distribution, missing data, or irregularly-spaced monitoring periods. In addition, data reported as being less than the detection limit (DL) can be used (Gibbons 1994). The test can assess whether a time-ordered dataset exhibits an increasing or decreasing trend, within a predetermined level of significance. While the Mann-Kendall Trend Test can use as few as four data points, often this is not enough data to detect a trend. Therefore, the test was performed only at those monitoring stations at the NC Sites for which data have been collected for at least six sampling events.

A customized Microsoft Excel spreadsheet was used to perform the Mann-Kendall Trend Test. The test involves listing the sampling results in chronological order and computing all differences that may be formed between current measurements and earlier measurements. The value of the test statistic (S) is the difference between the number of strictly positive differences and the number of strictly negative differences. If S is a large positive value, then evidence indicates an increasing trend in the data. If S is a large negative value, then evidence indicates a decreasing trend in the data. If no trend exists and all observations are independent, then all rank orderings of the annual statistics are equally likely (USEPA 2000). The results of the Mann-Kendall Trend Test are reported in terms of a p-value or Z-score, depending on sample size, N. If the sample size is less than or equal to 10, then the p-value is computed. If the p value is less than or equal to 0.05, the test concludes that the trend is statistically significant. If the p value is greater than 0.05, the test concludes no evidence of a significant trend exists. For dataset sizes larger than 10, the Z-score is compared to ±1.65, which is the comparison level at a 95 percent confidence level. If the Z-score is greater than 1.65, the test concludes that a significant upward trend exists. If the Z-score is less than –1.65, the test concludes that a significant downward trend exists. For Z-scores between –1.65 and 1.65, no evidence of a significant trend exists.

The results of the Mann-Kendall Trend Test are less reliable for datasets containing a high number of non-detects, particularly if the DL changes over time. For that reason, for datasets in which more than 50 percent of the time-series data are non-detect, the Mann-Kendall Trend Test was not conducted. No general consensus exists regarding the percentage of non-detects that can be handled by the Mann-Kendall Trend Test. However, because the Mann-Kendall Trend Test is a nonparametric test that uses relative magnitudes, not actual values, it is generally valid even in cases in which there are a large number of non-detects.

Only unfiltered data were used, and split and QC sample results were not included in the database for the Mann-Kendall Trend Test. The Mann-Kendall Trend Test is used to evaluate the radiological data and to determine trends without regard to isotopic analysis. In addition, for monitoring wells for which the Mann-Kendall Trend Test has indicated a trend (either upward or downward), another analysis is performed to determine whether the trend is due to inherent error associated with the analytical test method for each sample analysis. This analysis involves graphing the data and the associated error-bar for the specific constituent. The time-versus-concentration plot for molybdenum in HISS-10 is provided on Figure 4-3.

Results of Trend Analysis for Ground Water at the Latty Avenue Properties

For those stations at which an analyte exceeded the ROD guideline at least once during the year and for which sufficient historical data were available to evaluate trends (i.e., at least six samples), statistical trend analysis is conducted to assess whether concentrations of the analyte are increasing (upward trending) or decreasing (downward trending) over time. For the purposes of this trend analysis, a statistically significant trend in concentration is defined as a trend with a confidence level greater than 95 percent. The confidence level denotes the probability that the indicated trend is an actual trend in the data, rather than a result of the random nature of environmental data.

HZ-A Ground Water

The Mann-Kendall Trend Test was performed for those wells in which analytes exceeded the ROD guidelines at least once during CY 2017, for which sufficient data were available (i.e., at least six samples were collected during the period from the first quarter of CY 1999 to the fourth quarter of CY 2017), and at which the percentage of non-detect results is less than or equal to 50 percent. The Mann-Kendall Trend Test was performed using data collected during the period from the first quarter of CY 1999 to the fourth quarter of CY 2017.

Inorganics

The concentration of one inorganic soil COC, molybdenum, was above the ROD ground-water criteria in the CY 2017 ground-water samples from HZ-A well HISS-10. Therefore, a trend analysis was conducted for molybdenum in HISS-10. As shown in Table 4-3 and on the time-versus-concentration plot on Figure 4-3, a statistically significant increasing trend in molybdenum concentrations (i.e., a trend with a confidence level greater than 95 percent) was observed for HISS-10 for the CY 1999 through CY 2017 dataset.

Radionuclides

Concentrations of all radiological COCs were below the ROD ground-water criteria in ground-water samples from the six HZ-A wells sampled in CY 2017. Therefore, a trend analysis was not conducted for radiological COCs in HZ-A ground water.

The time-versus-concentration plots shown on Figure 4-4 provide an overview of the temporal and spatial variability in the concentrations of total U in ground water at the Latty Avenue Properties. Total U concentrations were calculated using the isotopic U results measured in pCi/L and converted to µg/L using radionuclide-specific activities. The reported values were used for detected and non-detected isotopic values, except when the value was negative. If the reported value was negative, a value equal to zero was substituted for the result prior to calculating the total U concentration.

Table 4-3. Results of Mann-Kendall Trend Test for Analyte Exceeding the ROD Guidelines at the Latty Avenue Properties in CY 2017

Analyte	Station	N[a]	Test Statistics[b]		Trend[d]
			S[c]	Z[c]	
Molybdenum	HISS-10	14	43	2.33	Upward Trend

[a] N is the number of unfiltered ground-water sample results for a particular analyte for the period between January of 1999 and December of 2017.
[b] Test Statistics: S – the S-Statistic; Z – Z-score, or normalized test statistic (for datasets having N greater than 10).
[c] One-tailed Mann-Kendall Trend Tests were performed at a UCL_{95}.
[d] Trend: If N greater than 10, the Z-score is compared to ±1.65 to determine trend significance.

HZ-C Ground Water

The Mann-Kendall Trend Test is performed for those wells in which analytes exceeded the ROD guidelines at least once during CY 2017. Concentrations of all soil COCs were below the

ROD ground-water criteria in CY 2017 ground-water samples from the HZ-C well HW23 when measurement error is taken into account. Therefore, a trend analysis was not conducted for HZ-C ground water.

4.1.3 Evaluation of the Potentiometric Surface at the Latty Avenue Properties

Ground-water surface elevations were measured at the Latty Avenue Properties in February, May, August, and November of CY 2017. The potentiometric surface maps for HZ-A and HZ-C created from the May 22 and November 13, 2017, ground-water elevation measurements are provided on Figures 4-5, 4-6, 4-7, and 4-8. The ground-water surface elevations at the Latty Avenue Properties and the SLAPS and SLAPS VPs were mapped on the same figures, because these areas are located in the same ground-water flow regime.

The top of the saturated zone occurs in the low hydraulic conductivity silts and clays of stratigraphic Units 2 and 3T at the Latty Avenue Properties. The potentiometric data indicate some mounding of the HZ-A ground water at the HISS and Futura. Wells HISS-01, HISS-10, and HISS-17S have the highest potentiometric surface elevations, with lower ground-water elevations measured in the surrounding wells. At the western edge of the HISS and Futura, ground water in the HZ-A zone flows to the west toward CWC. The local horizontal gradient for HZ-A ground water at the HISS and Futura ranged from 0.011 ft/ft (May) to 0.009 ft/ft (November) in CY 2017. Based on the CY 2017 water-level measurements, the position of the HZ-A ground-water surface averages approximately 3.5 ft higher in the corresponding shallow wells at the HISS in the wet season (May) than in the dry season (November).

The potentiometric surface of the HZ-C ground water at the Latty Avenue Properties is not well defined due to the limited data available for the deeper HZs. Based on measured ground-water elevations in the HZ-C monitoring well HW23 at the Latty Avenue Properties and several HZ-C wells located to the southwest at the SLAPS and SLAPS VPs, the flow direction in the HZ-C ground water beneath the Latty Avenue Properties was generally toward the east-northeast at an average horizontal gradient of 0.002 ft/ft in both May and November of CY 2017.

4.2 ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES

Ground-water monitoring wells have been installed at the SLAPS and SLAPS VPs to characterize the site stratigraphy, ground-water chemistry, and ground-water migration pathways.

Stratigraphy at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

In the vicinity of the SLAPS and the adjacent SLAPS VP ballfields, surficial deposits (Unit 1) include topsoil and anthropogenic fill (rubble, scrap metal, gravel, glass, slag, and concrete) generally less than 14 ft thick (Figures 4-1, 4-9, and 4-10). Unit 2 is comprised of loess and has a thickness of 11 to 30 ft. Unit 3, which is subdivided into Subunits 3T, 3M, and 3B, consists primarily of clay and silt lakebed deposits. Each of these clayey subunits has a thickness of up to 30 ft. Unit 4 consists of clayey gravel with fine to very-fine sand and sandy gravel. This unit is interpreted to be approximately 5 to 15 ft thick and thins eastward and westward of the SLAPS. This unit is absent beneath the eastern part of the SLAPS, where the 3T, 3M, and 3B drape, or onlap, onto shale bedrock. Below Units 3 and 4 are Units 5 and 6, which consist of Pennsylvanian shale/siltstone and Mississippian limestone, respectively. Depth to bedrock ranges from approximately 55 ft on the eastern part of the SLAPS to a maximum of 90 ft toward CWC to the west. The hydrogeologic and geologic setting at the SLAPS and SLAPS VPs is similar to that at the HISS, with one exception. The Pennsylvanian shale bedrock unit (Unit 5), present beneath portions of the SLAPS and SLAPS VPs, is absent beneath the HISS.

Five HZs (HZ-A through HZ-E) are recognized beneath the SLAPS and SLAPS VPs. HZ-A consists of fill (Unit 1) and the Pleistocene, glacially related sediments of stratigraphic Unit 2, and Subunit 3T. Underlying HZ-A is HZ-B, which consists of highly impermeable clay (Subunit 3M). HZ-C consists of the stratigraphic Subunit 3B and Unit 4. The shale (Unit 5) and limestone (Unit 6) bedrock are recognized as HZ-D and HZ-E, respectively. HZ-E is the protected aquifer for the site.

The shallow (HZ-A) ground-water flow is toward CWC under normal flow conditions. Average depths to the ground-water surface at the site range from near the ground surface during the spring months to approximately 10 ft below ground surface (bgs) during the fall months. The dominant flow in HZ-A is through the more permeable Unit 2. Each of the subunits in Unit 3 has lower hydraulic conductivity than Units 1, 2, and 4. Units HZ-B and the Pennsylvanian shale HZ-D limit the passage of ground water vertically beneath the SLAPS and SLAPS VPs. Subunit 3M of HZ-B acts as a vertical barrier to ground-water movement under the western portion of the site. Subunit 3M is a clayey aquitard (unit resisting water passage) that effectively separates the HZ-A ground-water system from the underlying HZ-C and HZ-E. The dominant unit to obtain water in the lower horizon is the sandy, clayey gravel of Unit 4. Unit 4 of HZ-C is used as a surrogate for HZ-E, because water movement within the Mississippian limestone is dependent upon the limestone's joint and solutioned system. In addition, the limestone has exhibited massive characteristics and is very slow to recharge.

Summary of Calendar Year 2017 Ground-Water Monitoring Results at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Four soil COCs (barium, chromium, nickel, and total U) exceeded the ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2017. One radiological COC (total U) has exceeded the ROD guideline for a period of at least 12 months. Statistically significant increasing trends were observed for chromium and nickel concentrations in B53W09S. The Mann-Kendall Trend Test results indicate no trend for total U in PW46, nickel in PW43, or barium in B53W01S.

Because a significant degradation of CWC surface water has not occurred, no findings currently indicate significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2017. However, because total U levels have exceeded the ROD guidelines for a period of at least 12 months, ground-water monitoring will continue subject to subsequent CERCLA 5-year reviews.

Based on the CY 2017 results for B53W01D, B53W07D, PW35, and PW36, no inorganic or radiological soil COC concentrations exceeded ROD ground-water guidelines in HZ-C during CY 2017 when measurement error is taken into account. Therefore, no findings currently indicate significantly degraded ground-water conditions in HZ-C ground water.

4.2.1 Evaluation of Ground-Water Monitoring Data at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The purpose of the ground-water monitoring conducted at the SLAPS and SLAPS VPs is specified in the ROD (USACE 2005). Response-action monitoring is currently being conducted in HZ-A and HZ-C to assess the improvement of water quality due to source removals, and to document the protection of the limestone aquifer (HZ-E) during the RA.

As noted in Section 4.1.1, the ground-water monitoring data at the SLAPS and SLAPS VPs are evaluated against the requirements for ground-water monitoring identified in the ROD (USACE 2005).

In addition to the previously described monitoring, an evaluation of concentration trends is conducted for the COCs detected in excess of the ROD guidelines in ground water to support assessment of the effectiveness of the RA in the CERCLA 5-year reviews.

Monitoring Well Network at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The current EMP well network for the SLAPS and SLAPS VPs is shown on Figure 4-11. A summary of the HZ information for the ground-water monitoring wells located at the SLAPS and SLAPS VPs is provided in Table 4-4. HZ-A is considered the upper (or shallow) zone, while HZ-C, HZ-D, and HZ-E have been considered the lower (or deep) zone. This designation of upper and lower zones is separated at Subunit 3M of HZ-B. Fourteen (14) wells are screened exclusively across the shallow zone (HZ-A). Four (4) wells are screened exclusively in the lower zone across HZ-C, HZ-D, and/or HZ-E. The remaining well (PW36) is screened across both HZ-B and HZ-C. Appendix G provides the well maintenance checklists for the annual inspection of the ground-water monitoring wells at the SLAPS and SLAPS VPs, conducted in March 2017.

Table 4-4. Ground-Water Monitoring Well Network at the SLAPS and SLAPS VPs in CY 2017

Well ID	Screened HZs			
	HZ-A	HZ-B	HZ-C	HZ-E
B53W01D[a]			X	
B53W01S[a]	X			
B53W06S[a]	X			
B53W07D[a]			X	
B53W07S	X			
B53W09S[a]	X			
B53W13S	X			
B53W17S[a]	X			
B53W18S	X			
B53W19S	X			
MW31-98	X			
MW32-98	X			
PW35[a]				X
PW36[a]		X	X	
PW42			X	
PW43[a]	X			
PW44	X			
PW45	X			
PW46[a]	X			

[a] Wells sampled in CY 2017.

During CY 2017, 10 ground-water wells were sampled for various parameters at the SLAPS and SLAPS VPs. Ground-water samples collected from these wells were analyzed for both radiological and inorganic constituents. Historically, radiological parameters (Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238) and inorganic constituents have been the main focus of the ground-water sampling. In CY 2017, ground-water sampling was conducted on February 13 and 14 (first quarter); May 23 (second quarter); August 14 and 15 (third quarter); and November 13 and 14 (fourth quarter).

HZ-A Ground Water

Six HZ-A wells (B53W01S, B53W06S, B53W09S, B53W17S, PW43, and PW46) were sampled at the SLAPS and SLAPS VPs during CY 2017. The analytical data for the CY 2017 ground-water sampling at the SLAPS and SLAPS VPs are contained in Appendix E, Table E-4.

The CY 2017 results were compared to ROD guidelines for the soil COCs identified in the ROD (i.e., antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238). Table 4-5 lists those soil COCs exceeding the ROD guidelines in CY 2017 ground-water samples from HZ-A wells at the SLAPS and SLAPS VPs.

Table 4-5. Analytes Exceeding ROD Guidelines in HZ-A Ground Water at the SLAPS and SLAPS VPs in CY 2017

Analyte	Units	Station	ROD Guidelines[a]	Minimum Detected	Maximum Detected	Mean Detected	No. Detects > ROD Guidelines[a]	Frequency of Detection
Barium	μg/L	B53W01S	390	120	500	256.7	1	3/3
Chromium	μg/L	B53W09S	9.6	15[b]	26	19.7	3	3/3
Nickel	μg/L	B53W09S	83	73	460	237.7	2	3/3
		PW43	3.6	18	18	18	1	1/1
U-234	pCi/L	PW46	5,500	587[c]	587[c]	587	0	1/1
U-235	pCi/L	PW46	290	27.9[c]	27.9[c]	27.9	0	1/1
U-238	pCi/L	PW46	5,600	602[c]	602[c]	602	0	1/1
Total U[d]	μg/L	PW46	30	1,810	1,810	1,810	1	1/1

[a] ROD guidelines = response-action monitoring guideline and total U monitoring guideline. Response-action monitoring guideline = 2 x UCL_{95} (based on historical concentrations before RAs were initiated). Total U monitoring guideline = 30 μg/L (USACE 2005).
[b] The results did not exceed the ROD guideline if the associated measurement errors are taken into account.
[c] The results for U-234, U-235, and U-238 do not exceed the ROD guidelines. The results are provided because they were used in the total U calculation.
[d] Total U values were calculated from isotopic concentrations in pCi/L and converted to μg/L using radionuclide-specific activities with the following formula: total U (μg/L) = U-234 (pCi/L)/6240 + U-235 (pCi/L)/2.16 + U-238 (pCi/L)/0.335.

Three inorganic soil COCs (barium, chromium, and nickel) were detected in HZ-A ground water at concentrations in excess of the ROD guidelines at the SLAPS and SLAPS VPs. Barium was detected in B53W01S at levels above the ROD guideline of 390 μg/L in the second-quarter sample (500 μg/L) but was below the ROD guideline in the third and fourth quarter samples (150 μg/L and 120 μg/L, respectively). Therefore, barium concentrations in B53W01S did not exceed the ROD guideline for more than 12 months.

Chromium was detected at concentrations in excess of the ROD guidelines in the HZ-A well B53W09S during CY 2017. Chromium concentrations exceeded the ROD guideline of 9.6 μg/L in the first-, second-, and fourth-quarter samples from B53W09S (26 μg/L, 18 μg/L, and 15 μg/L, respectively). However, chromium concentrations did not exceed the ROD guideline in the third- and fourth-quarter samples if the associated measurement error is taken into account. Therefore, chromium concentrations in B53W09S did not exceed the ROD guideline for more than 12 months when measurement error is taken into account.

Nickel was detected at concentrations in excess of the ROD guidelines in two HZ-A wells (B53W09S and PW43) during CY 2017. The concentration of nickel detected at B53W09S during the first- and fourth-quarter sampling events (460 μg/L and 180 μg/L, respectively) exceeded the ROD guideline (83 μg/L). However, nickel was detected at concentrations below the ROD guideline in the second-quarter sample (73 μg/L). Therefore, the nickel concentration at B53W09S has not exceeded the ROD guideline for a period of at least 12 months. The nickel concentration in

PW43 exceeded the ROD guideline of 3.6 µg/L in the third-quarter sample (18.0 µg/L). Nickel also exceeded in the third-quarter sample from PW43 in CY 2016. However, the nickel concentration (4.0 µg/L) was not above the ROD guideline in the third-quarter CY 2016 sample. Therefore, the nickel concentration at PW43 has not exceeded the ROD guideline for a period of at least 12 months if the associated measurement error is taken into account.

One radiological soil COC (total U) exceeded the ROD guideline of 30 µg/L in HZ-A ground water at the SLAPS and SLAPS VPs. The total U concentration in PW46 (calculated from the isotopic concentrations) exceeded the 30-µg/L guideline during the first-quarter CY 2017 sampling event. The total U concentration in PW46 was 1,810 µg/L on February 13, 2017. PW46 is an RA evaluation well that was installed at the western edge of the SLAPS in April of 2006. Although no ground-water sampling data are available for PW46 prior to May 18, 2006, data are available for PW38, the previous well at this location. The ROD guidelines for PW46 were developed using pre-2004 data from PW38. Based on the total U data collected from PW38 prior to its decommissioning in November of 2003, the CY 2017 total U concentration at PW46 is lower than the historical concentrations reported at PW38. Based on the statistical evaluation of trends presented in Section 4.2.2, no statistically significant trend in the concentrations of total U was observed in PW46 during CY 2017.

In summary, three inorganic soil COCs (barium in B53W01S, chromium in B53W09S, and nickel in B53W09s and PW43) exceeded the ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2017. However, none of these inorganics exceeded the ROD guidelines for a period of at least 12 months when measurement error is taken into account. In addition, the concentration of total U exceeded the guideline of 30 µg/L in one HZ-A well (PW46) located at the western edge of the SLAPS and has exceeded the ROD guideline for a period of at least 12 months. However, comparison of the CY 2017 concentration with historical well data did not indicate that significant degradation of HZ-A ground water is occurring. Because a significant degradation of CWC surface water has not occurred, no findings currently indicate significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2017. However, because total U levels have exceeded the ROD guidelines for a period of at least 12 months, monitoring will continue subject to subsequent CERCLA 5-year reviews.

Lower Ground Water (HZ-C Through HZ-E)

Four wells (B53W01D, B53W07D, PW35, and PW36) screened across lower ground water (HZ C through HZ-E) were sampled at the SLAPS and SLAPS VPs during CY 2017. Comparison of the data to the ROD guidelines indicates that concentrations of cadmium in PW35 (1.6 µg/L) exceeded the ROD guideline (0.6 µg/L) in HZ-C through HZ-E ground water in CY 2017. However, the cadmium concentration did not exceed the ROD guideline if the associated measurement error is taken into account. Therefore, the CY 2017 HZ-C through HZ-E ground-water data from the SLAPS and SLAPS VPs do not indicate significant degradation of lower ground water.

4.2.2 Comparison of Historical Ground-Water Data at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Results of ground-water sampling conducted from CY 1998 though CY 2017 indicate that various inorganics and radionuclides have been detected at concentrations in excess of the ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs. Statistical analysis was used to identify trends for those contaminants that exceeded these guidelines during CY 2017. As described in Section 4.1.2, the Mann-Kendall Trend Test is the statistical method used to evaluate contaminant trend in ground water. Filtered data, split samples, and field duplicates were not included in the analysis. For datasets in which 50 percent or more of the time-series data are non-detect, the Mann-Kendall Trend Test was not performed.

Results of Trend Analysis at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The evaluation of historical trends for ground water at the SLAPS and SLAPS VPs focuses on those contaminants that exceeded the ROD guidelines in samples collected during CY 2017. For those monitoring wells at which an analyte exceeded these guidelines in one or more samples during CY 2017 and the historical dataset had a detection frequency greater than 50 percent and a sample size of at least six, a statistical trend analysis was conducted to assess whether concentrations of the analyte are increasing (upward trending) or decreasing (downward trending) over time. For the purposes of this EMDAR, a statistically significant trend in concentration is defined as a trend with a confidence level greater than 95 percent. Because the Mann-Kendall Trend Test does not consider the effects of measurement error and does not provide any information concerning the magnitude of trends, time-versus-concentration plots were used to evaluate these factors.

Based on the CY 2017 ground-water monitoring data for the SLAPS and SLAPS VPs, four soil COCs (barium, chromium, nickel, and total U) exceeded the ROD guidelines in HZ-A ground water in CY 2017. The Mann-Kendall Trend Test was performed for barium in B53W01S; chromium in B53W09S; nickel in B53W09S and PW43; and total U in PW46. For nickel in PW43, the time period was limited to CY 2003 through CY 2017 to obtain a dataset for which less than 50 percent of the results were non-detect. To aid in the evaluation of trends, time-versus-concentration plots for chromium and nickel and for total U are provided on Figures 4-12 and 4-13, respectively.

Trend analysis was not performed for deep (HZ-C through HZ-E) ground water, because no soil COCs exceeded their ROD guidelines in deep ground water during CY 2017 at the SLAPS and SLAPS VPs when measurement error is taken into account.

Inorganics

The results of the Mann-Kendall Trend Tests are provided in Table 4-6. As shown in Table 4-6, statistically significant increasing trends were observed for chromium and nickel concentrations in B53W09S. Because the Mann-Kendall Trend Test does not consider the effects of measurement error and does not provide any information concerning the magnitude of the trend, time-versus-concentration plots for those soil COCs having statistically significant increasing trends in ground water (provided in Figure 4-12) were used to evaluate these factors. The best-fit trend lines based on the data scatter are also shown on the graphs on this figure.

Table 4-6. Results of Mann-Kendall Trend Test for Analytes with Concentrations Exceeding ROD Guidelines in Ground Water at the SLAPS and SLAPS VPs in CY 2017

Analyte	Station	N[a]	Test Statistics[b]		Trend[d]
			S[c]	Z[c]	
Barium	B53W01S	15	-9	-0.4	No Trend
Chromium	B53W09S	28	210	4.14	Upward Trend
Nickel	B53W09S	28	176	3.46	Upward Trend
	PW43	15	25	1.20	No Trend
Total U	PW46	18	-9	-0.30	No Trend

[a] N is the number of unfiltered ground-water sample results for a particular analyte for the period between January of 1999 and December of 2017. With the exception of nickel at PW43 and total U at PW46, the time period is between January of 1999 and December of 2017. For PW43, the nickel dataset was restricted to the period between January of 2003 and December of 2017 to meet the Mann-Kendall Trend Test requirement that the dataset have a detection frequency greater than 50 percent. For PW46, which was installed in April 2006, the dataset covers the period between May of 2006 and December of 2017.

[b] Test Statistics: S – the S-Statistic; Z – Z-score, or normalized test statistic (used if N greater than 10).

[c] One-tailed Mann-Kendall Trend Tests were performed at a 95-percent level of confidence.

[d] Trend: If N is greater than 10, the Z-score is compared to ±1.64 to determine trend significance.

Radionuclides

A statistical evaluation of historical uranium concentrations has been conducted using total U concentrations. Total U values were calculated from isotopic concentrations in pCi/L and converted to µg/L using radionuclide-specific activities. The Mann-Kendall Trend Test was performed for total U in the HZ-A well with concentrations in excess of the 30-µg/L ROD guideline in CY 2017 (PW46). The results of the Mann-Kendall Trend Test are provided in Table 4-6. The Mann-Kendall Trend Test results indicate no trend for total U in PW46. A graph of time-versus-total-U concentrations for PW46 is shown on Figure 4-13. PW46 was installed in April of 2006 near the former location of PW38 and is screened across the same interval. For comparison purposes, the PW38 data collected between March of 2000 and November of 2003 are also shown on the graph of PW46 data on Figure 4-13. As indicated on the graph, total U concentrations in PW46 have decreased from the levels reported at PW38 prior to installation of PW46. Time-versus-concentration graphs for total U for some of the wells sampled in CY 2017 at the SLAPS and SLAPS VPs are provided on Figure 4-14.

4.2.3 Evaluation of Potentiometric Surface at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Ground-water surface elevations were measured from wells at the SLAPS and SLAPS VPs in February, May, August, and November of CY 2017. Ground-water elevation contours were drawn using the May 22, 2017, and November 13, 2017, measurements to provide a comparison of the ground-water flow conditions during periods of high and low ground-water elevations, respectively. The potentiometric surface maps, shown on Figures 4-5 through 4-8, were developed for both HZ-A and HZ-C ground-water zones. The ground-water flow direction is interpreted to be perpendicular to the ground-water equipotential contours.

In May and November of CY 2017, the ground-water flow direction in the HZ-A ground water at the SLAPS and adjacent SLAPS VP ballfields was northwesterly toward CWC (Figures 4-5 and 4-7). In the eastern portion of the SLAPS, the average horizontal hydraulic gradient was 0.005 ft/ft in the wet season (May 22, 2017) and 0.009 ft/ft in the dry season (November 13, 2017). The hydraulic gradient increases near CWC, where the average horizontal gradient ranges from 0.027 ft/ft (May 22, 2017) to 0.018 ft/ft (November 13, 2017). The unconfined HZ-A ground water is interpreted to discharge into CWC, which divides the HZ-A ground-water system south and east of the creek from areas north and west of CWC. Ground-water recharge comes from three primary sources: precipitation, off-site inflow of ground water, and creek bed infiltration during high creek stage. Ground-water discharge could occur by seepage into CWC during low creek stage (DOE 1994). The vertical gradient varies beneath the site and is influenced by stratigraphic heterogeneity and seasonal fluctuations in recharge and evapotranspiration. Based on the CY 2017 water-level measurements, the position of the HZ-A ground-water surface averaged approximately 6.6 ft higher in the corresponding shallow wells at the SLAPS and SLAPS VPs in the wet season (May) than in the dry season (November).

A review of the screened intervals in the deep wells indicates that many wells are screened across multiple lithologic units and HZs. Based on this review, the HZ-C (Units 3B and 4) potentiometric surface was determined to be a proper representation of the lower ground-water system. This review reduces the number of data points used to develop the potentiometric surface contours, but results in a higher level of confidence in contouring the HZ-C potentiometric surface.

The potentiometric surface contours for the HZ-C ground water in CY 2017 are illustrated on Figures 4-6 and 4-8. The flow direction in HZ-C is generally east or northeast beneath the SLAPS and SLAPS VPs, at an average horizontal gradient of 0.0013 ft/ft in May and 0.0016 ft/ft in November of 2017. A comparison of the ground-water elevations from monitoring well pairs indicates that the wells completed in HZ-A exhibit different hydraulic heads from the wells completed in HZ-C. Near CWC, the potentiometric surface of the "confined" aquifer HZ-C averages approximately 7.0 ft higher than the potentiometric surface of the unconfined HZ-A zone, indicating an upward vertical gradient. The large difference in hydraulic head demonstrates that the HZ-A and HZ-C ground-water zones are distinct ground-water systems with limited hydraulic connection. This is supported by the lithologic data, which indicate that a highly impermeable clay (Subunit 3M of HZ-B) and silty clay (Subunit 3B of HZ-C) separates the HZ-A ground-water system from the underlying ground-water zones. The HZ-C potentiometric surfaces do not appear to be influenced by CWC (the creek's thalweg is approximately 500 ft amsl) or by seasonal changes. These features are likely a result of the overlying clay layers limiting vertical ground-water movement.

5.0 ENVIRONMENTAL QUALITY ASSURANCE PROGRAM

5.1 PROGRAM OVERVIEW

The environmental quality assurance (QA) program includes management of the QA/QC programs, plans, and procedures governing environmental monitoring activities at all SLS and at subcontracted vendor laboratories. This section discusses the environmental monitoring standards of the FUSRAP and the goals for these programs, plans, and procedures.

The environmental QA program provides the 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. The MDNR conducted site visits on February 14, 2017, March 16, 2017, May 23, 2017, August 14, 2017, October 12, 2017, and November 14, 2017, to observe the environmental monitoring activities. USEPA and MDNR regulatory oversight of sampling activities provided an additional level of QA/QC.

Key elements in achieving the goals of this program are maintaining compliance with the QA program; 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 are:

- To provide data of sufficient quality and quantity to support ongoing remedial efforts, aid in defining potential COCs, meet the requirements of the EMG and the SAG, and support the ROD (USACE 1999a, 2000, 2005).
- To provide data of sufficient quality to meet applicable State of Missouri and federal concerns (e.g., reporting requirements).
- To ensure samples were collected using approved techniques and are representative of existing site conditions.

5.2 QUALITY ASSURANCE PROGRAM PLAN

The quality assurance program plan (QAPP) for activities performed at the NC Sites is described within Section 3.0 of the SAG. The QAPP provides the organization, objectives, functional activities, and specific QA/QC activities associated with investigations and sampling activities at the NC Sites.

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).

5.3 SAMPLING AND ANALYSIS GUIDE

The SAG summarizes standard operating procedures (SOPs) and data quality requirements for collecting and analyzing environmental data. The SAG integrates protocols and methodologies identified under various USACE and regulatory guidance. It describes administrative procedures for managing environmental data and governs sampling plan preparation, data review, evaluation and validation, database administration, and data archiving. The identified sampling and monitoring structures are delineated in programmatic documents such as the EMG (USACE 1999a) for the NC Sites, which is an upper-tier companion document to the SAG (USACE 2000). The EMICY17 outlines the analyses to be performed at the NC Sites for various media (USACE 2016).

Flexibility to address non-periodic environmental sampling (e.g., specific studies regarding environmental impacts, well installations, and/or in-situ waste characterizations) was accomplished by the issuance of work descriptions. Environmental monitoring data obtained during these sampling activities were reported to the USEPA Region 7 on a quarterly basis.

5.4 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 that standard procedures were followed in sample collection and completion of field logbooks, chain-of-custody forms, labels, and custody seals. Documentation of training and readiness were submitted to 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 fieldwork or data quality of any environmental samples for a given day. Guidance for documenting specific types of field sampling activities in field logbooks or log sheets is provided 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 St. Louis FUSRAP database may be flagged accordingly.

5.5 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 SAG and activity-specific work description or the EMICY17 (USACE 2016).

5.5.1 Field Assessments

Internal assessments (audit or surveillance) of field activities (sampling and measurements) were conducted by the QA/QC Officer (or designee). Assessments included an examination of field sampling records; field instrument operating records; sample collection, handling, and packaging procedures; and maintenance of QA procedures and chain-of-custody forms. These assessments occurred at the onset of the project to verify that all established procedures were followed (systems audit).

Performance assessments followed the system audits to ensure that 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 the USACE; USEPA Region 7; or the State of Missouri.

5.5.2 Laboratory Audits

The on-site USACE St. Louis FUSRAP laboratory locations are subject to periodic review(s) by the local USACE Chemist to demonstrate compliance with the *Department of Defense/Department of Energy Consolidated Quality Systems Manual for Environmental Laboratories* (QSM) (U.S. Department of Defense [DOD] and DOE 2017). In conjunction, the on-site laboratories participate in blind, third-party performance evaluation studies (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 DOD Environmental Laboratory Accreditation Program (ELAP). The DOD ELAP requires an annual audit and re-accreditation every 3 years.

These 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 that 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 Radioanalytical Laboratory* (USACE 2013). 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's SOPs. Internal performance audits were also conducted on a regular basis. Single-blind performance samples were prepared and submitted along with project samples to the laboratory for analysis. The Laboratory QA Manager evaluated the analytical results of these single-blind performance samples to ensure that the laboratory maintained acceptable performance. Quarterly QA/QC reports were 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 follow the guidance presented in the QSM (DOD and DOE 2017).

5.6 SUBCONTRACTED LABORATORY PROGRAMS

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

Samples collected during these investigations were analyzed by the USEPA methods contained in *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 the QSM) (DOD and DOE 2017).

5.7 QUALITY ASSURANCE AND QUALITY CONTROL SAMPLES

The QA and QC samples were analyzed for the purpose of assessing the quality of the sampling effort and the reported analytical data. The QA and QC samples include duplicate samples (–1) and split samples (–2). The equations utilized for accuracy and precision can be found in Section 5.9.

5.7.1 Duplicate Samples

These samples, which measure precision, were collected by the sampling teams and were submitted for analysis to the on-site USACE St. Louis FUSRAP laboratory or contract laboratories. The identity of duplicate samples is held blind to the analysts. 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 contracted laboratories for analysis. One duplicate sample was collected for approximately every 20 field samples of each matrix and analyte across the SLS. Precision is measured by the relative percent difference (RPD) for radiological and by non-radiological analyses or the normalized absolute difference (NAD) for radiological analyses.

The RPDs for non-radiological analyses are presented in Tables 5-1 and 5-2. The RPDs and NADs for radiological analyses are presented in Tables 5-3 through 5-5. The overall precision for CY 2017 environmental monitoring activities was acceptable. See Section 5.9 for the evaluation process.

Table 5-1. Non-Radiological Duplicate Sample Analysis for CY 2017 – Surface and Ground Water

Sample Name[a]	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD[b]	**RPD[b]**	**RPD[b]**	**RPD[b]**	**RPD[b]**
CWC195845 / CWC195845-1	NC	NC	0.00	NC	NC
CWC199427 / CWC199427-1	NC	NC	1.08	NC	NC
SVP196688 / SVP196688-1	NC	0.00	1.98	NC	NC
Sample Name[a]	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD[b]	**RPD[b]**	**RPD[b]**	**RPD[b]**	**RPD[b]**
CWC195845 / CWC195845-1	0.00	0.00	NC	NC	NC
CWC199427 / CWC199427-1	3.17	9.09	3.39	NC	NC
SVP196688 / SVP196688-1	NC	NC	NC	NC	NC

[a] Surface/ground-water samples ending in "-1" are duplicate surface/ground water samples.
[b] RPD criterion for liquid samples is less than or equal to 30 percent.
NC – not calculated (due to one or both concentrations being below DLs)

Table 5-2. Non-Radiological Duplicate Sample Analysis for CY 2017 – Sediment

Sample Name[a]	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD[b]	**RPD[b]**	**RPD[b]**	**RPD[b]**	**RPD[b]**
CWC195846 / CWC195846-1	NC	47.19	**97.44**	**58.71**	45.16
CWC199426 / CWC199426-1	NC	36.52	14.29	15.38	12.50
Sample Name[a]	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD[b]	**RPD[b]**	**RPD[b]**	**RPD[b]**	**RPD[b]**
CWC195846 / CWC195846-1	**73.38**	**63.64**	NC	NC	49.06
CWC199426 / CWC199426-1	**66.67**	19.35	42.86	NC	10.53

[a] Sediment samples ending in "-1" are duplicate sediment samples.
[b] RPD criterion for solid matrix samples is less than or equal to 50 percent.
Bold values exceed the control limits. Values not in bold are within control limits.
NC – not calculated (due to one or both concentrations being below DLs)

Table 5-3. Radiological Duplicate Sample Analysis for CY 2017 – Surface and Ground Water

Sample Name[a]	Ra-226		Ra-228		Th-228		Th-230	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195845 / CWC195845-1	NC	NA	*	*	NC	NA	NC	NA
CWC199427 / CWC199427-1	NC	NA	*	*	NC	NA	NC	NA
SVP196688 / SVP196688-1	NC	NA	*	*	NC	NA	NC	NA
Sample Name[a]	**Th-232**		**U-234**		**U-235**		**U-238**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195845 / CWC195845-1	NC	NA	7.11	NA	NC	NA	24.32	NA
CWC199427 / CWC199427-1	NC	NA	73.71	0.80	NC	NA	25.67	NA
SVP196688 / SVP196688-1	NC	NA	NC	NA	NC	NA	NC	NA

[a] Surface/ground-water samples ending in "-1" are duplicate surface/ground water samples.
[b] RPD criterion for liquid 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.
* Not calculated, because either parent or duplicate sample was not analyzed.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

Table 5-4. Radiological Duplicate Sample Alpha Analysis for CY 2017 – Sediment

Sample Name[a]	Th-228		Th-230		Th-232	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-1	26.49	NA	67.13	1.75	24.30	NA
CWC199426 / CWC199426-1	6.97	NA	0.00	NA	2.17	NA

[a] Sediment samples ending in "-1" are duplicate sediment 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)

Table 5-5. Radiological Duplicate Sample Gamma Analysis for CY 2017 – Sediment

Sample Name[a]	Ac-227		Am-241		Cs-137		K-40	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-1	NC	NA	NC	NA	NC	NA	9.84	NA
CWC199426 / CWC199426-1	NC	NA	NC	NA	NC	NA	18.46	NA
Sample Name[a]	**Pa-231**		**Ra-226**		**Ra-228**		**Th-228**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-1	NC	NA	10.53	NA	1.98	NA	*	*
CWC199426 / CWC199426-1	NC	NA	15.71	NA	25.24	NA	*	*
Sample Name[a]	**Th-230**		**Th-232**		**U-235**		**U-238**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-1	*	*	38.90	NA	NC	NA	52.89	0.70
CWC199426 / CWC199426-1	*	*	5.51	NA	NC	NA	NC	NA

[a] Sediment samples ending in "-1" are duplicate sediment 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.
* Not calculated, because either parent or split sample was not analyzed.
Am – americium
Cs – cesium
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

5.7.2 Split Samples

Split samples measure accuracy and were collected by the sampling team and sent to a USACE 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 non-radiological and for radiological analytes across the SLS.

The RPDs for non-radiological analyses are presented in Tables 5-6 and 5-7. The RPDs and NADs for radiological analyses are presented in Tables 5-8 through 5-10. The overall accuracy for the CY 2017 environmental monitoring activities was acceptable. See Section 5.9 for the evaluation process.

Table 5-6. Non-Radiological Split Sample Analysis for CY 2017 – Surface and Ground Water

Sample Name[a]	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD[b]	RPD[b]	RPD[b]	RPD[b]	RPD[b]
CWC195845 / CWC195845-2	NC	NC	8.00	NC	NC
CWC199427 / CWC199427-2	NC	NC	5.24	NC	NC
SVP196688 / SVP196688-2	NC	26.80	27.27	NC	NC
Sample Name[a]	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD[b]	RPD[b]	RPD[b]	RPD[b]	RPD[b]
CWC195845 / CWC195845-2	5.78	24.00	NC	NC	NC
CWC199427 / CWC199427-2	6.06	16.47	26.09	NC	NC
SVP196688 / SVP196688-2	NC	NC	NC	NC	NC

[a] Surface/ground-water samples ending in "-2" are split surface/ground water samples.
[b] RPD criterion for liquid samples is less than or equal to 30 percent.
NC – not calculated (due to one or both concentrations being below DLs)

Table 5-7. Non-Radiological Split Sample Analysis for CY 2017 – Sediment

Sample Name[a]	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD[b]	RPD[b]	RPD[b]	RPD[b]	RPD[b]
CWC195846 / CWC195846-2	NC	**72.00**	31.21	**73.08**	**74.29**
CWC199426 / CWC199426-2	NC	32.48	44.90	37.74	12.50
Sample Name[a]	**Molybdenum**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD[b]	RPD[b]	RPD[b]	RPD[b]	RPD[b]
CWC195846 / CWC195846-2	**53.24**	**79.07**	NC	NC	**50.00**
CWC199426 / CWC199426-2	**64.46**	11.11	NC	NC	22.22

[a] Sediment samples ending in "-2" are split sediment samples.
[b] RPD criterion for solid matrix samples is less than or equal to 50 percent.
Bold values exceed the control limits. Values not in bold are within control limits.
NC – not calculated (due to one or both concentrations being below DLs)

Table 5-8. Radiological Split Sample Analysis for CY 2017 – Surface and Ground Water

Sample Name[a]	Ra-226		Ra-228		Th-228		Th-230	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195845 / CWC195845-2	NC	NA	*	*	NC	NA	44.81	0.41
CWC199427 / CWC199427-2	NC	NA	*	*	NC	NA	101.05	1.03
SVP196688 / SVP196688-2	NC	NA	*	*	NC	NA	37.11	0.33
Sample Name[a]	**Th-232**		**U-234**		**U-235**		**U-238**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195845 / CWC195845-2	NC	NA	5.91	NA	NC	NA	32.82	0.48
CWC199427 / CWC199427-2	NC	NA	112.73	1.41	NC	NA	48.16	0.50
SVP196688 / SVP196688-2	NC	NA	NC	NA	NC	NA	NC	NA

[a] Surface/ground-water samples ending in "-2" are split surface/ground water samples.
[b] RPD criterion for liquid 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.
* Not calculated, because either parent or split sample was not analyzed.
NA – not applicable (see RPD)
NC – not calculated (due to one or both concentrations being below MDCs)

Table 5-9. Radiological Split Sample Alpha Analysis for CY 2017 – Sediment

Sample Name[a]	Th-228		Th-230		Th-232	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-2	27.03	NA	22.94	NA	29.60	NA
CWC199426 / CWC199426-2	37.37	NA	8.06	NA	4.72	NA

[a] Sediment samples ending in "-2" are split sediment samples.
[b] RPD criterion for solid matrix sample 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)

Table 5-10. Radiological Split Sample Gamma Analysis for CY 2017 – Sediment

Sample Name[a]	Ac-227		Am-241		Cs-137		K-40	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-2	NC	NA	NC	NA	NC	NA	15.14	NA
CWC199426 / CWC199426-2	NC	NA	NC	NA	NC	NA	2.51	NA
Sample Name[a]	**Pa-231**		**Ra-226**		**Ra-228**		**Th-228**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-2	NC	NA	21.18	NA	44.27	NA	32.71	NA
CWC199426 / CWC199426-2	NC	NA	43.74	NA	30.64	NA	1.91	NA
Sample Name[a]	**Th-230**		**Th-232**		**U-235**		**U-238**	
	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]	RPD[b]	NAD[b]
CWC195846 / CWC195846-2	NC	NA	32.71	NA	NC	NA	NC	NA
CWC199426 / CWC199426-2	NC	NA	1.91	NA	NC	NA	NC	NA

[a] Sediment samples ending in "-2" are split sediment 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)

5.7.3 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. All of the monitoring wells have dedicated sampling equipment, rendering decontamination unnecessary. Because decontamination does not apply, equipment rinsate blanks were not employed.

Sediment samples from CWC are collected from each station using a clean sampling spoon. These spoons are segregated after use and decontaminated at the SLAPS field trailer 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 would therefore not apply. The CWC 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.

5.8 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 1110-1-263 (USACE 1998c) was also used when planning for chemical data management and evaluation. Additional details of data review, evaluation, and validation are provided in the *FUSRAP Laboratory Data Management Process for the St. Louis Site* (USACE 1999b). Data assessment guidance to determine the usability of data from hazardous, toxic, and radioactive waste projects is provided in EM 200-1-6 (USACE 1997).

One hundred (100) percent of the data generated from all analytical laboratories was independently reviewed and either evaluated and/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 the USACE Chemist or USACE 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.

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

The data evaluation process considers precision, accuracy, representativeness, completeness, comparability, and sensitivity. This section provides detail to the particular parameters and how the data were evaluated for each, with discussion and tables to present the associated data. An evaluation of the overall precision, accuracy, representativeness, completeness, comparability, and sensitivity of the CY 2017 environmental monitoring activities was acceptable and complete.

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 and ground-water radiological samples, when the RPD is greater than 30 percent, the NAD is used to determine the accuracy or precision of the method. NAD accounts for uncertainty in the results; RPD does not. The NAD should be equal to or less than a value of 1.96. The RPD criterion for sediment samples is equal to 50 percent. 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 through 5-5). Sample collection precision was measured in the laboratory by the analyses of duplicates. With the exception of a few outliers, which were qualified accordingly, the overall precision for the CY 2017 environmental monitoring 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 5-6 through 5-10). For this EMDAR, accuracy is measured 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 2017 environmental monitoring 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 network design was developed from the EMICY17, the sampling protocol from the SAG has been followed, and analytical procedures were conducted within the bounds of the QAPP. The overall representativeness of the CY 2017 environmental monitoring activities was acceptable.

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. For example, post-CY 1997 analytical data may not be directly comparable to data collected before CY 1997, because of differences in DQOs. Additionally, some sample media (e.g., storm water and radiological monitoring) have values that are primarily useful in the present, thus the comparison to historical data is not as relevant. However, the overall comparability of the applicable environmental monitoring 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 2017 environmental monitoring activities, the data completeness was 100 percent (St. Louis FUSRAP DQO for completeness is 90 percent).

Sensitivity is the determination of minimum detectable concentration (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 EMDAR, MDC is a term generically used to represent both the method detection limit (MDL) for non-radiologicals and the minimum detectable activity (MDA) for radiological analytes. The closer a measured value to the MDC, the less confidence and more variation the measurement will have. Project sensitivity goals were expressed as quantitation level goals in the SAG. 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 gamma spectroscopy for all radionuclides of concern, with additional analyses from alpha spectroscopy for thorium and from inductively coupled plasma (ICP) for metals. 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 gamma and alpha spectroscopy at the laboratory. Variations in MDLs for the same non-radiological analyte reflect variability in calibrations between laboratories, dilutions, and analytical methods. In order to complete the data evaluation (i.e., precision, accuracy, representativeness, and comparability), analytical results that exceed the MDC of the analyte are desired.

5.10 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 less than desired but adequate for interpretation.

These data can withstand scientific scrutiny, are appropriate for the intended purpose, and are technically defensible. The environmental information presented has an established confidence, which allows utilization for the project objectives and provides data for future needs.

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

Summaries of the QA parent sample results and associated duplicate and/or split sample results are presented in Tables 5-11 through 5-14.

Table 5-11. Non-Radiological Parent Samples and Associated Duplicate and Split Samples (Surface and Ground Water) for CY 2017

Sample Name[a]	Antimony[b]			Arsenic[b]			Barium[b]			Cadmium[b]			Chromium[b]		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC195845	2.00	2.00	U	4.00	4.00	U	120.00	0.90	=	0.20	0.20	U	4.00	4.00	U
CWC195845-1	2.00	2.00	U	4.00	4.00	U	120.00	0.90	=	0.20	0.20	U	4.00	4.00	U
CWC195845-2	1.10	0.13	J	3.80	0.22	J	130.00	0.30	J	0.33	0.33	UJ	1.50	0.11	J
CWC199427	2.00	2.00	U	4.00	4.00	U	93.00	0.90	=	0.20	0.20	U	4.00	4.00	U
CWC199427-1	2.00	2.00	U	4.00	4.00	U	92.00	0.90	=	0.20	0.20	U	4.00	4.00	U
CWC199427-2	0.55	0.01	J	3.00	0.13	J	98.00	0.06	J	0.07	0.03	J	1.30	0.14	J
SVP196688	2.00	2.00	U	110.00	4.00	=	500.00	0.90	=	0.20	0.20	U	4.00	4.00	U
SVP196688-1	2.00	2.00	U	110.00	4.00	=	510.00	0.90	=	0.20	0.20	U	4.00	4.00	U
SVP196688-2	0.39	0.13	J	84.00	0.22	=	380.00	0.30	=	0.33	0.33	U	0.11	0.11	U
Sample Name[a]	**Molybdenum[b]**			**Nickel[b]**			**Selenium[b]**			**Thallium[b]**			**Vanadium[b]**		
	Result	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**
CWC195845	8.40	2.00	=	2.20	2.00	=	2.00	2.00	U	0.90	0.90	U	4.00	4.00	U
CWC195845-1	8.40	2.00	=	2.20	2.00	=	2.00	2.00	U	0.90	0.90	U	4.00	4.00	U
CWC195845-2	8.90	0.32	J	2.80	0.19	J	2.00	0.25	J	0.09	0.09	UJ	2.30	0.18	J
CWC199427	32.00	2.00	=	4.60	2.00	=	3.00	2.00	=	0.90	0.90	U	4.00	4.00	U
CWC199427-1	31.00	2.00	=	4.20	2.00	=	2.90	2.00	=	0.90	0.90	U	4.00	4.00	U
CWC199427-2	34.00	0.20	J	3.90	0.04	J	3.90	0.06	J	0.05	0.03	J	3.40	0.21	J
SVP196688	2.00	2.00	U	2.00	2.00	U	2.00	2.00	U	0.90	0.90	U	4.00	4.00	U
SVP196688-1	2.00	2.00	U	2.00	2.00	=	2.00	2.00	U	0.90	0.90	U	4.00	4.00	U
SVP196688-2	1.20	0.32	=	0.19	0.19	U	0.69	0.25	J	0.10	0.09	J	0.18	0.18	U

[a] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[b] Result values are expressed in µg/L.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, and "J" analyte was identified as estimated quantity.

Table 5-12. Non-Radiological Parent Samples and Associated Duplicate and Split Samples (Sediment) for CY 2017

Sample Name[a]	Antimony[b]			Arsenic[b]			Barium[b]			Cadmium[b]			Chromium[b]		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC195846	0.61	0.61	U	6.80	1.20	=	100.00	1.50	=	0.71	0.07	=	24.00	1.40	=
CWC195846-1	1.30	1.30	U	11.00	2.60	=	290.00	3.30	=	1.30	0.16	=	38.00	3.00	=
CWC195846-2	0.05	0.05	UJ	3.20	0.09	J	73.00	0.07	J	0.33	0.06	J	11.00	0.08	J
CWC199426	0.69	0.69	U	6.80	1.40	=	150.00	1.70	=	0.63	0.08	=	17.00	1.60	=
CWC199426-1	0.82	0.64	=	4.70	1.30	=	130.00	1.60	=	0.54	0.08	=	15.00	1.40	=
CWC199426-2	0.13	0.13	UJ	4.90	0.20	J	95.00	0.03	J	0.43	0.05	J	15.00	0.05	J
Sample Name[a]	**Molybdenum[b]**			**Nickel[b]**			**Selenium[b]**			**Thallium[b]**			**Vanadium[b]**		
	Result	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**	**Result**	**DL**	**VQ**
CWC195846	0.88	0.61	=	15.00	0.61	=	0.98	0.98	U	0.61	0.61	U	20.00	1.20	=
CWC195846-1	1.90	1.30	=	29.00	1.30	=	2.10	2.10	U	1.30	1.30	U	33.00	2.60	=
CWC195846-2	0.51	0.14	J	6.50	0.14	J	0.09	0.09	UJ	0.26	0.04	J	12.00	0.16	J
CWC199426	1.60	0.69	J	17.00	0.69	=	1.10	1.10	=	0.69	0.69	U	20.00	1.40	=
CWC199426-1	3.20	0.64	=	14.00	0.64	=	1.70	1.00	=	0.64	0.64	U	18.00	1.30	=
CWC199426-2	0.82	0.06	J	19.00	0.07	J	0.23	0.23	UJ	0.15	0.15	UJ	16.00	0.05	J

[a] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[b] Result values are expressed in mg/kg.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" analyte was identified as estimated quantity, and "UJ" analyte was not detected and had QC deficiencies.

Table 5-13. Radiological Parent Samples and Associated Duplicate and Split Samples (Surface and Ground Water) for CY 2017

Sample Name[a]	Ra-226[b]				Ra-228[b]				Th-228[b]				Th-230[b]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195845	0.21	0.43	0.85	UJ	*	*	*	*	0.13	0.20	0.35	UJ	0.36	0.33	0.44	UJ
CWC195845-1	0.15	0.49	1.14	UJ	*	*	*	*	0.07	0.25	0.53	UJ	0.42	0.36	0.48	UJ
CWC195845-2	0.02	0.06	0.12	UJ	*	*	*	*	-0.05	0.15	0.36	UJ	0.24	0.20	0.26	UJ
CWC199427	0.42	0.48	0.38	UJ	*	*	*	*	0.28	0.28	0.19	UJ	0.21	0.24	0.19	UJ
CWC199427-1	0.96	0.80	0.89	J	*	*	*	*	0.38	0.35	0.49	UJ	0.18	0.20	0.16	UJ
CWC199427-2	0.15	0.08	0.09	J	*	*	*	*	0.48	0.60	0.99	UJ	0.64	0.51	0.46	J
SVP196688	0.61	0.71	1.12	UJ	*	*	*	*	0.34	0.30	0.18	J	0.24	0.28	0.40	UJ
SVP196688-1	0.17	0.35	0.47	UJ	*	*	*	*	0.31	0.36	0.58	UJ	0.42	0.35	0.19	J
SVP196688-2	0.63	0.16	0.09	=	*	*	*	*	0.13	0.16	0.26	UJ	0.15	0.13	0.12	J
Sample Name[a]	**Th-232[b]**				**U-234[b]**				**U-235[b]**				**U-238[b]**			
	Result	**Error**	**MDC**	**VQ**	**Result**	**Error**	**MDC**	**VQ**	**Result**	**Error**	**MDC**	**VQ**	**Result**	**Error**	**MDC**	**VQ**
CWC195845	0.00	0.00	0.15	U	1.22	0.59	0.39	=	0.00	0.00	0.20	U	0.98	0.53	0.39	J
CWC195845-1	0.10	0.15	0.14	UJ	1.31	0.60	0.16	=	0.00	0.00	0.20	U	1.25	0.58	0.16	=
CWC195845-2	0.02	0.14	0.29	UJ	1.15	0.29	0.11	=	0.02	0.04	0.06	UJ	0.70	0.22	0.10	=
CWC199427	0.07	0.14	0.19	UJ	0.47	0.37	0.37	J	0.08	0.15	0.21	UJ	0.62	0.43	0.46	J
CWC199427-1	0.12	0.17	0.16	UJ	1.01	0.58	0.42	J	0.00	0.00	0.23	U	0.80	0.51	0.42	J
CWC199427-2	-0.02	0.05	0.46	UJ	1.67	0.77	0.41	=	0.03	0.23	0.65	UJ	1.01	0.65	0.69	J
SVP196688	0.17	0.24	0.40	UJ	0.00	0.00	0.26	U	0.00	0.00	0.32	U	-0.05	0.10	0.57	UJ
SVP196688-1	0.03	0.16	0.42	UJ	0.08	0.15	0.21	UJ	-0.05	0.09	0.56	UJ	0.00	0.00	0.21	U
SVP196688-2	-0.01	0.02	0.14	UJ	0.07	0.09	0.12	UJ	0.00	0.01	0.08	UJ	0.02	0.04	0.10	UJ

[a] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[b] Result values are expressed in pCi/L. Negative results are less than the laboratory system's background level.
* Not available, because sample was not analyzed.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" analyte was identified as estimated quantity, and "UJ" analyte was not detected and had QC deficiencies.

Table 5-14. Radiological Parent Samples and Associated Duplicate and Split Samples (Sediment) for CY 2017

Sample Name[a]	Th-228[b,c]				Th-230[b,c]				Th-232[b,c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195846	1.18	0.46	0.20	J	5.79	1.44	0.17	=	1.02	0.42	0.17	=
CWC195846-1	0.90	0.39	0.09	J	2.88	0.83	0.09	J	0.80	0.36	0.16	=
CWC195846-2	0.90	0.19	0.09	=	7.29	0.79	0.02	=	0.76	0.17	0.02	=
CWC199426	1.01	0.40	0.15	=	1.29	0.47	0.15	=	0.68	0.32	0.15	=
CWC199426-1	0.94	0.36	0.20	=	1.29	0.43	0.15	=	0.70	0.29	0.07	=
CWC199426-2	0.69	0.17	0.06	=	1.19	0.23	0.07	=	0.72	0.18	0.08	=
Sample Name[a]	Ac-227[c]				Am-241[c]				Cs-137[c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195846	0.01	0.08	0.12	UJ	0.00	0.02	0.04	UJ	0.01	0.01	0.02	UJ
CWC195846-1	0.15	0.12	0.18	UJ	-0.02	0.03	0.05	UJ	0.01	0.02	0.03	UJ
CWC195846-2	0.03	0.07	2.27	UJ	-0.11	0.28	0.47	UJ	0.03	0.07	0.11	UJ
CWC199426	0.10	0.23	0.34	UJ	-0.01	0.06	0.10	UJ	0.00	0.03	0.06	UJ
CWC199426-1	0.04	0.08	0.12	UJ	-0.01	0.02	0.04	UJ	-0.01	0.01	0.02	UJ
CWC199426-2	0.31	0.68	0.98	UJ	-0.01	0.13	0.24	UJ	0.03	0.05	0.08	UJ
Sample Name[a]	K-40[c]				Pa-231[c]				Ra-226[c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195846	11.60	0.85	0.18	=	-0.14	0.45	0.73	UJ	0.95	0.25	0.04	=
CWC195846-1	12.80	1.03	0.22	=	0.64	0.49	1.07	UJ	1.06	0.29	0.06	=
CWC195846-2	13.50	2.34	0.83	=	0.75	2.37	5.35	UJ	1.18	0.24	0.16	=
CWC199426	11.80	1.44	0.40	=	1.04	1.32	1.41	UJ	1.29	0.42	0.14	=
CWC199426-1	14.20	0.99	0.16	=	0.10	0.48	0.57	UJ	1.51	0.38	0.05	=
CWC199426-2	12.10	2.02	0.80	=	0.00	0.78	5.23	UJ	0.83	0.20	0.15	=
Sample Name[a]	Ra-228[c]				Th-228[b,c]				Th-230[b,c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195846	0.66	0.05	0.05	=	0.66	0.05	0.05	=	3.17	3.42	3.57	UJ
CWC195846-1	0.65	0.08	0.09	=	0.76	0.08	0.09	=	1.25	3.48	4.81	UJ
CWC195846-2	1.04	0.34	0.26	=	*	*	*	*	*	*	*	*
CWC199426	0.64	0.14	0.14	=	0.64	0.14	0.14	=	2.13	5.32	9.26	UJ
CWC199426-1	0.83	0.06	0.05	=	0.83	0.06	0.05	=	1.88	2.38	4.06	UJ
CWC199426-2	0.88	0.27	0.32	=	*	*	*	*	*	*	*	*
Sample Name[a]	Th-232[b,c]				U-235[c]				U-238[c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC195846	0.66	0.05	0.05	=	0.06	0.14	0.23	UJ	0.73	0.45	0.35	J
CWC195846-1	0.76	0.08	0.09	=	-0.02	0.20	0.32	UJ	1.26	0.61	0.46	=
CWC195846-2	1.13	0.34	0.26	=	-0.06	0.45	1.19	UJ	0.43	0.72	4.17	UJ
CWC199426	0.64	0.14	0.14	=	-0.18	0.37	0.59	UJ	0.72	0.61	1.09	UJ
CWC199426-1	0.83	0.06	0.05	=	0.11	0.16	0.26	UJ	0.92	0.39	0.39	=
CWC199426-2	0.88	0.30	0.37	=	0.19	0.27	0.33	UJ	0.23	0.26	2.42	UJ

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

6.0 RADIOLOGICAL DOSE ASSESSMENT

This section evaluates the cumulative dose to a hypothetically impacted individual from exposure to radiological contaminants at the NC Sites and documents dose trends. The regulatory dose limit for members of the public is 100 mrem per year, as stated in 10 *CFR* 20.1301. Although 10 *CFR* 20.1301 is not an ARAR for the NC Sites, the USACE has provided this evaluation to assess public exposures from St. Louis FUSRAP cleanup operations. Compliance with the dose limit in §20.1301 can be demonstrated in one of the two following methods (§20.1302(b)(1) and (2)):

1) Demonstrating by measurement or calculation that the TEDE to the individual likely to receive the highest dose from FUSRAP cleanup operations at the NC Sites does not exceed the annual dose limit (i.e., 100 mrem per year); or
2) Demonstrating that: (*i*) the annual average concentration of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area does not exceed the values specified in Table 2 of Appendix B to 10 *CFR* 20; and (*ii*) if an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 2 mrem per hour.

The USACE has elected to demonstrate compliance by calculation of the TEDE to a hypothetical individual likely to receive the highest dose from FUSRAP cleanup operations at the NC Sites (method 1). This section describes the methodology employed for this evaluation.

Dose calculations are presented for hypothetical maximally exposed individuals at the Latty Avenue Properties, SLAPS, SLAPS VPs, and CWC. The monitoring data used in the dose calculations are reported in the respective environmental monitoring sections of this EMDAR.

Dose calculations related to airborne emissions, as required by 40 *CFR* 61, Subpart I, *National Emission Standards for Emissions of Radionuclides Other Than Radon From Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered By Subpart H,* are presented in Appendix A (the "North St. Louis County FUSRAP Sites 2017 Radionuclide Emissions NESHAP Report Submitted in Accordance with Requirements of 40 *CFR* 61, Subpart I").

6.1 SUMMARY OF ASSESSMENT RESULTS AND DOSE TRENDS

No excavation or loadout activities occurred on the Latty Avenue Properties, and soil cleanup activities on the most contaminated Latty Avenue Properties (HISS and Futura) were completed in CY 2011. The TEDE from Latty Avenue Properties to a hypothetical maximally exposed receptor was indistinguishable from background radiation dose after the cleanup concluded on the Latty Avenue Properties. Therefore, calculation of TEDE from the Latty Avenue Properties to a hypothetical maximally exposed receptor was not included in the reports from 2012 until the 2016 because neither excavation or loadout activities occurred on those properties during that time. In 2017, a small area was identified along the railroad tracks on VP-40A where the external radiation levels are slightly above background levels. This area is currently classified as inaccessible and is known to have radiological contamination in excess of ROD RGs. Although the average external gamma radiation levels do not exceed the monitoring threshold of 20 μR/hour in the ROD, monitoring was started and dose to a hypothetical maximally exposed individual from all complete/applicable pathways combined was calculated to be less than 1.4 mrem per year, estimated for an individual who works full time at a location approximately 75 m east on the Futura property.

The TEDE from the SLAPS to a hypothetical maximally exposed individual from all complete/applicable pathways combined was less than 0.1 mrem per year, estimated for an individual who works full time at a location approximately 500 m west-southwest from the center of the SLAPS Loadout area.

The TEDE from the SLAPS VPs to a hypothetical maximally exposed individual from all complete/applicable pathways combined was 5.4 mrem per year, estimated for a resident who lives full time at a location approximately 20 m south from the center of the Palm Drive excavation area.

The TEDE from CWC to a hypothetical maximally exposed individual from all complete/applicable pathways combined was 0.3 mrem per year, estimated for a resident youth (10-year-old child) spending time as a recreational user of CWC.

Annual dose trends from CY 2000 to CY 2017 at applicable NC Sites are documented on Figure 6-1. A comparison of the maximum annual dose from CY 2000 to CY 2017 at each of the applicable NC Sites to the annual average natural background dose of approximately 300 mrem per year is provided on Figure 6-2.

6.2 PATHWAY ANALYSIS

The six complete pathways for exposure to NC Site radiological contaminants evaluated by the St. Louis FUSRAP EMP are listed in Table 6-1. These pathways are used to identify data gaps in the EMP and to estimate potential radiological exposures from the site. Of the six complete pathways, four were applicable in CY 2017 and were thus incorporated into radiological dose estimates.

Table 6-1. Complete Radiological Exposure Pathways for the NC Sites

Exposure Pathway	Pathway Description	Applicable to CY 2017 Dose Estimate	
		NC Sites	CWC
Liquid A	Ingestion of ground water from local wells down-gradient from the site.	NA	NA
Liquid B	Ingestion of fish inhabiting CWC.	NC	NA
Liquid C	Ingestion of surface water[a] and sediments.	NC	Y[b]
Airborne A	Inhalation of particulates dispersed through wind erosion and RAs.	Y	NC
Airborne B	Inhalation of Rn-222 and decay products emitted from contaminated soils/wastes.	Y	NC
External	Direct gamma radiation from contaminated soils/wastes.	Y	NA

[a] Surface water includes storm-water run-off from NC Sites, MSD discharges, and the water in CWC.
[b] The pathway is only applicable to a recreational receptor (youth) exposed to contaminants present in CWC water and sediments. Data from NC Sites storm-water discharges and MSD discharges are not applicable to the hypothetical recreational receptor; therefore, those data are not evaluated in this section.
NA – not applicable for the site
NC – not a complete pathway for the respective site
Y – applicable for the site

In developing specific elements of the St. Louis FUSRAP EMP, potential exposure pathways of the radioactive materials present on site are reviewed to determine which pathways are complete. Evaluation of each exposure pathway is based on hypothetical sources, release mechanisms, types, probable environmental fates of contaminants, and the locations and activities of potential receptors. Pathways are then reviewed to determine whether a link exists between one or more radiological contaminant sources, or between one or more environmental transport processes, to an exposure point at which human receptors are present. If a link exists, the pathway is termed complete. Each complete pathway was reviewed to determine if a potential for exposure was present in CY 2017. If a potential for exposure was possible, the pathway is termed applicable. Only applicable pathways are considered in estimates of dose.

The pathways applicable to the CY 2017 dose estimates for NC Sites, including CWC, are shown in Table 6-1. The incomplete pathways were not considered in the dose assessment and are only listed in Table 6-1 because they were complete for at least one receptor location. The pathways listed as not applicable were listed as such in CY 2017 for the following reasons:

- Liquid A is not applicable, because the aquifer is of naturally low quality and is not known to be used for any domestic purpose in the vicinity of the NC Sites (DOE 1994).
- Liquid B is not applicable at CWC or for the SLAPS transient receptor, because the receptor would be unlikely to catch and eat a game fish. A survey was conducted, and 97 percent of the fish collected at CWC during the survey were fathead minnows (Parker and Szlemp 1987).
- The dose equivalent from CWC to the receptor from contaminants in the water/sediment was estimated using the Microshield Version 5.03 computer-modeling program. The scenario used was a youth playing in the creek bed (1.0 ft of water shielding and dry) for 52 hours per year. The highest estimated whole body dose to the youth was 0.3 microrem per year. The gamma dose rate emitted from the contaminants is indistinguishable from background gamma radiation. Therefore, the external gamma pathway (from contaminants in the creek water/sediment) is not applicable for the CWC receptor.

6.3 EXPOSURE SCENARIOS

Dose calculations were performed for maximally exposed individuals at critical receptor locations for applicable exposure pathways (see Table 6-1) to assess dose due to radiological releases from the NC Sites. First, conditions were set to determine the TEDE to a maximally exposed individual at each of the main site locations on which excavation and loadout activities occurred (i.e., Latty Avenue Properties, the SLAPS, and the SLAPS VPs). A second dose equivalent for CWC was calculated. A third set of dose equivalent calculations was performed to meet NESHAP requirements (Appendix A). These dose equivalent calculations were also used for purposes of TEDE calculation.

The scenarios and models used to evaluate these radiological exposures are conservative but appropriate. Although radiation doses can be calculated or measured for individuals, it is not appropriate to predict the health risk to a single individual using the methods prescribed herein. Dose equivalents to a single individual are estimated by hypothesizing a maximally exposed individual and placing this individual in a reasonable but conservative scenario. This method is acceptable when the magnitude of the dose to a hypothetical maximally exposed individual is small, as is the case for the NC Sites. This methodology provides for reasonable estimates of potential exposure to the public and maintains a conservative approach. The scenarios and resulting estimated doses are outlined in Section 6.4.

All ingestion calculations were performed using the methodology described in International Commission on Radiation Protection (ICRP) Reports 26 and 30 for a 50-year committed effective dose equivalent (CEDE). The 50-year CEDE conversion factors were obtained from *Federal Guidance Report* 11 (USEPA 1989a) and *Calculation of Slope Factors and Dose Coefficients* (ORNL 2014).

6.4 DETERMINATION OF TOTAL EFFECTIVE DOSE EQUIVALENT FOR EXPOSURE SCENARIOS

The TEDE for the exposure scenarios was calculated using CY 2017 monitoring data. Calculations for dose scenarios are provided in Appendix H. Dose equivalent estimates are well below the standards set by the NRC for annual public exposure and the USEPA NESHAP limits.

The CY 2017 TEDE for a hypothetical maximally exposed individual near the Latty Avenue Properties, SLAPS and the SLAPS VPs, and CWC is 1.4 mrem per year, 5.4 mrem per year, and 0.3 mrem per year, respectively. In comparison, the annual average exposure to natural background radiation in the United States results in a TEDE of approximately 300 mrem per year (NCRP 2009). Assumptions are detailed in the following sections.

6.4.1 Radiation Dose Equivalent from Latty Avenue Properties to a Maximally Exposed Individual

Although there were no Latty Avenue Properties at which RA occurred in the CY, the TEDE to a hypothetical maximally exposed individual was calculated for an area adjacent to the VP-40A railroad tracks. There were no excavation or loadout activities at the Latty Avenue Properties during CY 2017; therefore, dose from the remainder of the Latty Avenue Properties is considered negligible.

This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to work in an area directly adjacent to the railroad tracks on VP-40A near the fence on the boundary of VP-40A and Futura. No private residences are adjacent to the site. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A full-time-employee business receptor was considered the maximally exposed individual for VP-40A. The receptor could be either a railroad worker or someone who works full time outside on the Futura property.

The exposure scenario assumptions are:

- Exposure to radiation from all VP-40A sources occurs to the maximally exposed individual while working full-time outside at the receptor location facility (Futura) located approximately 75 m east from the area identified as having the highest external gamma level on VP-40A. Exposure time is 2,000 hours per year (Leidos 2018e).
- Exposure from external gamma radiation was calculated using environmental TLD monitoring data at the perimeter between the source and the receptor. The site is assumed to represent a line-source to the receptor (Leidos 2018e).
- Exposure from Rn-222 (and progeny) was calculated using a dispersion factor and Rn-222 (ATD) monitoring data at the site perimeter between the source and the receptor (Leidos 2018e).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual working outside at the Futura facility 75 m east from the monitored area on VP-40A identified as having the highest external gamma level would have received less than 0.1 mrem per year from external gamma, and 1.4 mrem per year from Rn-222, for a TEDE of 1.4 mrem per year (Leidos 2018e).

6.4.2 Radiation Dose Equivalent from St. Louis Airport Site to a Maximally Exposed Individual

The SLAPS Properties contributing to dose (i.e., those properties at which RA occurred in CY 2017) include: the SLAPS Loadout area. This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to frequent the perimeter of the SLAPS and to receive a radiation dose by the exposure pathways identified previously. No private residences are adjacent to the site. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A full-time-employee business receptor was considered the maximally exposed individual for the SLAPS.

The exposure scenario assumptions are:

- Exposure to radiation from all SLAPS sources occurs to the maximally exposed individual while working full time outside at the receptor location facility located approximately 500 m west-southwest from the center of the SLAPS Loadout area. Exposure time is 2,000 hours per year (Leidos 2018b).
- Exposure from external gamma radiation was calculated using environmental TLD monitoring data at the perimeter between the source and the receptor. The site is assumed to represent a line-source to the receptor (Leidos 2018b).
- Exposure from airborne radioactive particulates was calculated using soil concentration data and air particulate monitoring data to determine a source term and then running the CAP88-PC modeling code to calculate dose to the receptor (Leidos 2018b).
- Exposure from Rn-222 (and progeny) was calculated using a dispersion factor and Rn-222 (ATD) monitoring data at the site perimeter between the source and the receptor (Leidos 2018b).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual working outside at the receptor facility 500 m west-southwest of the center of the SLAPS Loadout area would have received less than 0.1 mrem per year from external gamma, less than 0.1 mrem per year from airborne radioactive particulates, and 0.1 mrem per year from Rn-222, for a TEDE of less than 0.1 mrem per year (Leidos 2018b).

6.4.3 Radiation Dose Equivalent from St. Louis Airport Site Vicinity Properties to a Maximally Exposed Individual

The SLAPS VPs contributing to dose (i.e., those properties at which RA occurred in CY 2017) include: Duchesne Park, Palm Drive Properties, and the Ballfields (IA-09). This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to frequent the perimeter of the SLAPS VPs and to receive a radiation dose by the exposure pathways identified previously. Because radiation dose due to radon and external gamma radiation are considered negligible at the SLAPS VPs, the estimated TEDE only includes dose from exposure to airborne radioactive particulates that are assumed to be released during active excavations. The excavation activities at Palm Drive yielded the highest estimated exposure to airborne radioactive particulates (5.4 mrem per year) from SLAPS VPs, and a private residence is located approximately 20 m northeast of the Palm Drive excavation; therefore a residential receptor was considered the maximally exposed individual for the SLAPS VPs.

The exposure scenario assumptions are:

- Exposure to radiation from all SLAPS VP sources occurs to the maximally exposed individual while living full time at the residence receptor location located approximately 20 m south from the center of the Palm Drive excavation area. Exposure time is 8,760 hours per year (Leidos 2018b).
- Exposure from airborne radioactive particulates was calculated using soil concentration data and air particulate monitoring data to determine a source term and then running the CAP88-PC modeling code to calculate dose to the receptor (Leidos 2018b).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual living at the residence receptor location 20 m south from the center of the Palm Drive excavation areas would have received 5.4 mrem per year from airborne radioactive particulates for a TEDE of 5.4 mrem per year (Leidos 2018b).

6.4.4 Radiation Dose Equivalent from Coldwater Creek to a Maximally Exposed Individual

This section describes the estimated TEDE to a hypothetical maximally exposed individual assumed to frequent CWC and receive a radiation dose by the exposure pathways identified previously. The assumed scenario is for a recreational user. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A youth spending time as a recreational user of CWC is considered the maximally exposed individual for CWC.

The exposure scenario assumptions are:

- The youth spends 2 hours at CWC during each visit, and visits once every 2 weeks. It is likely that this activity would be greater in summer and less in winter, but the yearly average is 26 visits.
- The soil/sediment ingestion rate is 50 mg per day, and the water ingestion rate is 2 L per day (USEPA 1989b).
- The UCL_{95} of the mean radionuclide concentrations in CWC surface water/sediment samples collected in CY 2017 were assumed to be present in the water/sediment ingested by the maximally exposed individual (Leidos 2018c).
- Dose equivalent conversion factors for ingestion (for a 10-year-old child) are: total U, 2.63E-04 mrem/pCi; Ra-226, 2.97E-03 mrem/pCi; Ra-228, 1.45E-02 mrem/pCi; Th-228, 5.07E-04 mrem/pCi; Th-230, 9.10E-04 mrem/pCi; and Th-232, 1.07E-03 mrem/pCi (ORNL 2014).

Based on the exposure scenario and assumptions described herein, a maximally exposed individual using CWC for recreational purposes would have received less than 0.1 mrem per year from soil/sediment ingestion and 0.3 mrem per year from water ingestion, for a TEDE of 0.3 mrem per year (Leidos 2018c).

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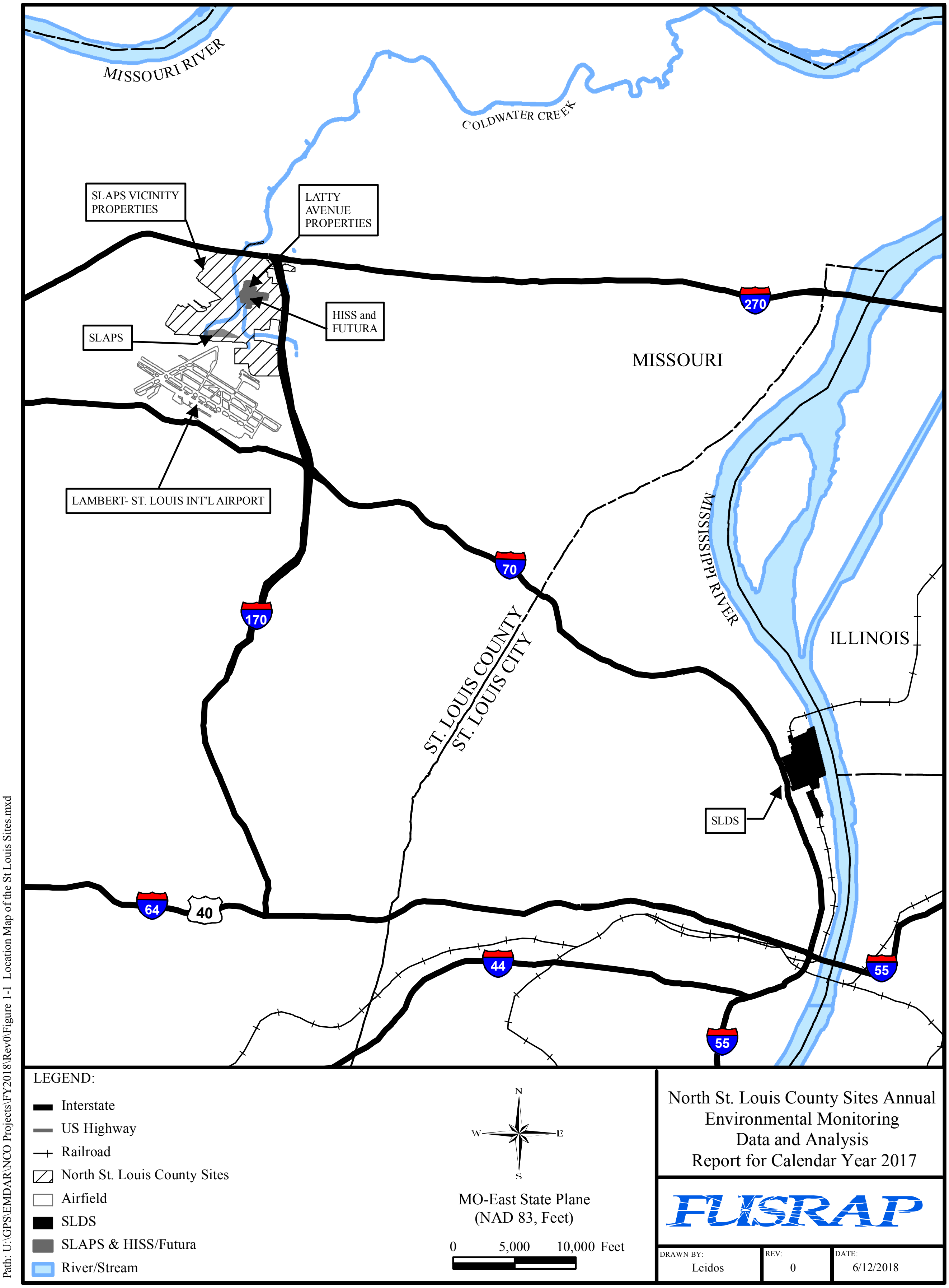
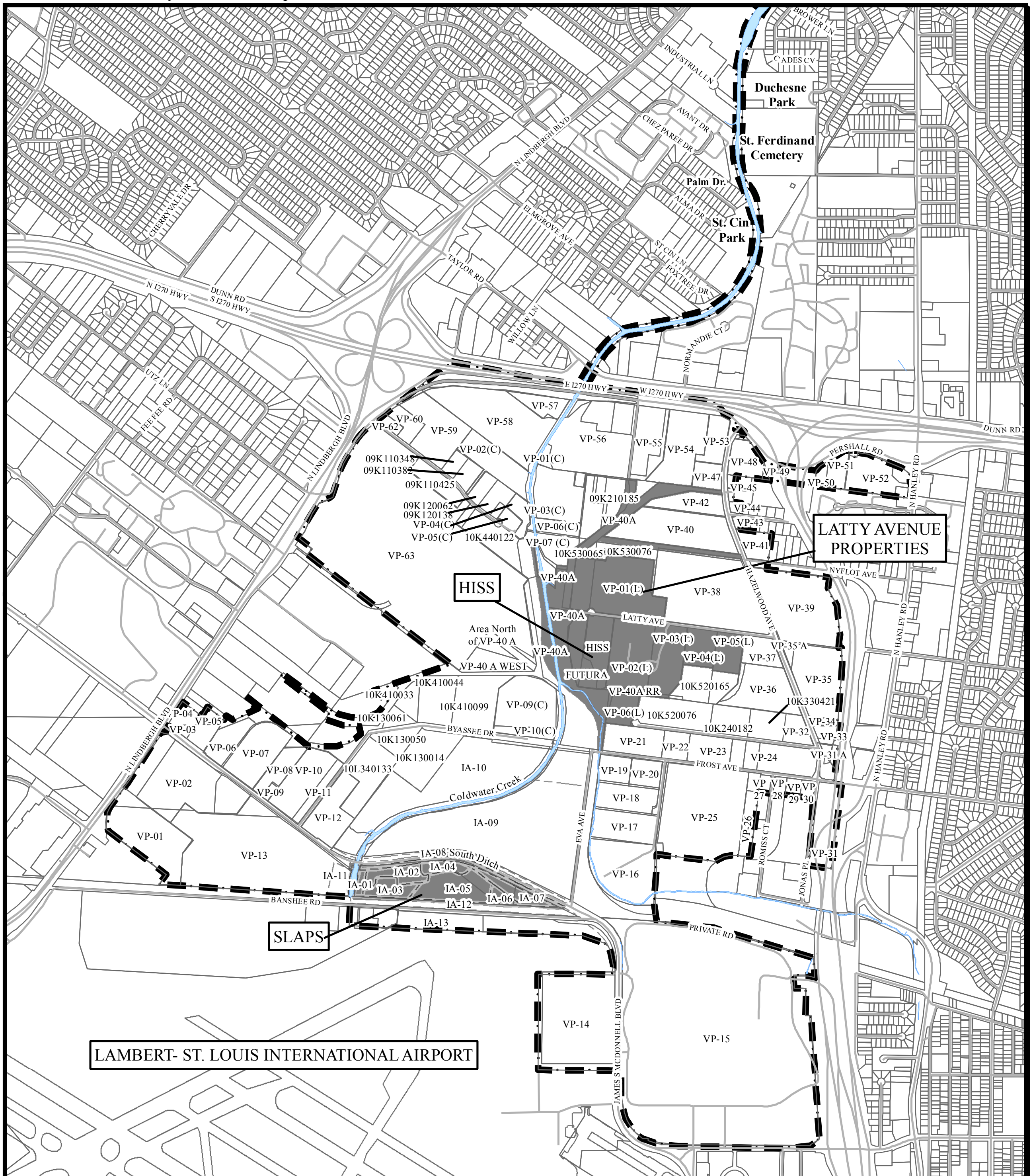


Figure 1-1. Location Map of the St. Louis Sites

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 1-2 Plan View of the SLAPS and SLAPS VPs.mxd



LEGEND:

- Road
- Airfield
- General Location of SLAPS and Latty Avenue Properties
- Investigation Areas
- Parcel Boundary
- River/Stream
- ROD Boundary

N W E S

MO-East State Plane
(NAD 83, Feet)

North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017

FUSRAP

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Figure 1-2. Plan View of the SLAPS, SLAPS VPs, and Latty Avenue Properties

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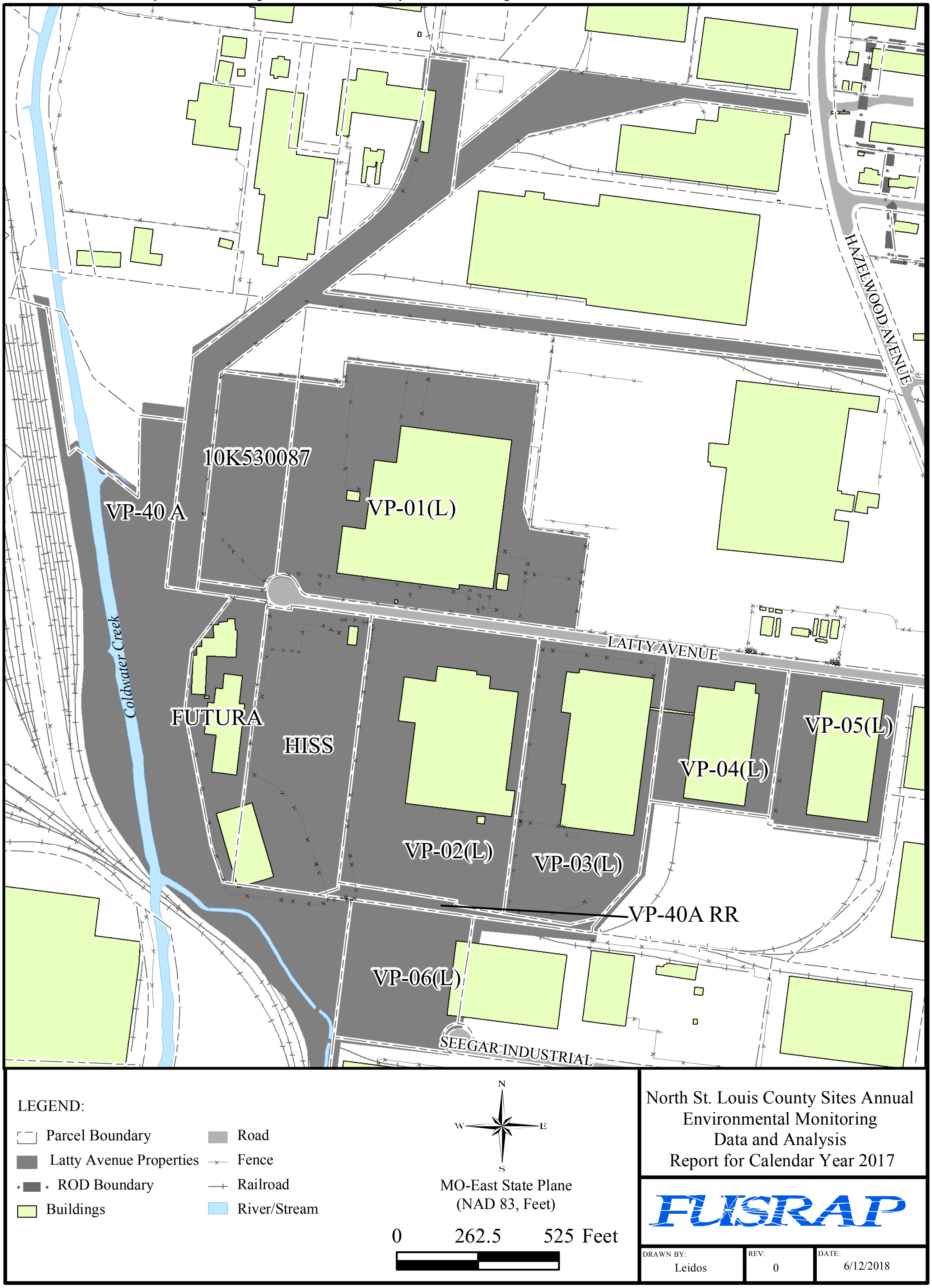


Figure 1-3. Plan View of the Latty Avenue Properties including HISS and Futura

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 2-1 Gamma Radiation, Rn, and Particulate Air Monitoring at St. Louis Background Location2.mxd

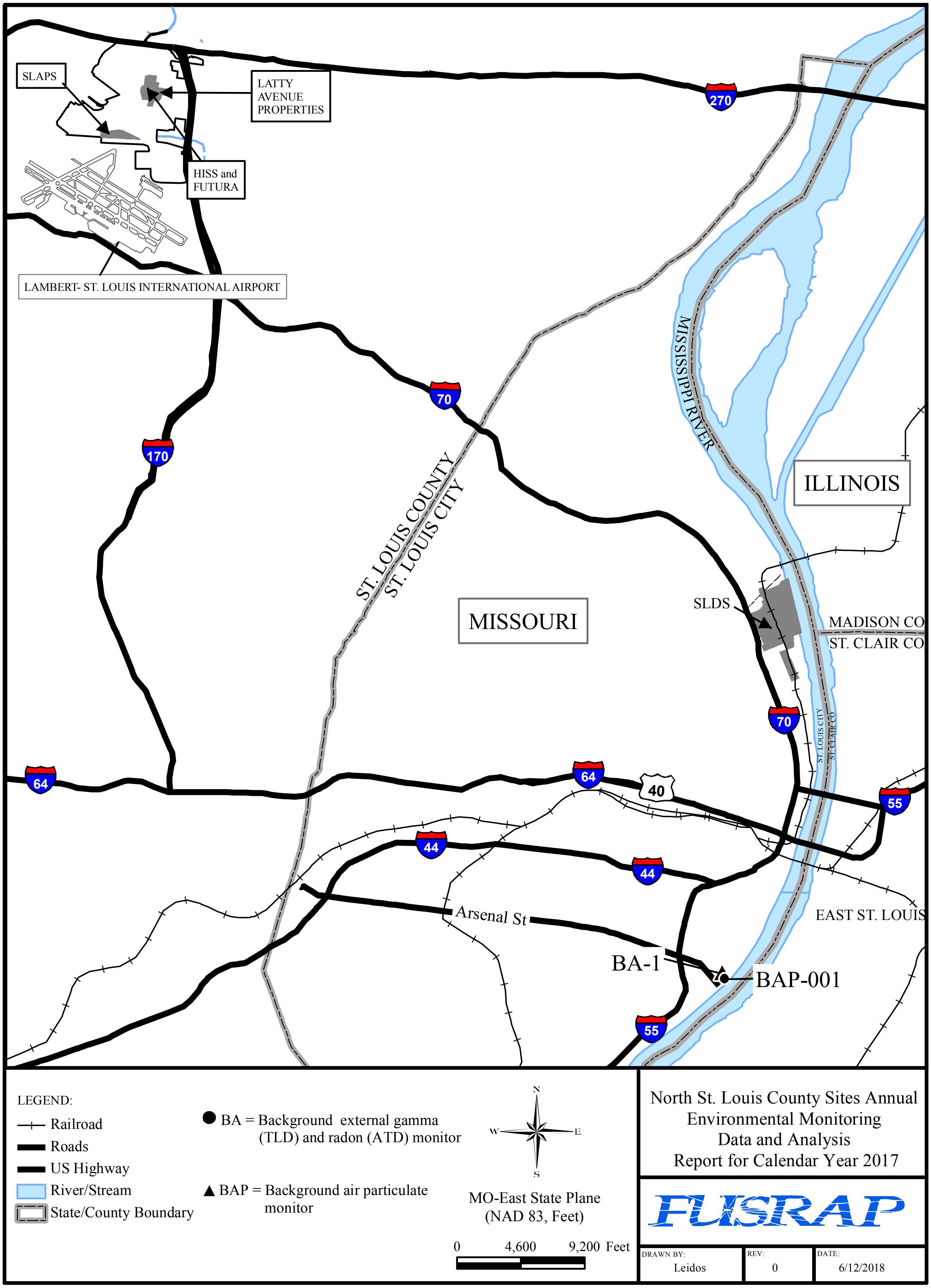


Figure 2-1. Gamma Radiation, Radon, and Particulate Air Monitoring at St. Louis Background Location - USACE Service Base

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 2-2 Gamma Radiation, Rn, and Particulate Air Monitoring Locations at the Latty Avenue Properties.mxd

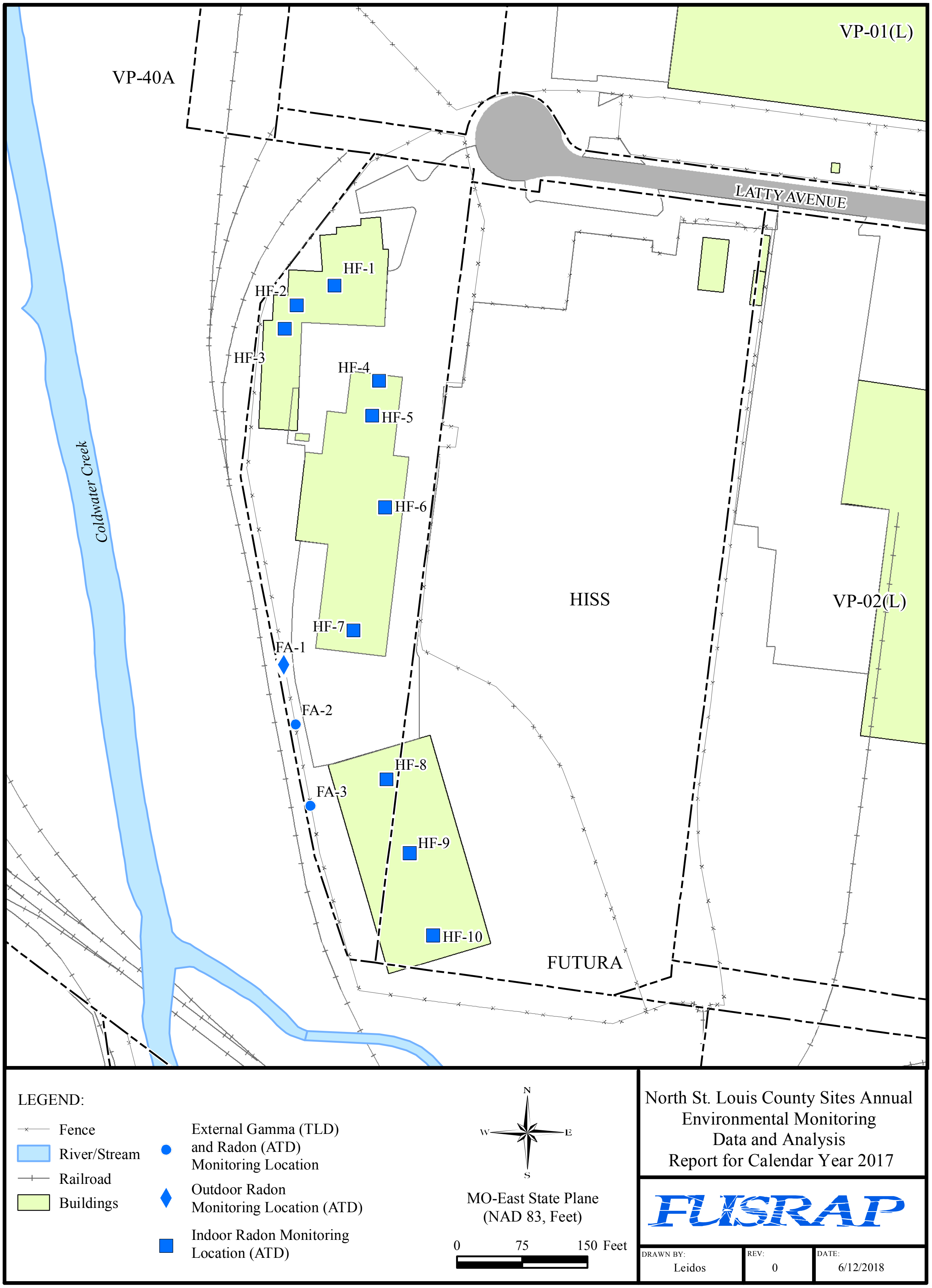


Figure 2-2. Radon Monitoring Locations at the Latty Avenue Properties

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 2-3 Gamma Radiation, Rn, and Particulate Air Monitoring Locations at the SLAPS and SLAPS VPs.mxd

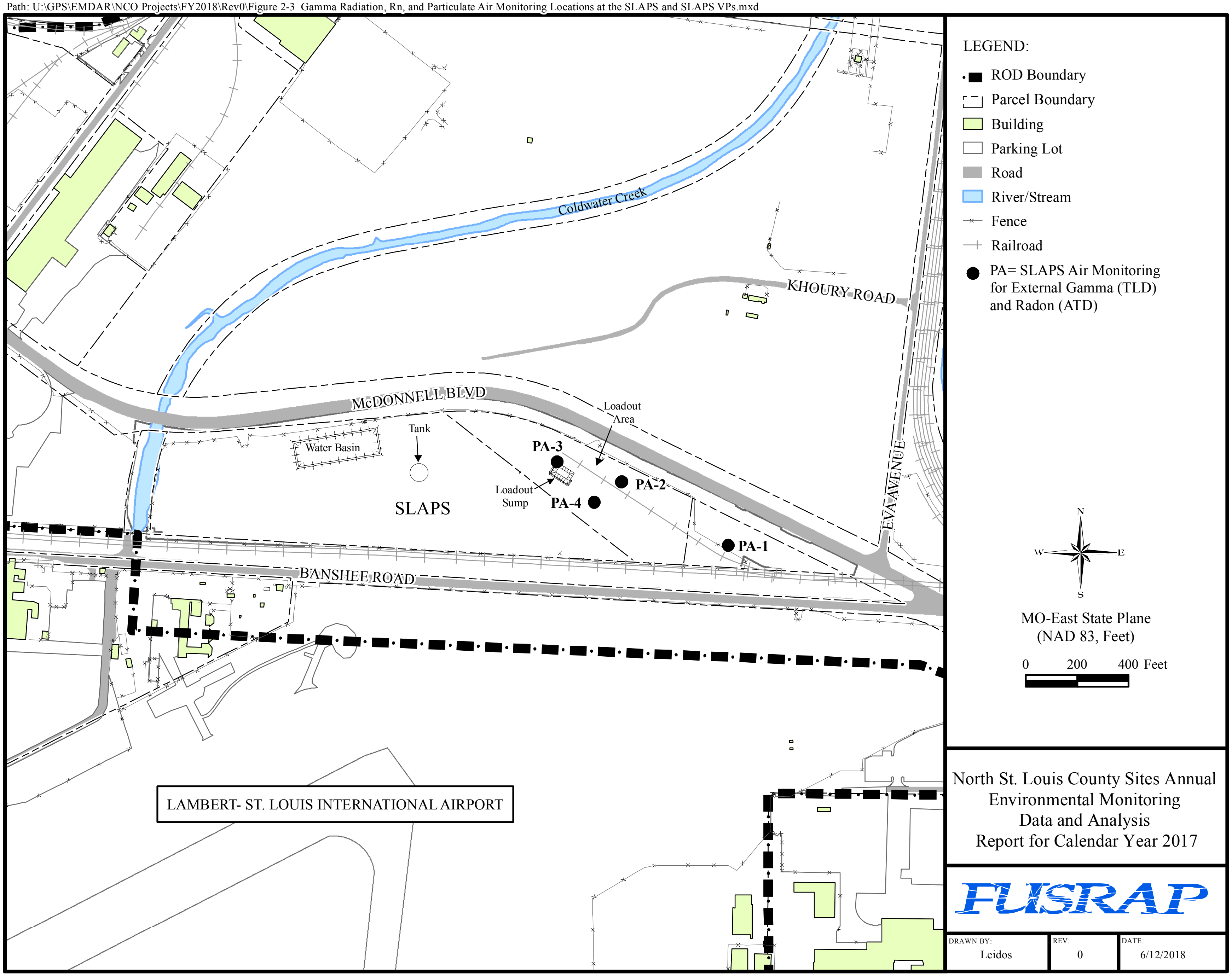


Figure 2-3. Gamma Radiation and Radon Monitoring Locations at the SLAPS

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 3-1 MSD Discharge Point for Waste Water from the HISS Labratory.mxd

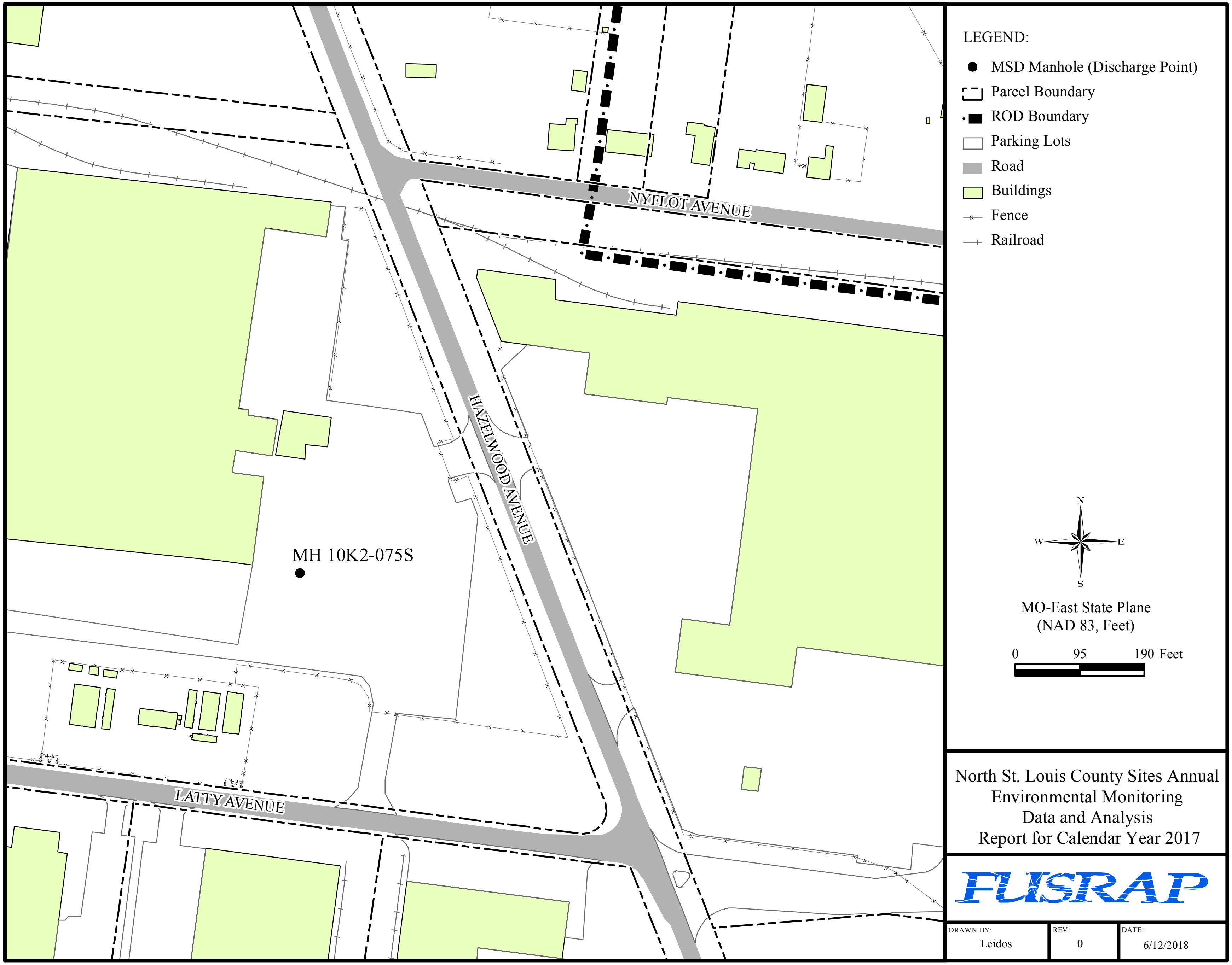


Figure 3-1. MSD Discharge Point for Wastewater from the USACE St. Louis FUSRAP Laboratory

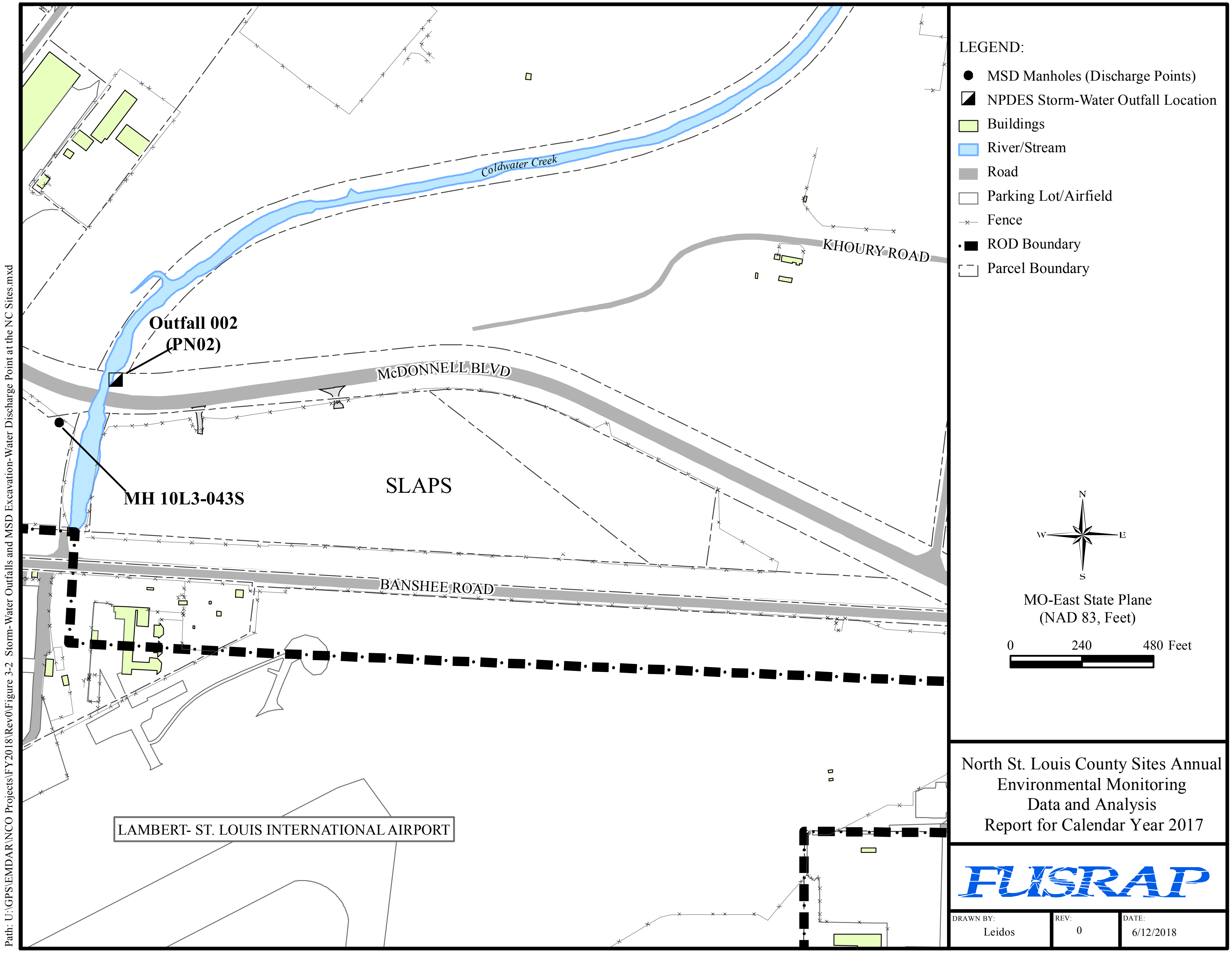


Figure 3-2. Storm-Water Outfall and MSD Excavation-Water Discharge Points at the SLAPS

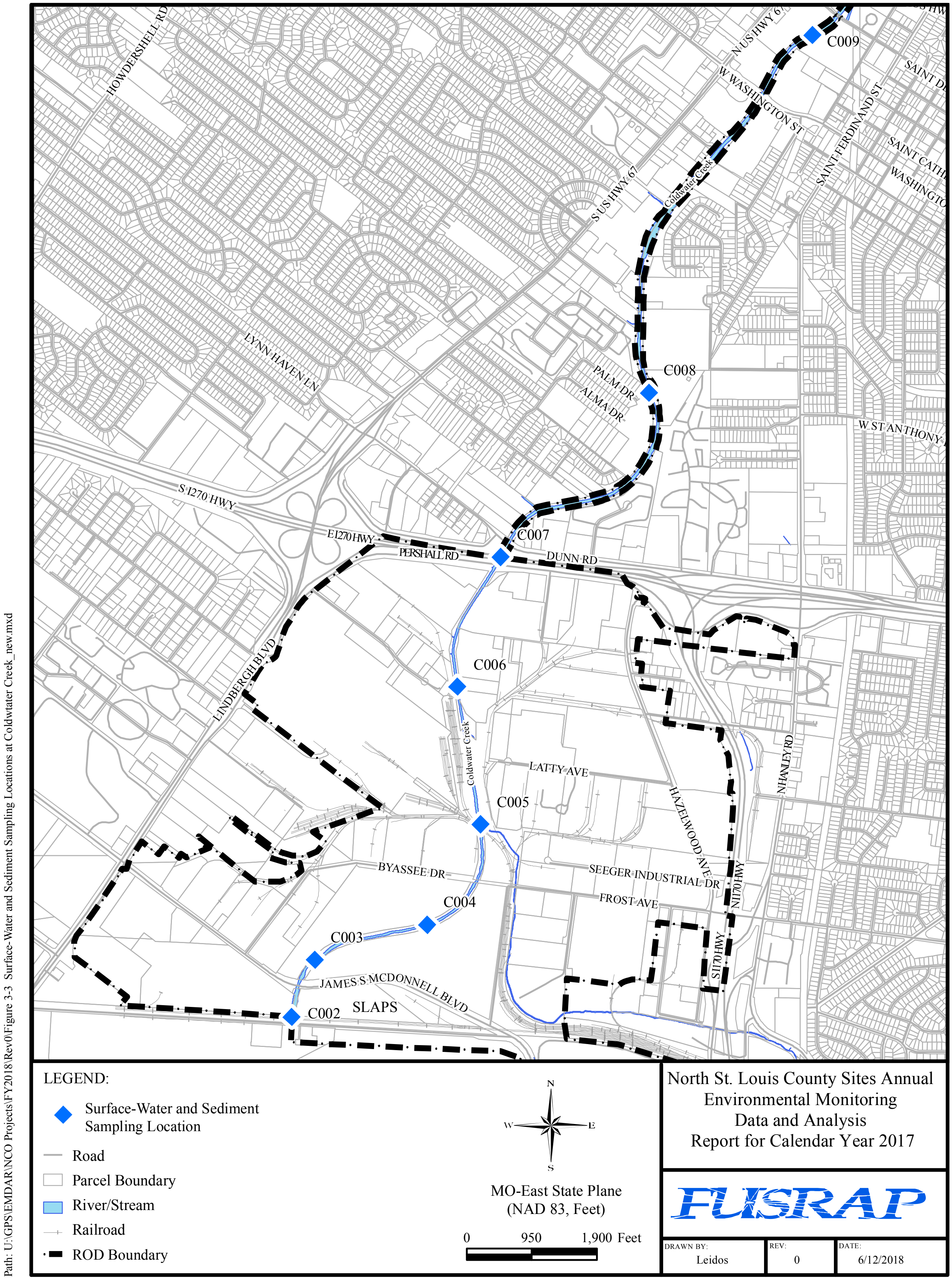
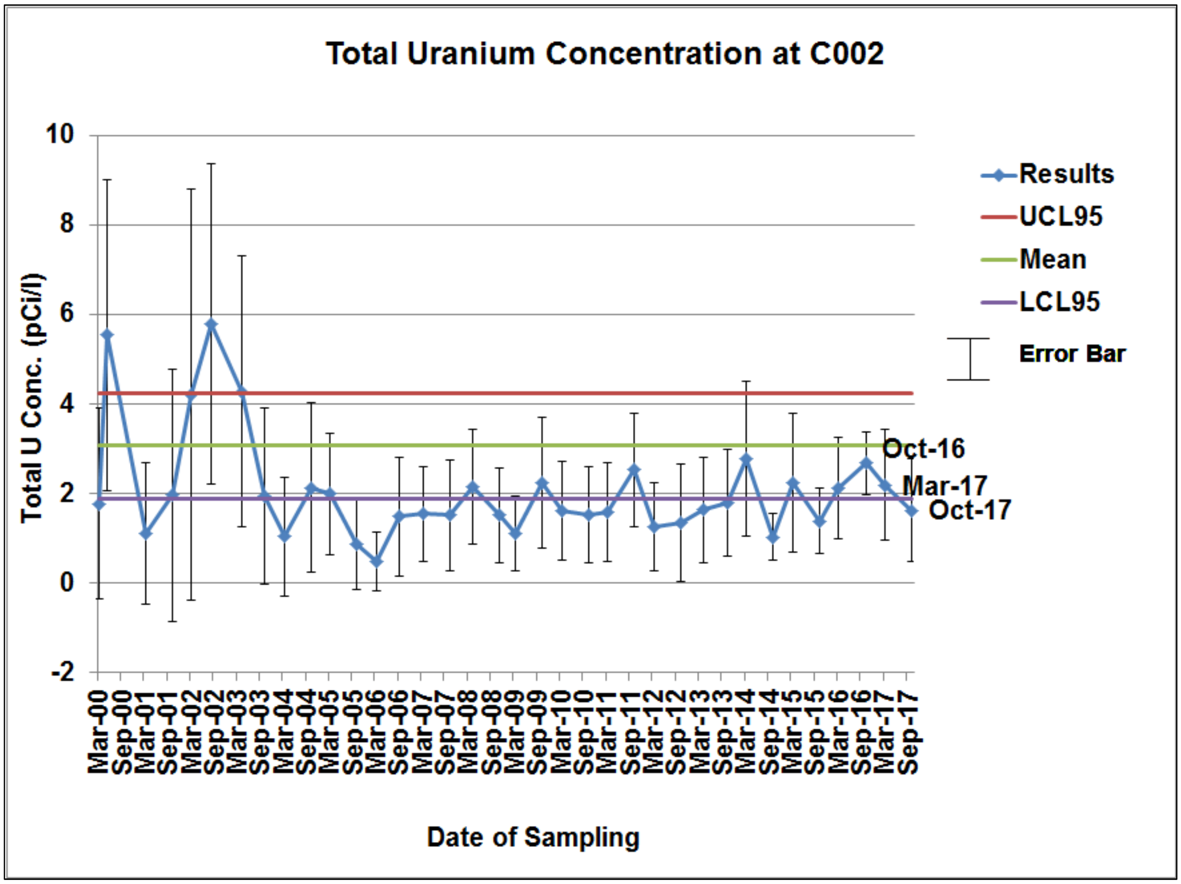


Figure 3-3. Surface-Water and Sediment Sampling Locations at Coldwater Creek



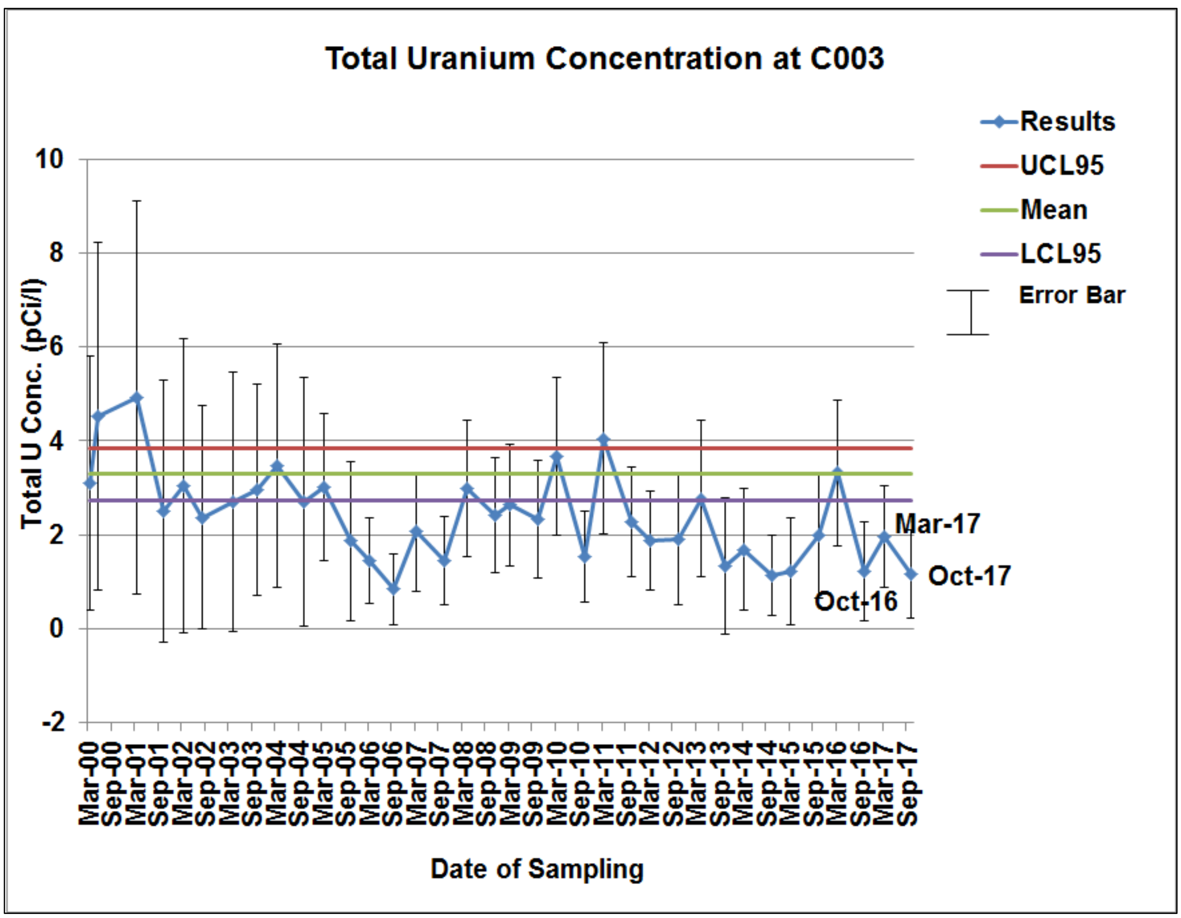
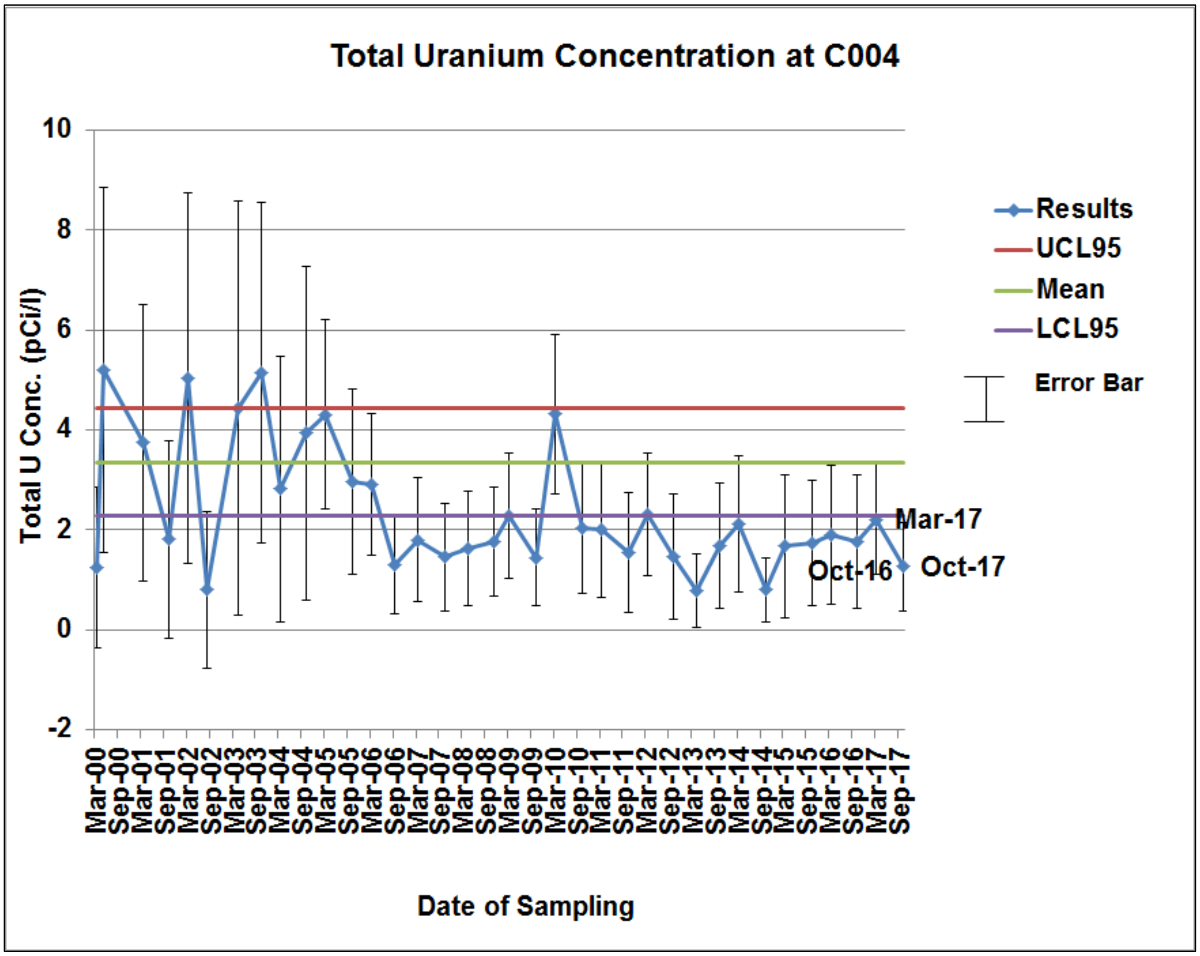


Figure 3-4. Total U Concentration Statistics in Surface Water Versus Sampling Data



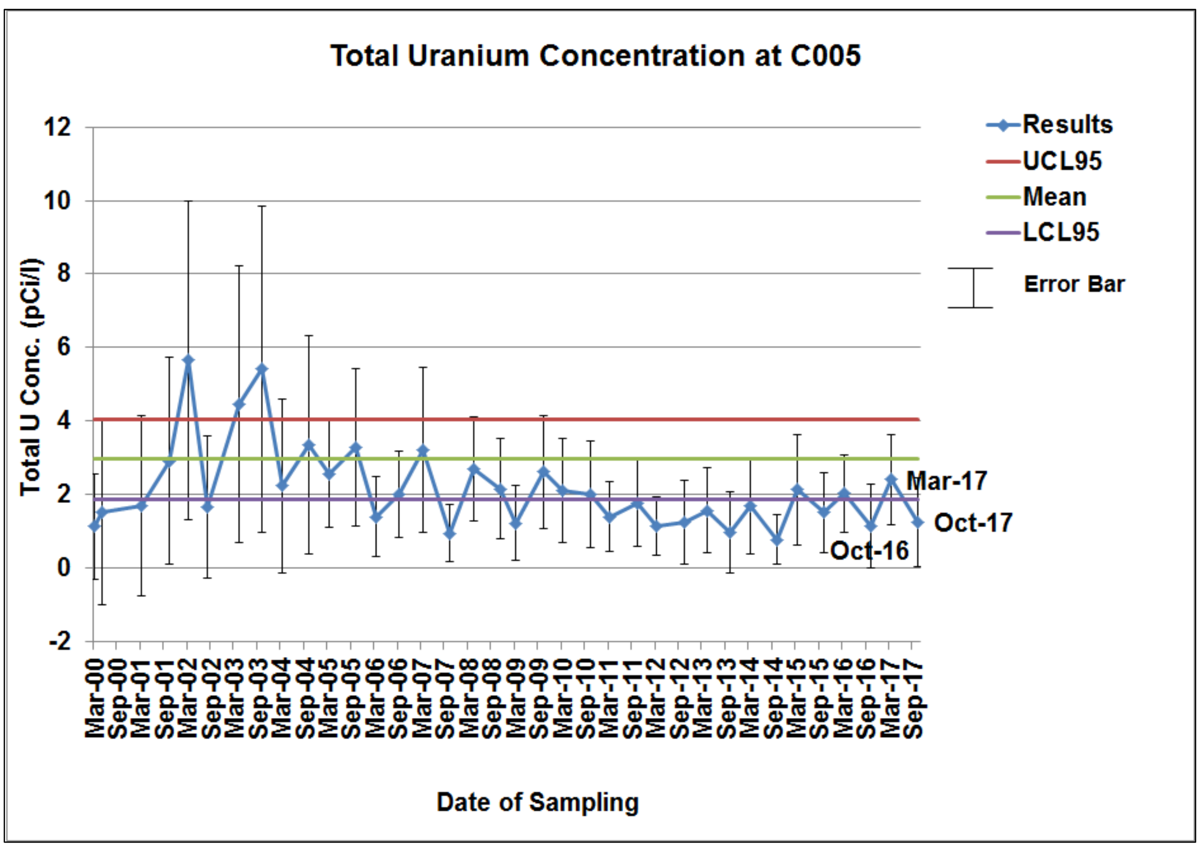
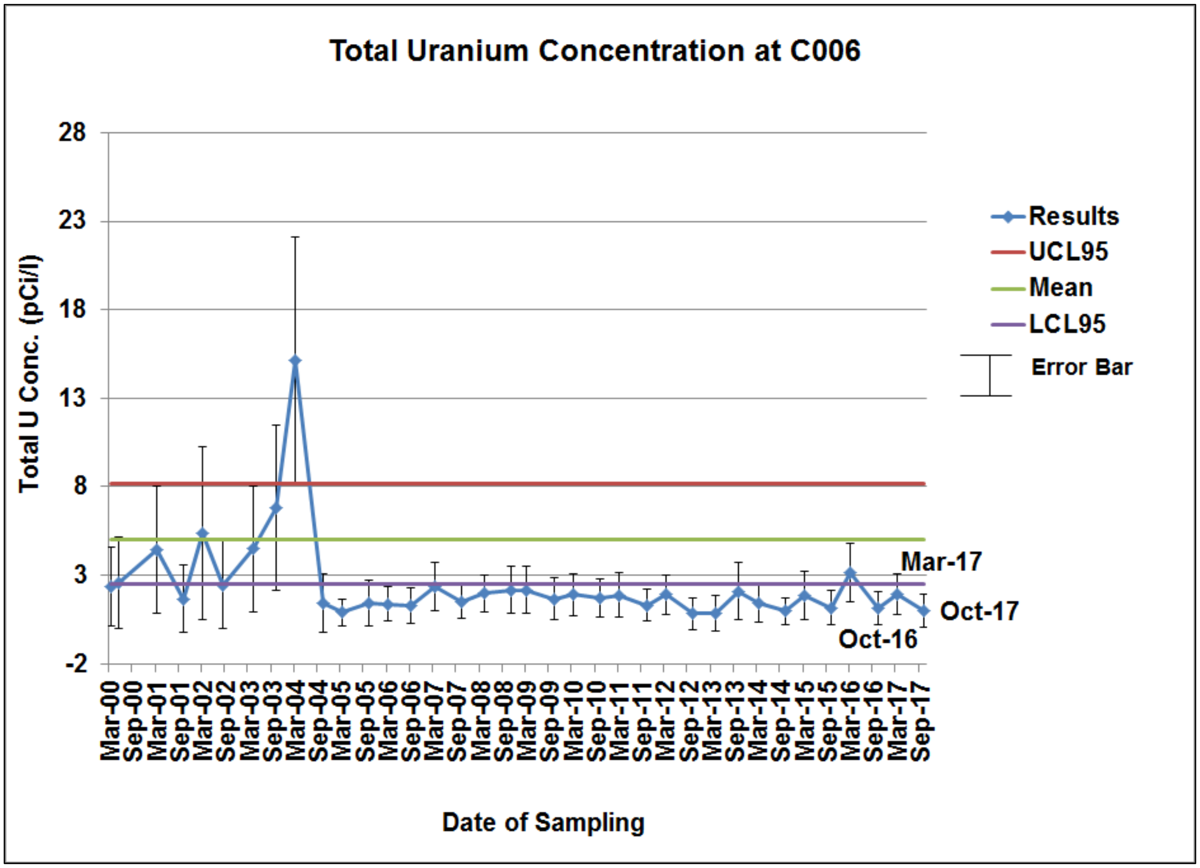


Figure 3-4. Total U Concentration Statistics in Surface Water Versus Sampling Data (Continued)



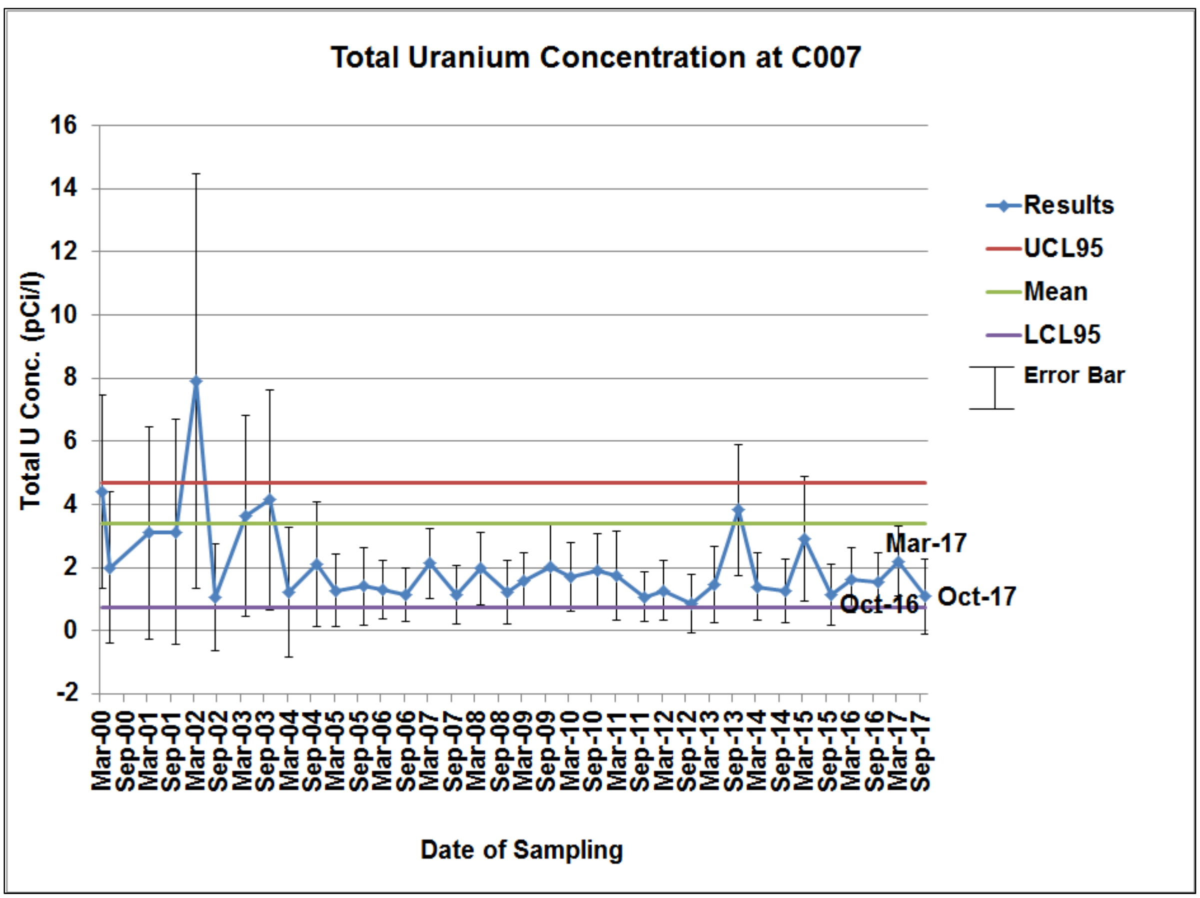
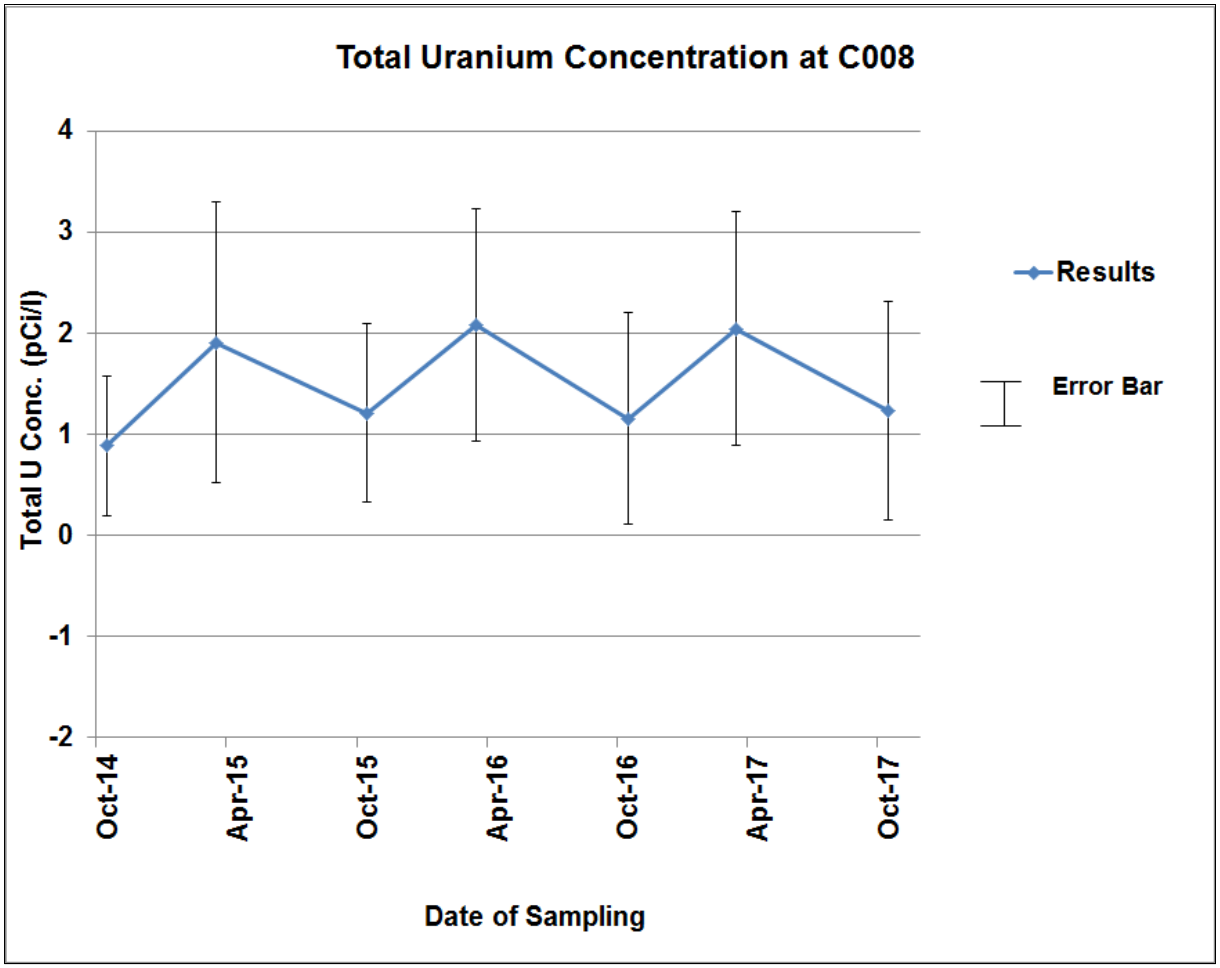


Figure 3-4. Total U Concentration Statistics in Surface Water Versus Sampling Data (Continued)



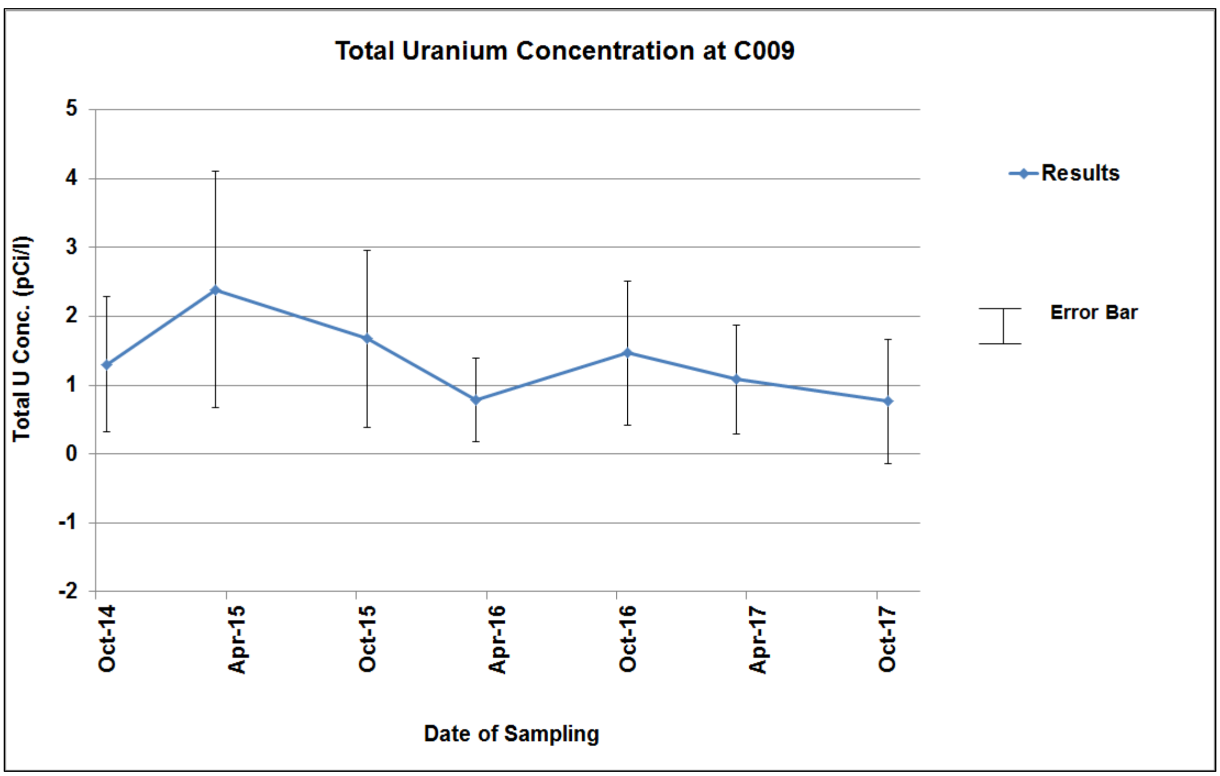
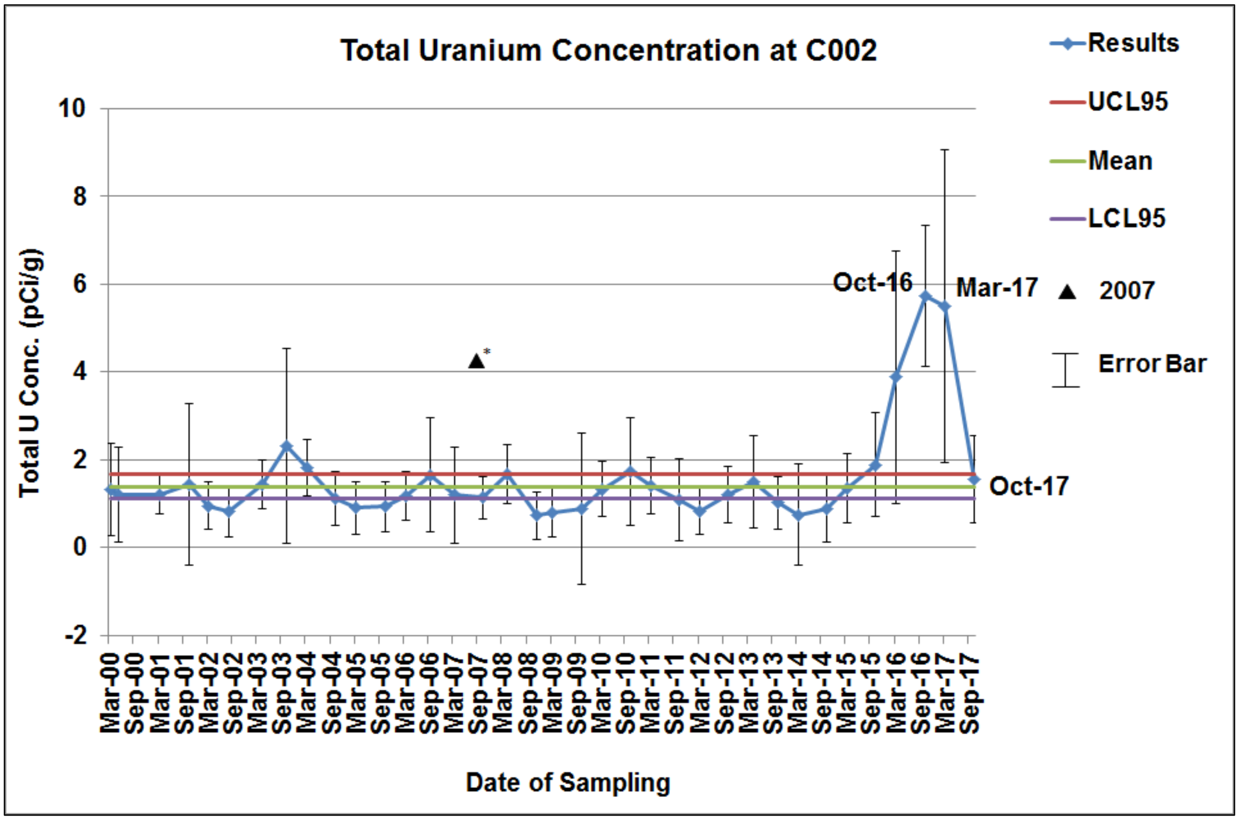
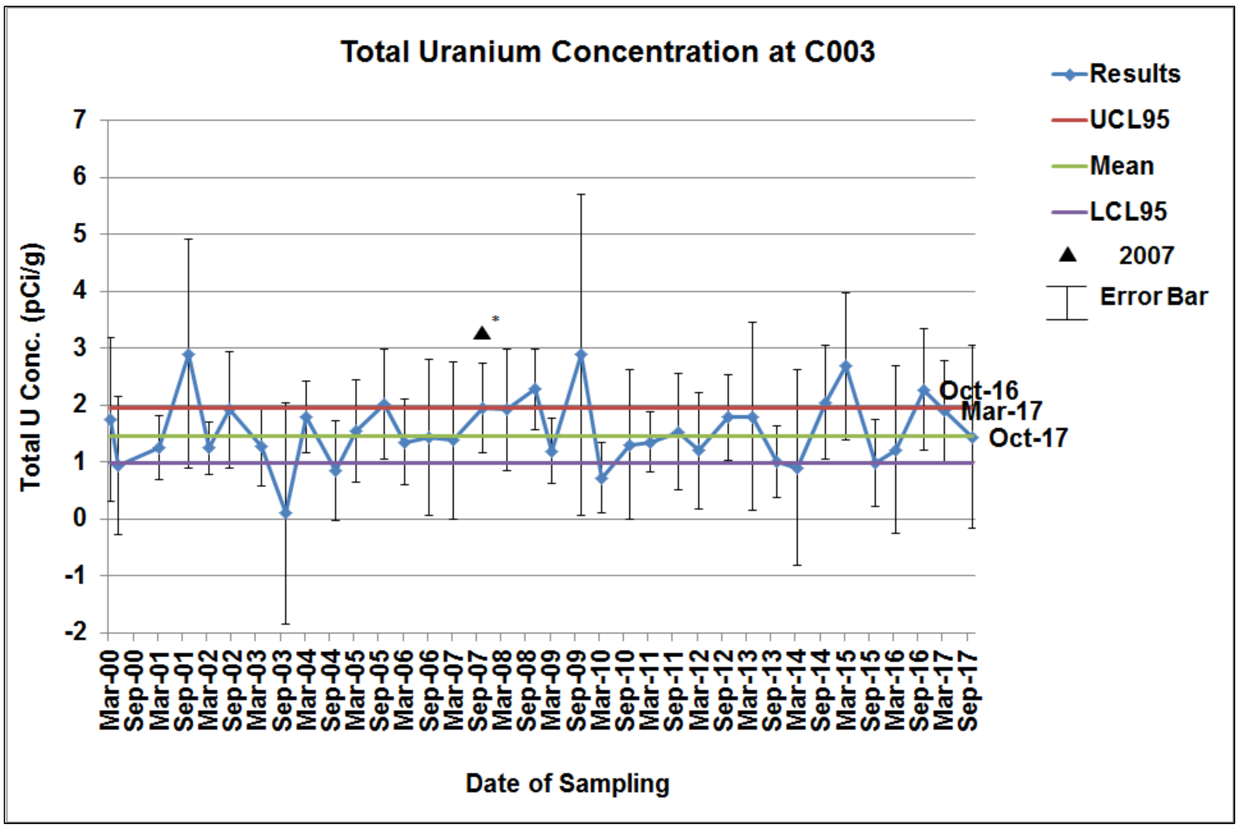


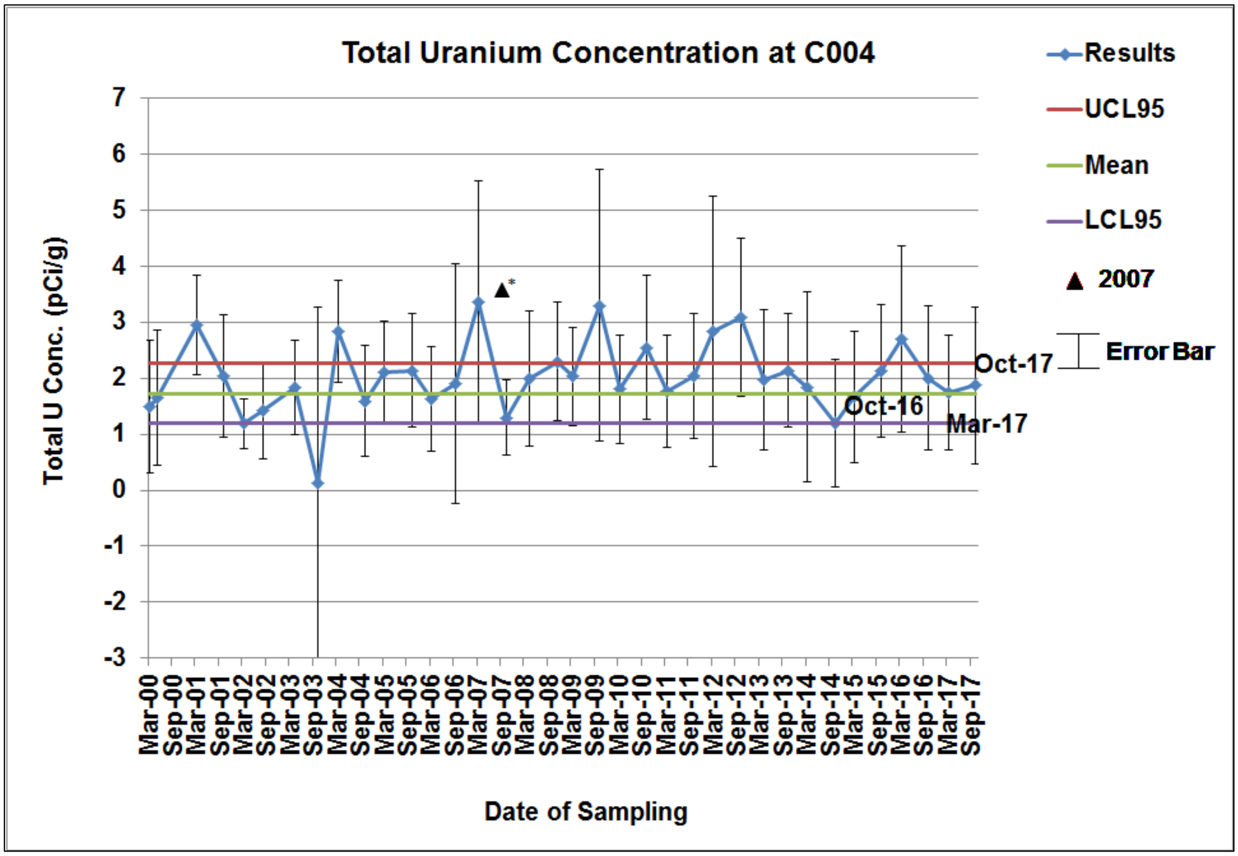
Figure 3-4. Total U Concentration Statistics in Surface Water Versus Sampling Data (Continued)

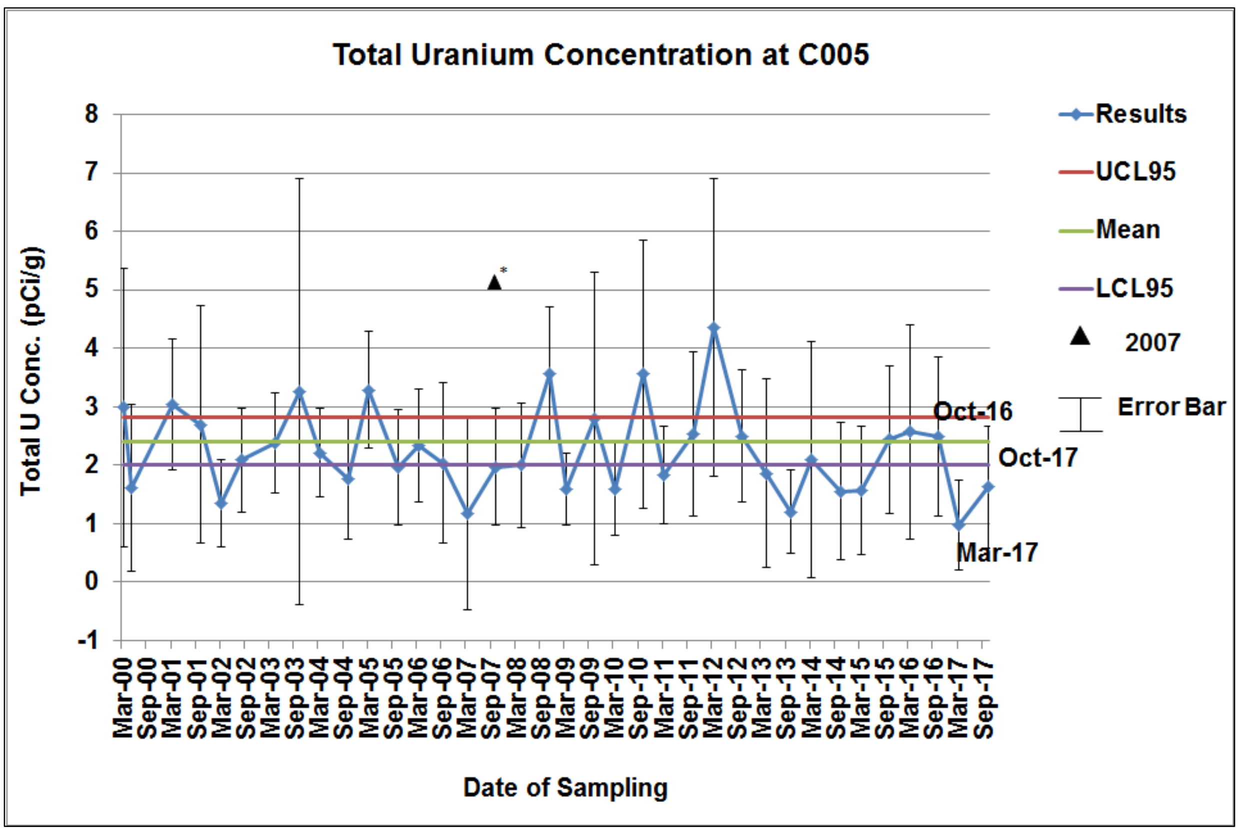




* The October 2007 value was incorrectly graphed in previous reports due to the alpha and gamma results being added together, artificially increasing the value. The charts in this figure have been corrected.

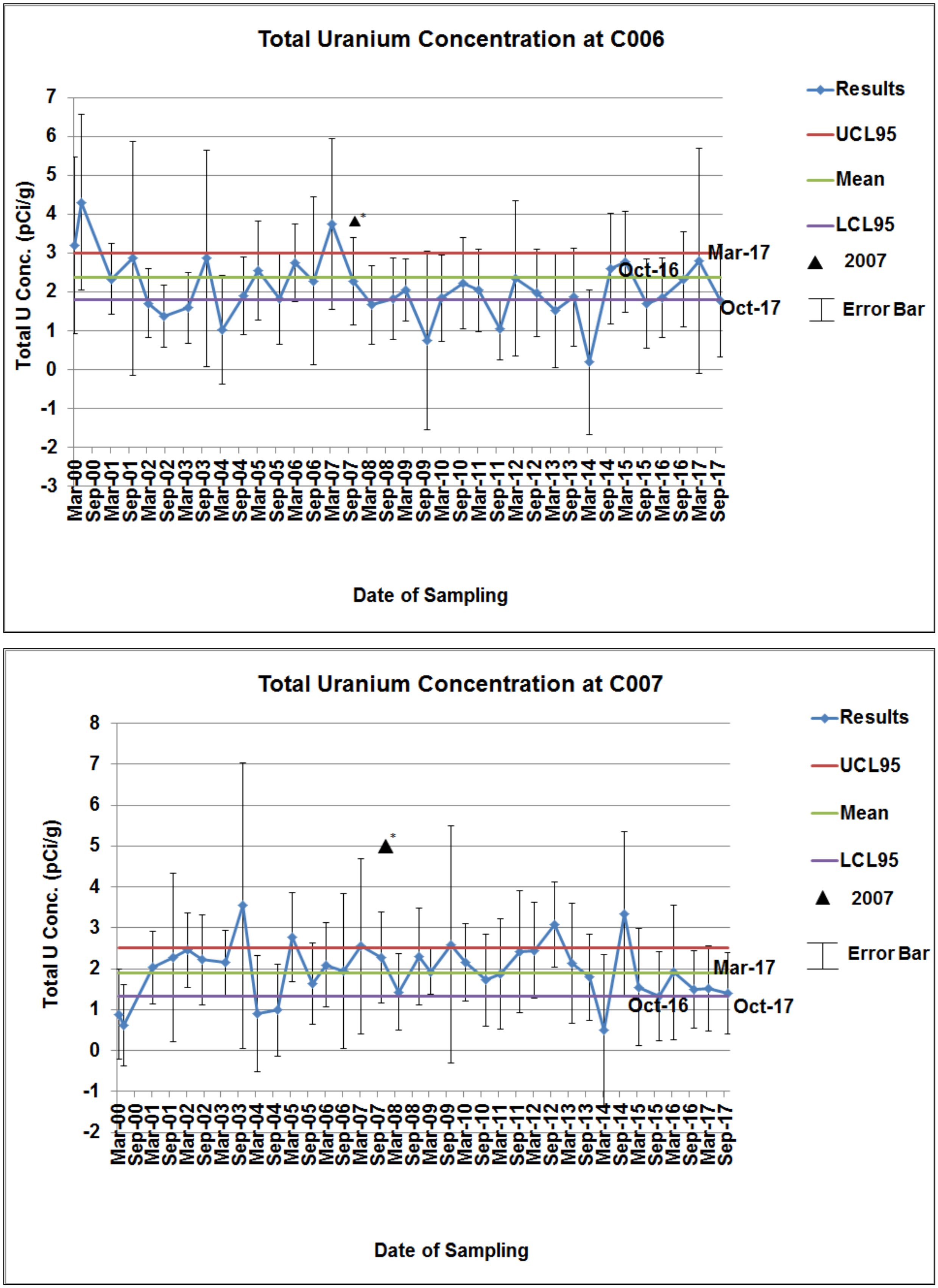
Figure 3-5. Total U Concentration Statistics in Sediment Versus Sampling Date





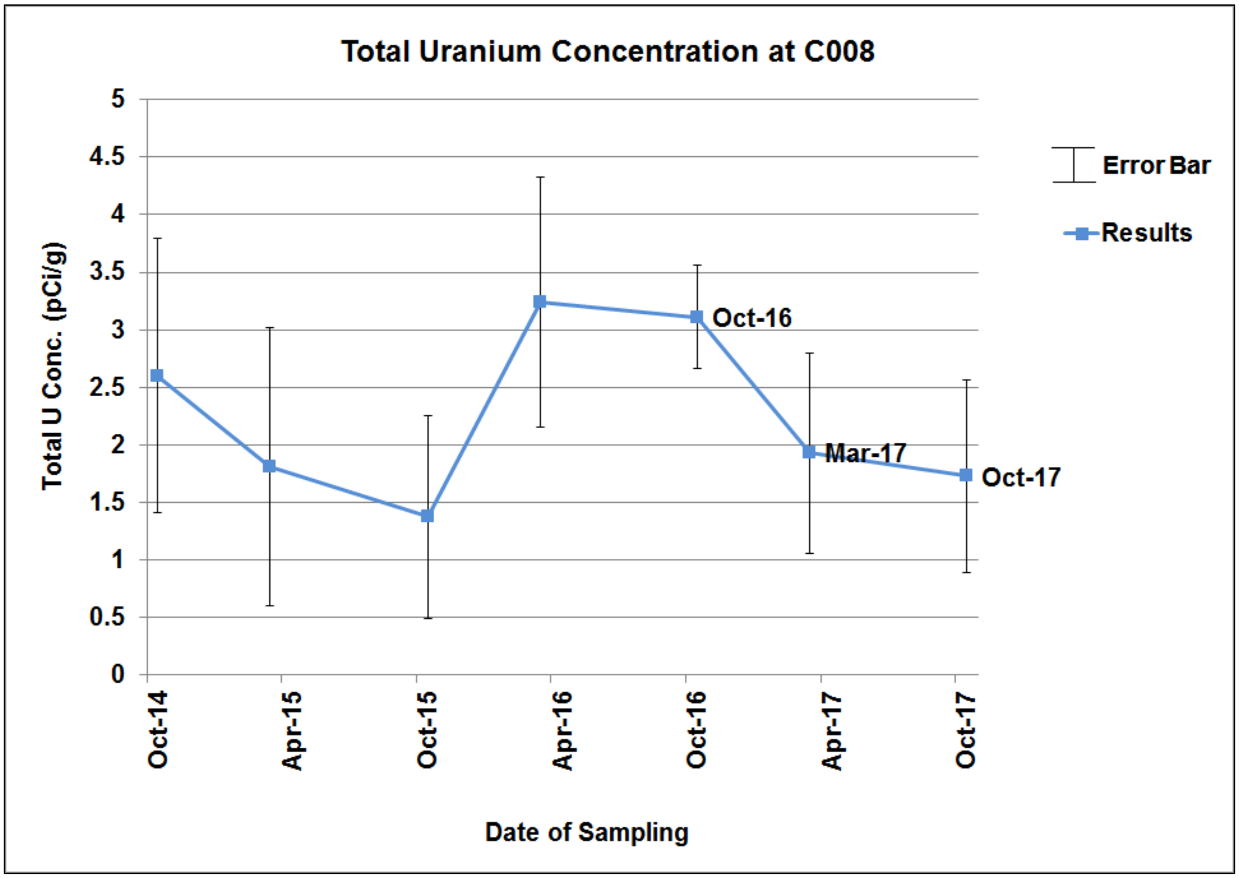
* The October 2007 value was incorrectly graphed in previous reports due to the alpha and gamma results being added together, artificially increasing the value. The charts in this figure have been corrected.

Figure 3-5. Total U Concentration Statistics in Sediment Versus Sampling Date (Continued)



* The October 2007 value was incorrectly graphed in previous reports due to the alpha and gamma results being added together, artificially increasing the value. The charts in this figure have been corrected.

Figure 3-5. Total U Concentration Statistics in Sediment Versus Sampling Date (Continued)



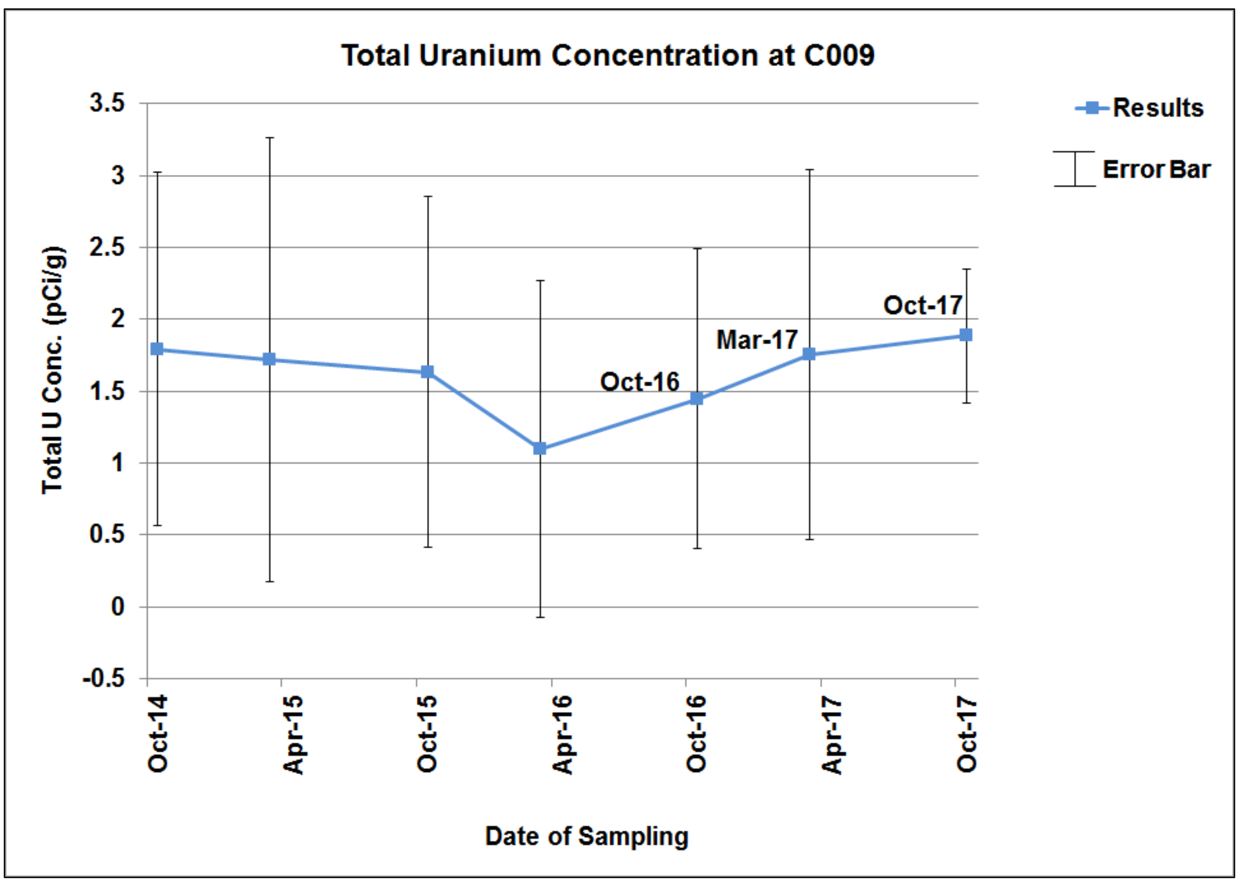


Figure 3-5. Total U Concentration Statistics in Sediment Versus Sampling Date (Continued)

Zone	Period	Epoch	Stratigraphy	Thickness (ft.)	Description
Hydrostratigraphic zone (HZ)-A	Quaternary	Holocene	FILL/TOPSOIL	0-14	**UNIT 1** Fill - Sand, silt, clay, concrete, rubble. Topsoil - Organic silts, clayey silts, wood, fine sand.
Hydrostratigraphic zone (HZ)-A	Quaternary	Pleistocene	LOESS (CLAYEY SILT)	11-32	**UNIT 2** Clayey silts, fine sands, commonly mottled with iron oxide staining. Scattered roots and organic material, and a few fossils.
Hydrostratigraphic zone (HZ)-A	Quaternary	Pleistocene	GLACIOLACUSTRINE SERIES: SILTY CLAY	19-75 (3) 9-27 (3T)	**UNIT 3** Silty clay with scattered organic blebs and peat stringers. Moderate plasticity. Moist to saturated (3T).
Hydrostratigraphic zone (HZ)-B	Quaternary	Pleistocene	VARVED CLAY	0-8	Alternating layers of dark and light clay as much as 1/16 inch thick (3M).
Hydrostratigraphic zone (HZ)-B	Quaternary	Pleistocene	CLAY	0-26	Dense, stiff, moist, highly plastic clay (3M).
Hydrostratigraphic zone (HZ)-C	Quaternary	Pleistocene	SILTY CLAY	10-29	Similar to upper silty clay. Probable unconformable contact with highly plastic clay (3B).
Hydrostratigraphic zone (HZ)-C	Quaternary	Pleistocene	BASAL CLAYEY AND SANDY GRAVEL	0-6	**UNIT 4** Glacial clayey gravels, sands, and sandy gravels. Mostly chert.
Hydrostratigraphic zone (HZ)-D	Pennsylvanian		CHEROKEE (?) GROUP (UNDIFFERENTIATED)	0-35	**UNIT 5** BEDROCK: Interbedded silty clay/shale, lignite/coal, sandstone, and siltstone. Erosionally truncated by glaciolacustrine sequences. (Absent at the HISS).
Hydrostratigraphic zone (HZ)-E	Mississippian		STE. GENEVIEVE ST. LOUIS LIMESTONES	10+	**UNIT 6** BEDROCK: Hard, white to olive, well cemented, sandy limestone with interbedded shale laminations.

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North St. Louis County Sites
Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017

DRAWN BY:	REV. NO./DATE:	FILE:	
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Figure 4-1. Generalized Stratigraphic Column for the NC Sites

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 4-2 Existing Monitoring Well Locations at the Latty Avenue Properties.mxd

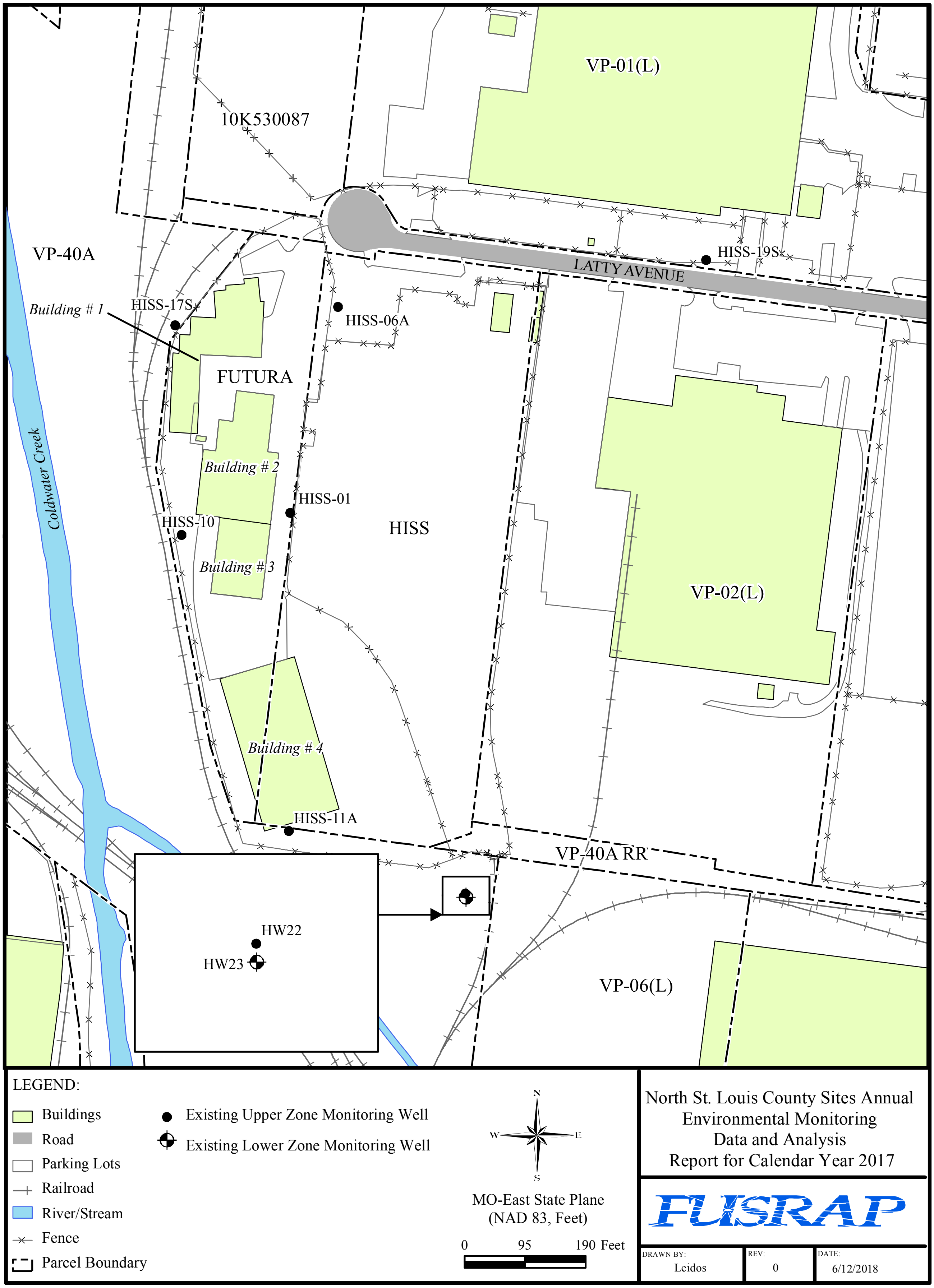
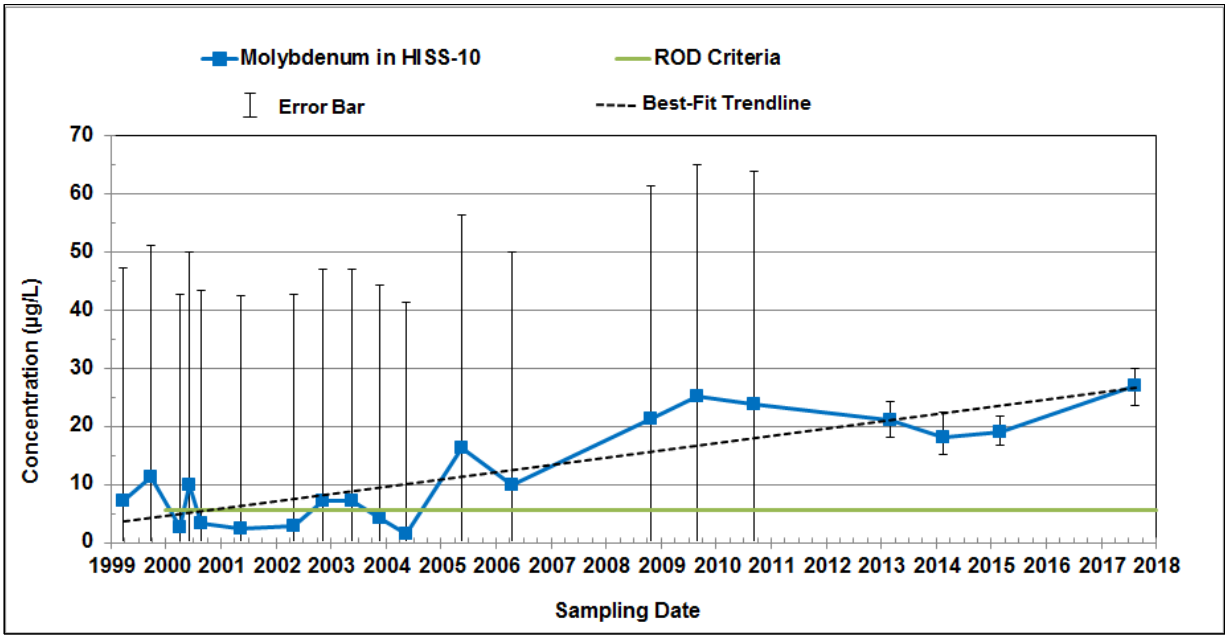


Figure 4-2. Existing Monitoring Well Locations at the Latty Avenue Properties



Notes:
For molybdemum results less than 3 times the reporting limit (RL), the error bar represents ± RL. The RL for molybdenum changed from 40 µg/L to 5 µg/L in CY 2011.
For molybdenum results exceeding 3 times the RL, the error bar represents the upper and lower control limits on the control spike samples.
Molybdenum error bars for 2003 and earlier are based on laboratory control limits for 2003. Error bars for 2004 and later are based on laboratory control limits reported for the respective years.

Figure 4-3. Time-Versus-Concentration Plots for Molybdenum in HISS-10 at the HISS

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 4-4 Selenium Concentrations in Unfiltered HZ-A Ground Water at the Latty Avenue Properties.mxd

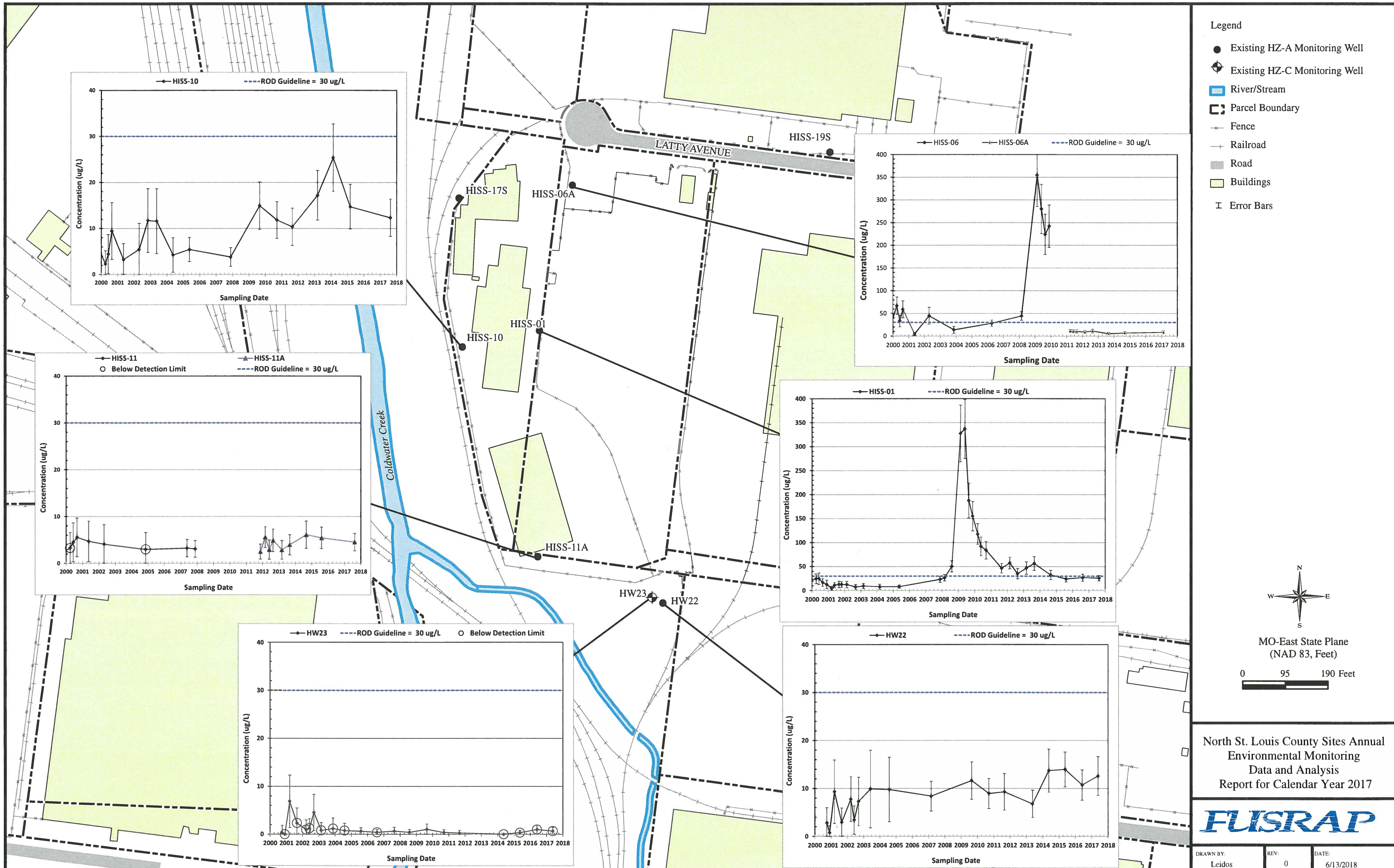


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Figure 4-4. Total U Concentrations in Unfiltered Ground Water at the Latty Avenue Properties

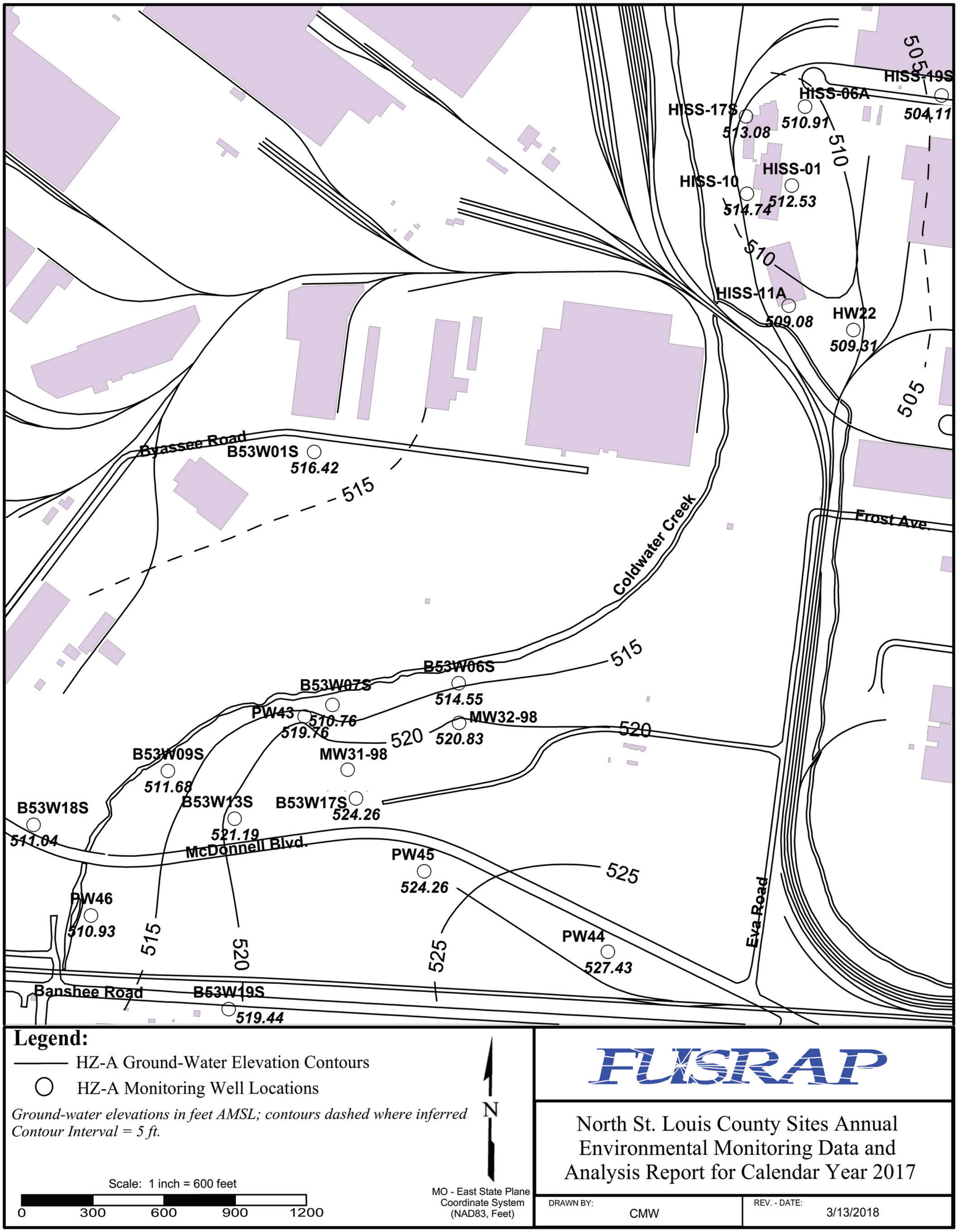


Figure 4-5. HZ-A Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (May 22, 2017)

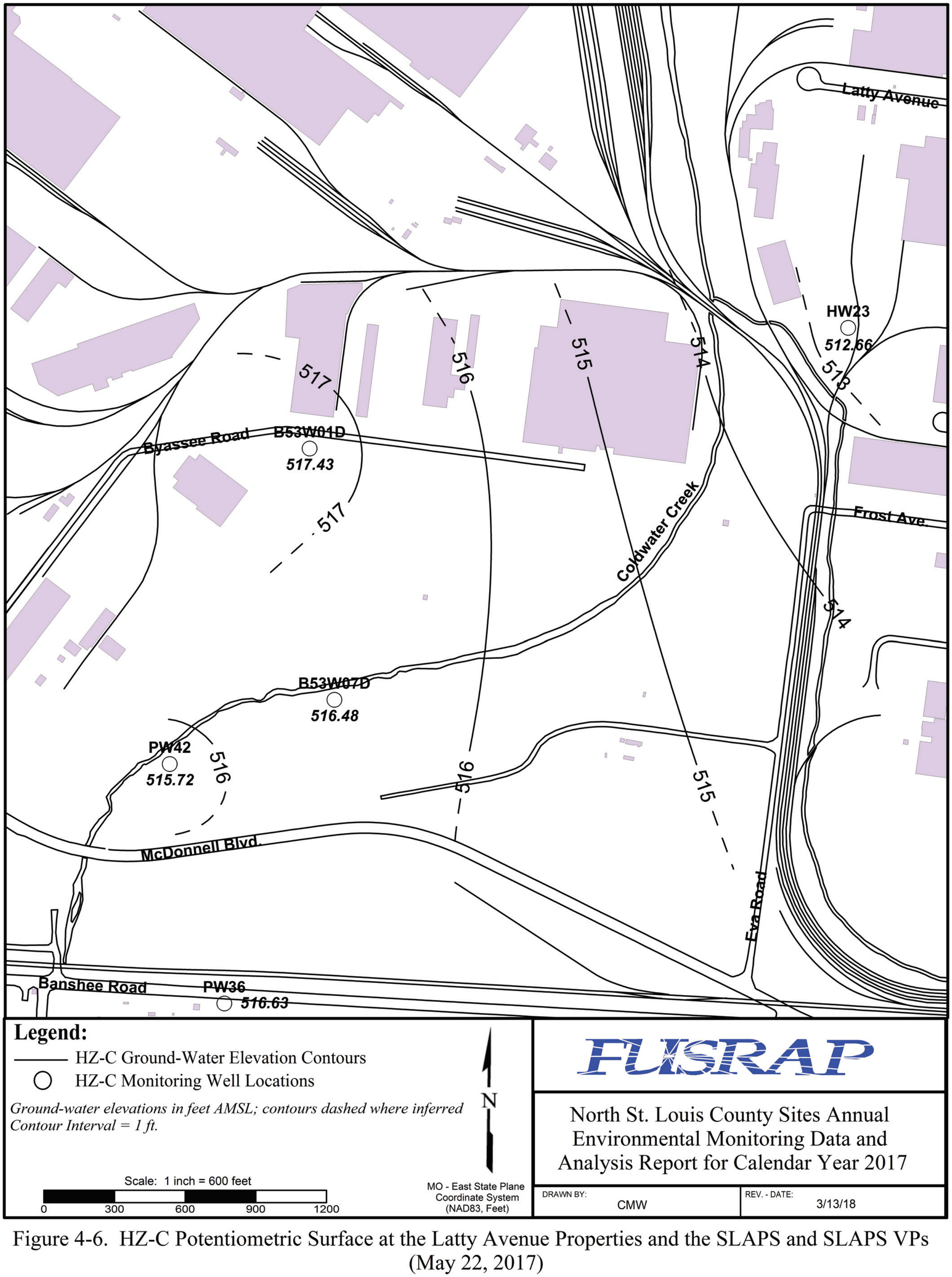
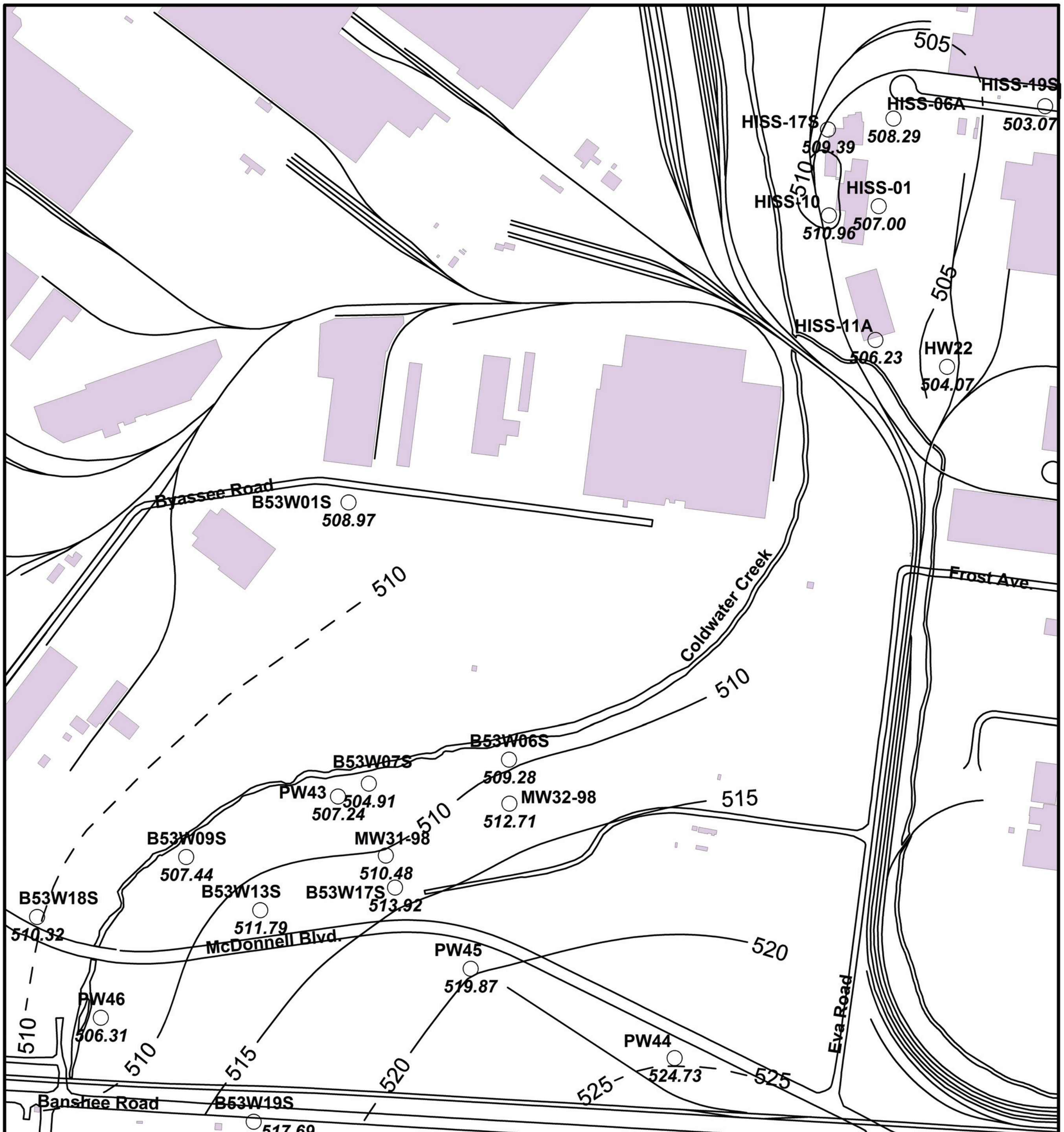


Figure 4-6. HZ-C Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (May 22, 2017)



Legend:

HZ-A Ground-Water Elevation Contours

HZ-A Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 5 ft.

Scale: 1 inch = 600 feet

0 300 600 900 1200

N

MO - East State Plane Coordinate System (NAD83, Feet)

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North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017

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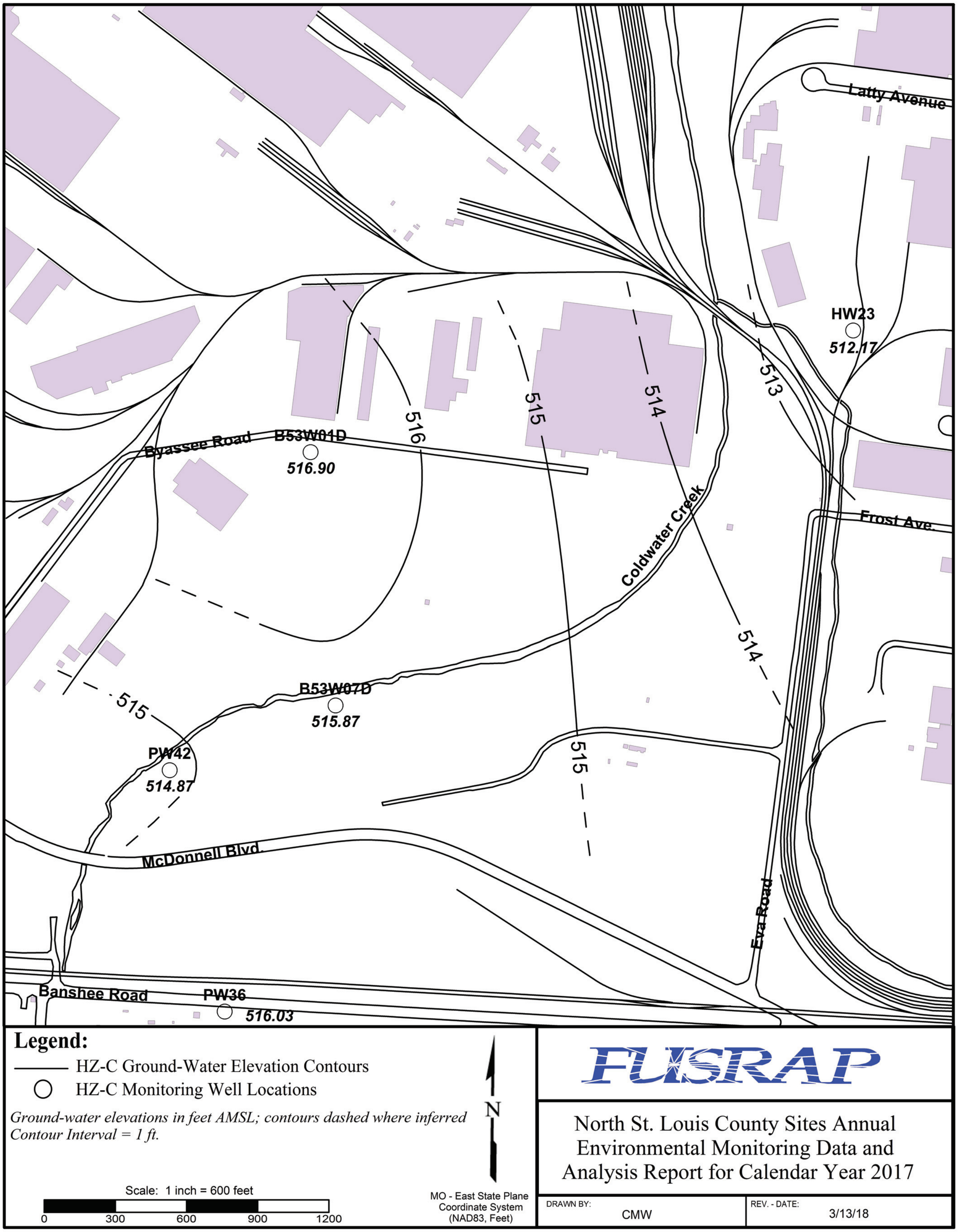
CMW	3/13/2018

Figure 4-7. HZ-A Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (November 13, 2017)



Legend:

HZ-C Ground-Water Elevation Contours

HZ-C Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 1 ft.

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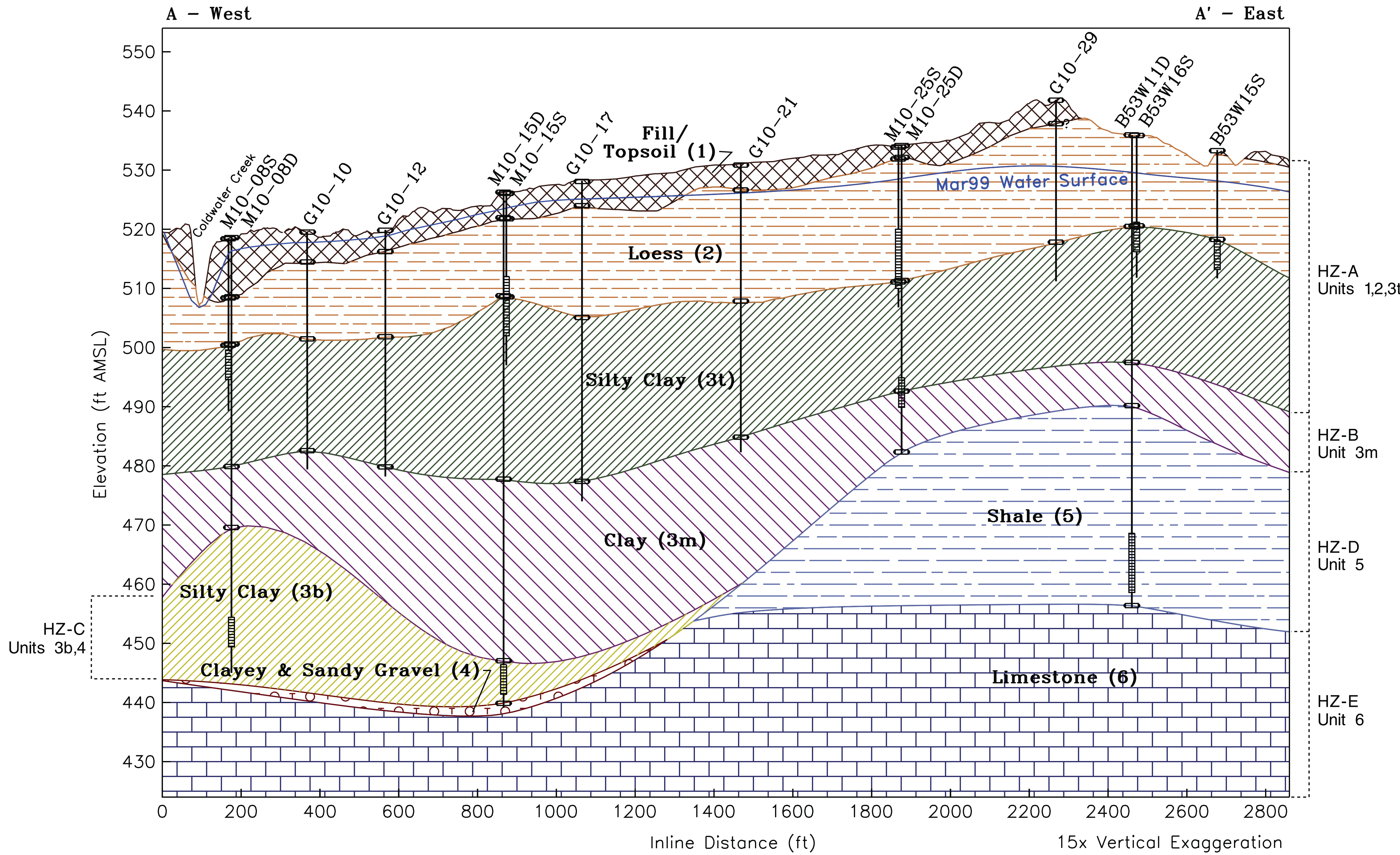
Figure 4-8. HZ-C Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (November 13, 2017)



Notes

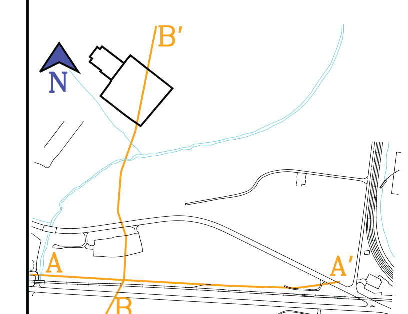
Geologic data used in the cross section collected through 2000.

Legend

Borehole pick

Well screen

Cross Section Location Map



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North St. Louis County Sites
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Calendar Year 2017

Drawn By: N. Voorhies

Date: 08/29/2000, rev01/26/2018

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Figure 4-9. Geologic Cross-Section A-A' at the SLAPS

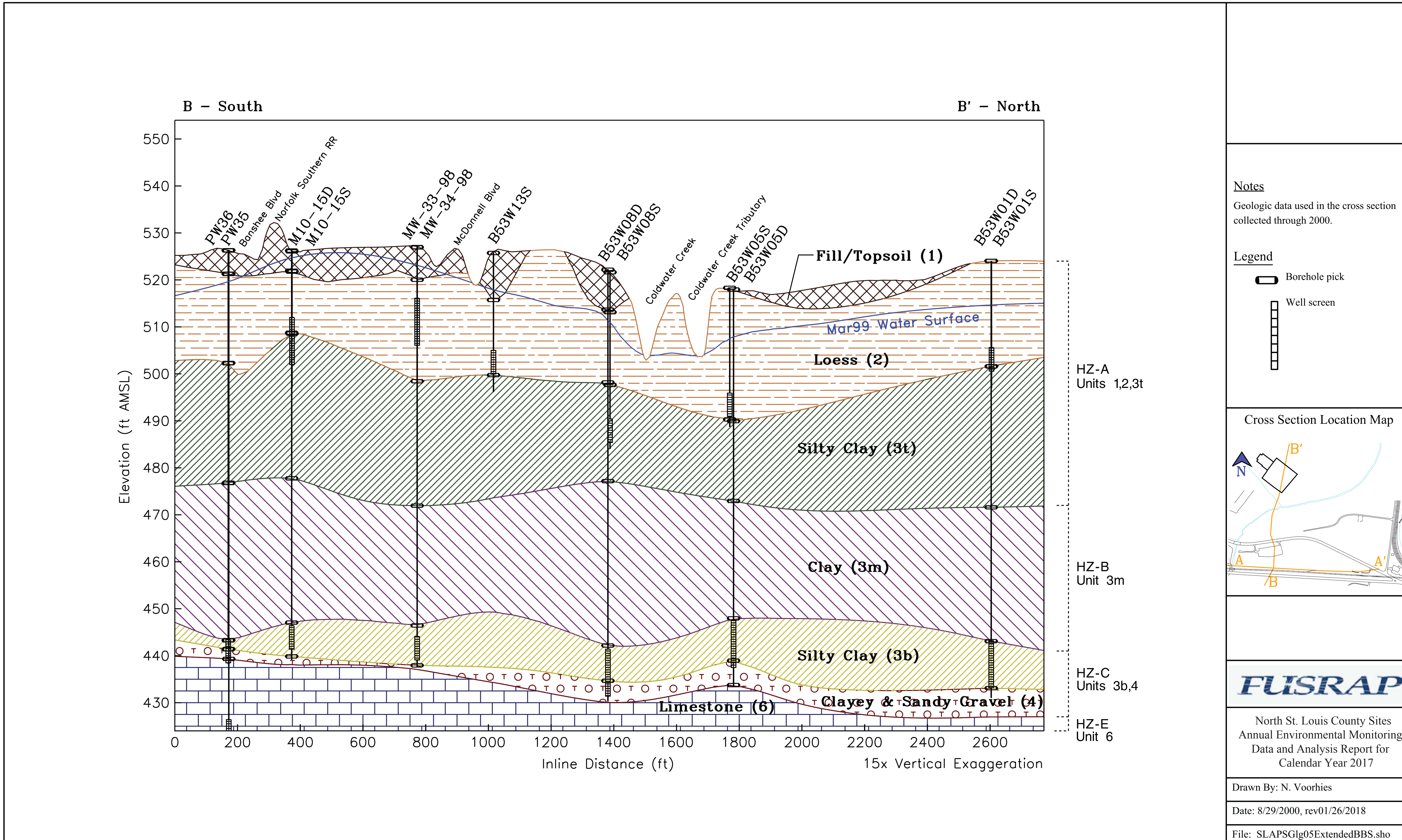


Figure 4-10. Geologic Cross-Section B-B' at the SLAPS and SLAPS VPs

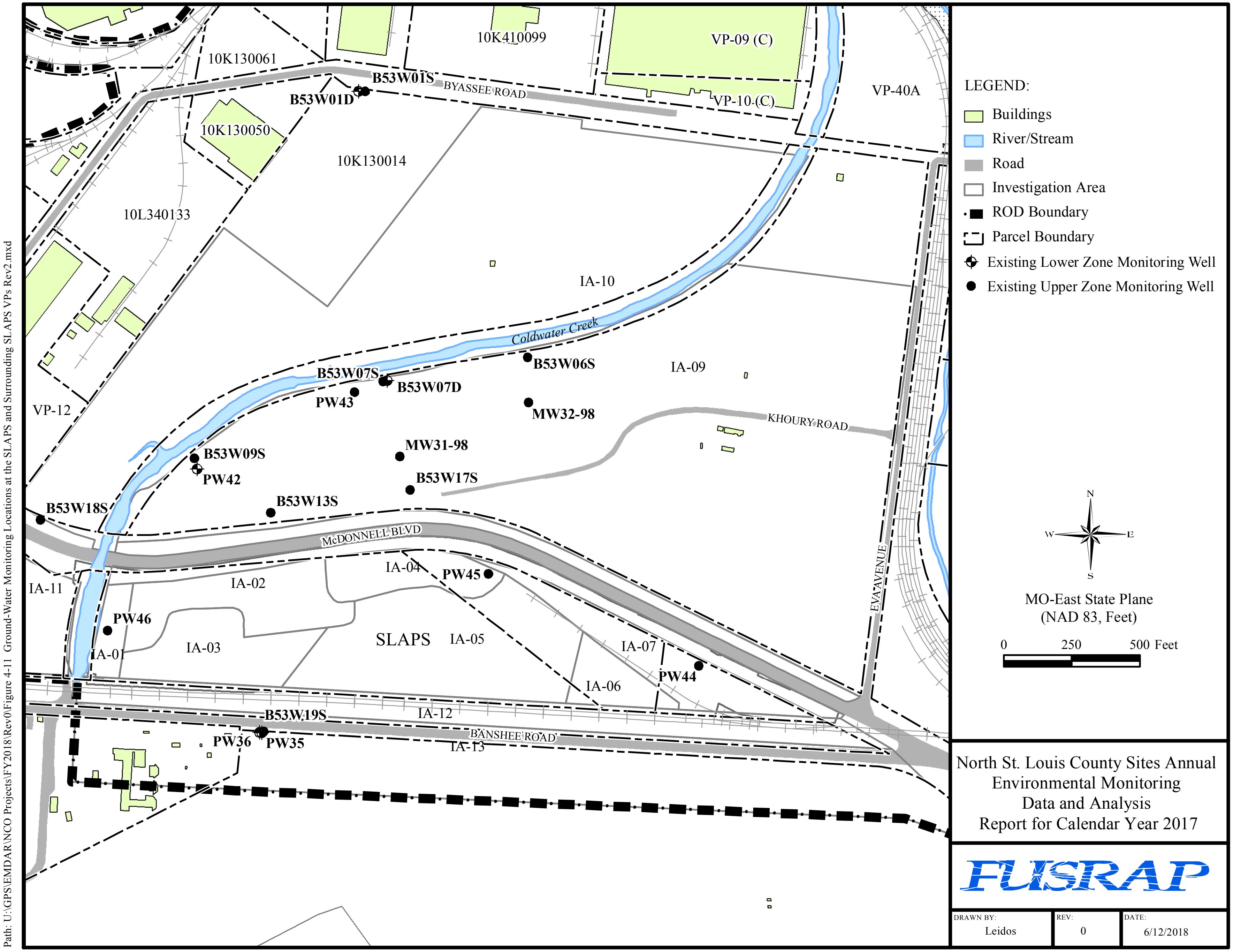
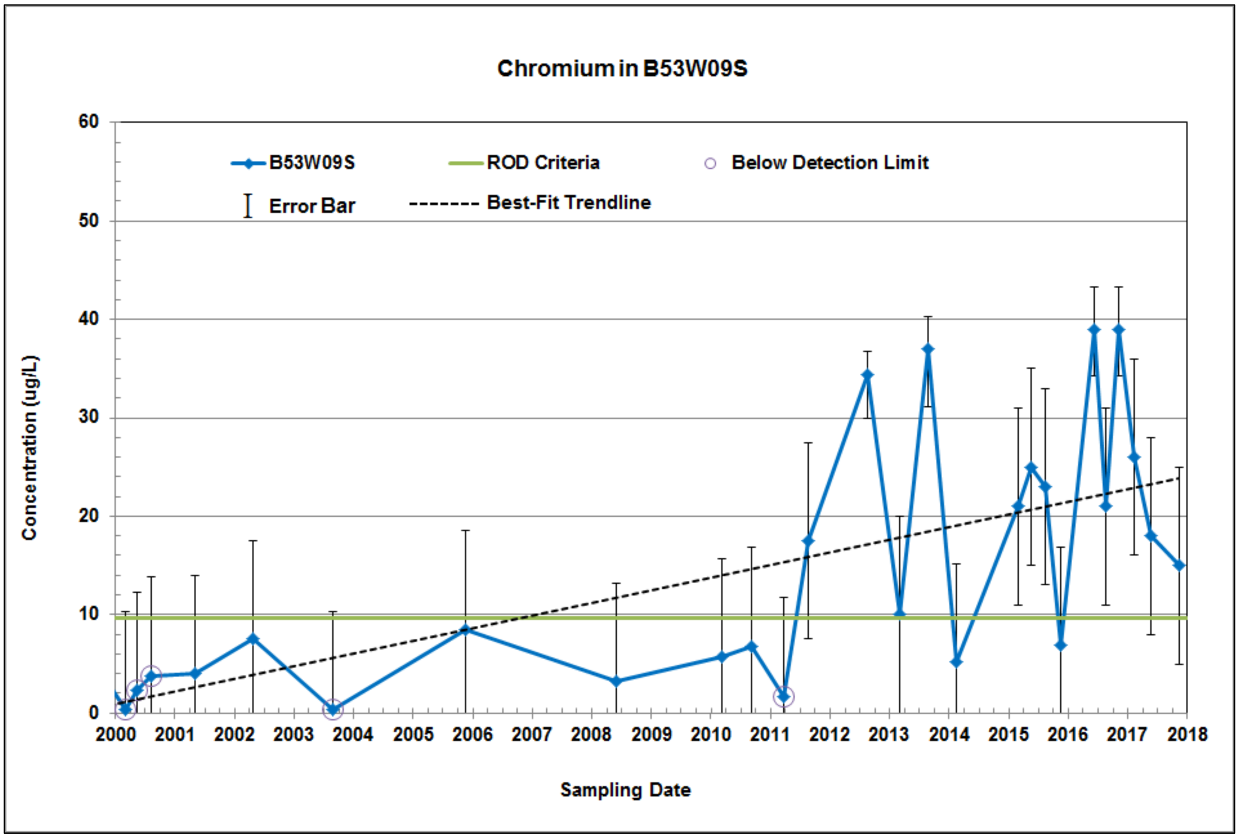
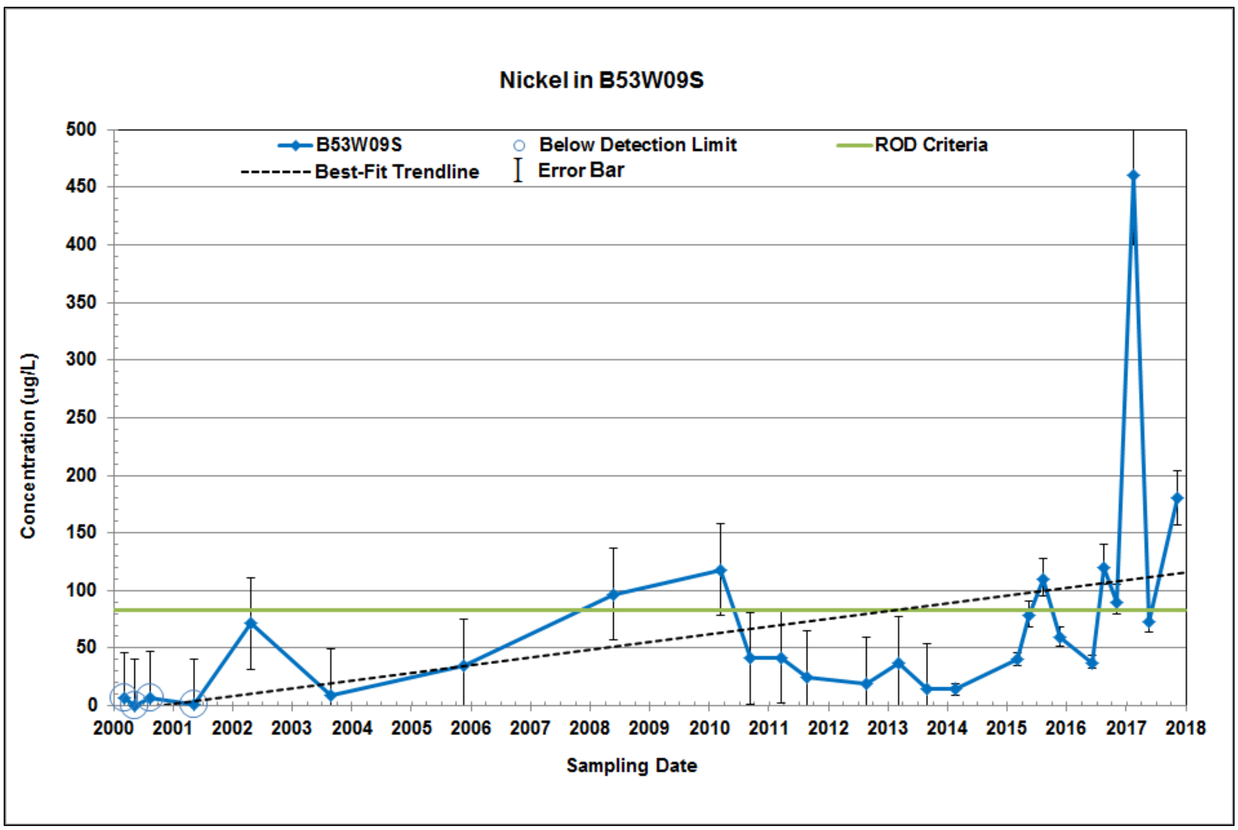


Figure 4-11. Existing Ground-Water Monitoring Locations at the SLAPS and SLAPS VPs



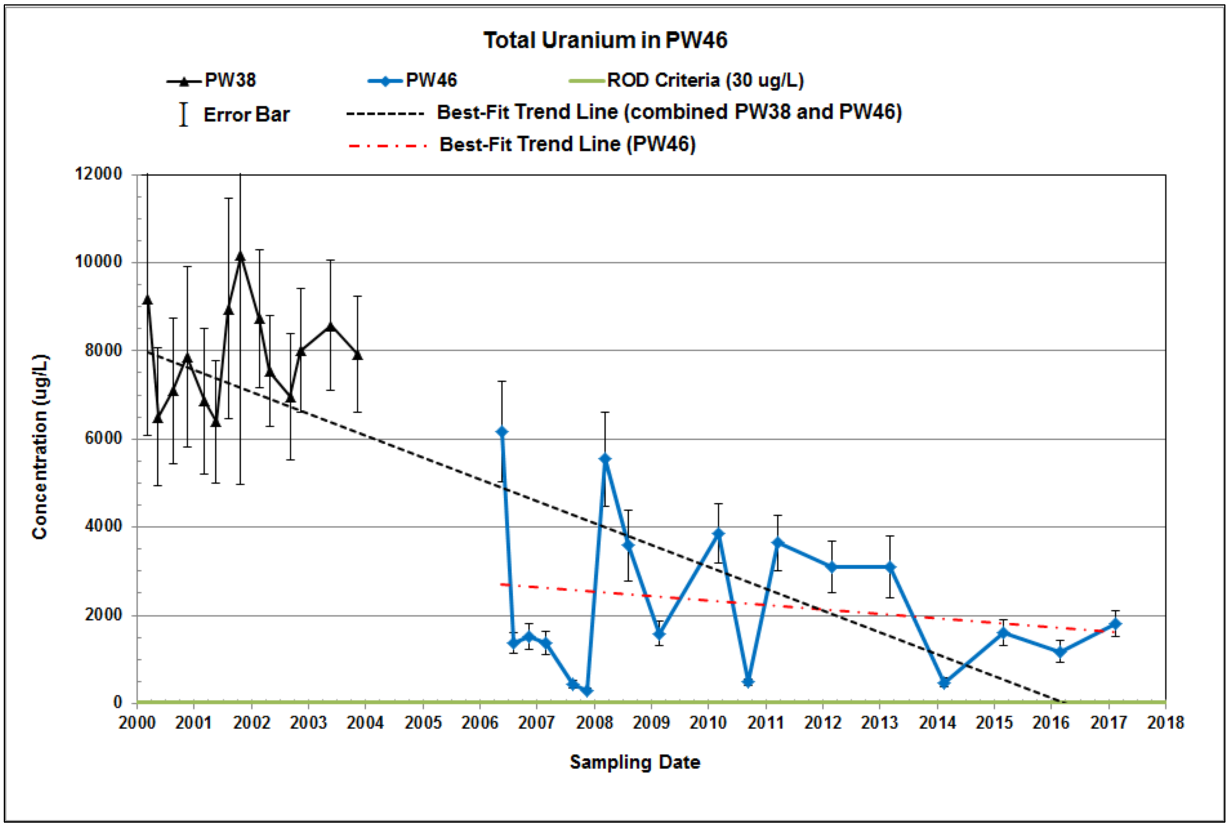


Notes:

For results less than 3 times the RL, the error bar represents ± RL. For results exceeding 3 times the RL, the error bar represents the upper and lower control limits on the control spike samples.

For results reported below the DL (nondetect), the value plotted is half the DL.

Figure 4-12. Time-Versus-Concentration Graphs for Chromium and Nickel in Ground Water at B53W09S



Note:
For total U, the error bar represents ± the sum of the measurement errors for U-234, U-235, and U-238, converted to µg/L.

Figure 4-13. Time-Versus-Concentration Graphs for Total U in Ground Water at PW38 and PW46

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure 4-14 Selenium Concentrations in Ground Water at the SLAPS and SLAPS VPs.mxd

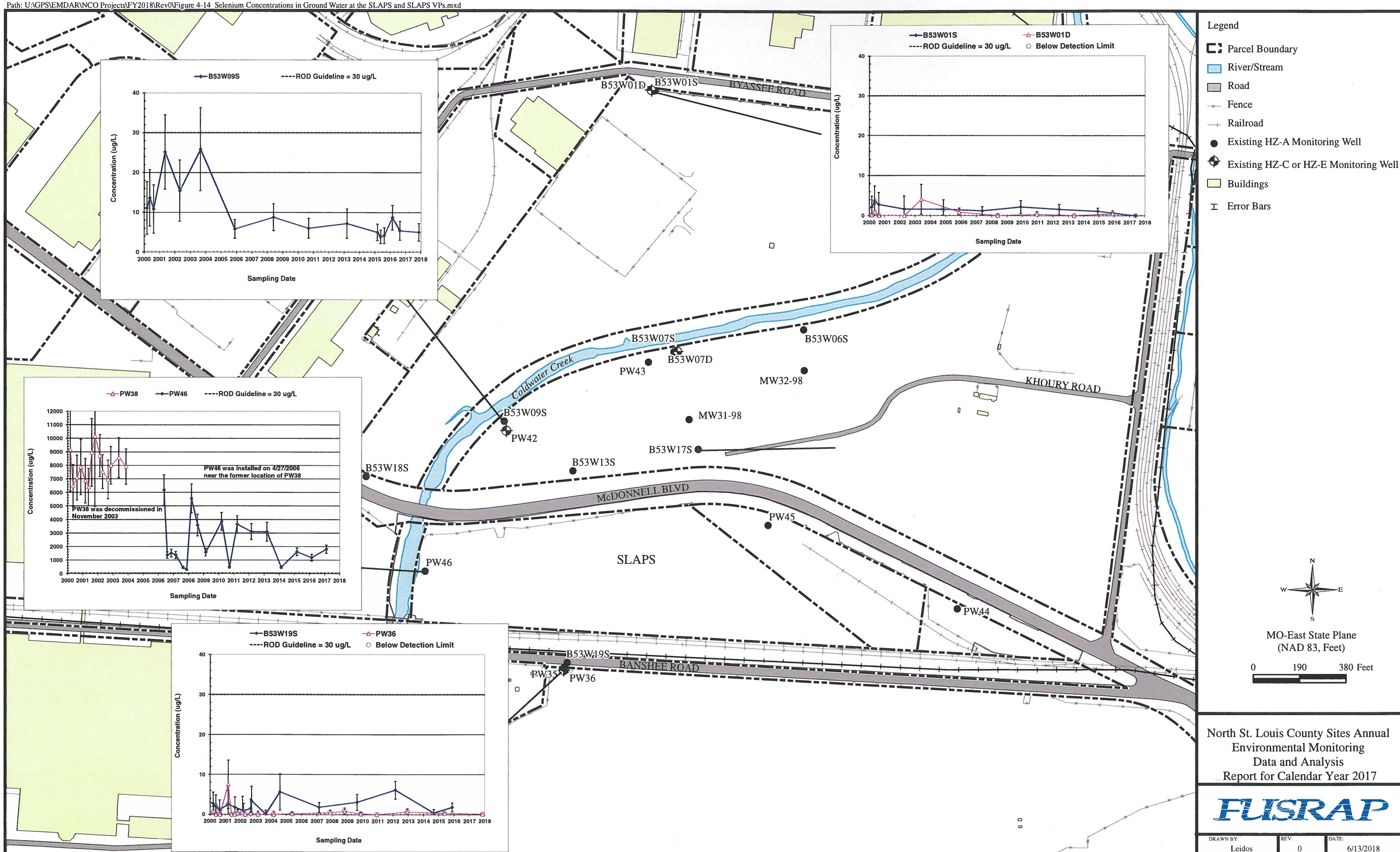


Figure 4-14. Total U Concentrations in Unfiltered Ground Water at the SLAPS and SLAPS VPs

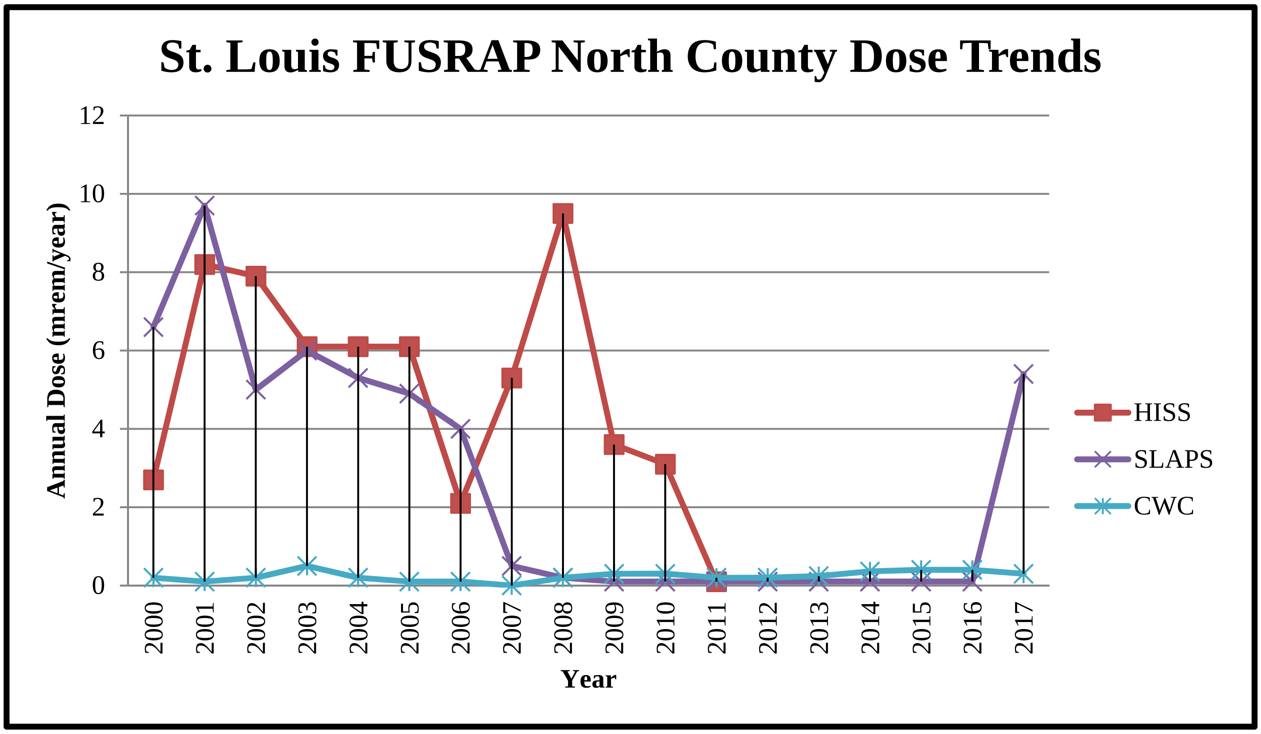


Figure 6-1. St. Louis FUSRAP NC Sites Dose Trends

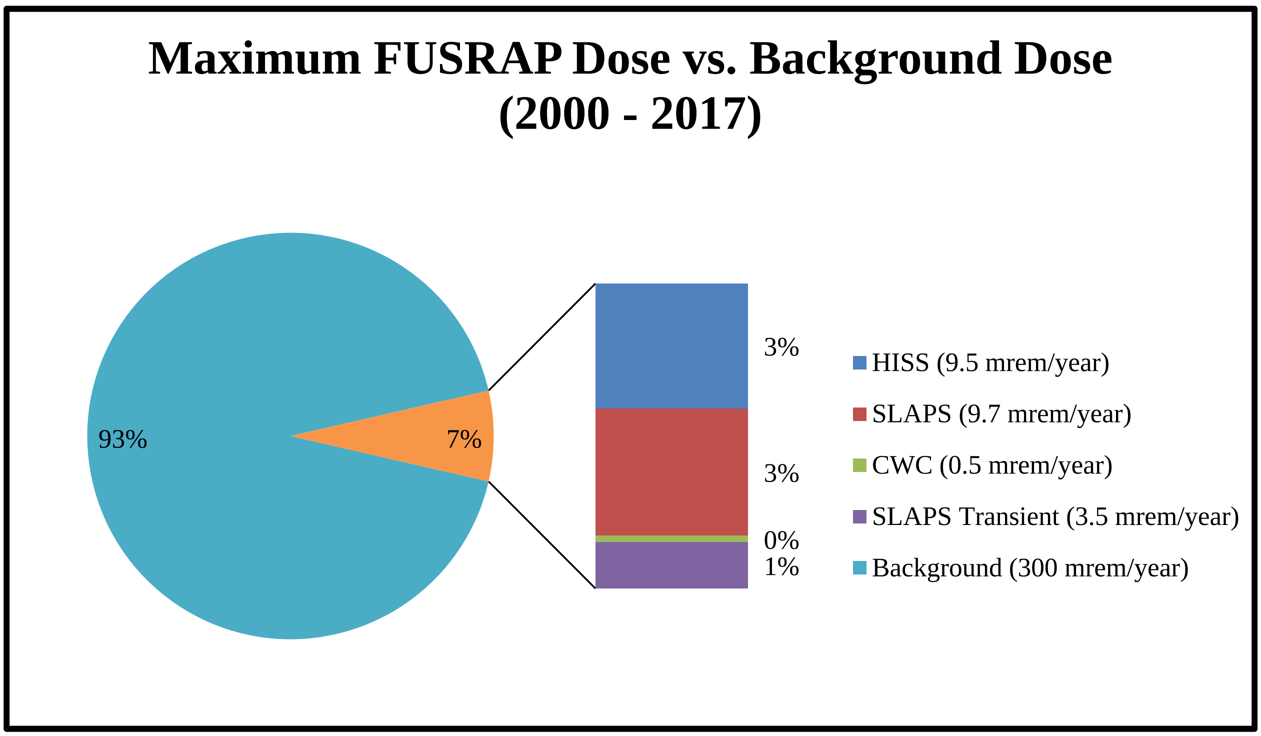


Figure 6-2. St. Louis FUSRAP NC Sites Maximum Dose Versus Background Dose

APPENDIX A

NORTH ST. LOUIS COUNTY FUSRAP SITES
2017 RADIONUCLIDE EMISSIONS NESHAP REPORT
SUBMITTED IN ACCORDANCE WITH REQUIREMENTS OF 40 *CFR* 61, SUBPART I

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ACRONYMS AND ABBREVIATIONS

Ac	actinium
AEC	Atomic Energy Commission
BNI	Bechtel National Inc.
CFR	*Code of Federal Regulations*
CWC	Coldwater Creek
CY	calendar year
DOE	U.S. Department of Energy
EDE	effective dose equivalent
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
GIS	geographic information system
HEPA	high efficiency particulate air
HISS	Hazelwood Interim Storage Site
IA	investigation area
IAAAP	Iowa Army Ammunition Plant
MED	Manhattan Engineer District
NC	North St. Louis County
NESHAP	National Emission Standard for Hazardous Air Pollutants
Pa	protactinium
Ra	radium
RA	remedial action
SLAPS	St. Louis Airport Site
SLDS	St. Louis Downtown Site
STLAA	St. Louis Airport Authority
SU	survey unit
Th	thorium
U	uranium
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VP	vicinity property

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)
g	gram(s)
kg	kilogram(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
yd^3	cubic yard(s)

EXECUTIVE SUMMARY AND DECLARATION STATEMENT

This report presents the results of National Emission Standard for Hazardous Air Pollutants (NESHAP) calculations for the St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) North St. Louis County (NC) Sites for calendar year (CY) 2017. The NESHAP requires the calculation of the effective dose equivalent (EDE) from radionuclide emissions to critical receptors. The report follows the requirements and procedures contained in 40 *Code of Federal Regulations (CFR)* 61, Subpart I, *National Emission Standards for Radionuclide Emissions from Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H.*

This report describes evaluations of sites at which a reasonable potential exists for radionuclide emissions due to St. Louis FUSRAP activities. These sites include: Duchesne Park, Palm Drive Properties, investigation area (IA)-09 Ballfields, and the St. Louis Airport Site (SLAPS) Loadout area. This report also evaluates radionuclide emissions from the U.S. Army Corps of Engineers (USACE) St. Louis District FUSRAP Radioanalytical Laboratory operations. Emissions from the sites and laboratory were evaluated for the entire CY 2017 to provide a conservative estimate of total emissions.

The NESHAP of EDE to a critical receptor from radionuclide emissions is 10 mrem per year. None of the sites exceeded this standard. The EDEs from radionuclide emissions at the sites were calculated using soil characterization data, air particulate monitoring data, and the U.S. Environmental Protection Agency (USEPA) CAP88-PC modeling code, which resulted in an EDE of less than 0.1 mrem per year from the SLAPS and 5.4 mrem per year from the SLAPS VPs. The EDE from the laboratory emissions was calculated using the methodology prescribed in 40 *CFR* 61, Appendix D, *Methods for Estimating Radionuclide Emissions*, soil characterization data, and the USEPA CAP88-PC modeling code (USEPA 2014), resulting in an EDE of less than 0.1 mrem per year.

Evaluations for the Latty Avenue Properties, the SLAPS, the SLAPS VPs, and the USACE St. Louis FUSRAP laboratory resulted in an EDE of less than 10 percent of the dose standard prescribed in 40 *CFR* 61.102. These sites are exempt from the reporting requirements of 40 *CFR* 61.104(a).

DECLARATION STATEMENT – 40 *CFR* 61.104(a)(xvi)

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 *U.S. Code* 1001.

Signature   Date

Office: U.S. Army Corps of Engineers, St. Louis District Office
Address: 8945 Latty Ave.
Berkeley, MO 63134
Contact: Jon Rankins

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1.0 PURPOSE

This NESHAP report contains the EDE calculations from radionuclide emissions (exclusive of radon) to critical receptors from the NC Sites at which a reasonable potential existed for radionuclide emissions due to St. Louis FUSRAP activities. These sites include: Duchesne Park, Palm Drive Properties, IA-09 Ballfields, SLAPS Loadout area, and the USACE St. Louis FUSRAP laboratory. The air emissions from the laboratory include fume hood stack releases of particulate radionuclides from sample preparation and separation activities. The air emissions from the other sites are ground releases of particulate radionuclides in soil as a result of windblown action and remedial action (RA) in the form of excavation and off-site disposal of soil.

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2.0 METHOD

Emission rates for the NC Sites were modeled using guidance documents (i.e., *A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions from NRC-Licensed and Non-DOE Federal Facilities* [USEPA 1989]) referenced in 40 *CFR* 61, Appendix E, *Compliance Procedures Methods for Determining Compliance with Subpart I*, and were measured by collection of environmental air samples. Emission rates for the laboratory were modeled using guidance in 40 *CFR* 61, Appendix D, *Methods for Estimating Radionuclide Emissions.* Emission rates were input into the USEPA computer code CAP88-PC, along with appropriate meteorological data and distances to critical receptors[1], to obtain the EDE from the air emissions.

Although 40 *CFR* 61.103 requires the use of the USEPA computer code COMPLY, USEPA no longer supplies technical support for COMPLY. However, the USEPA lists both COMPLY and CAP88-PC as atmospheric models for assessing dose and risk from radioactive air emissions (USEPA 2014). The USEPA continues to maintain and update the CAP88-PC modeling program and has updated it as recently as September 2014. In previous FUSRAP NESHAP reports, both COMPLY and CAP88-PC results have been compared. This comparison indicated that CAP88-PC is a comparable and conservative method of demonstrating compliance with 40 *CFR* 61, Subpart I. For these reasons, CAP88-PC was used in this report to demonstrate compliance with the NESHAP.

2.1 EMISSION RATE

Two methods were used to determine particulate radionuclide emission rates from the sites: (1) 40 *CFR* 61 Appendix D, *Methods for Estimating Radionuclide Emissions*, and (2) environmental air samples collected from the perimeter of a site. Emissions during excavations and waste loadout were evaluated using air sampling data at the excavation and waste loadout perimeters.

2.2 EFFECTIVE DOSE EQUIVALENT

The EDE to critical receptors[1] is obtained using USEPA computer code CAP88-PC, Version 4.0 (USEPA 2014). CAP88-PC uses a Gaussian plume equation to estimate the dispersion of radionuclides and is referenced by the USEPA to demonstrate compliance with the NESHAP emissions criterion in 40 *CFR* 61. An area ground release at a height of 1.0 m is modeled for the sites, and a stack release is modeled for the laboratory.

The EDE is calculated by combining doses from ingestion, inhalation, air immersion, and external ground surface. 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 emissions source.

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

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3.0 METEOROLOGICAL DATA

Meteorological data were obtained from the CAP88-PC code for the Lambert – St. Louis International Airport (wind file 13994.WND). Data in the file were accumulated from 1988 through 1992.

- Average Annual Wind Velocity: 4.446 m per second
- Average Annual Precipitation Rate: 111 cm per year
- Average Annual Air Temperature: 14.18 °C

Wind speed frequency data were obtained from Lambert – St. Louis International Airport (see Table A-1).

Table A-1. St. Louis Wind Speed Frequency

Wind Speed Group (Knots)	Frequency (Percent)
0 – 3	10
4 – 7	29
8 – 12	36
13 – 18	21
19 – 24	3
25 – 31	1

Knot – 1.151 miles per hour

Wind direction frequency data were obtained from the CAP88-PC wind file, 13994.WND (see Table A-2).

Table A-2. St. Louis Wind Rose Frequency

Wind Direction		Wind Frequency (Percent)	Wind Direction		Wind Frequency (Percent)
Wind Toward	Wind From		Wind Toward	Wind From	
N	S	13.1	S	N	5.6
NNW	SSE	7.4	SSE	NNW	4.3
NW	SE	6.8	SE	NW	6.1
WNW	ESE	6.9	ESE	WNW	8.7
W	E	5.5	E	W	9.0
WSW	ENE	2.8	ENE	WSW	6.8
SW	NE	3.1	NE	SW	5.4
SSW	NNE	3.7	NNE	SSW	5.0

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4.0 LATTY AVENUE PROPERTIES UNDER ACTIVE REMEDIATION

4.1 SITE HISTORY

In 1966, Continental Mining and Milling Company of Chicago, Illinois, purchased the wastes stored at the SLAPS and began moving them to a property at 9200 Latty Avenue (known as the Futura Coatings Company [Futura] since 1979) for storage. In 1967, the Commercial Discount Corporation of Chicago, Illinois, purchased the residues, dried the materials, and shipped much of the material to Canon City, Colorado. Cotter Corporation purchased the remaining residues in 1969 and dried and shipped more material to Canon City during 1970. In 1973, the remaining undried material was shipped to Canon City, and leached barium sulfate was mixed with soil and transported to a St. Louis County landfill. During these activities, improper storage, handling, and transportation of materials caused the spread of materials along haul routes and to the adjacent vicinity properties (VPs).

In 1979, the owner of the 9200 Latty Avenue property excavated approximately 13,000 yd^3 from the western half of the property prior to constructing a manufacturing facility. The material excavated at this time was stockpiled on the eastern half of the property at 9170 Latty Avenue, which has been known as the Hazelwood Interim Storage Site (HISS) since 1979. In 1984, Bechtel National Inc. (BNI) performed removal actions, including clearing, cleanup, and excavation of the property at 9200 Latty Avenue and the surrounding VPs. This action created approximately 14,000 yd^3 of additional contaminated soil, which was stockpiled at the HISS.

In 1986, the U.S. Department of Energy (DOE) provided radiological support to the cities of Hazelwood and Berkeley, Missouri, for a drainage and road improvement project. Soil with constituents in excess of DOE RA guidelines was excavated and stored at the HISS. This action resulted in an additional 4,600 yd^3 of material being placed at the HISS in a supplemental storage pile.

In 1996, the owner of the property to the east of the HISS, General Investment Funds Real Estate Holding Company, in consultation with the DOE, made commercial parking and drainage improvements on the property. This action resulted in the stockpiling of approximately 8,000 yd^3 of soil and debris in two interim storage piles located in the southwestern portion of the Latty Avenue VP-02(L). These piles were referred to as the Eastern Piles.

In 2000 and 2001, the USACE removed the Main, Supplemental, and Eastern Piles and shipped the material by rail to properly permitted disposal facilities. The ground surface on which the piles were previously located was covered by a layer of plastic and approximately 6 inches of gravel.

4.2 MATERIAL HANDLING AND PROCESSING FOR CALENDAR YEAR 2017

Soil cleanup activities at the HISS and Futura, which were the Latty Avenue Properties with the highest initial levels of residual contamination, were completed in CY 2011. No excavation or loadout activities for the Latty Avenue Properties occurred in CY 2017; therefore, radioactive particulate emissions were considered negligible, air sampling for particulate radionuclides was not conducted, and NESHAP calculations for these properties were not required.

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5.0 ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES UNDER ACTIVE REMEDIATION

5.1 SITE HISTORY

The Manhattan Engineer District (MED) acquired the SLAPS in 1946 to store uranium-bearing residuals generated at the St. Louis Downtown Site (SLDS) from 1946 through 1966. In 1966, these residuals were purchased by Continental Mining and Milling Company of Chicago, removed from the SLAPS, and placed in storage at 9200 Latty Avenue (known as Futura since 1979) under an Atomic Energy Commission (AEC) license. After most of the residuals were removed, site structures were demolished and buried on the property, along with approximately 60 truckloads of scrap metal and a vehicle that had become contaminated. In 1973, the U.S. Congress and the City of St. Louis agreed to transfer ownership from the AEC to the St. Louis Airport Authority (STLAA). The USACE conducted cleanup operations on the SLAPS from 1998 through 2007. Although excavations have concluded at the SLAPS, a small portion of the site is still used to conduct waste storage and loadout activities.

5.2 MATERIAL HANDLING AND PROCESSING FOR CALENDAR YEAR 2017

During CY 2017, excavations were conducted on Duchesne Park, the Palm Drive Properties, and the Ballfields portion of IA-09; and waste loadout activities were conducted at the SLAPS Loadout facility. Air particulate samples were collected around excavation perimeters during active excavation on the SLAPS VPs and around the SLAPS Loadout area throughout CY 2017. Analytical results of air particulate samples were used to determine windblown in situ emissions.

5.3 SOURCE DESCRIPTION – RADIONUCLIDE SOIL CONCENTRATIONS

The radionuclide concentrations for Duchesne Park, the Palm Drive Properties, the Ballfields portion of IA-09, and the SLAPS Loadout area were obtained from data contained in the *Pre-Design Investigation Summary Report for St. Cin Park, the Archdiocese of St. Louis Property, and Duchesne Park* (USACE 2015), *Pre-Design Investigation Summary Report, Palm Drive Properties* (USACE 2016), *Pre-Design Investigation Summary Report, Investigation Area (IA)-09: Ballfields, IA-08: North Ditch, and Ballfields: North of IA-09, St. Louis Airport Site Vicinity Properties, North St. Louis County Site, St. Louis, Missouri* (USACE 2008), and railcar waste characterization data collected by the remedial action contractor, respectively. Attachment A-1 of this NESHAP report contains a summary table of the radionuclide concentrations used to calculate the emission rate from each site.

5.4 LIST OF ASSUMED AIR RELEASES FOR CALENDAR YEAR 2017

Ground releases of particulate radionuclides in soil, as a result of windblown action and RA in the form of excavation (for Duchesne Park, the Palm Drive Properties, and the Ballfields portion of IA-09) and off-site disposal (for the SLAPS Loadout area) of soil, are assumed for the particulate radionuclide emission determinations from the SLAPS VPs at which excavations occurred in CY 2017. Other SLAPS VPs do not contribute to the emission determinations for periods of inactivity due to the low activity and vegetative cover.

5.5 DISTANCES TO CRITICAL RECEPTORS

The distances to critical receptors are shown on Figures A-2 and A-3 and presented in Table A-3. Distances and directions to critical receptors are determined using tools in a geographic information system (GIS).

Table A-3. SLAPS and SLAPS VPs Critical Receptors for CY 2017

Sources	Nearest Residence		Farm		Business		School	
	Distance (m)	Direction	Distance (m)	Direction	Distance (m)[a]	Direction	Distance (m)	Direction
Duchesne Park	150	NE	4,500	WNW	70	W	600	E
Palm Drive	20	S	4,300	WNW	400	N	850	SE
IA-09 Ballfields	720	NE	1,700	NE	580	WSW	2,500	E
SLAPS Loadout	770	NE	1,710	NE	500	WSW	2,580	E

[a] Distance from business receptor to fenceline is 160 m. Distance from business receptor to center of source from the SLAPS Loadout is 500 m for emissions determination.

5.6 EMISSIONS DETERMINATION

5.6.1 Measured Airborne Radioactive Particulate Emissions

Particulate air samples were collected from around the perimeter of active excavations and the SLAPS Loadout area to measure the radionuclide emissions. The samples provide the basis for determining the radionuclide emission rates during all of CY 2017. The average gross alpha and gross beta concentrations (in μCi/mL) were determined for each sample location for CY 2017. The site average concentrations are presented in Table A-4.

Table A-4. SLAPS and SLAPS VPs Average Gross Alpha and Beta Airborne Particulate Emissions for CY 2017

Monitoring Location	Average Concentration (μCi/mL)	
	Gross Alpha	Gross Beta
Duchesne Park	7.46E-15	3.18E-14
Palm Drive Properties	4.01E-15	2.33E-14
IA-09 Ballfields	3.89E-15	3.21E-14
SLAPS Loadout	3.38E-15	3.22E-14
Background Concentration[a]	4.93E-15	2.13E-14

[a] These concentrations are provided for informational purposes only. As a conservative approach, background values were not subtracted from the gross average concentration during the determination of EDE.

Radionuclide activity fractions are determined for alpha and beta from the average radionuclide concentration data contained in *Pre-Design Investigation Summary Report for St. Cin Park, the Archdiocese of St. Louis Property, and Duchesne Park* (USACE 2015), *Pre-Design Investigation Summary Report, Palm Drive Properties* (USACE 2016), *Pre-Design Investigation Summary Report, Investigation Area (IA)-09: Ballfields, IA-08: North Ditch, and Ballfields: North of IA-09, St. Louis Airport Site Vicinity Properties, North St. Louis County Site, St. Louis, Missouri* (USACE 2008), and railcar waste characterization data collected by the remedial action contractor, respectively. The product of each radionuclide activity fraction and the gross concentration provide the radionuclide emission concentration as measured in $\mu Ci/cm^3$. The gross average concentration (in $\mu Ci/cm^3$) is converted to a release (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) (page 3-21, [2]) includes 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 = the effective diameter of the release (in m)
A = the area of the stack, vent, or release point (in m^2)

Table A-5 provides the effective surface area available for release of airborne radionuclides normalized to 1 year and the effective diameter for the SLAPS and SLAPS VPs that were excavated in CY 2017. Calculation of the effective surface area is contained in Attachment A-1 of this NESHAP report.

Table A-5. SLAPS and SLAPS VPs Excavation Effective Areas and Effective Diameters for CY 2017

Location	Effective Area (m^2)	Effective Diameters (m)
Duchesne Park	88	11
Palm Drive Properties	1,030	37
IA-09 Ballfields	244	18
SLAPS Loadout	600	28

The average annual wind speed for the Lambert – St. Louis International Airport is provided in CAP88-PC as 4.446 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.

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

where:

V = the wind velocity (in m per minute) = 266.76 m per minute
F = the flow rate (in m^3 per minute)
π = a mathematical constant
D = the effective diameter of the release (in m) determined using Equation 13

Converting the velocity of emissions from the sites to an effective flow rate results in the following site release flow rates for the SLAPS and SLAPS VPs, as listed in Table A-6. 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 contained in Table A-7. Attachment A-1 of this NESHAP report contains flow rate and average radionuclide concentration data.

Table A-6. SLAPS and SLAPS VPs Site Release Flow Rates for CY 2017

Location	Site Release Flow Rate (m^3/minute)
Duchesne Park	2.4E+04
Palm Drive Properties	2.8E+05
IA-09 Ballfields	6.6E+04
SLAPS Loadout	1.6E+05

5.6.2 St. Louis Airport Site and St. Louis Airport Site Vicinity Properties Total Airborne Radioactive Particulate Emission Rates

The total CY 2017 emission/release rates input into the USEPA codes for the SLAPS and SLAPS VPs are shown in Table A-7 and are based on the measured emission rates from the air samples collected from the perimeter of the site or excavations as appropriate.

Table A-7. SLAPS and SLAPS VPs Total Airborne Radioactive Particulate Emission Rates for CY 2017

Radionuclide	Emission (Ci/year)[a]			
	Duchesne Park	Palm Drive	IA-09 Ballfields	SLAPS Loadout
Uranium (U)-238	8.0E-06	4.5E-05	1.2E-05	2.6E-05
U-235	2.6E-07	1.4E-06	9.5E-07	1.8E-05
U-234	8.0E-06	4.5E-05	1.2E-05	2.6E-05
Radium (Ra)-226	9.5E-06	4.8E-05	1.1E-05	2.9E-05
Thorium (Th)-232	6.7E-06	3.6E-05	9.0E-06	2.4E-05
Th-230	4.6E-05	3.2E-04	6.7E-05	8.6E-05
Th-228	7.5E-06	4.1E-05	9.9E-06	2.3E-05
Ra-224	7.5E-06	4.1E-05	9.9E-06	2.3E-05
Th-234	1.1E-04	9.8E-04	3.4E-04	6.0E-04
Protactinium (Pa)-234m	1.1E-04	9.8E-04	3.4E-04	6.0E-04
Th-231	3.8E-06	3.0E-05	2.6E-05	4.2E-04
Ra-228	8.5E-05	7.2E-04	2.1E-04	5.7E-04
Actinium (Ac)-228	8.5E-05	7.2E-04	2.1E-04	5.7E-04
Pa-231	5.9E-07	2.8E-06	2.1E-06	1.7E-05
Ac-227	3.9E-07	5.2E-06	1.2E-06	1.7E-05

[a] Release rate based on a 365-day period at a respective flow rate (as presented in Table A-6) as determined from the average annual wind speed (4.446 m per second) and the effective site area (as presented in Table A-5) for each location.

5.7 CAP88-PC RESULTS

The CAP88-PC report is contained in Attachment A-2 of this NESHAP report. The effective area factor input was taken from Table A-5. Results show compliance with the 10 mrem per year criterion for all critical receptors. The results are summarized in Table A-8.

Table A-8. SLAPS and SLAPS VPs CAP88-PC Results for Critical Receptors for CY 2017

Source	Dose (mrem/year)			
	Nearest Residence[a]	Farm[a]	Business[b]	School[b]
Duchesne Park	<0.1	<0.1	<0.1	<0.1
Palm Drive Properties	5.4	0.6	0.2	0.2
IA-09 Ballfields	<0.1	<0.1	<0.1	<0.1
SLAPS Loadout[c]	<0.1	<0.1	<0.1	<0.1

[a] Occupancy factor is 100 percent for the nearest residence and farm.
[b] Corrected for the 23 percent occupancy factor (40 hours per week for 50 weeks per year).
[c] Distance from the business receptor to the fenceline is 160 m. Distance from the business receptor to the center of the source is 500 m for emissions determination.

6.0 U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT FUSRAP RADIOANALYTICAL LABORATORY

6.1 SITE DESCRIPTION

The USACE St. Louis FUSRAP laboratory is located on VP-38. VP-38 is a SLAPS VP owned by SuperValue Inc. The USACE St. Louis FUSRAP laboratory is bounded to the north, east, and west by the SuperValue Inc. property and bounded to the south by Latty Avenue. The laboratory site covers approximately 4,047 m^2 of VP-38.

6.2 LIST OF ASSUMED AIR RELEASES FOR CALENDAR YEAR 2017

Emissions from the USACE St. Louis FUSRAP laboratory operations are assumed for the particulate radionuclide emission determinations from the laboratory site. No active excavations occurred on VP-38 during CY 2017.

6.3 EFFLUENT CONTROLS

The effluent controls at the USACE St. Louis FUSRAP laboratory during operations include performing all radioanalytical activities in fume hoods that exhaust to the outside air after passing through a high efficiency particulate air (HEPA) filter.

6.4 DISTANCES TO CRITICAL RECEPTORS

The distances to critical receptors are shown on Figure A-1 and listed in Table A-9. Distances and directions to critical receptors are determined using tools in a GIS.

Table A-9. Laboratory Critical Receptors for CY 2017

Receptor	Distance (m)	Direction from Site
Nearest Residence	300	NE
Farm	300	NE
Business	110	S
School	1,830	SE

6.5 EMISSIONS DETERMINATIONS

6.5.1 Stack Emissions from U.S. Army Corps of Engineers St. Louis District FUSRAP Radioanalytical Laboratory Operations

Two potential sources of emissions from laboratory operations exist:

1) The drying and grinding operations for soil samples, and
2) The dissolution of soil and water samples.

To obtain an estimate of the emissions these operations can cause, the methodology in 40 *CFR* 61, Appendix D, *Methods for Estimating Radionuclide Emissions*, was utilized. For the drying and grinding operations, a factor of 0.001 (applicable to liquids and powders) was applied to the entire annual laboratory inventory to determine the emissions for the year. For the dissolution operation, however, only 5 g of any sample are used. Because the dissolution involved heating samples to near boiling temperatures, no adjustment was made to the dissolution inventory to determine the emissions (a factor of 1.0, as specified in 40 *CFR* 61, Appendix D). To account for the small aliquot utilized, the annual inventory was adjusted by a factor of 0.005 (the ratio of the

5-g aliquot to the 1-kg sample mass) to estimate emissions. The two emission sources were then summed to determine the total laboratory source term.

Note that no credit is taken for emission controls during the drying and grinding operations, although 40 *CFR* 61, Appendix D, allows for credit to be taken for the HEPA filters installed on the grinder equipment. The calculated source term therefore provides a conservative basis on which to determine compliance with USEPA guidance in 40 *CFR* 61.

To determine whether the laboratory complies with the 10 mrem per year limit specified in 40 *CFR* 61, Subpart I, the annual inventory handled by the laboratory had to be determined. The actual number of samples handled by the laboratory was reported as shown in Table A-10. With these data, the following equation was used to calculate laboratory emissions from the operations conducted in CY 2017.

$$\text{Emission Rate (Ci/year)} = \text{C} * \left[N_1 * F_1 + N_2 * F_2 \right] * 1{,}000\ \text{g/sample} * 1\text{E} \quad 12\ \text{(Ci per picocuries)}$$

where:

- C = the concentration of a radionuclide of concern in a sample type (in pCi/g)
- N_1 = the number of samples involved in a drying and grinding operation
- N_2 = the number of samples involved in a separations operation
- F = the appropriate correction factor (i.e., 0.001 for drying and grinding [F_1] or 0.005 for dissolution [F_2])

Table A-10. Laboratory Annual Sample Inventory for CY 2017[a]

Site	Type	Gamma Spectroscopy	Isotopic Ra[b]	Isotopic Th[b]	Isotopic U[b]	Total Drying and Grinding[c]	Total Separations[d]
HISS	Soil	NA	NA	NA	NA	0	0
HISS	Water	NA	7	7	7	0	21
Latty Avenue Properties	Soil	NA	NA	NA	NA	0	0
Latty Avenue Properties	Water	NA	NA	NA	NA	0	0
Iowa Army Ammunitions Plant (IAAAP)	Soil	638	NA	NA	638	638	638
IAAAP	Water	NA	NA	NA	19	0	19
SLAPS	Soil	NA	NA	NA	NA	0	0
SLAPS	Water	3	6	6	3	3	15
SLAPS VPs	Soil	1,994	NA	1,766	NA	1,994	1,766
SLAPS VPs	Water	3	18	18	2	3	38
Coldwater Creek (CWC)	Sediment (soil)	1,397	NA	1,382	NA	1,397	1,382
CWC	Water		18	18	18	0	54
SLDS	Soil	517		510		517	510
SLDS	Water		136	136	6	0	278
		HISS and Latty Avenue Properties			**Total**	0	21
		IAAAP			**Total**	638	657
		SLAPS, SLAPS VPs, and CWC			**Total**	3,397	3,255
		SLDS			**Total**	517	510
					Grand Total	4,552	4,721

[a] Data provided by the USACE St. Louis FUSRAP laboratory for CY 2017.
[b] Assumes isotopic Ra, Th, and U occur in separate and distinct processes.
[c] Assumes all soil samples went through a drying and grinding process.
[d] Assumes all soil and water samples for isotopic Ra, Th, and U went through a separations process.
Notes: CWC samples use SLAPS characterization data to determine release rates.
NA – not applicable

6.5.2 Laboratory Total Airborne Radioactive Particulate Emission Rates

The USACE St. Louis FUSRAP laboratory total CY 2017 emission rate was input into the USEPA CAP88-PC code. The total emission rates are shown in Table A-11 as the calculated emissions from laboratory operations. The result was then used to calculate total dose to the hypothetical maximally exposed receptor. Calculation of emission rates is contained in Attachment A-1 of this NESHAP report.

Table A-11. Laboratory Total Airborne Radioactive Particulate Emission Rates for CY 2017

Radionuclide	Emission (Ci/year)[a]
U-238	1.3E-07
U-235	2.9E-08
U-234	1.2E-07
Ra-226	6.0E-08
Th-232	4.9E-08
Th-230	1.4E-07
Th-228	5.1E-08
Ra-224	5.1E-08
Th-234	1.3E-07
Protactinium (Pa)-234m	1.3E-07
Th-231	2.9E-08
Ra-228	4.4E-08
Ac-228	4.4E-08
Pa-231	2.7E-08
Ac-227	2.4E-08

[a] Total emission rate is the sum of individual emission rates determined using the calculation in Section 6.5.1 of this NESHAP report.

6.6 CAP88-PC RESULTS

The CAP88-PC report is contained in Attachment A-2 of this NESHAP report. The stack factor input was 3 m high and 0.3 m in diameter. This evaluation demonstrates that all USACE St. Louis FUSRAP laboratory critical receptors receive less than 10 percent of the dose standard prescribed in 40 *CFR* 61.102; therefore, the laboratory is exempt from the reporting requirement of 40 *CFR* 61.104(a). The results are summarized in Table A-12.

Table A-12. Laboratory CAP88-PC Results for Critical Receptors for CY 2017

Receptor	Distance (m)	Direction from Site	Dose (mrem/year)
Nearest Residence[a]	300	NE	<0.1
Farm[a]	300	NE	<0.1
Business[b]	110	S	<0.1
School[b]	1,830	SE	<0.1

[a] Occupancy factor is 100 percent for the nearest residence and farm.
[b] Corrected for the 23 percent occupancy factor (40 hours per week for 50 weeks per year).

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7.0 REFERENCES

USACE 2008, *Pre-Design Investigation Summary Report, Investigation Area (IA)-09: Ballfields, IA-08: North Ditch, and Ballfields: North of IA-09, St. Louis Airport Site Vicinity Properties, North St. Louis County Site, St. Louis, Missouri,* Revision 0. October 23.

USACE 2011. U.S. Army Corps of Engineers, St. Louis District Office. *Feasibility Study for the Iowa Army Ammunition Plant*, Burlington, Iowa. Final. April.

USACE 2015. U.S. Army Corps of Engineers. *Pre-Design Investigation Summary Report for St. Cin Park, the Archdiocese of St. Louis Property, and Duchesne Park,* St. Louis, Missouri. Revision 0. June 24.

USACE 2016. *Pre-Design Investigation Summary Report, Palm Drive Properties, FUSRAP North St. Louis County Sites, St. Louis, Missouri*, Revision 0. July 14.

USACE 2018. U.S. Army Corps of Engineers. *St. Louis Downtown Site Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017*, St. Louis, Missouri. Revision 0. June 21.

USEPA 1989. U.S. Environmental Protection Agency, Office of Radiation Programs, Washington, D.C. *A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions from NRC-Licensed and Non-DOE Federal Facilities*. EPA 520/1-89-002. October.

USEPA 2014. U.S. Environmental Protection Agency. CAP88-PC Version 4.0 Computer Code, U.S. Environmental Protection Agency. September.

18 *U.S. Code* 1001. *U.S. Code,* Title 18, Crimes and Criminal Procedure; Part I, Crimes; Chapter 47, Fraud and False Statements; Section 1001, Statements or entries generally.

40 *CFR* 61, Subpart I. *National Emission Standards for Radionuclide Emissions From Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H*.

40 *CFR* 61, Appendix D. *Methods for Estimating Radionuclide Emissions.*

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

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APPENDIX A

FIGURES

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Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure A-1 FUSRAP Lab Critical Reports.mxd

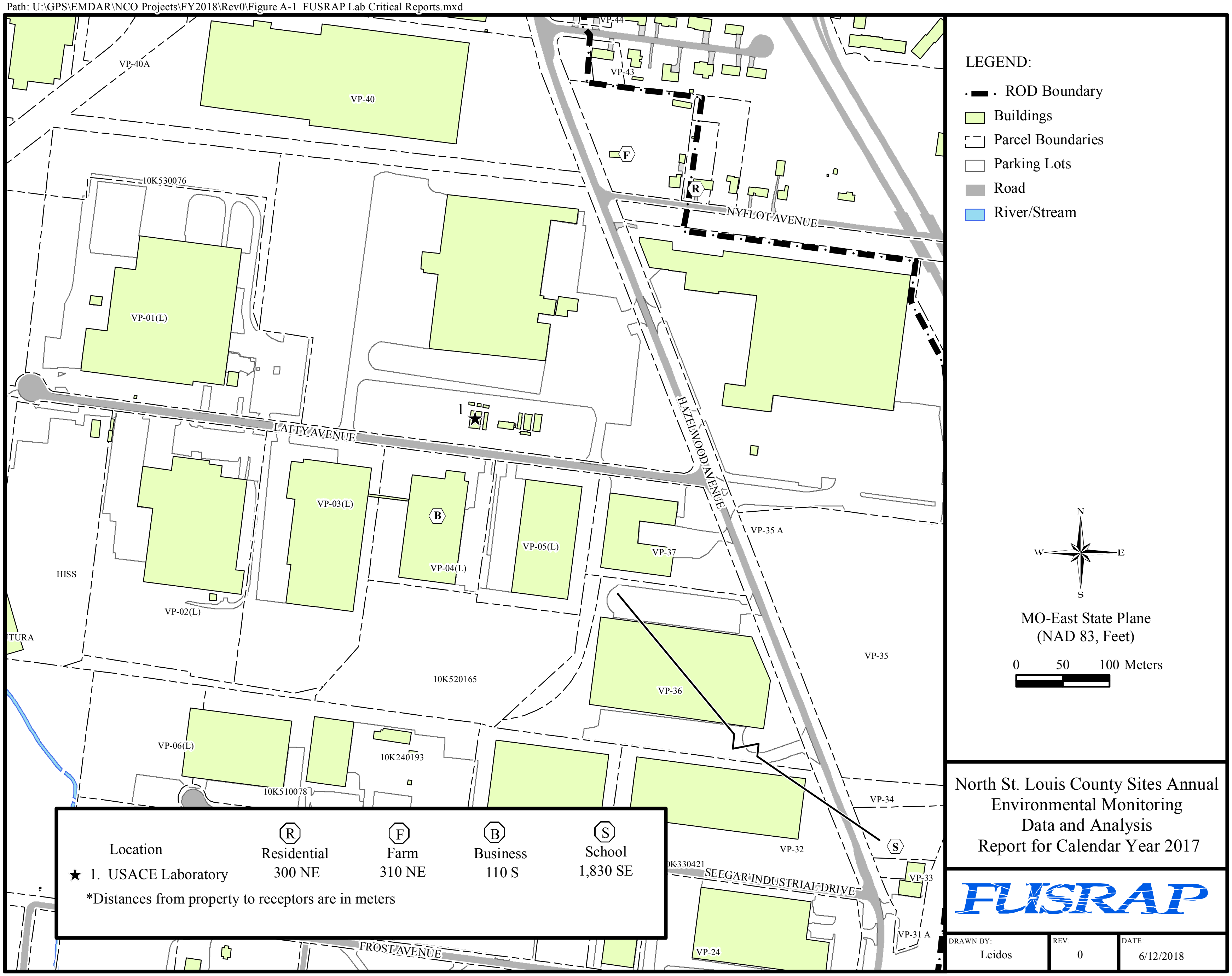
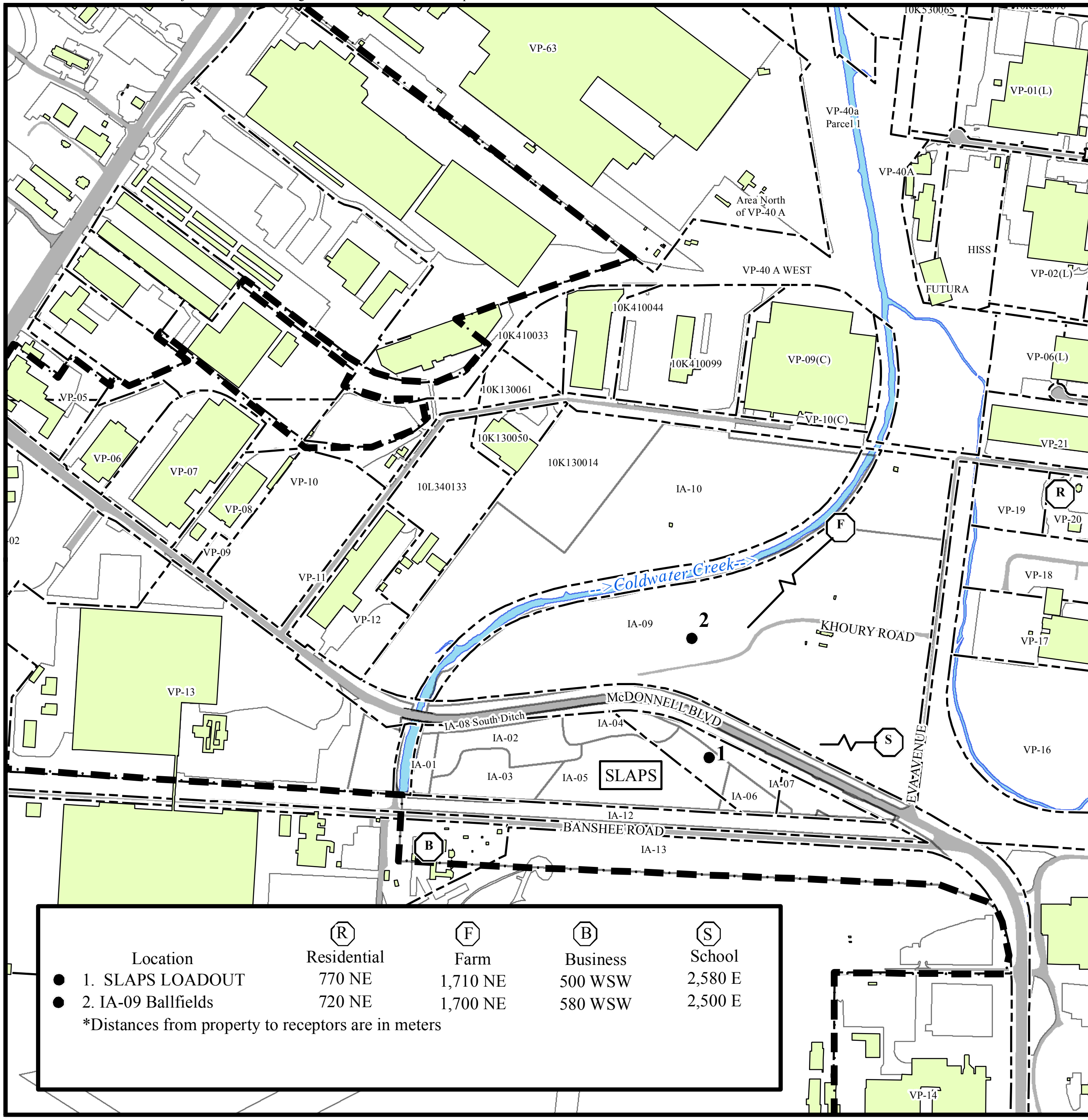


Figure A-1. Latty Avenue Properties and USACE St. Louis FUSRAP Laboratory Critical Receptors

Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure A-2 SLAPS Crticial Receptors.mxd



Location	Residential (R)	Farm (F)	Business (B)	School (S)
1. SLAPS LOADOUT	770 NE	1,710 NE	500 WSW	2,580 E
2. IA-09 Ballfields	720 NE	1,700 NE	580 WSW	2,500 E

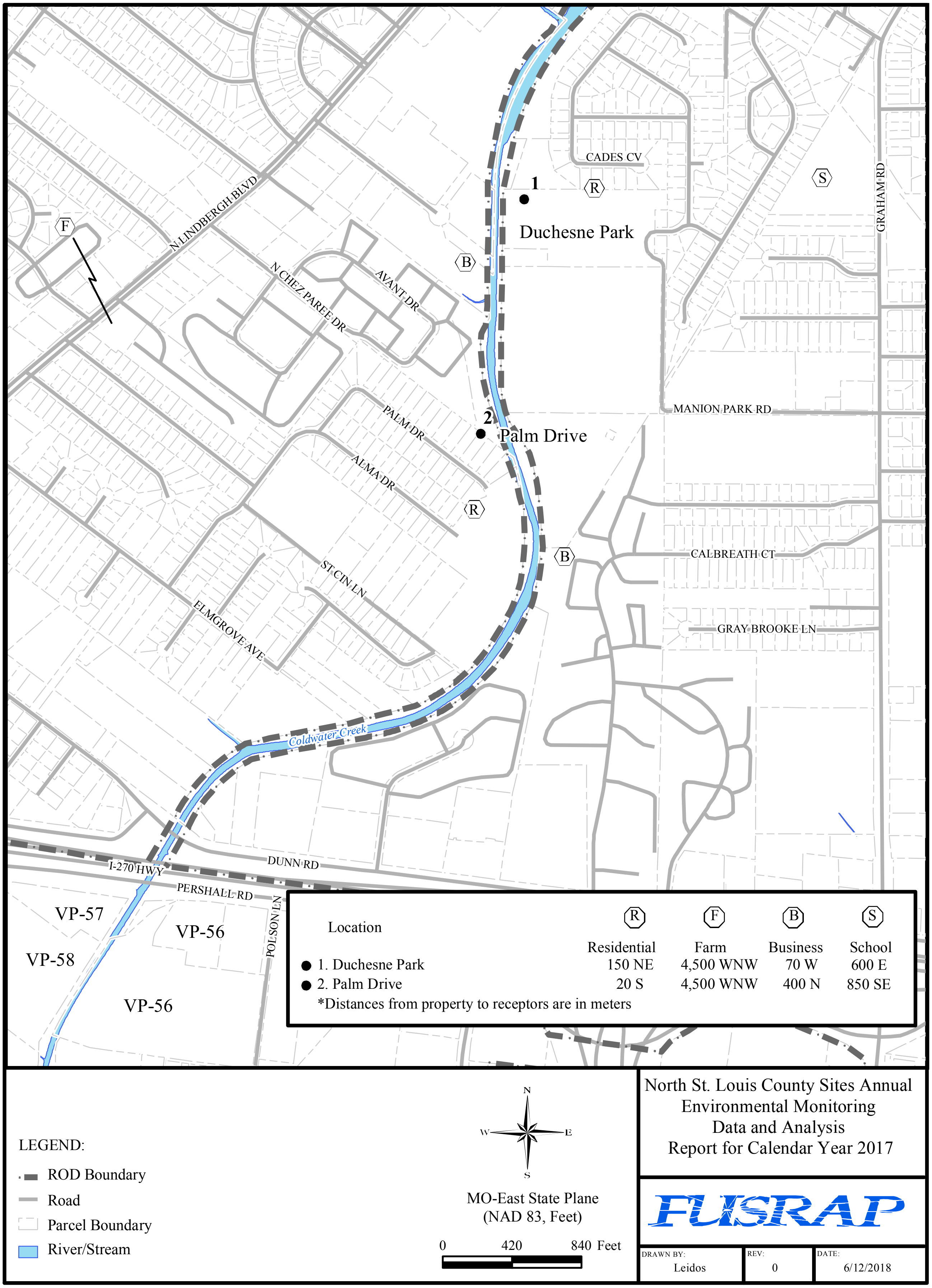
*Distances from property to receptors are in meters

North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2017

FUSRAP

DRAWN BY:	REV:	DATE:
Leidos	0	6/12/2018

Figure A-2. SLAPS and SLAPS VPs Critical Receptors - South



Path: U:\GPS\EMDAR\NCO Projects\FY2018\Rev0\Figure A-3 SLAPS Critical Receptors Portrait.mxd

Figure A-3. SLAPS and SLAPS VPs Critical Receptors - North

ATTACHMENT A-1

CALCULATED EMISSION RATES FROM NORTH ST. LOUIS COUNTY SITE PROPERTIES

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Table A-1-1. North St. Louis County Site Properties Soil Radionuclide Concentrations for CY 2017

Property	Duchesne Park[a]	Palm Drive Properties[b]	IA-09 Ballfields[c]	SLAPS Loadout
Radionuclide	**Average Concentration (pCi/g)**			
U-238	1.2	1.32	1.55	1.5
U-235	0.04	0.040	0.12	1.03
U-234	1.2	1.32	1.55	1.5
Ra-226	1.4	1.40	1.43	1.6
Ra-228	0.9	0.97	0.98	1.4
Th-232	1.0	1.040	1.13	1.4
Th-230	6.96	9.42	8.39	4.9
Th-228	1.1	1.190	1.25	1.3
Pa-231	0.09	0.08	0.26	1.0
Ac-227	0.06	0.15	0.15	0.96

[a] Derived from the average soil radionuclide concentrations from the *Pre-Design Investigation Summary Report for St. Cin Park, the Archdiocese of St. Louis Property, and Duchesne Park* (USACE 2015).
[b] Derived from the average soil radionuclide concentrations from the *Pre-Design Investigation Summary Report, Palm Drive Properties, FUSRAP North St. Louis County Sites, St. Louis, Missouri* (USACE 2016).
[c] Derived from the average soil radionuclide concentrations from the *Pre-Design Investigation Summary Report for, Investigation Area (IA)-09: Ballfields, IA-08: North Ditch, and Ballfields: North of IA-09, North St. Louis County Site, St. Louis, Missouri* (USACE 2008).

Table A-1-2. North St. Louis County Sites Average Gross Alpha and Beta Airborne Particulate Emissions for CY 2017

Location	Average Concentration (µCi/mL) for Location[a]	
	Gross Alpha	**Gross Beta**
Duchesne Park	7.46E-15	3.18E-14
Palm Drive	4.01E-15	2.33E-14
IA-09 Ballfields	3.89E-15	3.21E-14
SLAPS Loadout	3.38E-15	3.22E-14
Background Concentration	4.93E-15	2.13E-14

[a] Average concentration values for the sampling period by location.

Table A-1-3. North St. Louis County Site Properties Excavation Data for CY 2017

Location	Area (m^2)	Excavation Start Date[a]	Excavation End Date[a]
Duchesne Park, Survey Unit (SU)-2B	34	07/18/16	02/06/17[c]
Duchesne Park, SU-2E	836	12/06/16	02/06/17
Palm Drive Properties, SU-1	2,441	05/02/17	07/31/17[d]
Palm Drive Properties, SU-2	2,168	05/22/17	07/31/17[d]
Ballfields - Phase 2B, SU-11B	628	08/28/17	12/12/17[e]
Ballfields - Phase 2B, SU-11C	389	12/04/17	12/28/17
Ballfields - Phase 2B, SU-12A	454	12/12/17	12/31/17
Ballfields - Phase 2B, SU-12B	589	12/27/17	12/31/17

[a] Start dates are approximate, plus/minus two weeks.
[b] The date of the verbal/e-mail USACE backfill authorization is used for the backfill date except as otherwise noted.
[c] Backfill authorization received November 14, 2016; however, backfilling was postponed until February 6, 2017.
[d] Partial backfill authorization received June 26, 2017; however, backfilling was not completed until July 31, 2017.
[e] Backfill authorization received October 25, 2017; however, backfilling was postponed until December 12, 2017.
Note: OPEN - Excavation in progress or backfill authorization not yet obtained as of December 31, 2017.

Table A-1-4. North St. Louis County Site Properties Average Surface Area and Flow Rate per Location for CY 2017

Location	Total Days	Surface Area × Total Days	Average Surface Area/Year (A) (m^2)	Diameter of Stack D = $(1.3\ A)^{1/2}$ (m)	Flow Rate $F = V \pi [(D)^2/4]*60$ (m^3/minute)
Duchesne Park					
Duchesne Park, SU-2B	37	1,258	NA	NA	NA
Duchesne Park, SU-2E	37	30,932	NA	NA	NA
	Total	32,190	88	11	2.4E+04
Palm Drive Properties					
Palm Drive Properties, SU-1	91	222,131	NA	NA	NA
Palm Drive Properties, SU-2	71	153,928	NA	NA	NA
	Total	376,059	1,030	37	2.8E+05
IA-09 Ballfields					
Ballfields Phase 2B, SU-11B	107	67,196	NA	NA	NA
Ballfields Phase 2B, SU-11C	25	9,725	NA	NA	NA
Ballfields Phase 2B, SU-12A	20	9,080	NA	NA	NA
Ballfields Phase 2B, SU-12B	5	2,945	NA	NA	NA
	Total	88,946	244	18	6.6E+04
SLAPS Loadout					
SLAPS Loadout	365	219,000	NA	NA	NA
	Total	219,000	600	28	1.6E+05

Note: NA – not applicable

Table A-1-5. SLAPS and SLAPS VPs Airborne Radioactive Particulate Emissions Based on Site Perimeter Air Samples for CY 2017

Property	Duchesne Park			Palm Drive			IA-09 Ballfields			SLAPS Loadout		
Radionuclide	Activity Fraction[a]	Emission Conc. (μCi/cm³)[b]	Release Rate (Ci/year)[c]	Activity Fraction[a]	Emission Conc. (μCi/cm³)[b]	Release Rate (Ci/year)[c]	Activity Fraction[a]	Emission Conc. (μCi/cm³)[b]	Release Rate (Ci/year)[c]	Activity Fraction[a]	Emission Conc. (μCi/cm³)[b]	Release Rate (Ci/year)[c]
U-238[a]	0.08	6.3E-16	8.0E-06	0.08	3.1E-16	4.5E-05	0.09	3.5E-16	1.2E-05	0.09	3.0E-16	2.6E-05
U-235[a]	0.003	2.1E-17	2.6E-07	0.002	9.3E-18	1.4E-06	0.01	2.7E-17	9.5E-07	0.062	2.1E-16	1.8E-05
U-234[d]	0.08	6.3E-16	8.0E-06	0.08	3.1E-16	4.5E-05	0.09	3.5E-16	1.2E-05	0.09	3.0E-16	2.6E-05
Ra-226[a]	0.10	7.5E-16	9.5E-06	0.08	3.3E-16	4.8E-05	0.08	3.3E-16	1.1E-05	0.10	3.3E-16	2.9E-05
Th-232[a]	0.07	5.3E-16	6.7E-06	0.06	2.4E-16	3.6E-05	0.07	2.6E-16	9.0E-06	0.08	2.8E-16	2.4E-05
Th-230[a]	0.49	3.6E-15	4.6E-05	0.55	2.2E-15	3.2E-04	0.49	1.9E-15	6.7E-05	0.30	1.0E-15	8.6E-05
Th-228[a]	0.08	5.9E-16	7.5E-06	0.07	2.8E-16	4.1E-05	0.07	2.8E-16	9.9E-06	0.08	2.7E-16	2.3E-05
Ra-224[d]	0.08	5.9E-16	7.5E-06	0.07	2.8E-16	4.1E-05	0.07	2.8E-16	9.9E-06	0.08	2.7E-16	2.3E-05
Th-234[d]	0.28	9.0E-15	1.1E-04	0.29	6.7E-15	9.8E-04	0.30	9.6E-15	3.4E-04	0.22	7.0E-15	6.0E-04
Pa-234m[d]	0.28	9.0E-15	1.1E-04	0.29	6.7E-15	9.8E-04	0.30	9.6E-15	3.4E-04	0.22	7.0E-15	6.0E-04
Th-231[d]	0.01	3.0E-16	3.8E-06	0.009	2.0E-16	3.0E-05	0.02	7.4E-16	2.6E-05	0.15	4.9E-15	4.2E-04
Ra-228[a]	0.21	6.7E-15	8.5E-05	0.21	4.9E-15	7.2E-04	0.19	6.1E-15	2.1E-04	0.21	6.6E-15	5.7E-04
Ac-228[d]	0.21	6.7E-15	8.5E-05	0.21	4.9E-15	7.2E-04	0.19	6.1E-15	2.1E-04	0.21	6.6E-15	5.7E-04
Pa-231[a]	0.006	4.7E-17	5.9E-07	0.005	1.9E-17	2.8E-06	0.02	5.9E-17	2.1E-06	0.060	2.0E-16	1.7E-05
Ac-227[a]	0.004	3.1E-17	3.9E-07	0.009	3.5E-17	5.2E-06	0.01	3.4E-17	1.2E-06	0.058	2.0E-16	1.7E-05

[a] Average soil concentrations are presented in Table A-1-1.
[b] Emission concentration is equal to the activity fraction * the gross alpha or gross beta airborne particulate concentrations listed in Table A-1-2.
[c] Release rate based on 365-day period at measured flow rate (Table A-1-4) for each site as determined from the average annual wind speed (4.446 m per second) and calculated site area (Table A-1-4). (Note: 1 mL = 1 cm³).
[d] When data were not available, the radionuclide was assumed to be in secular equilibrium with the parent radionuclide.

Table A-1-6. USACE St. Louis FUSRAP Laboratory Analyses for CY 2017

Site	Type	Gamma Spectroscopy	Isotopic Ra[a]	Isotopic Th[a]	Isotopic U[a]	Total Drying and Grinding[b]	Total Separations[c]
HISS	Soil	0	0	0	0	0	0
HISS	Water	0	7	7	7	0	21
Latty Avenue Properties	Soil	0	0	0	0	0	0
Latty Avenue Properties	Water	0	0	0	0	0	0
IAAAP	Soil	638	0	0	638	638	638
IAAAP	Water	0	0	0	19	0	19
SLAPS	Soil	0	0	0	0	0	0
SLAPS	Water	3	6	6	3	3	15
SLAPS VPs	Soil	1,994	0	1,766	0	1,994	1,766
SLAPS VPs	Water	3	18	18	2	3	38
CWC	Sediment (soil)	1,397	0	1,382	0	1,397	1,382
CWC	Water	0	18	18	18	0	54
SLDS	Soil	517	0	510	0	517	510
SLDS	Water	0	136	136	6	0	278
		HISS and Latty Avenue Properties			**Total**	0	21
		IAAAP			**Total**	638	657
		SLAPS, SLAPS VPs, and CWC			**Total**	3,397	3,255
		SLDS			**Total**	517	788
					Grand Total	4,552	4,721

[a] Assumes isotopic Ra, Th, and U occur in separate and distinct processes.
[b] Assumes all soil samples went through a drying and grinding process.
[c] Assumes all soil and water samples for isotopic Ra, Th, and U went through a separations process.
Notes:
Data provided by the USACE St. Louis FUSRAP laboratory for CY 2017.
CWC samples use SLAPS characterization data to determine release rates.

Table A-1-7. SLDS Property Laboratory Samples for CY 2017

Radionuclide	Average (pCi/g)	No. Samples (Drying and Grinding)	No. Samples (Separations)	Emission Rate[a] (Ci/year)
U-238[b]	10.0	517	788	4.5E-08
U-235[b]	0.6	517	788	2.7E-09
U-234[bc]	10.0	517	788	4.5E-08
Ra-226[b]	2.9	517	788	1.3E-08
Th-232[b]	0.9	517	788	4.0E-09
Th-230[b]	3.1	517	788	1.4E-08
Th-228[b]	1.0	517	788	4.5E-09
Ra-224[c]	1.0	517	788	4.5E-09
Th-234[c]	10.0	517	788	4.5E-08
Pa-234m[c]	10.0	517	788	4.5E-08
Th-231[c]	0.6	517	788	2.7E-09
Ra-228	0.9	517	788	4.0E-09
Ac-228[c]	0.9	517	788	4.0E-09
Pa-231	1.1	517	788	4.9E-09
Ac-227	0.7	517	788	3.1E-09

[a] Emission Rate = (0.001 * Avg * No. Samples [drying and grinding] + 0.005 * Avg * No. Samples [separations]) * (1,000 g * 1E-12Ci/pCi).
[b] Average soil concentration from all data analyzed at the USACE radioanalytical laboratory during 2017.
[c] When data were not available, the radionuclide was assumed to be in secular equilibrium with the parent radionuclide.

Table A-1-8. SLAPS and SLAPS VPs Laboratory Samples for CY 2017

Radionuclide	Average (pCi/g)	No. Samples (Drying and Grinding)	No. Samples (Separations)	Emission Rate[a] (Ci/year)
U-238[b]	3.7	3,397	3,255	7.2E-08
U-235[b]	1.2	3,397	3,255	2.3E-08
U-234[bc]	3.7	3,397	3,255	7.2E-08
Ra-226[b]	2.0	3,397	3,255	3.9E-08
Th-232[b]	1.9	3,397	3,255	3.7E-08
Th-230[b]	4.9	3,397	3,255	9.7E-08
Th-228[b]	2.0	3,397	3,255	3.9E-08
Ra-224[c]	2.0	3,397	3,255	3.9E-08
Th-234[c]	3.7	3,397	3,255	7.2E-08
Pa-234m[c]	3.7	3,397	3,255	7.2E-08
Th-231[c]	1.2	3,397	3,255	2.3E-08
Ra-228	1.7	3,397	3,255	3.2E-08
Ac-228[c]	1.7	3,397	3,255	3.2E-08
Pa-231[b]	1.0	3,397	3,255	1.9E-08
Ac-227[b]	0.8	3,397	3,255	1.7E-08

[a] Emission Rate = (0.001 * Avg * No. Samples [drying and grinding] + 0.005 * Avg * No. Samples [separations]) * (1,000 g * 1E-12Ci/pCi).
[b] Average soil concentration from all data analyzed at the USACE radioanalytical laboratory during 2017.
[c] When data were not available, the radionuclide was assumed to be in secular equilibrium with the parent radionuclide.

Table A-1-9. Latty Avenue Property Laboratory Samples for CY 2017

Radionuclide	Average (pCi/g)[a]	No. Samples (Drying and Grinding)	No. Samples[a] (Separations)	Emission Rate (Ci/year)
U-238	NA	0	21	NA
U-235	NA	0	21	NA
U-234	NA	0	21	NA
Ra-226	NA	0	21	NA
Th-232	NA	0	21	NA
Th-230	NA	0	21	NA
Th-228	NA	0	21	NA
Ra-224	NA	0	21	NA
Th-234	NA	0	21	NA
Pa-234m	NA	0	21	NA
Th-231	NA	0	21	NA
Ra-228	NA	0	21	NA
Ac-228	NA	0	21	NA
Pa-231	NA	0	21	NA
Ac-227	NA	0	21	NA

[a] No soil samples collected at Latty Avenue properties during 2017. All samples analyzed were water samples.
Note: NA – Not applicable.

Table A-1-10. Iowa Army Ammunition Plant Laboratory Samples for CY 2017

Radionuclide	Average (pCi/g)	No. Samples (Drying and Grinding)	No. Samples (Separations)	Emission Rate[b] (Ci/year)
U-238[a]	2.5	638	657	9.9E-09
U-235[a]	1.0	638	657	3.8E-09
U-234[c]	1.8	638	657	6.9E-09
Ra-226[a]	2.0	638	657	7.9E-09
Th-232[a]	2.0	638	657	7.7E-09
Th-230[a]	6.8	638	657	2.7E-08
Th-228[a]	2.0	638	657	7.9E-09
Ra-224[c]	2.0	638	657	7.9E-09
Th-234[c]	2.5	638	657	9.9E-09
Pa-234m[c]	2.5	638	657	9.9E-09
Th-231[c]	1.0	638	657	3.8E-09
Ra-228[a]	1.9	638	657	7.3E-09
Ac-228[c]	1.9	638	657	7.3E-09
Pa-231[a]	0.8	638	657	3.3E-09
Ac-227[a]	1.2	638	657	4.6E-09

[a] Average soil concentration from all data analyzed at the USACE radioanalytical laboratory during 2017.
[b] Emission Rate = (0.001 * Avg * No. Samples [drying and grinding]+ 0.005 * Avg * No. Samples [separations]) * (1,000 g * 1E-12Ci/pCi).
[c] When data were not available, the radionuclide was assumed to be in secular equilibrium with the parent radionuclide.

Table A-1-11. Total Laboratory Airborne Radioactive Particulate Emission Rate for CY 2017

Radionuclide	Emission Rate (Ci/year)				
	SLDS	SLAPS and SLAPS VPs	Latty Avenue Properties	IAAAP	Total Across Laboratory[a]
U-238	4.5E-08	7.2E-08	NA	9.9E-09	1.3E-07
U-235	2.7E-09	2.3E-08	NA	3.8E-09	2.9E-08
U-234	4.5E-08	7.2E-08	NA	6.9E-09	1.2E-07
Ra-226	1.3E-08	3.9E-08	NA	7.9E-09	6.0E-08
Th-232	4.0E-09	3.7E-08	NA	7.7E-09	4.9E-08
Th-230	1.4E-08	9.7E-08	NA	2.7E-08	1.4E-07
Th-228	4.5E-09	3.9E-08	NA	7.9E-09	5.1E-08
Ra-224	4.5E-09	3.9E-08	NA	7.9E-09	5.1E-08
Th-234	4.5E-08	7.2E-08	NA	9.9E-09	1.3E-07
Pa-234m	4.5E-08	7.2E-08	NA	9.9E-09	1.3E-07
Th-231	2.7E-09	2.3E-08	NA	3.8E-09	2.9E-08
Ra-228	4.0E-09	3.2E-08	NA	7.3E-09	4.4E-08
Ac-228	4.0E-09	3.2E-08	NA	7.3E-09	4.4E-08
Pa-231	4.9E-09	1.9E-08	NA	3.3E-09	2.7E-08
Ac-227	3.1E-09	1.7E-08	NA	4.6E-09	2.4E-08

[a] Total emission rate is the sum of the SLDS, SLAPS and SLAPS VPs, Latty Avenue Properties, and IAAAP emission rates.
Note: NA – Not applicable.

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ATTACHMENT A-2

CAP88-PC RUNS FOR NORTH ST. LOUIS COUNTY SITE PROPERTIES

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CAP88-PC RUNS FOR THE SLAPS AND SLAPS VICINITY PROPERTIES

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CAP88 OUTPUT RESULTS

DUCHESNE PARK

CAP88-PC

Version 4.0

Clean Air Act Assessment Package - 1988

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 05 15:40:22 2018

```
     Facility:  Duchesne Park
      Address:
         City:  St. Louis
        State:  MO          Zip:  63042


  Source Category:  Area
      Source Type:  Area
    Emission Year:  2017
   DOSE Age Group:  Adult

         Comments:  Air


     Dataset Name:  Duchesne Park 20
     Dataset Date:  Apr 5, 2018 03:40 PM
        Wind File:  C:\Users\passigm\Documents\CAP88\Wind Files\13994.WND
```

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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.11E-01
UB_Wall	1.21E-01
Bone_Sur	8.60E+00
Brain	1.16E-01
Breasts	1.25E-01
St_Wall	1.17E-01
SI_Wall	1.16E-01
ULI_Wall	1.22E-01
LLI_Wall	1.34E-01
Kidneys	2.21E-01
Liver	7.58E-01
Muscle	1.28E-01
Ovaries	1.86E-01
Pancreas	1.12E-01
R_Marrow	5.55E-01
Skin	8.21E-01
Spleen	1.17E-01
Testes	2.00E-01
Thymus	1.16E-01
Thyroid	1.20E-01
GB_Wall	1.12E-01
Ht_Wall	1.16E-01
Uterus	1.15E-01
ET_Reg	6.96E-01
Lung_66	1.89E+00
Effectiv	5.25E-01

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	3.27E-02
INHALATION	3.92E-01
AIR IMMERSION	4.66E-06
GROUND SURFACE	1.00E-01
INTERNAL	4.25E-01
EXTERNAL	1.00E-01
TOTAL	5.25E-01

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NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	3.99E-03
Th-234	3.18E-04
Pa-234m	1.49E-03
Pa-234	2.94E-05
U-234	4.81E-03
Th-230	1.34E-01
Ra-226	7.78E-03
Rn-222	6.05E-06
Po-218	1.08E-10
Pb-214	3.95E-03
At-218	4.06E-10
Bi-214	2.31E-02
Rn-218	2.35E-12
Po-214	1.28E-06
Tl-210	9.01E-06
Pb-210	1.93E-05
Bi-210	3.12E-04
Hg-206	2.52E-11
Po-210	8.09E-08
Tl-206	7.29E-10
U-235	2.02E-04
Th-231	6.62E-06
Pa-231	1.17E-02
Ac-227	9.64E-02
Th-227	5.82E-04
Fr-223	5.48E-06
Ra-223	6.50E-04
Rn-219	2.82E-04
At-219	0.00E+00
Bi-215	1.27E-09
Po-215	8.60E-07
Pb-211	5.53E-04
Bi-211	2.28E-04
Tl-207	2.87E-04
Po-211	1.10E-07
Th-232	3.59E-02
Ra-228	7.23E-02
Ac-228	2.68E-02
Th-228	5.42E-02
Ra-224	3.76E-03
Rn-220	1.85E-05
Po-216	4.46E-07
Pb-212	4.06E-03
Bi-212	4.73E-03
Po-212	0.00E+00
Tl-208	3.27E-02
TOTAL	5.25E-01

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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	4.15E-09
INHALATION	8.42E-08
AIR IMMERSION	2.51E-12
GROUND SURFACE	5.22E-08
INTERNAL	8.84E-08
EXTERNAL	5.22E-08
TOTAL	1.41E-07

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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.33E-09
Th-234	1.24E-10
Pa-234m	2.61E-10
Pa-234	1.60E-11
U-234	1.65E-09
Th-230	2.97E-08
Ra-226	4.12E-09
Rn-222	3.30E-12
Po-218	4.83E-17
Pb-214	2.11E-09
At-218	5.01E-17
Bi-214	1.22E-08
Rn-218	1.29E-18
Po-214	7.02E-13
Tl-210	4.81E-12
Pb-210	8.65E-12
Bi-210	3.46E-11
Hg-206	1.12E-17
Po-210	4.44E-14
Tl-206	8.20E-17
U-235	8.05E-11
Th-231	2.99E-12
Pa-231	5.07E-10
Ac-227	1.21E-08
Th-227	3.15E-10
Fr-223	2.04E-12
Ra-223	3.51E-10
Rn-219	1.54E-10
At-219	0.00E+00
Bi-215	5.65E-16
Po-215	4.72E-13
Pb-211	1.98E-10
Bi-211	1.24E-10
Tl-207	3.68E-11
Po-211	6.01E-14
Th-232	7.87E-09
Ra-228	1.04E-08
Ac-228	1.42E-08
Th-228	1.95E-08
Ra-224	1.42E-09
Rn-220	1.01E-11
Po-216	2.45E-13
Pb-212	2.21E-09
Bi-212	1.83E-09
Po-212	0.00E+00
Tl-208	1.78E-08
TOTAL	1.41E-07

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INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Direction	Distance (m) 70	150	600	4500	
N	5.3E-01	1.6E-01	3.5E-02	2.5E-02	
NNW	2.8E-01	9.3E-02	3.0E-02	2.4E-02	
NW	3.2E-01	1.1E-01	3.0E-02	2.4E-02	
WNW	3.9E-01	1.2E-01	3.2E-02	2.4E-02	farm
W	3.0E-01	1.0E-01	3.0E-02	2.4E-02	business
WSW	1.6E-01	6.1E-02	2.7E-02	2.4E-02	
SW	2.1E-01	7.6E-02	2.8E-02	2.4E-02	
SSW	2.6E-01	8.8E-02	2.9E-02	2.4E-02	
S	2.3E-01	8.0E-02	2.8E-02	2.4E-02	
SSE	1.7E-01	6.3E-02	2.7E-02	2.4E-02	
SSE	2.3E-01	8.0E-02	2.9E-02	2.4E-02	
ESE	3.8E-01	1.2E-01	3.2E-02	2.4E-02	
E	4.9E-01	1.5E-01	3.4E-02	2.4E-02	school
ENE	4.1E-01	1.3E-01	3.2E-02	2.4E-02	
NE	2.6E-01	8.9E-02	2.9E-02	2.4E-02	resident
NNE	2.2E-01	7.8E-02	2.8E-02	2.4E-02	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in the 2017 Radionuclide Emissions NESHAP Report (Appendix A) taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy.

Thu Apr 05 15:40:22 2018 SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	70	150	600	4500
N	1.4E-07	4.0E-08	6.0E-09	3.1E-09
NNW	7.4E-08	2.2E-08	4.5E-09	3.1E-09
NW	8.5E-08	2.6E-08	4.8E-09	3.1E-09
WNW	1.0E-07	3.1E-08	5.2E-09	3.1E-09
W	7.9E-08	2.4E-08	4.6E-09	3.1E-09
WSW	4.0E-08	1.3E-08	3.8E-09	3.1E-09
SW	5.5E-08	1.7E-08	4.1E-09	3.1E-09
SSW	6.6E-08	2.1E-08	4.4E-09	3.1E-09
S	6.0E-08	1.8E-08	4.2E-09	3.1E-09
SSE	4.3E-08	1.4E-08	3.9E-09	3.1E-09
SSE	6.0E-08	1.9E-08	4.3E-09	3.1E-09
ESE	1.0E-07	3.0E-08	5.1E-09	3.1E-09
E	1.3E-07	3.8E-08	5.7E-09	3.1E-09
ENE	1.1E-07	3.2E-08	5.3E-09	3.1E-09
NE	6.8E-08	2.1E-08	4.4E-09	3.1E-09
NNE	5.8E-08	1.8E-08	4.2E-09	3.1E-09

CAP88 OUTPUT RESULTS

PALM DRIVE PROPERTIES

CAP88-PC

Version 4.0

Clean Air Act Assessment Package - 1988

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 05 15:44:57 2018

```
      Facility:  Palm Drive
       Address:
          City:  St. Louis
         State:  MO          Zip:  63042

Source Category:  Area
    Source Type:  Area
  Emission Year:  2017
 DOSE Age Group:  Adult

       Comments:  Air

   Dataset Name:  Palm Drive 2017.
   Dataset Date:  Apr 5, 2018 03:44 PM
      Wind File:  C:\Users\passigm\Documents\CAP88\Wind Files\13994.WND
```

Thu Apr 05 15:44:57 2018

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.03E+00
UB_Wall	2.23E+00
Bone_Sur	1.33E+02
Brain	2.13E+00
Breasts	2.31E+00
St_Wall	2.15E+00
SI_Wall	2.14E+00
ULI_Wall	2.23E+00
LLI_Wall	2.42E+00
Kidneys	4.22E+00
Liver	5.29E+00
Muscle	2.38E+00
Ovaries	2.86E+00
Pancreas	2.05E+00
R_Marrow	9.55E+00
Skin	1.52E+01
Spleen	2.17E+00
Testes	3.16E+00
Thymus	2.14E+00
Thyroid	2.21E+00
GB_Wall	2.06E+00
Ht_Wall	2.13E+00
Uterus	2.12E+00
ET_Reg	1.28E+01
Lung_66	3.33E+01
Effectiv	8.62E+00

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	8.21E-01
INHALATION	5.79E+00
AIR IMMERSION	1.19E-04
GROUND SURFACE	2.01E+00
INTERNAL	6.61E+00
EXTERNAL	2.01E+00
TOTAL	8.62E+00

Thu Apr 05 15:44:57 2018 SUMMARY
Page 2

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	6.77E-02
Th-234	7.54E-03
Pa-234m	2.56E-02
Pa-234	5.05E-04
U-234	3.81E-03
Th-230	2.81E+00
Ra-226	1.21E-01
Rn-222	9.39E-05
Po-218	1.68E-09
Pb-214	6.13E-02
At-218	6.31E-09
Bi-214	3.59E-01
Rn-218	3.66E-11
Po-214	1.99E-05
Tl-210	1.40E-04
Pb-210	2.99E-04
Bi-210	4.84E-03
Hg-206	3.90E-10
Po-210	1.25E-06
Tl-206	1.13E-08
U-235	3.27E-03
Th-231	1.08E-04
Pa-231	1.68E-01
Ac-227	1.09E-02
Th-227	9.15E-04
Fr-223	8.62E-06
Ra-223	1.02E-03
Rn-219	4.43E-04
At-219	0.00E+00
Bi-215	1.99E-09
Po-215	1.35E-06
Pb-211	8.70E-04
Bi-211	3.58E-04
Tl-207	4.51E-04
Po-211	1.73E-07
Th-232	5.81E-01
Ra-228	1.88E+00
Ac-228	6.11E-01
Th-228	8.94E-01
Ra-224	6.37E-02
Rn-220	4.18E-04
Po-216	1.01E-05
Pb-212	9.17E-02
Bi-212	1.07E-01
Po-212	0.00E+00
Tl-208	7.39E-01
TOTAL	8.62E+00

Thu Apr 05 15:44:57 2018 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	8.56E-08
INHALATION	1.37E-06
AIR IMMERSION	6.41E-11
GROUND SURFACE	1.05E-06
INTERNAL	1.46E-06
EXTERNAL	1.05E-06
TOTAL	2.51E-06

Thu Apr 05 15:44:57 2018 SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	2.26E-08
Th-234	2.79E-09
Pa-234m	4.48E-09
Pa-234	2.74E-10
U-234	1.31E-09
Th-230	6.22E-07
Ra-226	6.47E-08
Rn-222	5.13E-11
Po-218	7.50E-16
Pb-214	3.28E-08
At-218	7.78E-16
Bi-214	1.89E-07
Rn-218	2.00E-17
Po-214	1.09E-11
Tl-210	7.48E-11
Pb-210	1.34E-10
Bi-210	5.36E-10
Hg-206	1.73E-16
Po-210	6.88E-13
Tl-206	1.27E-15
U-235	1.30E-09
Th-231	4.89E-11
Pa-231	7.25E-09
Ac-227	1.36E-09
Th-227	4.96E-10
Fr-223	3.21E-12
Ra-223	5.53E-10
Rn-219	2.42E-10
At-219	0.00E+00
Bi-215	8.89E-16
Po-215	7.42E-13
Pb-211	3.11E-10
Bi-211	1.96E-10
Tl-207	5.79E-11
Po-211	9.45E-14
Th-232	1.27E-07
Ra-228	2.68E-07
Ac-228	3.23E-07
Th-228	3.21E-07
Ra-224	2.43E-08
Rn-220	2.29E-10
Po-216	5.54E-12
Pb-212	4.99E-08
Bi-212	4.13E-08
Po-212	0.00E+00
Tl-208	4.02E-07
TOTAL	2.51E-06

Thu Apr 05 15:44:57 2018 SUMMARY
Page 5

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Direction	Distance (m) 20	400	850	4300	
N	8.2E+00	7.4E-01	6.5E-01	6.2E-01	business
NNW	8.6E+00	6.8E-01	6.4E-01	6.2E-01	
NW	8.2E+00	6.9E-01	6.4E-01	6.2E-01	
WNW	6.9E+00	7.1E-01	6.4E-01	6.2E-01	farm
W	6.0E+00	6.9E-01	6.4E-01	6.2E-01	
WSW	5.3E+00	6.5E-01	6.3E-01	6.2E-01	
SW	4.9E+00	6.7E-01	6.3E-01	6.2E-01	
SSW	4.9E+00	6.8E-01	6.3E-01	6.2E-01	
S	5.4E+00	6.7E-01	6.3E-01	6.2E-01	resident
SSE	6.1E+00	6.6E-01	6.3E-01	6.2E-01	
SSE	6.9E+00	6.7E-01	6.3E-01	6.2E-01	school
ESE	7.4E+00	7.1E-01	6.4E-01	6.2E-01	
E	7.6E+00	7.3E-01	6.5E-01	6.2E-01	
ENE	7.2E+00	7.1E-01	6.4E-01	6.2E-01	
NE	7.4E+00	6.8E-01	6.4E-01	6.2E-01	
NNE	8.0E+00	6.7E-01	6.3E-01	6.2E-01	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in the 2017 Radionuclide Emissions NESHAP Report (Appendix A) taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy.

Thu Apr 05 15:44:57 2018 SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	20	400	850	4300
N	2.4E-06	1.0E-07	7.3E-08	6.5E-08
NNW	2.5E-06	8.3E-08	6.9E-08	6.5E-08
NW	2.4E-06	8.6E-08	7.0E-08	6.5E-08
WNW	2.0E-06	9.1E-08	7.1E-08	6.5E-08
W	1.7E-06	8.5E-08	6.9E-08	6.5E-08
WSW	1.5E-06	7.4E-08	6.7E-08	6.5E-08
SW	1.4E-06	7.8E-08	6.8E-08	6.5E-08
SSW	1.4E-06	8.1E-08	6.8E-08	6.5E-08
S	1.5E-06	7.9E-08	6.8E-08	6.5E-08
SSE	1.7E-06	7.5E-08	6.7E-08	6.5E-08
SSE	2.0E-06	8.0E-08	6.8E-08	6.5E-08
ESE	2.1E-06	9.0E-08	7.1E-08	6.5E-08
E	2.2E-06	9.8E-08	7.3E-08	6.5E-08
ENE	2.1E-06	9.3E-08	7.1E-08	6.5E-08
NE	2.1E-06	8.2E-08	6.9E-08	6.5E-08
NNE	2.3E-06	7.9E-08	6.8E-08	6.5E-08

CAP88 OUTPUT RESULTS

IA-09 BALLFIELDS

CAP88-PC

Version 4.0

Clean Air Act Assessment Package - 1988

```
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 05 15:53:49 2018


       Facility:  IA-09 Ballfields
        Address:
           City:  St. Louis
          State:  MO         Zip:  63042


Source Category:  Area
    Source Type:  Area
  Emission Year:  2017
 DOSE Age Group:  Adult

       Comments:  Air


   Dataset Name:  IA-09 Ballfields
   Dataset Date:  Apr 5, 2018 03:53 PM
      Wind File:  C:\Users\passigm\Documents\CAP88\Wind Files\13994.WND
```

Thu Apr 05 15:53:49 2018

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	4.66E-03
UB_Wall	5.10E-03
Bone_Sur	3.13E-01
Brain	4.88E-03
Breasts	5.27E-03
St_Wall	4.93E-03
SI_Wall	4.90E-03
ULI_Wall	5.14E-03
LLI_Wall	5.66E-03
Kidneys	9.46E-03
Liver	1.71E-02
Muscle	5.42E-03
Ovaries	6.71E-03
Pancreas	4.70E-03
R_Marrow	2.31E-02
Skin	3.37E-02
Spleen	4.96E-03
Testes	7.35E-03
Thymus	4.90E-03
Thyroid	5.06E-03
GB_Wall	4.71E-03
Ht_Wall	4.88E-03
Uterus	4.85E-03
ET_Reg	2.33E-02
Lung_66	5.99E-02
Effectiv	1.83E-02

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	2.37E-03
INHALATION	1.15E-02
AIR IMMERSION	2.53E-07
GROUND SURFACE	4.38E-03
INTERNAL	1.39E-02
EXTERNAL	4.38E-03
TOTAL	1.83E-02

Thu Apr 05 15:53:49 2018 SUMMARY
Page 2

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	1.32E-04
Th-234	1.95E-05
Pa-234m	5.51E-05
Pa-234	1.09E-06
U-234	1.59E-04
Th-230	4.28E-03
Ra-226	2.22E-04
Rn-222	1.70E-07
Po-218	3.04E-12
Pb-214	1.11E-04
At-218	1.14E-11
Bi-214	6.48E-04
Rn-218	6.61E-14
Po-214	3.59E-08
Tl-210	2.53E-07
Pb-210	5.42E-07
Bi-210	8.76E-06
Hg-206	7.07E-13
Po-210	2.27E-09
Tl-206	2.04E-11
U-235	1.66E-05
Th-231	5.89E-07
Pa-231	9.10E-04
Ac-227	8.84E-04
Th-227	1.04E-05
Fr-223	9.77E-08
Ra-223	1.16E-05
Rn-219	5.01E-06
At-219	0.00E+00
Bi-215	2.25E-11
Po-215	1.53E-08
Pb-211	9.85E-06
Bi-211	4.06E-06
Tl-207	5.10E-06
Po-211	1.95E-09
Th-232	1.05E-03
Ra-228	4.56E-03
Ac-228	1.37E-03
Th-228	1.56E-03
Ra-224	1.14E-04
Rn-220	9.38E-07
Po-216	2.26E-08
Pb-212	2.06E-04
Bi-212	2.40E-04
Po-212	0.00E+00
Tl-208	1.66E-03
TOTAL	1.83E-02

Thu Apr 05 15:53:49 2018 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	2.26E-10
INHALATION	2.52E-09
AIR IMMERSION	1.36E-13
GROUND SURFACE	2.29E-09
INTERNAL	2.75E-09
EXTERNAL	2.29E-09
TOTAL	5.04E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	4.34E-11
Th-234	6.94E-12
Pa-234m	9.64E-12
Pa-234	5.90E-13
U-234	5.45E-11
Th-230	9.42E-10
Ra-226	1.30E-10
Rn-222	9.27E-14
Po-218	1.36E-18
Pb-214	5.93E-11
At-218	1.41E-18
Bi-214	3.42E-10
Rn-218	3.62E-20
Po-214	1.97E-14
Tl-210	1.35E-13
Pb-210	2.43E-13
Bi-210	9.70E-13
Hg-206	3.13E-19
Po-210	1.24E-15
Tl-206	2.30E-18
U-235	6.65E-12
Th-231	2.65E-13
Pa-231	3.93E-11
Ac-227	1.10E-10
Th-227	5.61E-12
Fr-223	3.64E-14
Ra-223	6.25E-12
Rn-219	2.74E-12
At-219	0.00E+00
Bi-215	1.01E-17
Po-215	8.40E-15
Pb-211	3.52E-12
Bi-211	2.22E-12
Tl-207	6.55E-13
Po-211	1.07E-15
Th-232	2.29E-10
Ra-228	5.99E-10
Ac-228	7.28E-10
Th-228	5.59E-10
Ra-224	4.42E-11
Rn-220	5.14E-13
Po-216	1.24E-14
Pb-212	1.12E-10
Bi-212	9.28E-11
Po-212	0.00E+00
Tl-208	9.04E-10
TOTAL	5.04E-09

Thu Apr 05 15:53:49 2018

SUMMARY
Page 5

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	580	720	1700	2500	
N	1.8E-02	1.3E-02	4.4E-03	3.2E-03	
NNW	1.0E-02	7.5E-03	3.2E-03	2.6E-03	
NW	1.2E-02	8.5E-03	3.4E-03	2.7E-03	
WNW	1.4E-02	9.9E-03	3.7E-03	2.8E-03	
W	1.1E-02	7.9E-03	3.2E-03	2.6E-03	
WSW	6.2E-03	4.8E-03	2.6E-03	2.3E-03	business
SW	8.0E-03	6.0E-03	2.8E-03	2.4E-03	
SSW	9.5E-03	6.9E-03	3.0E-03	2.5E-03	
S	8.6E-03	6.4E-03	2.9E-03	2.4E-03	
SSE	6.6E-03	5.1E-03	2.6E-03	2.3E-03	
SSE	8.7E-03	6.5E-03	2.9E-03	2.5E-03	
ESE	1.4E-02	9.7E-03	3.6E-03	2.8E-03	
E	1.7E-02	1.2E-02	4.1E-03	3.1E-03	school
ENE	1.4E-02	1.0E-02	3.7E-03	2.9E-03	
NE	9.6E-03	7.0E-03	3.1E-03	2.5E-03	resident (720), farm (1,700)
NNE	8.4E-03	6.2E-03	2.9E-03	2.4E-03	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in the 2017 Radionuclide Emissions NESHAP Report (Appendix A) taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy.

Thu Apr 05 15:53:49 2018 SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	580	720	1700	2500
N	5.0E-09	3.4E-09	9.3E-10	5.8E-10
NNW	2.7E-09	1.9E-09	5.7E-10	3.9E-10
NW	3.1E-09	2.1E-09	6.2E-10	4.2E-10
WNW	3.7E-09	2.5E-09	7.2E-10	4.7E-10
W	2.9E-09	2.0E-09	5.9E-10	4.0E-10
WSW	1.5E-09	1.0E-09	3.8E-10	2.9E-10
SW	2.0E-09	1.4E-09	4.5E-10	3.2E-10
SSW	2.4E-09	1.7E-09	5.1E-10	3.6E-10
S	2.2E-09	1.5E-09	4.9E-10	3.5E-10
SSE	1.6E-09	1.1E-09	4.0E-10	3.0E-10
SSE	2.2E-09	1.5E-09	5.0E-10	3.5E-10
ESE	3.6E-09	2.5E-09	7.1E-10	4.6E-10
E	4.7E-09	3.2E-09	8.5E-10	5.3E-10
ENE	3.9E-09	2.6E-09	7.3E-10	4.7E-10
NE	2.5E-09	1.7E-09	5.3E-10	3.7E-10
NNE	2.1E-09	1.5E-09	4.8E-10	3.4E-10

CAP88 OUTPUT RESULTS

SLAPS Loadout

CAP88-PC

Version 4.0

Clean Air Act Assessment Package - 1988

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 05 15:57:20 2018

```
      Facility:  SLAPS Loadout
       Address:
          City:  St. Louis
         State:  MO          Zip:  63042

 Source Category:  Area
     Source Type:  Area
   Emission Year:  2017
  DOSE Age Group:  Adult

        Comments:  Air

    Dataset Name:  SLAPS Loadout 20
    Dataset Date:  Apr 5, 2018 03:57 PM
       Wind File:  C:\Users\passigm\Documents\CAP88\Wind Files\13994.WND
```

Thu Apr 05 15:57:20 2018 SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.72E-02
UB_Wall	1.88E-02
Bone_Sur	1.30E+00
Brain	1.80E-02
Breasts	1.94E-02
St_Wall	1.82E-02
SI_Wall	1.81E-02
ULI_Wall	1.90E-02
LLI_Wall	2.10E-02
Kidneys	3.53E-02
Liver	7.90E-02
Muscle	2.00E-02
Ovaries	2.62E-02
Pancreas	1.74E-02
R_Marrow	8.81E-02
Skin	1.20E-01
Spleen	1.83E-02
Testes	2.85E-02
Thymus	1.81E-02
Thyroid	1.87E-02
GB_Wall	1.74E-02
Ht_Wall	1.80E-02
Uterus	1.79E-02
ET_Reg	6.67E-02
Lung_66	1.72E-01
Effectiv	6.43E-02

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	7.26E-03
INHALATION	4.14E-02
AIR IMMERSION	8.99E-07
GROUND SURFACE	1.56E-02
INTERNAL	4.87E-02
EXTERNAL	1.56E-02
TOTAL	6.43E-02

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NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	3.76E-04
Th-234	4.60E-05
Pa-234m	1.54E-04
Pa-234	3.04E-06
U-234	4.53E-04
Th-230	7.24E-03
Ra-226	7.39E-04
Rn-222	5.60E-07
Po-218	1.00E-11
Pb-214	3.66E-04
At-218	3.76E-11
Bi-214	2.14E-03
Rn-218	2.18E-13
Po-214	1.18E-07
Tl-210	8.34E-07
Pb-210	1.79E-06
Bi-210	2.90E-05
Hg-206	2.34E-12
Po-210	7.51E-09
Tl-206	6.77E-11
U-235	4.14E-04
Th-231	1.45E-05
Pa-231	9.73E-03
Ac-227	5.63E-03
Th-227	8.70E-05
Fr-223	8.20E-07
Ra-223	9.73E-05
Rn-219	4.21E-05
At-219	0.00E+00
Bi-215	1.89E-10
Po-215	1.29E-07
Pb-211	8.27E-05
Bi-211	3.41E-05
Tl-207	4.28E-05
Po-211	1.64E-08
Th-232	3.70E-03
Ra-228	1.54E-02
Ac-228	4.86E-03
Th-228	4.79E-03
Ra-224	3.58E-04
Rn-220	3.31E-06
Po-216	7.98E-08
Pb-212	7.27E-04
Bi-212	8.48E-04
Po-212	0.00E+00
Tl-208	5.86E-03
TOTAL	6.43E-02

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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	6.74E-10
INHALATION	7.56E-09
AIR IMMERSION	4.85E-13
GROUND SURFACE	8.15E-09
INTERNAL	8.23E-09
EXTERNAL	8.15E-09
TOTAL	1.64E-08

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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.24E-10
Th-234	1.69E-11
Pa-234m	2.70E-11
Pa-234	1.65E-12
U-234	1.56E-10
Th-230	1.60E-09
Ra-226	4.17E-10
Rn-222	3.05E-13
Po-218	4.47E-18
Pb-214	1.96E-10
At-218	4.63E-18
Bi-214	1.13E-09
Rn-218	1.19E-19
Po-214	6.50E-14
Tl-210	4.45E-13
Pb-210	8.03E-13
Bi-210	3.21E-12
Hg-206	1.04E-18
Po-210	4.12E-15
Tl-206	7.61E-18
U-235	1.66E-10
Th-231	6.52E-12
Pa-231	4.21E-10
Ac-227	7.03E-10
Th-227	4.71E-11
Fr-223	3.06E-13
Ra-223	5.25E-11
Rn-219	2.31E-11
At-219	0.00E+00
Bi-215	8.45E-17
Po-215	7.05E-14
Pb-211	2.96E-11
Bi-211	1.86E-11
Tl-207	5.51E-12
Po-211	8.98E-15
Th-232	8.09E-10
Ra-228	2.09E-09
Ac-228	2.57E-09
Th-228	1.72E-09
Ra-224	1.40E-10
Rn-220	1.81E-12
Po-216	4.39E-14
Pb-212	3.95E-10
Bi-212	3.27E-10
Po-212	0.00E+00
Tl-208	3.19E-09
TOTAL	1.64E-08

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INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Direction	Distance (m) 500	770	1710	2580	
N	6.4E-02	3.2E-02	1.2E-02	9.1E-03	
NNW	3.6E-02	1.9E-02	9.1E-03	7.4E-03	
NW	4.1E-02	2.1E-02	9.6E-03	7.7E-03	
WNW	4.9E-02	2.5E-02	1.0E-02	8.1E-03	
W	3.8E-02	2.0E-02	9.3E-03	7.5E-03	
WSW	2.1E-02	1.3E-02	7.4E-03	6.6E-03	business
SW	2.8E-02	1.5E-02	8.1E-03	6.9E-03	
SSW	3.3E-02	1.8E-02	8.7E-03	7.2E-03	
S	3.0E-02	1.6E-02	8.4E-03	7.1E-03	
SSE	2.3E-02	1.3E-02	7.6E-03	6.7E-03	
SSE	3.0E-02	1.7E-02	8.5E-03	7.1E-03	
ESE	4.7E-02	2.4E-02	1.0E-02	8.1E-03	
E	6.0E-02	3.0E-02	1.2E-02	8.7E-03	school
ENE	5.1E-02	2.6E-02	1.1E-02	8.2E-03	
NE	3.3E-02	1.8E-02	8.8E-03	7.2E-03	resident (770), farm (1,710)
NNE	2.9E-02	1.6E-02	8.3E-03	7.0E-03	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in the 2017 Radionuclide Emissions NESHAP Report (Appendix A) 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	500	770	1710	2580
N	1.6E-08	7.7E-09	2.4E-09	1.5E-09
NNW	8.7E-09	4.2E-09	1.5E-09	1.0E-09
NW	1.0E-08	4.8E-09	1.6E-09	1.1E-09
WNW	1.2E-08	5.7E-09	1.8E-09	1.2E-09
W	9.3E-09	4.5E-09	1.5E-09	1.0E-09
WSW	4.7E-09	2.4E-09	1.0E-09	7.7E-10
SW	6.4E-09	3.2E-09	1.2E-09	8.7E-10
SSW	7.8E-09	3.8E-09	1.3E-09	9.5E-10
S	7.0E-09	3.5E-09	1.3E-09	9.2E-10
SSE	5.1E-09	2.6E-09	1.1E-09	8.1E-10
SSE	7.2E-09	3.5E-09	1.3E-09	9.3E-10
ESE	1.2E-08	5.6E-09	1.8E-09	1.2E-09
E	1.5E-08	7.1E-09	2.2E-09	1.4E-09
ENE	1.3E-08	5.9E-09	1.9E-09	1.2E-09
NE	8.0E-09	3.9E-09	1.4E-09	9.7E-10
NNE	6.8E-09	3.4E-09	1.3E-09	9.0E-10

CAP88-PC RUNS FOR THE USACE ST. LOUIS FUSRAP LABORATORY

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CAP88 OUTPUT RESULTS

USACE Laboratory

CAP88-PC

Version 4.0

Clean Air Act Assessment Package - 1988

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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
Tue Apr 03 10:55:13 2018


     Facility:  USACE Laboratory
      Address:
         City:  St. Louis
        State:  MO          Zip:  63042


Source Category:  Area
    Source Type:  Area
  Emission Year:  2017
 DOSE Age Group:  Adult

       Comments:  Air


   Dataset Name:  USACE Laboratory
   Dataset Date:  Apr 3, 2018 10:55 AM
      Wind File:  C:\Users\passigm\Documents\CAP88\Wind Files\13994.WND
```

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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.31E-04
UB_Wall	1.42E-04
Bone_Sur	1.47E-02
Brain	1.37E-04
Breasts	1.47E-04
St_Wall	1.38E-04
SI_Wall	1.37E-04
ULI_Wall	1.45E-04
LLI_Wall	1.61E-04
Kidneys	3.20E-04
Liver	9.32E-04
Muscle	1.51E-04
Ovaries	2.48E-04
Pancreas	1.32E-04
R_Marrow	7.17E-04
Skin	1.39E-03
Spleen	1.39E-04
Testes	2.66E-04
Thymus	1.37E-04
Thyroid	1.42E-04
GB_Wall	1.33E-04
Ht_Wall	1.37E-04
Uterus	1.36E-04
ET_Reg	8.86E-04
Lung_66	2.68E-03
Effectiv	7.39E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.74E-05
INHALATION	6.06E-04
AIR IMMERSION	8.36E-10
GROUND SURFACE	1.15E-04
INTERNAL	6.24E-04
EXTERNAL	1.15E-04
TOTAL	7.39E-04

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NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	1.84E-05
Th-234	5.74E-07
Pa-234m	6.86E-06
Pa-234	1.35E-07
U-234	2.05E-05
Th-230	1.16E-04
Ra-226	1.47E-05
Rn-222	1.07E-08
Po-218	1.92E-13
Pb-214	7.00E-06
At-218	7.20E-13
Bi-214	4.09E-05
Rn-218	4.17E-15
Po-214	2.27E-09
Tl-210	1.60E-08
Pb-210	3.44E-08
Bi-210	5.56E-07
Hg-206	4.48E-14
Po-210	1.44E-10
Tl-206	1.30E-12
U-235	6.44E-06
Th-231	2.08E-07
Pa-231	1.52E-04
Ac-227	1.02E-04
Th-227	1.37E-06
Fr-223	1.29E-08
Ra-223	1.53E-06
Rn-219	6.63E-07
At-219	0.00E+00
Bi-215	2.98E-12
Po-215	2.03E-09
Pb-211	1.30E-06
Bi-211	5.37E-07
Tl-207	6.75E-07
Po-211	2.58E-10
Th-232	7.43E-05
Ra-228	1.14E-05
Ac-228	1.91E-05
Th-228	1.04E-04
Ra-224	6.88E-06
Rn-220	1.37E-08
Po-216	3.30E-10
Pb-212	3.01E-06
Bi-212	3.51E-06
Po-212	0.00E+00
Tl-208	2.42E-05
TOTAL	7.39E-04

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                  CANCER RISK SUMMARY


                                   Selected Individual
                                     Total Lifetime
                   Cancer          Fatal Cancer Risk
                   ______          ___________________



                  PATHWAY RISK SUMMARY


                                   Selected Individual
                                     Total Lifetime
                   Pathway         Fatal Cancer Risk
                   ______          ___________________

                   INGESTION             5.58E-12
                   INHALATION            1.19E-10
                   AIR IMMERSION         4.43E-16
                   GROUND SURFACE        5.78E-11
                   INTERNAL              1.25E-10
                   EXTERNAL              5.78E-11

                   TOTAL                 1.83E-10
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	6.12E-12
Th-234	2.83E-13
Pa-234m	1.20E-12
Pa-234	7.35E-14
U-234	7.05E-12
Th-230	2.56E-11
Ra-226	8.14E-12
Rn-222	5.85E-15
Po-218	8.56E-20
Pb-214	3.74E-12
At-218	8.87E-20
Bi-214	2.16E-11
Rn-218	2.28E-21
Po-214	1.24E-15
Tl-210	8.53E-15
Pb-210	1.54E-14
Bi-210	6.16E-14
Hg-206	1.99E-20
Po-210	7.90E-17
Tl-206	1.46E-19
U-235	2.57E-12
Th-231	9.49E-14
Pa-231	6.57E-12
Ac-227	1.28E-11
Th-227	7.42E-13
Fr-223	4.81E-15
Ra-223	8.27E-13
Rn-219	3.63E-13
At-219	0.00E+00
Bi-215	1.33E-18
Po-215	1.11E-15
Pb-211	4.65E-13
Bi-211	2.93E-13
Tl-207	8.67E-14
Po-211	1.41E-16
Th-232	1.63E-11
Ra-228	1.57E-12
Ac-228	1.01E-11
Th-228	3.74E-11
Ra-224	2.53E-12
Rn-220	7.49E-15
Po-216	1.81E-16
Pb-212	1.63E-12
Bi-212	1.35E-12
Po-212	0.00E+00
Tl-208	1.32E-11
TOTAL	1.83E-10

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INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	110	300	1830	
N	7.4E-04	1.9E-04	2.1E-05	
NNW	4.1E-04	1.1E-04	1.7E-05	
NW	4.2E-04	1.2E-04	1.8E-05	
WNW	4.9E-04	1.4E-04	1.9E-05	
W	3.9E-04	1.1E-04	1.7E-05	
WSW	2.0E-04	6.1E-05	1.5E-05	
SW	2.5E-04	8.0E-05	1.6E-05	
SSW	3.0E-04	9.6E-05	1.7E-05	
S	3.2E-04	8.7E-05	1.6E-05	business
SSE	2.4E-04	6.5E-05	1.5E-05	school
SSE	3.3E-04	8.8E-05	1.6E-05	
ESE	4.9E-04	1.4E-04	1.9E-05	
E	5.8E-04	1.8E-04	2.0E-05	
ENE	4.7E-04	1.5E-04	1.9E-05	
NE	3.4E-04	9.7E-05	1.7E-05	resident, farm
NNE	3.0E-04	8.4E-05	1.6E-05	

Note: Highlighted EDE values (in mrem) are applicable to the critical receptors as defined in the 2017 Radionuclide Emissions NESHAP Report (Appendix A) taking into account the distance and direction from the applicable site to each receptor. The highlighted value assumes 100 percent occupancy for the resident and farm. Business and school values are corrected for a 23 percent occupancy factor (40 hours per week for 50 weeks per year).

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Direction	110	300	1830
	Distance (m)		
N	1.8E-10	4.8E-11	6.2E-12
NNW	1.0E-10	2.7E-11	5.3E-12
NW	1.0E-10	3.1E-11	5.4E-12
WNW	1.2E-10	3.6E-11	5.7E-12
W	9.8E-11	2.9E-11	5.3E-12
WSW	5.0E-11	1.6E-11	4.8E-12
SW	6.3E-11	2.1E-11	5.0E-12
SSW	7.5E-11	2.5E-11	5.2E-12
S	8.1E-11	2.2E-11	5.1E-12
SSE	6.0E-11	1.7E-11	4.8E-12
SSE	8.2E-11	2.3E-11	5.1E-12
ESE	1.2E-10	3.6E-11	5.7E-12
E	1.4E-10	4.5E-11	6.0E-12
ENE	1.2E-10	3.8E-11	5.7E-12
NE	8.3E-11	2.5E-11	5.2E-12
NNE	7.4E-11	2.2E-11	5.1E-12

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APPENDIX B

ENVIRONMENTAL THERMOLUMINESCENT DOSIMETER, ALPHA TRACK DETECTOR, AND PERIMETER AIR DATA

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

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Table B-1. Background Air Particulate Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
HIS194067	BAP-001	01/03/17	Gross Alpha/Beta	Gross Alpha	7.86E-15	1.47E-15	4.62E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194067	BAP-001	01/03/17	Gross Alpha/Beta	Gross Alpha	8.32E-15	1.51E-15	4.62E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194067	BAP-001	01/03/17	Gross Alpha/Beta	Gross Beta	2.25E-14	2.47E-15	8.72E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194067	BAP-001	01/03/17	Gross Alpha/Beta	Gross Beta	2.26E-14	2.47E-15	8.72E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194068	BAP-001	01/09/17	Gross Alpha/Beta	Gross Alpha	8.52E-15	1.64E-15	5.40E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194068	BAP-001	01/09/17	Gross Alpha/Beta	Gross Beta	2.32E-14	2.65E-15	1.02E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194069	BAP-001	01/17/17	Gross Alpha/Beta	Gross Alpha	6.34E-15	1.29E-15	4.52E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194069	BAP-001	01/17/17	Gross Alpha/Beta	Gross Beta	2.56E-14	2.68E-15	8.53E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194070	BAP-001	01/23/17	Gross Alpha/Beta	Gross Alpha	7.02E-15	1.53E-15	5.84E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194070	BAP-001	01/23/17	Gross Alpha/Beta	Gross Beta	2.26E-14	2.68E-15	1.10E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194071	BAP-001	01/30/17	Gross Alpha/Beta	Gross Beta	5.81E-15	1.29E-15	4.98E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194071	BAP-001	01/30/17	Gross Alpha/Beta	Gross Alpha	1.85E-14	2.23E-15	9.40E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194072	BAP-001	02/06/17	Gross Alpha/Beta	Gross Beta	6.06E-15	1.34E-15	5.20E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194072	BAP-001	02/06/17	Gross Alpha/Beta	Gross Alpha	2.10E-14	2.45E-15	9.81E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194073	BAP-001	02/13/17	Gross Alpha/Beta	Gross Beta	6.50E-15	1.36E-15	4.90E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194073	BAP-001	02/13/17	Gross Alpha/Beta	Gross Alpha	2.55E-14	2.73E-15	9.24E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194074	BAP-001	02/21/17	Gross Alpha/Beta	Gross Beta	4.67E-15	1.11E-15	4.60E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194074	BAP-001	02/21/17	Gross Alpha/Beta	Gross Alpha	1.75E-14	2.09E-15	8.68E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194075	BAP-001	02/27/17	Gross Alpha/Beta	Gross Beta	3.82E-15	1.11E-15	5.72E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194075	BAP-001	02/27/17	Gross Alpha/Beta	Gross Alpha	2.05E-14	2.50E-15	1.08E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194076	BAP-001	03/06/17	Gross Alpha/Beta	Gross Beta	4.87E-15	1.21E-15	5.32E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194076	BAP-001	03/06/17	Gross Alpha/Beta	Gross Alpha	2.46E-14	2.74E-15	1.00E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194077	BAP-001	03/13/17	Gross Alpha/Beta	Gross Beta	3.06E-15	9.25E-16	4.96E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194077	BAP-001	03/13/17	Gross Alpha/Beta	Gross Alpha	1.17E-14	1.70E-15	9.35E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194078	BAP-001	03/20/17	Gross Alpha/Beta	Gross Beta	3.41E-15	9.90E-16	5.11E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194078	BAP-001	03/20/17	Gross Alpha/Beta	Gross Alpha	2.21E-14	2.52E-15	9.63E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194079	BAP-001	03/27/17	Gross Alpha/Beta	Gross Beta	2.16E-15	8.25E-16	5.49E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194079	BAP-001	03/27/17	Gross Alpha/Beta	Gross Alpha	1.81E-14	2.28E-15	1.04E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194080	BAP-001	04/04/17	Gross Alpha/Beta	Gross Beta	3.05E-15	8.79E-16	4.68E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194080	BAP-001	04/04/17	Gross Alpha/Beta	Gross Alpha	1.16E-14	1.58E-15	8.22E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194080	BAP-001	04/04/17	Gross Alpha/Beta	Gross Beta	4.10E-15	1.02E-15	4.68E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194080	BAP-001	04/04/17	Gross Alpha/Beta	Gross Alpha	1.07E-14	1.51E-15	8.22E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194081	BAP-001	04/10/17	Gross Alpha/Beta	Gross Beta	4.07E-15	1.15E-15	6.03E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194081	BAP-001	04/10/17	Gross Alpha/Beta	Gross Alpha	1.28E-14	1.87E-15	1.06E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194082	BAP-001	04/17/17	Gross Alpha/Beta	Gross Beta	6.00E-15	1.37E-15	5.70E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194082	BAP-001	04/17/17	Gross Alpha/Beta	Gross Alpha	1.69E-14	2.14E-15	1.00E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194083	BAP-001	04/24/17	Gross Alpha/Beta	Gross Beta	4.13E-15	1.05E-15	4.92E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194083	BAP-001	04/24/17	Gross Alpha/Beta	Gross Alpha	1.26E-14	1.69E-15	8.63E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194084	BAP-001	05/01/17	Gross Alpha/Beta	Gross Beta	2.36E-15	8.59E-16	5.68E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194084	BAP-001	05/01/17	Gross Alpha/Beta	Gross Alpha	1.13E-14	1.70E-15	9.97E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194085	BAP-001	05/08/17	Gross Alpha/Beta	Gross Beta	3.00E-15	9.05E-16	5.06E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194085	BAP-001	05/08/17	Gross Alpha/Beta	Gross Alpha	1.43E-14	1.85E-15	8.87E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194086	BAP-001	05/15/17	Gross Alpha/Beta	Gross Beta	5.22E-15	1.25E-15	5.51E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194086	BAP-001	05/15/17	Gross Alpha/Beta	Gross Alpha	2.32E-14	2.60E-15	9.66E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

Table B-1. Background Air Particulate Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
HIS194087	BAP-001	05/19/17	Gross Alpha/Beta	Gross Beta	3.42E-15	1.38E-15	9.93E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194087	BAP-001	05/19/17	Gross Alpha/Beta	Gross Alpha	2.40E-14	3.30E-15	1.74E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194088	BAP-001	05/30/17	Gross Alpha/Beta	Gross Beta	4.33E-15	1.17E-15	5.81E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194088	BAP-001	05/30/17	Gross Alpha/Beta	Gross Alpha	1.67E-14	2.15E-15	1.02E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194089	BAP-001	06/06/17	Gross Alpha/Beta	Gross Beta	3.55E-15	9.79E-16	5.00E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194089	BAP-001	06/06/17	Gross Alpha/Beta	Gross Alpha	2.12E-14	2.37E-15	8.77E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194090	BAP-001	06/13/17	Gross Alpha/Beta	Gross Beta	2.13E-15	8.28E-16	5.79E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194090	BAP-001	06/13/17	Gross Alpha/Beta	Gross Alpha	1.57E-14	2.06E-15	1.02E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194091	BAP-001	06/19/17	Gross Alpha/Beta	Gross Beta	8.95E-16	6.01E-16	6.23E-16	µCi/mL	J	T04, T20	HISS Air (Particulate Air)-Environmental Monitoring
HIS194091	BAP-001	06/19/17	Gross Alpha/Beta	Gross Alpha	1.32E-14	1.93E-15	1.09E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194092	BAP-001	06/26/17	Gross Alpha/Beta	Gross Beta	1.97E-15	7.64E-16	5.35E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194092	BAP-001	06/26/17	Gross Alpha/Beta	Gross Alpha	1.63E-14	2.04E-15	9.38E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194093	BAP-001	07/03/17	Gross Alpha/Beta	Gross Beta	5.63E-15	1.26E-15	4.72E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194093	BAP-001	07/03/17	Gross Alpha/Beta	Gross Alpha	1.87E-14	2.32E-15	1.44E-15	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194093	BAP-001	07/03/17	Gross Alpha/Beta	Gross Beta	6.63E-15	1.38E-15	4.72E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194093	BAP-001	07/03/17	Gross Alpha/Beta	Gross Alpha	1.99E-14	2.41E-15	1.44E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194094	BAP-001	07/10/17	Gross Alpha/Beta	Gross Beta	7.60E-15	1.54E-15	5.12E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194094	BAP-001	07/10/17	Gross Alpha/Beta	Gross Alpha	2.57E-14	2.91E-15	1.56E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194095	BAP-001	07/17/17	Gross Alpha/Beta	Gross Beta	7.08E-15	1.40E-15	4.49E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194095	BAP-001	07/17/17	Gross Alpha/Beta	Gross Alpha	1.94E-14	2.33E-15	1.37E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194096	BAP-001	07/25/17	Gross Alpha/Beta	Gross Beta	5.40E-15	1.26E-15	4.91E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194096	BAP-001	07/25/17	Gross Alpha/Beta	Gross Alpha	2.21E-14	2.61E-15	1.50E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194097	BAP-001	07/31/17	Gross Alpha/Beta	Gross Beta	5.58E-15	1.33E-15	5.33E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194097	BAP-001	07/31/17	Gross Alpha/Beta	Gross Alpha	1.90E-14	2.46E-15	1.62E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194098	BAP-001	08/08/17	Gross Alpha/Beta	Gross Beta	5.08E-15	1.17E-15	4.51E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194098	BAP-001	08/08/17	Gross Alpha/Beta	Gross Alpha	2.16E-14	2.49E-15	1.37E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194099	BAP-001	08/14/17	Gross Alpha/Beta	Gross Beta	5.99E-15	1.41E-15	5.58E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194099	BAP-001	08/14/17	Gross Alpha/Beta	Gross Alpha	2.41E-14	2.89E-15	1.70E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194100	BAP-001	08/21/17	Gross Alpha/Beta	Gross Beta	5.26E-15	1.29E-15	5.36E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194100	BAP-001	08/21/17	Gross Alpha/Beta	Gross Alpha	2.31E-14	2.77E-15	1.63E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194101	BAP-001	08/29/17	Gross Alpha/Beta	Gross Beta	3.92E-15	9.62E-16	4.00E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194101	BAP-001	08/29/17	Gross Alpha/Beta	Gross Alpha	2.18E-14	2.40E-15	1.22E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194102	BAP-001	09/05/17	Gross Alpha/Beta	Gross Beta	4.00E-15	1.15E-15	5.70E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194102	BAP-001	09/05/17	Gross Alpha/Beta	Gross Alpha	2.83E-14	3.22E-15	1.73E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194103	BAP-001	09/11/17	Gross Alpha/Beta	Gross Beta	3.36E-15	1.04E-15	5.52E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194103	BAP-001	09/11/17	Gross Alpha/Beta	Gross Alpha	2.19E-14	2.72E-15	1.68E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194104	BAP-001	09/18/17	Gross Alpha/Beta	Gross Beta	3.51E-15	9.75E-16	4.64E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194104	BAP-001	09/18/17	Gross Alpha/Beta	Gross Alpha	2.68E-14	2.90E-15	1.41E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194105	BAP-001	09/25/17	Gross Alpha/Beta	Gross Beta	1.96E-15	7.66E-16	5.11E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194105	BAP-001	09/25/17	Gross Alpha/Beta	Gross Alpha	3.01E-14	3.23E-15	1.56E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194106	BAP-001	10/02/17	Gross Alpha/Beta	Gross Beta	8.10E-15	1.59E-15	6.24E-16	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194106	BAP-001	10/02/17	Gross Alpha/Beta	Gross Alpha	2.99E-14	3.12E-15	1.01E-15	µCi/mL			HISS Air (Particulate Air)-Environmental Monitoring
HIS194106	BAP-001	10/02/17	Gross Alpha/Beta	Gross Beta	9.68E-15	1.75E-15	6.24E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194106	BAP-001	10/02/17	Gross Alpha/Beta	Gross Alpha	2.90E-14	3.06E-15	1.01E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

Table B-1. Background Air Particulate Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
HIS194107	BAP-001	10/11/17	Gross Alpha/Beta	Gross Beta	5.97E-15	1.14E-15	4.32E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194107	BAP-001	10/11/17	Gross Alpha/Beta	Gross Alpha	1.68E-14	1.87E-15	6.97E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194108	BAP-001	10/16/17	Gross Alpha/Beta	Gross Beta	4.25E-15	1.32E-15	8.39E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194108	BAP-001	10/16/17	Gross Alpha/Beta	Gross Alpha	1.63E-14	2.37E-15	1.35E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194109	BAP-001	10/23/17	Gross Alpha/Beta	Gross Beta	7.96E-15	1.56E-15	6.08E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194109	BAP-001	10/23/17	Gross Alpha/Beta	Gross Alpha	2.62E-14	2.82E-15	9.82E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194110	BAP-001	10/30/17	Gross Alpha/Beta	Gross Beta	4.38E-15	1.15E-15	6.19E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194110	BAP-001	10/30/17	Gross Alpha/Beta	Gross Alpha	1.39E-14	1.90E-15	9.99E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194111	BAP-001	11/06/17	Gross Alpha/Beta	Gross Beta	6.22E-15	1.34E-15	5.83E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194111	BAP-001	11/06/17	Gross Alpha/Beta	Gross Alpha	2.92E-14	3.01E-15	9.42E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194112	BAP-001	11/13/17	Gross Alpha/Beta	Gross Beta	6.19E-15	1.39E-15	6.37E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194112	BAP-001	11/13/17	Gross Alpha/Beta	Gross Alpha	2.56E-14	2.82E-15	1.03E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194113	BAP-001	11/20/17	Gross Alpha/Beta	Gross Beta	7.13E-15	1.46E-15	5.98E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194113	BAP-001	11/20/17	Gross Alpha/Beta	Gross Alpha	2.71E-14	2.88E-15	9.65E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194114	BAP-001	11/27/17	Gross Alpha/Beta	Gross Beta	4.45E-15	1.18E-15	6.39E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194114	BAP-001	11/27/17	Gross Alpha/Beta	Gross Alpha	2.63E-14	2.88E-15	1.03E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194115	BAP-001	12/04/17	Gross Alpha/Beta	Gross Beta	4.74E-15	1.17E-15	5.90E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194115	BAP-001	12/04/17	Gross Alpha/Beta	Gross Alpha	2.75E-14	2.90E-15	9.53E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194116	BAP-001	12/11/17	Gross Alpha/Beta	Gross Beta	3.19E-15	9.91E-16	6.29E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194116	BAP-001	12/11/17	Gross Alpha/Beta	Gross Alpha	2.52E-14	2.78E-15	1.02E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194117	BAP-001	12/18/17	Gross Alpha/Beta	Gross Beta	3.01E-15	9.26E-16	5.82E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194117	BAP-001	12/18/17	Gross Alpha/Beta	Gross Alpha	2.58E-14	2.76E-15	9.39E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194118	BAP-001	12/26/17	Gross Alpha/Beta	Gross Beta	3.14E-15	8.69E-16	4.95E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS194118	BAP-001	12/26/17	Gross Alpha/Beta	Gross Alpha	3.41E-14	3.23E-15	7.99E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

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.

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

Validation Reason Code:

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

Table B-2. NC Sites Ra-222 Results for CY 2017

Sample Name	Station Name	Collect Date	Method Type	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event Name
HIS194336	BA-1	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	Background Air (Alpha Tracks)-Environmental Monitoring
HIS200275	BA-1	01/09/18	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	Background Air (Alpha Tracks)-Environmental Monitoring
HIS194337	HF-1	07/05/17	Radiological	Ra-222	1.5	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200276	HF-1	01/09/18	Radiological	Ra-222	2.4	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194338	HF-2	07/05/17	Radiological	Ra-222	6	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200277	HF-2	01/09/18	Radiological	Ra-222	6.2	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194339	HF-3	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200278	HF-3	01/09/18	Radiological	Ra-222	1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194340	HF-4	07/05/17	Radiological	Ra-222	0.7	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200279	HF-4	01/09/18	Radiological	Ra-222	1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194341	HF-5	07/05/17	Radiological	Ra-222	0.8	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200280	HF-5	01/09/18	Radiological	Ra-222	1.1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194342	HF-6	07/05/17	Radiological	Ra-222	0.7	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200281	HF-6	01/09/18	Radiological	Ra-222	1.1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194343	HF-7	07/05/17	Radiological	Ra-222	1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200282	HF-7	01/09/18	Radiological	Ra-222	1.3	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194344	HF-8	07/05/17	Radiological	Ra-222	0.8	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200283	HF-8	01/09/18	Radiological	Ra-222	1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194345	HF-9	07/05/17	Radiological	Ra-222	0.9	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200284	HF-9	01/09/18	Radiological	Ra-222	1.1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS194346	HF-10	07/05/17	Radiological	Ra-222	0.8	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
HIS200285	HF-10	01/09/18	Radiological	Ra-222	1.1	0	0.2	pCi/L	J	Y01	Futura Air (Alpha Tracks)-Environmental Monitoring
SLA194351	PA-1	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA200315	PA-1	01/09/18	Radiological	Ra-222	0.2	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA194352	PA-2	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA200316	PA-2	01/09/18	Radiological	Ra-222	0.3	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA194352-1	PA-2 dup	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA200316-1	PA-2 dup	01/09/18	Radiological	Ra-222	0.4	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA194353	PA-3	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA200317	PA-3	01/09/18	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA194354	PA-4	07/05/17	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA200318	PA-4	01/09/18	Radiological	Ra-222	0.3	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
HIS200286	FA-1	01/09/18	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	VP-40A Air (Alpha Tracks)-Environmental Monitoring
HIS200287	FA-2	01/09/18	Radiological	Ra-222	0.3	0	0.2	pCi/L	J	Y01	VP-40A Air (Alpha Tracks)-Environmental Monitoring
HIS200288	FA-3	01/09/18	Radiological	Ra-222	0.2	0	0.2	pCi/L	UJ	Y01	VP-40A Air (Alpha Tracks)-Environmental Monitoring

Note: ATD stations on VP-40A were not set up until July 2017.

VQs:

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

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

Validation Reason Code:

Y01 FUSRAP Only: Not enough supporting documentation to perform validation.

Table B-3. NC Sites External Gamma Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
HIS194368	BA-1	04/03/17	Radiological	External gamma radiation	19.8	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2017
HIS194369	BA-1	07/05/17	Radiological	External gamma radiation	19.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2017
HIS194370	BA-1	10/02/17	Radiological	External gamma radiation	20.1	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2017
HIS200323	BA-1	01/09/18	Radiological	External gamma radiation	20.3	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2017
SLA194375	PA-1	04/03/17	Radiological	External gamma radiation	19.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2017
SLA194379	PA-1	07/05/17	Radiological	External gamma radiation	20.3	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2017
SLA194383	PA-1	10/02/17	Radiological	External gamma radiation	19.8	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2017
SLA200351	PA-1	01/09/18	Radiological	External gamma radiation	22.2	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2017
SLA194376	PA-2	04/03/17	Radiological	External gamma radiation	24.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2018
SLA194380	PA-2	07/05/17	Radiological	External gamma radiation	23	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2018
SLA194384	PA-2	10/02/17	Radiological	External gamma radiation	24	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2018
SLA200352	PA-2	01/09/18	Radiological	External gamma radiation	24.6	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2018
SLA194376-1	PA-2dup	04/03/17	Radiological	External gamma radiation	22.8	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2019
SLA194380-1	PA-2dup	07/05/17	Radiological	External gamma radiation	22.9	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2019
SLA194384-1	PA-2dup	10/02/17	Radiological	External gamma radiation	23.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2019
SLA200352-1	PA-2dup	01/09/18	Radiological	External gamma radiation	22.6	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2019
SLA194377	PA-3	04/03/17	Radiological	External gamma radiation	21.6	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2020
SLA194381	PA-3	07/05/17	Radiological	External gamma radiation	19.7	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2020
SLA194385	PA-3	10/02/17	Radiological	External gamma radiation	20.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2020
SLA200353	PA-3	01/09/18	Radiological	External gamma radiation	21.5	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2020
SLA194378	PA-4	04/03/17	Radiological	External gamma radiation	24.8	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-1Q2021
SLA194382	PA-4	07/05/17	Radiological	External gamma radiation	24.2	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-2Q2021
SLA194386	PA-4	10/02/17	Radiological	External gamma radiation	23.7	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2021
SLA200354	PA-4	01/09/18	Radiological	External gamma radiation	26.3	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2021
HIS199422	FA-2	10/02/17	Radiological	External gamma radiation	9.4	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2017
HIS200324	FA-2	01/09/18	Radiological	External gamma radiation	24.7	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2017
HIS199423	FA-3	10/02/17	Radiological	External gamma radiation	7.2	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-3Q2017
HIS200325	FA-3	01/09/18	Radiological	External gamma radiation	19.6	0	0.1	mrem	J	Y01	Environmental Monitoring (TLDs)-4Q2017

VQs:

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

Validation Reason Code:

Y01 FUSRAP Only: Not enough supporting documentation to perform validation.

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP199192	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Alpha	6.453E-15	9.939E-15	1.68E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP199192	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Beta	6.004E-14	2.278E-14	2.669E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199193	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Alpha	1.162E-14	1.161E-14	1.68E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199193	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Beta	4.682E-14	2.13E-14	2.669E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199194	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Alpha	1.316E-14	1.196E-14	1.658E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199194	BALLFIELDS	12/04/17	Gross Alpha/Beta	Gross Beta	2.12E-14	1.803E-14	2.633E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199195	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Alpha	7.04E-15	7.883E-15	1.196E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199195	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Beta	1.96E-15	1.123E-14	1.899E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199196	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Alpha	-3.06E-16	5.092E-15	1.196E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199196	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Beta	1.137E-14	1.25E-14	1.899E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199197	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Alpha	3.367E-15	6.631E-15	1.196E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199197	BALLFIELDS	12/05/17	Gross Alpha/Beta	Gross Beta	2.156E-14	1.378E-14	1.899E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199198	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Alpha	2.206E-15	6.343E-15	1.231E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199198	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Beta	4.076E-14	1.634E-14	1.956E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199199	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Alpha	-2.865E-15	3.887E-15	1.244E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199199	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Beta	1.345E-14	1.321E-14	1.975E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199200	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Alpha	4.728E-15	7.282E-15	1.231E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199200	BALLFIELDS	12/06/17	Gross Alpha/Beta	Gross Beta	2.22E-14	1.419E-14	1.956E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199201	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Alpha	3.139E-15	9.023E-15	1.751E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199201	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Beta	1.435E-14	1.801E-14	2.782E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199202	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Alpha	7.022E-15	1.082E-14	1.829E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199202	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Beta	3.297E-14	2.107E-14	2.905E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199203	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Alpha	-4.48E-16	7.459E-15	1.751E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199203	BALLFIELDS	12/07/17	Gross Alpha/Beta	Gross Beta	2.009E-14	1.875E-14	2.782E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199204	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Alpha	2.163E-15	6.22E-15	1.207E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199204	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Beta	3.443E-14	1.54E-14	1.918E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199205	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Alpha	9.36E-16	5.761E-15	1.219E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199205	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Beta	3.876E-14	1.6E-14	1.936E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199206	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Alpha	2.163E-15	6.22E-15	1.207E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP199206	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Alpha	-1.545E-15	4.509E-15	1.207E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199206	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Beta	4.472E-14	1.654E-14	1.918E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP199206	BALLFIELDS	12/11/17	Gross Alpha/Beta	Gross Beta	4.947E-14	1.705E-14	1.918E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199207	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Alpha	-3.061E-15	8.932E-15	2.391E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199207	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Beta	3.841E-14	2.698E-14	3.798E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199208	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Alpha	9.27E-16	5.705E-15	1.207E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199208	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Beta	2.097E-14	1.381E-14	1.918E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199209	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Alpha	4.204E-15	1.209E-14	2.346E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199209	BALLFIELDS	12/12/17	Gross Alpha/Beta	Gross Beta	3.461E-14	2.609E-14	3.727E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199210	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Alpha	-3.32E-16	5.516E-15	1.295E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199210	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Beta	2.93E-14	1.563E-14	2.057E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199211	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Alpha	9.36E-16	5.761E-15	1.219E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199211	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Beta	2.997E-14	1.5E-14	1.936E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP199212	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Alpha	2.321E-15	6.673E-15	1.295E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199212	BALLFIELDS	12/13/17	Gross Alpha/Beta	Gross Beta	4.373E-14	1.728E-14	2.057E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP195187	BALLFIELDS	07/25/17	Gross Alpha/Beta	Gross Alpha	5.666E-15	8.204E-15	1.315E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195187	BALLFIELDS	07/25/17	Gross Alpha/Beta	Gross Beta	3.993E-14	2.565E-14	3.612E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP195188	BALLFIELDS	07/26/17	Gross Alpha/Beta	Gross Alpha	1.453E-14	1.254E-14	1.573E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP195188	BALLFIELDS	07/26/17	Gross Alpha/Beta	Gross Beta	2.167E-14	2.835E-14	4.324E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195189	BALLFIELDS	07/27/17	Gross Alpha/Beta	Gross Alpha	6.503E-15	1.821E-14	3.52E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195189	BALLFIELDS	07/27/17	Gross Alpha/Beta	Gross Beta	4.013E-14	6.267E-14	9.674E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195190	BALLFIELDS	07/31/17	Gross Alpha/Beta	Gross Alpha	5.995E-15	7.263E-15	1.082E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195190	BALLFIELDS	07/31/17	Gross Alpha/Beta	Gross Beta	3.286E-14	2.111E-14	2.973E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP195191	BALLFIELDS	08/01/17	Gross Alpha/Beta	Gross Alpha	3.852E-15	7.171E-15	1.251E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195191	BALLFIELDS	08/01/17	Gross Alpha/Beta	Gross Beta	4.493E-14	2.503E-14	3.438E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP195192	BALLFIELDS	08/02/17	Gross Alpha/Beta	Gross Alpha	1.529E-14	1.616E-14	2.258E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195192	BALLFIELDS	08/02/17	Gross Alpha/Beta	Gross Beta	4.359E-14	4.182E-14	6.204E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP195193	BALLFIELDS	08/15/17	Gross Alpha/Beta	Gross Alpha	4.567E-15	5.471E-15	7.959E-15	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195193	BALLFIELDS	08/15/17	Gross Alpha/Beta	Gross Alpha	9.439E-15	7.348E-15	7.959E-15	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195193	BALLFIELDS	08/15/17	Gross Alpha/Beta	Gross Beta	2.47E-14	1.969E-14	2.73E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195193	BALLFIELDS	08/15/17	Gross Alpha/Beta	Gross Beta	3.408E-14	2.049E-14	2.73E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195194	BALLFIELDS	08/16/17	Gross Alpha/Beta	Gross Alpha	-1.48E-15	4.08E-16	7.738E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195194	BALLFIELDS	08/16/17	Gross Alpha/Beta	Gross Beta	1.337E-14	1.823E-14	2.654E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195195	BALLFIELDS	08/17/17	Gross Alpha/Beta	Gross Alpha	-3.17E-16	2.567E-15	8.274E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195195	BALLFIELDS	08/17/17	Gross Alpha/Beta	Gross Beta	1.999E-14	1.998E-14	2.838E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195196	BALLFIELDS	08/21/17	Gross Alpha/Beta	Gross Alpha	3.663E-15	5.353E-15	8.705E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195196	BALLFIELDS	08/21/17	Gross Alpha/Beta	Gross Beta	1.504E-14	2.051E-14	2.986E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195198	BALLFIELDS	08/23/17	Gross Alpha/Beta	Gross Alpha	3.03E-15	5.79E-15	1.029E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195198	BALLFIELDS	08/23/17	Gross Alpha/Beta	Gross Alpha	8.045E-15	7.677E-15	1.029E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195198	BALLFIELDS	08/23/17	Gross Alpha/Beta	Gross Beta	1.087E-14	1.861E-14	2.926E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195198	BALLFIELDS	08/23/17	Gross Alpha/Beta	Gross Beta	1.57E-14	1.903E-14	2.926E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195199	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Alpha	1.156E-14	1.103E-14	1.479E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195199	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Beta	4.106E-14	2.897E-14	4.203E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195200	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Alpha	2.645E-15	7.766E-15	1.533E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195200	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Beta	5.694E-14	3.126E-14	4.357E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195201	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Alpha	6.242E-15	9.199E-15	1.5E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195201	BALLFIELDS	08/30/17	Gross Alpha/Beta	Gross Beta	3.343E-14	2.867E-14	4.264E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195202	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Alpha	1.066E-14	8.553E-15	1.04E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195202	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Beta	3.781E-14	2.113E-14	2.955E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195203	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Alpha	1.223E-14	9.154E-15	1.066E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195203	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Beta	4.627E-14	2.231E-14	3.03E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195204	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Alpha	5.3E-16	4.64E-15	1.045E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195204	BALLFIELDS	08/31/17	Gross Alpha/Beta	Gross Beta	2.492E-14	2.011E-14	2.97E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195205	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Alpha	1.117E-15	7.53E-15	1.173E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195205	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Alpha	3.554E-15	8.285E-15	1.173E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195205	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Beta	2.841E-14	1.616E-14	1.934E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195205	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Beta	2.529E-14	1.583E-14	1.934E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195206	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Alpha	3.504E-15	8.167E-15	1.156E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195206	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Beta	2.493E-14	1.561E-14	1.906E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195207	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Alpha	6.082E-15	1.101E-14	1.495E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195207	BALLFIELDS	09/05/17	Gross Alpha/Beta	Gross Beta	2.925E-14	1.985E-14	2.464E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195208	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Alpha	4.819E-15	8.722E-15	1.184E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195208	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Beta	4.05E-14	1.753E-14	1.952E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195209	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Alpha	-1.339E-15	6.793E-15	1.19E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195209	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Beta	2.882E-14	1.64E-14	1.962E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195210	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Alpha	1.122E-15	7.566E-15	1.179E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195210	BALLFIELDS	09/06/17	Gross Alpha/Beta	Gross Beta	1.365E-14	1.463E-14	1.943E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195211	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Alpha	2.715E-15	1.83E-14	2.85E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195211	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Beta	-1.059E-14	3.026E-14	4.699E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195212	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Alpha	2.779E-15	1.874E-14	2.918E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195212	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Beta	8.573E-15	3.332E-14	4.811E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195213	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Alpha	-6.316E-15	1.552E-14	2.918E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195213	BALLFIELDS	09/07/17	Gross Alpha/Beta	Gross Beta	5.71E-14	3.876E-14	4.811E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195214	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Alpha	-2.162E-15	1.047E-15	8.941E-15	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195214	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Alpha	5.251E-15	6.152E-15	8.941E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195214	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Beta	2.208E-14	1.955E-14	2.751E-14	µCi/mL			IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195214	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Beta	2.764E-14	2.003E-14	2.751E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195215	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Alpha	3.07E-16	3.628E-15	8.898E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195215	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Beta	2.277E-14	1.953E-14	2.738E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195216	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Alpha	5.201E-15	6.093E-15	8.855E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195216	BALLFIELDS	09/12/17	Gross Alpha/Beta	Gross Beta	1.166E-14	1.847E-14	2.725E-14	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195217	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Alpha	9.953E-15	7.727E-15	8.73E-15	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195217	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Beta	5.487E-14	2.191E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195218	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Alpha	6.334E-15	6.478E-15	8.73E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195218	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Beta	3.241E-14	2.002E-14	2.686E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195219	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Alpha	1.116E-14	8.103E-15	8.73E-15	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195219	BALLFIELDS	09/13/17	Gross Alpha/Beta	Gross Beta	4.48E-14	2.107E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195220	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Alpha	3.921E-15	5.496E-15	8.73E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195220	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Beta	5.022E-14	2.152E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195221	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Alpha	9.953E-15	7.727E-15	8.73E-15	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195221	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Beta	5.332E-14	2.178E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195222	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Alpha	3.02E-16	3.559E-15	8.73E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195222	BALLFIELDS	09/14/17	Gross Alpha/Beta	Gross Beta	5.642E-14	2.204E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195223	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Alpha	2.821E-15	5.128E-15	9.072E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195223	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Beta	3.69E-14	2.108E-14	2.792E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195224	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Alpha	2.821E-15	5.128E-15	9.072E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195224	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Beta	5.783E-14	2.284E-14	2.792E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195225	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Alpha	4.075E-15	5.712E-15	9.072E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195225	BALLFIELDS	09/18/17	Gross Alpha/Beta	Gross Beta	5.702E-14	2.277E-14	2.792E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195226	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Alpha	3.02E-16	3.559E-15	8.73E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195226	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Beta	4.868E-14	2.14E-14	2.686E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195227	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Alpha	2.715E-15	4.934E-15	8.73E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195227	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Beta	3.241E-14	2.002E-14	2.686E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195228	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Alpha	1.515E-15	4.322E-15	8.771E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195228	BALLFIELDS	09/11/17	Gross Alpha/Beta	Gross Beta	2.244E-14	1.925E-14	2.699E-14	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195229	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Alpha	6.582E-15	6.732E-15	9.072E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195229	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Beta	4.173E-14	2.149E-14	2.792E-14	µCi/mL	J	T04, T20	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195230	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Alpha	6.582E-15	6.732E-15	9.072E-15	µCi/mL	UJ	T06	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195230	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Beta	4.495E-14	2.176E-14	2.792E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195231	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Alpha	7.836E-15	7.19E-15	9.072E-15	µCi/mL	UJ	T04, T05	IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195231	BALLFIELDS	09/19/17	Gross Alpha/Beta	Gross Beta	6.105E-14	2.31E-14	2.792E-14	µCi/mL	=		IA-09 (Ballfields)(General Area)-Perimeter Air
SVP195232	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Alpha	1.254E-15	4.397E-15	9.464E-15	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP195232	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Alpha	3.761E-15	5.654E-15	9.464E-15	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195232	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Beta	3.757E-14	2E-14	2.881E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP195232	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Beta	5.85E-14	2.184E-14	2.881E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP195233	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Alpha	2.483E-15	5.015E-15	9.372E-15	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195233	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Beta	4.518E-14	2.052E-14	2.853E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP195234	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Alpha	4.966E-15	6.129E-15	9.372E-15	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195234	BALLFIELDS	09/26/17	Gross Alpha/Beta	Gross Beta	4.438E-14	2.044E-14	2.853E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP195235	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Alpha	-1.486E-15	1.02E-14	1.336E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP195235	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Alpha	-1.486E-15	1.02E-14	1.336E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195235	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Beta	9.986E-15	1.486E-14	2.003E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP195235	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Beta	4.28E-15	1.421E-14	2.003E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195236	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Alpha	1.061E-15	1.082E-14	1.336E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195236	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Beta	9.171E-15	1.477E-14	2.003E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195237	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Alpha	1.051E-15	1.071E-14	1.323E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195237	BALLFIELDS	09/27/17	Gross Alpha/Beta	Gross Beta	1.392E-14	1.516E-14	1.983E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195238	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Alpha	-1.516E-15	1.041E-14	1.363E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195238	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Beta	1.601E-14	1.581E-14	2.044E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP195239	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Alpha	-1.532E-15	1.052E-14	1.377E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195239	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Beta	8.614E-15	1.513E-14	2.065E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195240	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Alpha	-2.759E-15	9.877E-15	1.336E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195240	BALLFIELDS	09/28/17	Gross Alpha/Beta	Gross Beta	1.814E-14	1.576E-14	2.003E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP195241	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Alpha	-1.442E-15	9.902E-15	1.297E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195241	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Beta	3.107E-14	1.673E-14	1.944E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP195242	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Alpha	3.503E-15	1.107E-14	1.297E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195242	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Beta	2.79E-14	1.64E-14	1.944E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP195243	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Alpha	2.267E-15	1.079E-14	1.297E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP195243	BALLFIELDS	10/02/17	Gross Alpha/Beta	Gross Beta	5.243E-14	1.888E-14	1.944E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195244	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Alpha	6.593E-15	8.363E-15	1.249E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195244	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Beta	2.447E-14	1.576E-14	1.951E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199172	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Alpha	4.04E-16	6.14E-15	1.225E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199172	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Alpha	1.496E-14	1.046E-14	1.225E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199172	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Beta	2.556E-14	1.563E-14	1.914E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199172	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Beta	2.167E-14	1.521E-14	1.914E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199173	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Alpha	5.357E-15	7.985E-15	1.249E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199173	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Beta	2.21E-14	1.55E-14	1.951E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199174	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Alpha	1.769E-15	7.221E-15	1.34E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199174	BALLFIELDS	10/03/17	Gross Alpha/Beta	Gross Beta	1.691E-14	1.588E-14	2.094E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199175	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Alpha	5.518E-15	8.225E-15	1.287E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199175	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Beta	2.928E-14	1.667E-14	2.01E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199176	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Alpha	-8.41E-16	5.864E-15	1.274E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199176	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Beta	3.868E-14	1.752E-14	1.99E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199177	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Alpha	4.12E-16	6.259E-15	1.249E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199177	BALLFIELDS	10/04/17	Gross Alpha/Beta	Gross Beta	3.872E-14	1.726E-14	1.951E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199178	BALLFIELDS	10/05/17	Gross Alpha/Beta	Gross Alpha	-9.702E-15	1.345E-14	3.676E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199178	BALLFIELDS	10/05/17	Gross Alpha/Beta	Gross Beta	9.123E-15	3.924E-14	5.742E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199179	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Alpha	7.906E-15	8.811E-15	1.261E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199179	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Beta	2.071E-14	1.548E-14	1.97E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199180	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Alpha	1.974E-15	8.061E-15	1.496E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199180	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Beta	1.035E-14	1.675E-14	2.337E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199181	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Alpha	-8.32E-16	5.806E-15	1.261E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199181	BALLFIELDS	10/11/17	Gross Alpha/Beta	Gross Beta	2.471E-14	1.591E-14	1.97E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199182	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Alpha	-2.071E-15	1.445E-14	3.138E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199182	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Beta	3.96E-14	3.718E-14	4.902E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199183	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Alpha	1.035E-14	1.907E-14	3.138E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199183	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Beta	2.171E-14	3.514E-14	4.902E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199184	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Alpha	2.016E-14	2.247E-14	3.216E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199184	BALLFIELDS	10/16/17	Gross Alpha/Beta	Gross Beta	5.944E-15	3.409E-14	5.025E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199186	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Alpha	3.234E-15	6.404E-15	1.086E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199186	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Alpha	6.872E-15	7.67E-15	1.086E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199186	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Beta	3.979E-14	1.712E-14	1.948E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199186	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Beta	4.057E-14	1.72E-14	1.948E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199187	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Alpha	1.536E-14	1.005E-14	1.086E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199187	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Beta	3.513E-14	1.664E-14	1.948E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199188	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Alpha	5.659E-15	7.272E-15	1.086E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199188	BALLFIELDS	10/17/17	Gross Alpha/Beta	Gross Beta	2.814E-14	1.591E-14	1.948E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199189	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Alpha	9.43E-16	6.304E-15	1.267E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199189	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Beta	2.921E-14	1.818E-14	2.273E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199190	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Alpha	5.188E-15	7.993E-15	1.267E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199190	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Beta	3.374E-14	1.866E-14	2.273E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP199191	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Alpha	1.085E-14	9.816E-15	1.267E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199191	BALLFIELDS	10/18/17	Gross Alpha/Beta	Gross Beta	1.925E-14	1.709E-14	2.273E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199213	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Alpha	3.812E-15	7.059E-15	1.172E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199213	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Alpha	-2.37E-15	4.384E-15	1.172E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199213	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Beta	1.873E-14	1.357E-14	1.892E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP199213	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Beta	2.981E-14	1.49E-14	1.892E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199214	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Alpha	7.521E-15	8.268E-15	1.172E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199214	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Beta	9.234E-15	1.236E-14	1.892E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199215	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Alpha	3.775E-15	6.991E-15	1.161E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199215	BALLFIELDS	12/14/17	Gross Alpha/Beta	Gross Beta	2.325E-14	1.401E-14	1.874E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199216	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Alpha	-2.393E-15	4.427E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199216	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Beta	4.449E-14	1.666E-14	1.911E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199217	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Alpha	2.503E-15	6.422E-15	1.139E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199217	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Beta	4.05E-14	1.578E-14	1.839E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199218	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Alpha	1.289E-15	5.898E-15	1.129E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199218	BALLFIELDS	12/18/17	Gross Alpha/Beta	Gross Beta	4.317E-14	1.596E-14	1.821E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199219	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Alpha	5.252E-15	7.785E-15	1.22E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199219	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Beta	6.56E-14	1.924E-14	1.969E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199220	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Alpha	1.346E-15	6.157E-15	1.178E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199220	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Beta	8.006E-14	2.026E-14	1.901E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199221	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Alpha	1.326E-15	6.068E-15	1.161E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199221	BALLFIELDS	12/19/17	Gross Alpha/Beta	Gross Beta	7.029E-14	1.911E-14	1.874E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199222	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Alpha	1.04E-16	5.66E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199222	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Beta	1.732E-14	1.351E-14	1.911E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199223	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Alpha	-2.393E-15	4.427E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199223	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Beta	1.252E-14	1.29E-14	1.911E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199224	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Alpha	-1.144E-15	5.08E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199224	BALLFIELDS	12/20/17	Gross Alpha/Beta	Gross Beta	2.451E-14	1.438E-14	1.911E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP199225	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Alpha	1.352E-15	6.187E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199225	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Beta	5.808E-14	1.81E-14	1.911E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199226	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Alpha	1.134E-14	9.421E-15	1.184E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP199226	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Beta	4.849E-14	1.709E-14	1.911E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199227	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Alpha	1.352E-15	6.187E-15	1.184E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP199227	BALLFIELDS	12/21/17	Gross Alpha/Beta	Gross Beta	3.01E-14	1.504E-14	1.911E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP199228	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Alpha	3.804E-15	6.511E-15	1.131E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP199228	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Alpha	1.221E-14	9.135E-15	1.131E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP199228	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Beta	3.525E-14	1.481E-14	1.792E-14	µCi/mL			Ballfields (General Area)-Perimeter Air
SVP199228	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Beta	5.678E-14	1.718E-14	1.792E-14	µCi/mL	=		Ballfields (General Area)-Perimeter Air
SVP199229	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Alpha	2E-16	5.001E-15	1.131E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199229	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Beta	1.525E-14	1.237E-14	1.792E-14	µCi/mL	UJ	T04, T05	Ballfields (General Area)-Perimeter Air
SVP199230	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Alpha	-1.001E-15	4.387E-15	1.131E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199230	BALLFIELDS	12/26/17	Gross Alpha/Beta	Gross Beta	2.525E-14	1.363E-14	1.792E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP199231	BALLFIELDS	12/27/17	Gross Alpha/Beta	Gross Alpha	1.222E-14	2.092E-14	3.631E-14	µCi/mL	UJ	T06	Ballfields (General Area)-Perimeter Air
SVP199231	BALLFIELDS	12/27/17	Gross Alpha/Beta	Gross Beta	5.888E-14	4.1E-14	5.756E-14	µCi/mL	J	T04, T20	Ballfields (General Area)-Perimeter Air
SVP192524	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Alpha	-1.136E-15	6.27E-15	1.414E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192524	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Alpha	9.463E-15	1.019E-14	1.414E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP192524	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Beta	3.504E-14	1.707E-14	2.311E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192524	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Beta	2.358E-14	1.562E-14	2.311E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP192525	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Alpha	3.252E-15	7.806E-15	1.35E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192525	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Beta	2.524E-14	1.527E-14	2.206E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192526	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Alpha	6.435E-15	9.239E-15	1.414E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192526	DUCHESNE PARK	01/03/17	Gross Alpha/Beta	Gross Beta	3.218E-14	1.671E-14	2.311E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192527	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Alpha	8.782E-15	8.513E-15	1.131E-14	µCi/mL	UJ	T04, T05	Duchesne Park (General Area)-Perimeter Air
SVP192527	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Beta	2.956E-14	1.384E-14	1.849E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192528	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Alpha	-9.08E-16	5.016E-15	1.131E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192528	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Beta	3.339E-14	1.43E-14	1.849E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192529	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Alpha	3.974E-15	7.046E-15	1.142E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192529	DUCHESNE PARK	01/04/17	Gross Alpha/Beta	Gross Beta	2.676E-14	1.36E-14	1.867E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192530	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Alpha	3.669E-15	8.807E-15	1.523E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192530	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Beta	2.539E-14	1.683E-14	2.489E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192531	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Alpha	3.012E-15	7.231E-15	1.25E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192531	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Beta	7.324E-15	1.197E-14	2.044E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192532	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Alpha	6.93E-15	9.949E-15	1.523E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192532	DUCHESNE PARK	01/05/17	Gross Alpha/Beta	Gross Beta	2.539E-14	1.683E-14	2.489E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192533	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Alpha	2.65E-15	6.36E-15	1.1E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192533	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Beta	2.726E-14	1.327E-14	1.798E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192534	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Alpha	3.792E-15	6.723E-15	1.09E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192534	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Beta	2.922E-14	1.342E-14	1.781E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192535	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Alpha	3.863E-15	6.849E-15	1.11E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192535	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Alpha	-8.91E-16	4.922E-15	1.11E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP192535	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Beta	2.601E-14	1.321E-14	1.814E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192535	DUCHESNE PARK	01/09/17	Gross Alpha/Beta	Gross Beta	2.751E-14	1.34E-14	1.814E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP192536	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Alpha	3.498E-14	3.1E-14	3.958E-14	µCi/mL	UJ	T04, T05	Duchesne Park (General Area)-Perimeter Air
SVP192536	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Beta	1.784E-14	3.713E-14	6.471E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192537	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Alpha	4.542E-15	1.823E-14	3.393E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192537	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Beta	-9.94E-15	2.794E-14	5.547E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192538	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Alpha	-3.077E-15	1.699E-14	3.831E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192538	DUCHESNE PARK	01/10/17	Gross Alpha/Beta	Gross Beta	1.986E-14	3.631E-14	6.263E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192539	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Alpha	4.052E-15	7.184E-15	1.164E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192539	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Beta	4.46E-14	1.59E-14	1.903E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192540	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Alpha	3.937E-15	6.979E-15	1.131E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192540	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Beta	6.474E-14	1.775E-14	1.849E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192541	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Alpha	3.12E-16	5.734E-15	1.164E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192541	DUCHESNE PARK	01/11/17	Gross Alpha/Beta	Gross Beta	4.224E-14	1.563E-14	1.903E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP192542	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Alpha	2.92E-15	7.009E-15	1.212E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192542	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Beta	5.953E-14	1.799E-14	1.981E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192543	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Alpha	8.931E-15	9.621E-15	1.334E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192543	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Beta	8.269E-14	2.16E-14	2.181E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192544	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Alpha	6.813E-15	8.338E-15	1.212E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP192544	DUCHESNE PARK	01/14/17	Gross Alpha/Beta	Gross Beta	6.854E-14	1.894E-14	1.981E-14	µCi/mL	=		Duchesne Park (General Area)-Perimeter Air
SVP192547	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Alpha	3.128E-14	2.035E-14	2.012E-14	µCi/mL	J	T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192547	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Alpha	6.255E-15	1.147E-14	2.012E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP192547	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Beta	8.628E-14	5.666E-14	6.431E-14	µCi/mL	J	F01, T04, T20	Duchesne Park (General Area)-Perimeter Air
SVP192547	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Beta	6.486E-14	5.515E-14	6.431E-14	µCi/mL			Duchesne Park (General Area)-Perimeter Air
SVP195045	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Alpha	1.039E-14	1.467E-14	2.313E-14	µCi/mL	UJ	T06	Duchesne Park (General Area)-Perimeter Air
SVP195045	DUCHESNE PARK	02/06/17	Gross Alpha/Beta	Gross Beta	2.409E-13	7.512E-14	7.395E-14	µCi/mL	J	F01	Duchesne Park (General Area)-Perimeter Air
SVP195061	PALM DR. PROPERTIES	04/12/17	Gross Alpha/Beta	Gross Alpha	-2.231E-15	6.205E-15	1.683E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195061	PALM DR. PROPERTIES	04/12/17	Gross Alpha/Beta	Gross Alpha	-3.19E-16	7.287E-15	1.683E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195061	PALM DR. PROPERTIES	04/12/17	Gross Alpha/Beta	Gross Beta	2.002E-14	1.963E-14	2.752E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195061	PALM DR. PROPERTIES	04/12/17	Gross Alpha/Beta	Gross Beta	2.606E-14	2.039E-14	2.752E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195062	PALM DR. PROPERTIES	04/13/17	Gross Alpha/Beta	Gross Alpha	-1.562E-15	4.343E-15	1.178E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195062	PALM DR. PROPERTIES	04/13/17	Gross Alpha/Beta	Gross Beta	1.908E-14	1.438E-14	1.926E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195063	PALM DR. PROPERTIES	04/18/17	Gross Alpha/Beta	Gross Alpha	2.264E-15	5.862E-15	1.087E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195063	PALM DR. PROPERTIES	04/18/17	Gross Alpha/Beta	Gross Beta	4.177E-14	1.607E-14	1.777E-14	µCi/mL	=		Palm Drive Properties (General Area)-Perimeter Air
SVP195064	PALM DR. PROPERTIES	04/19/17	Gross Alpha/Beta	Gross Alpha	-1.469E-15	4.085E-15	1.108E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195064	PALM DR. PROPERTIES	04/19/17	Gross Alpha/Beta	Gross Beta	1.954E-14	1.372E-14	1.812E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195065	PALM DR. PROPERTIES	04/24/17	Gross Alpha/Beta	Gross Alpha	-2.07E-16	4.728E-15	1.092E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195065	PALM DR. PROPERTIES	04/24/17	Gross Alpha/Beta	Gross Beta	2.552E-14	1.428E-14	1.785E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195066	PALM DR. PROPERTIES	04/20/17	Gross Alpha/Beta	Gross Alpha	6.027E-15	7.337E-15	1.097E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195066	PALM DR. PROPERTIES	04/20/17	Gross Alpha/Beta	Gross Beta	3.037E-14	1.49E-14	1.794E-14	µCi/mL	=		Palm Drive Properties (General Area)-Perimeter Air
SVP195067	PALM DR. PROPERTIES	04/25/17	Gross Alpha/Beta	Gross Alpha	1.14E-15	5.885E-15	1.203E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195067	PALM DR. PROPERTIES	04/25/17	Gross Alpha/Beta	Gross Beta	3.244E-14	1.624E-14	1.968E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195068	PALM DR. PROPERTIES	04/26/17	Gross Alpha/Beta	Gross Alpha	-4.122E-15	1.146E-14	3.109E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195068	PALM DR. PROPERTIES	04/26/17	Gross Alpha/Beta	Gross Beta	3.475E-14	3.598E-14	5.083E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195069	PALM DR. PROPERTIES	04/17/17	Gross Alpha/Beta	Gross Alpha	3.154E-15	5.431E-15	9.154E-15	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195069	PALM DR. PROPERTIES	04/17/17	Gross Alpha/Beta	Gross Alpha	7.068E-15	7.08E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195069	PALM DR. PROPERTIES	04/17/17	Gross Alpha/Beta	Gross Beta	1.711E-14	2.101E-14	3.002E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195069	PALM DR. PROPERTIES	04/17/17	Gross Alpha/Beta	Gross Beta	3.387E-14	2.24E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195070	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Alpha	3.512E-15	6.049E-15	1.019E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195070	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Beta	2.558E-14	2.394E-14	3.344E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195071	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Alpha	1.868E-15	4.809E-15	9.248E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195071	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Beta	2.744E-14	2.207E-14	3.033E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195072	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Alpha	5.853E-15	6.677E-15	9.296E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195072	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Beta	7.162E-15	2.048E-14	3.049E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195073	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Alpha	1.734E-15	4.464E-15	8.585E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195073	PALM DR. PROPERTIES	05/02/17	Gross Alpha/Beta	Gross Beta	1.919E-14	1.997E-14	2.816E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195074	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Alpha	8.73E-15	7.873E-15	9.544E-15	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195074	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Beta	2.22E-14	2.227E-14	3.13E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195075	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Alpha	7.967E-15	7.185E-15	8.71E-15	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195075	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Beta	3.86E-14	2.184E-14	2.857E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195076	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Alpha	4.201E-15	5.682E-15	8.626E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195076	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Beta	3.586E-14	2.143E-14	2.829E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195077	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Alpha	6.858E-15	6.87E-15	8.882E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195077	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Beta	2.148E-14	2.079E-14	2.913E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195078	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Alpha	4.348E-15	5.88E-15	8.926E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195078	PALM DR. PROPERTIES	05/09/17	Gross Alpha/Beta	Gross Beta	3.466E-14	2.198E-14	2.928E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195079	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	5.592E-15	6.38E-15	8.882E-15	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195079	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	6.858E-15	6.87E-15	8.882E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195079	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	4.18E-14	2.247E-14	2.913E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195079	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	4.099E-14	2.24E-14	2.913E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195080	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	3.03E-15	5.218E-15	8.795E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195080	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	3.576E-14	2.179E-14	2.885E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195081	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	6.791E-15	6.802E-15	8.795E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195081	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	4.944E-14	2.29E-14	2.885E-14	µCi/mL	=		Palm Drive Properties (General Area)-Perimeter Air
SVP195082	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	3.03E-15	5.218E-15	8.795E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195082	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	3.737E-14	2.192E-14	2.885E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195083	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Alpha	1.742E-15	4.485E-15	8.626E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195083	PALM DR. PROPERTIES	05/10/17	Gross Alpha/Beta	Gross Beta	3.586E-14	2.143E-14	2.829E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195084	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	1.035E-14	7.934E-15	8.626E-15	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195084	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	1.059E-14	1.934E-14	2.829E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195085	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	6.661E-15	6.671E-15	8.626E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195085	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	1.928E-14	2.006E-14	2.829E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195086	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	2.972E-15	5.118E-15	8.626E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195086	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	1.059E-14	1.934E-14	2.829E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195087	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	6.661E-15	6.671E-15	8.626E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195087	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	1.533E-14	1.973E-14	2.829E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195088	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	1.035E-14	7.934E-15	8.626E-15	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195088	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	3.033E-14	2.098E-14	2.829E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195089	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	6.661E-15	6.671E-15	8.626E-15	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195089	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Alpha	7.89E-15	7.116E-15	8.626E-15	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195089	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	3.033E-14	2.098E-14	2.829E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195089	PALM DR. PROPERTIES	05/11/17	Gross Alpha/Beta	Gross Beta	1.849E-14	2E-14	2.829E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195090	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Alpha	4.459E-15	6.03E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195090	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Beta	2.968E-14	2.206E-14	3.002E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195091	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Alpha	7.068E-15	7.08E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195091	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Beta	2.549E-14	2.171E-14	3.002E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195092	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Alpha	3.154E-15	5.431E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195092	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Beta	1.962E-14	2.122E-14	3.002E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195093	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Alpha	3.154E-15	5.431E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195093	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Beta	3.219E-14	2.226E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195094	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Alpha	5.764E-15	6.575E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195094	PALM DR. PROPERTIES	05/16/17	Gross Alpha/Beta	Gross Beta	3.387E-14	2.24E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195095	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Alpha	5.764E-15	6.575E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195095	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Beta	2.968E-14	2.206E-14	3.002E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195096	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Alpha	5.44E-16	3.979E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195096	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Beta	2.214E-14	2.143E-14	3.002E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195097	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Alpha	1.098E-14	8.42E-15	9.154E-15	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195097	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Beta	9.566E-15	2.038E-14	3.002E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195098	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Alpha	1.849E-15	4.76E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195098	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Beta	3.701E-15	1.988E-14	3.002E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195099	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Alpha	4.459E-15	6.03E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195099	PALM DR. PROPERTIES	05/15/17	Gross Alpha/Beta	Gross Beta	3.051E-14	2.213E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195100	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	5.764E-15	6.575E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195100	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	3.219E-14	2.226E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195101	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	9.678E-15	7.997E-15	9.154E-15	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195101	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	1.627E-14	2.094E-14	3.002E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195102	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	4.459E-15	6.03E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195102	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	4.141E-14	2.302E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195103	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	3.154E-15	5.431E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195103	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.884E-14	2.199E-14	3.002E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195104	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	4.459E-15	6.03E-15	9.154E-15	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195104	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	4.057E-14	2.295E-14	3.002E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195105	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Alpha	1.153E-14	9.394E-15	1.011E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195105	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Beta	3.178E-14	2.634E-14	3.232E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195106	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Alpha	3.145E-15	6.386E-15	1.011E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195106	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Beta	-5.24E-16	2.394E-14	3.232E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195107	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Alpha	4.542E-15	6.974E-15	1.011E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195107	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Beta	1.384E-14	2.501E-14	3.232E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195108	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Alpha	7.338E-15	8.027E-15	1.011E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195108	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Beta	2.012E-14	2.548E-14	3.232E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195109	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Alpha	5.94E-15	7.518E-15	1.011E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195109	PALM DR. PROPERTIES	05/22/17	Gross Alpha/Beta	Gross Beta	3.178E-14	2.634E-14	3.232E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195110	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	4.659E-15	8.426E-15	1.295E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195110	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	1.863E-15	7.436E-15	1.295E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195110	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	3.426E-14	1.807E-14	2.081E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195110	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	6.028E-15	1.488E-14	2.081E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195111	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	1.863E-15	7.436E-15	1.295E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195111	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	3.426E-14	1.807E-14	2.081E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195112	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	4.66E-16	6.889E-15	1.295E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195112	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	2.72E-14	1.731E-14	2.081E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195113	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	6.056E-15	8.882E-15	1.295E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195113	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	3.602E-14	1.826E-14	2.081E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195114	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Alpha	8.851E-15	9.732E-15	1.295E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195114	PALM DR. PROPERTIES	05/23/17	Gross Alpha/Beta	Gross Beta	4.044E-14	1.873E-14	2.081E-14	µCi/mL	=		North County Air (General Area Air)-Perimeter Air
SVP195115	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Alpha	1.776E-15	7.085E-15	1.234E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195115	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Beta	2.004E-14	1.584E-14	1.982E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195116	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Alpha	1.776E-15	7.085E-15	1.234E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195116	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Beta	1.163E-14	1.488E-14	1.982E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195117	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Alpha	-3.551E-15	4.676E-15	1.234E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195117	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Beta	1.079E-14	1.478E-14	1.982E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195118	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Alpha	4.463E-15	8.071E-15	1.24E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195118	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Beta	1.169E-14	1.496E-14	1.993E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195119	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Alpha	7.103E-15	8.877E-15	1.234E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195119	PALM DR. PROPERTIES	05/24/17	Gross Alpha/Beta	Gross Beta	2.004E-14	1.584E-14	1.982E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195120	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	1.615E-15	5.304E-15	9.347E-15	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195120	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	2.906E-15	5.902E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195120	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	1.693E-14	2.342E-14	2.987E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195120	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	2.772E-14	2.422E-14	2.987E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195121	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	2.906E-15	5.902E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195121	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	7.811E-15	2.275E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195122	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	2.906E-15	5.902E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195122	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	2.004E-15	2.231E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195123	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	4.198E-15	6.446E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195123	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	1.528E-14	2.33E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195124	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Alpha	-9.69E-16	3.844E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195124	PALM DR. PROPERTIES	05/25/17	Gross Alpha/Beta	Gross Beta	2.274E-14	2.386E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195125	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	3.95E-16	5.66E-15	1.142E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195125	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	8.532E-15	2.772E-14	3.65E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195126	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	6.851E-15	7.494E-15	9.443E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195126	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	2.716E-14	2.441E-14	3.017E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195127	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	1.631E-15	5.358E-15	9.443E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195127	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	2.884E-14	2.453E-14	3.017E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195128	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	2.936E-15	5.962E-15	9.443E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195128	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	1.376E-14	2.341E-14	3.017E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195129	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	4.241E-15	6.512E-15	9.443E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195129	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	2.214E-14	2.404E-14	3.017E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195130	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Alpha	2.936E-15	5.962E-15	9.443E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195130	PALM DR. PROPERTIES	05/30/17	Gross Alpha/Beta	Gross Beta	1.627E-14	2.36E-14	3.017E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195131	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Alpha	1.615E-15	5.304E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195131	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Beta	3.85E-14	2.502E-14	2.987E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195132	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Alpha	3.23E-16	4.631E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195132	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Beta	3.684E-14	2.49E-14	2.987E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195133	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Alpha	5.49E-15	6.949E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195133	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Beta	2.191E-14	2.379E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195134	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Alpha	4.198E-15	6.446E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195134	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Beta	1.528E-14	2.33E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195135	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Alpha	2.906E-15	5.902E-15	9.347E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195135	PALM DR. PROPERTIES	05/31/17	Gross Alpha/Beta	Gross Beta	1.175E-15	2.225E-14	2.987E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195139	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	7.69E-16	7.419E-15	1.059E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195139	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	2.087E-15	7.875E-15	1.059E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195139	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	4.444E-15	1.928E-14	2.929E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195139	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	1.63E-14	2.032E-14	2.929E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195140	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	2.087E-15	7.875E-15	1.059E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195140	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	2.307E-14	2.091E-14	2.929E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195141	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	2.087E-15	7.875E-15	1.059E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195141	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	2.984E-14	2.149E-14	2.929E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195142	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	-5.49E-16	6.935E-15	1.059E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195142	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	1.63E-14	2.032E-14	2.929E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195143	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Alpha	-5.49E-16	6.935E-15	1.059E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195143	PALM DR. PROPERTIES	06/01/17	Gross Alpha/Beta	Gross Beta	1.714E-14	2.039E-14	2.929E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195144	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Alpha	3.337E-15	8.139E-15	1.037E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195144	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Beta	1.763E-14	2.005E-14	2.87E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195145	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Alpha	7.54E-16	7.269E-15	1.037E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195145	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Beta	3.339E-14	2.141E-14	2.87E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195146	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Alpha	7.54E-16	7.269E-15	1.037E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195146	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Beta	1.182E-14	1.955E-14	2.87E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195147	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Alpha	4.629E-15	8.542E-15	1.037E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195147	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Beta	2.094E-14	2.034E-14	2.87E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195148	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Alpha	7.54E-16	7.269E-15	1.037E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195148	PALM DR. PROPERTIES	06/06/17	Gross Alpha/Beta	Gross Beta	5.184E-15	1.896E-14	2.87E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195149	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	5.636E-15	8.499E-15	9.873E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195149	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	2.231E-14	1.957E-14	2.732E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195150	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	8.018E-15	9.104E-15	9.779E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195150	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	9.58E-15	1.829E-14	2.706E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195151	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	-5.12E-16	6.468E-15	9.873E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195151	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	9.672E-15	1.847E-14	2.732E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195152	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	1.045E-14	9.745E-15	9.779E-15	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195152	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	2.444E-14	1.958E-14	2.706E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195153	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	-2.344E-15	3.99E-15	1.046E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195153	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Alpha	2.548E-15	6.313E-15	1.046E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195153	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	1.081E-14	1.347E-14	1.86E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195153	PALM DR. PROPERTIES	06/07/17	Gross Alpha/Beta	Gross Beta	1.467E-14	1.392E-14	1.86E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195154	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Alpha	5.091E-15	7.346E-15	1.067E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195154	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Beta	1.417E-14	1.411E-14	1.896E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195155	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Alpha	5.091E-15	7.346E-15	1.067E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195155	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Beta	1.968E-14	1.474E-14	1.896E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195156	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Alpha	-1.143E-15	4.77E-15	1.067E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195156	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Beta	1.81E-14	1.456E-14	1.896E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195157	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Alpha	1.06E-16	5.489E-15	1.088E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195157	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Beta	1.927E-14	1.494E-14	1.934E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195158	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Alpha	-1.154E-15	4.817E-15	1.077E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195158	PALM DR. PROPERTIES	06/08/17	Gross Alpha/Beta	Gross Beta	2.385E-15	1.281E-14	1.915E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195159	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	-1.887E-15	6.482E-15	1.07E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195159	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	7.438E-15	9.589E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195159	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	1.476E-14	2.038E-14	2.96E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195159	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	2.16E-14	2.098E-14	2.96E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195160	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	7.438E-15	9.589E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195160	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	2.588E-14	2.135E-14	2.96E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195161	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	1.01E-14	1.031E-14	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195161	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	2.16E-14	2.098E-14	2.96E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195162	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	5.861E-15	8.838E-15	1.027E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195162	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	4.291E-14	2.203E-14	2.841E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195163	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Alpha	-5.55E-16	7.007E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195163	PALM DR. PROPERTIES	06/12/17	Gross Alpha/Beta	Gross Beta	1.219E-14	2.016E-14	2.96E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195164	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Alpha	7.77E-16	7.497E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195164	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Beta	8.767E-15	1.986E-14	2.96E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195165	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Alpha	7.77E-16	7.497E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195165	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Beta	1.647E-14	2.053E-14	2.96E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195166	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Alpha	6.106E-15	9.207E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195166	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Beta	7.912E-15	1.978E-14	2.96E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195167	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Alpha	3.441E-15	8.393E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195167	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Beta	3.443E-14	2.208E-14	2.96E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195168	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Alpha	2.109E-15	7.957E-15	1.07E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195168	PALM DR. PROPERTIES	06/13/17	Gross Alpha/Beta	Gross Beta	1.989E-14	2.083E-14	2.96E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195169	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Alpha	1.322E-14	1.705E-14	1.902E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195169	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Beta	6.121E-14	3.925E-14	5.261E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195170	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Alpha	3.75E-15	1.415E-14	1.902E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195170	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Beta	4.448E-14	3.782E-14	5.261E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195171	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Alpha	1.322E-14	1.705E-14	1.902E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195171	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Beta	5.512E-14	3.873E-14	5.261E-14	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195172	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Alpha	6.118E-15	1.492E-14	1.902E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195172	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Beta	2.471E-14	3.61E-14	5.261E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195173	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Alpha	2.551E-15	1.121E-14	2.015E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195173	PALM DR. PROPERTIES	06/14/17	Gross Alpha/Beta	Gross Beta	2.676E-14	2.664E-14	3.582E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195174	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	6.994E-15	7.65E-15	9.639E-15	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195174	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	4.329E-15	6.648E-15	9.639E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SVP195174	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.431E-14	2.466E-14	3.08E-14	µCi/mL			North County Air (General Area Air)-Perimeter Air
SVP195174	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.516E-14	2.473E-14	3.08E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195175	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	8.326E-15	8.107E-15	9.639E-15	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195175	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.003E-14	2.435E-14	3.08E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195176	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	4.329E-15	6.648E-15	9.639E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195176	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.516E-14	2.473E-14	3.08E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195177	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	9.658E-15	8.54E-15	9.639E-15	µCi/mL	J	T04, T20	North County Air (General Area Air)-Perimeter Air
SVP195177	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.858E-14	2.498E-14	3.08E-14	µCi/mL	UJ	T04, T05	North County Air (General Area Air)-Perimeter Air
SVP195178	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Alpha	4.329E-15	6.648E-15	9.639E-15	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195178	PALM DR. PROPERTIES	05/18/17	Gross Alpha/Beta	Gross Beta	2.003E-14	2.435E-14	3.08E-14	µCi/mL	UJ	T06	North County Air (General Area Air)-Perimeter Air
SVP195179	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Alpha	7.066E-15	8.093E-15	1.227E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195179	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Alpha	1.104E-14	9.322E-15	1.227E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195179	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Beta	2.99E-14	1.586E-14	2.11E-14	µCi/mL			Palm Drive Properties (General Area)-Perimeter Air
SVP195179	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Beta	2.404E-14	1.518E-14	2.11E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195180	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Alpha	5.741E-15	7.642E-15	1.227E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195180	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Beta	1.735E-14	1.438E-14	2.11E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195181	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Alpha	1.785E-15	6.163E-15	1.24E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195181	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Beta	1.416E-14	1.411E-14	2.132E-14	µCi/mL	UJ	T04, T05	Palm Drive Properties (General Area)-Perimeter Air
SVP195182	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Alpha	5.801E-15	7.722E-15	1.24E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195182	PALM DR. PROPERTIES	07/13/17	Gross Alpha/Beta	Gross Beta	2.514E-14	1.544E-14	2.132E-14	µCi/mL	J	T04, T20	Palm Drive Properties (General Area)-Perimeter Air
SVP195197	PALM DR. PROPERTIES	08/14/17	Gross Alpha/Beta	Gross Alpha	2.524E-14	3.023E-14	4.398E-14	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SVP195197	PALM DR. PROPERTIES	08/14/17	Gross Alpha/Beta	Gross Beta	2.845E-14	9.944E-14	1.509E-13	µCi/mL	UJ	T06	Palm Drive Properties (General Area)-Perimeter Air
SLA193648	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Alpha	-2.216E-15	3.851E-15	1.096E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193648	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Alpha	3.565E-15	6.45E-15	1.096E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193648	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Beta	2.013E-14	1.444E-14	1.825E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193648	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Beta	1.502E-14	1.389E-14	1.825E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193649	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Alpha	2.409E-15	6.018E-15	1.096E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193649	SLAPS LOADOUT	01/03/17	Gross Alpha/Beta	Gross Beta	1.575E-14	1.397E-14	1.825E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193650	SLAPS LOADOUT	01/04/17	Gross Alpha/Beta	Gross Alpha	9.8E-17	5.143E-15	1.117E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193650	SLAPS LOADOUT	01/04/17	Gross Alpha/Beta	Gross Beta	2.422E-14	1.511E-14	1.859E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193651	SLAPS LOADOUT	01/04/17	Gross Alpha/Beta	Gross Alpha	2.453E-15	6.13E-15	1.117E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193651	SLAPS LOADOUT	01/04/17	Gross Alpha/Beta	Gross Beta	2.199E-14	1.487E-14	1.859E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193652	SLAPS LOADOUT	01/05/17	Gross Alpha/Beta	Gross Alpha	-2.332E-15	9.877E-15	2.412E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193652	SLAPS LOADOUT	01/05/17	Gross Alpha/Beta	Gross Beta	3.947E-14	3.125E-14	4.015E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193653	SLAPS LOADOUT	01/05/17	Gross Alpha/Beta	Gross Alpha	-7.419E-15	6.785E-15	2.412E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193653	SLAPS LOADOUT	01/05/17	Gross Alpha/Beta	Gross Beta	1.218E-14	2.819E-14	4.015E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193654	SLAPS LOADOUT	01/09/17	Gross Alpha/Beta	Gross Alpha	-2.257E-15	3.922E-15	1.117E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193654	SLAPS LOADOUT	01/09/17	Gross Alpha/Beta	Gross Beta	2.645E-14	1.535E-14	1.859E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193655	SLAPS LOADOUT	01/09/17	Gross Alpha/Beta	Gross Alpha	9.7E-17	5.096E-15	1.107E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193655	SLAPS LOADOUT	01/09/17	Gross Alpha/Beta	Gross Beta	3.21E-14	1.582E-14	1.842E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193656	SLAPS LOADOUT	01/11/17	Gross Alpha/Beta	Gross Alpha	2.17E-14	1.155E-14	1.138E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193656	SLAPS LOADOUT	01/11/17	Gross Alpha/Beta	Gross Beta	2.072E-13	3.156E-14	1.894E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193657	SLAPS LOADOUT	01/11/17	Gross Alpha/Beta	Gross Alpha	2.069E-14	1.139E-14	1.149E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193657	SLAPS LOADOUT	01/11/17	Gross Alpha/Beta	Gross Beta	2.367E-13	3.404E-14	1.912E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA193658	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Alpha	1.07E-14	8.77E-15	1.117E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193658	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Beta	7.254E-14	1.987E-14	1.859E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193659	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Alpha	1.343E-14	9.664E-15	1.149E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193659	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Alpha	1.343E-14	9.664E-15	1.149E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193659	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Beta	9.067E-14	2.19E-14	1.912E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193659	SLAPS LOADOUT	01/12/17	Gross Alpha/Beta	Gross Beta	6.467E-14	1.951E-14	1.912E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193660	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Alpha	3.735E-15	6.757E-15	1.149E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193660	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Beta	2.109E-14	1.513E-14	1.912E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193661	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Alpha	-2.236E-15	3.886E-15	1.107E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193661	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Beta	7.058E-15	1.31E-14	1.842E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193662	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Alpha	-8.064E-15	7.374E-15	2.622E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193662	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Beta	-5.963E-15	2.836E-14	4.365E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193663	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Alpha	2.995E-15	1.328E-14	2.622E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193663	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Beta	2.196E-14	3.164E-14	4.365E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193664	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Alpha	-8.243E-15	7.538E-15	2.68E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193664	SLAPS LOADOUT	01/17/17	Gross Alpha/Beta	Gross Beta	-9.664E-15	2.855E-14	4.462E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193665	SLAPS LOADOUT	01/18/17	Gross Alpha/Beta	Gross Alpha	9.7E-17	5.096E-15	1.107E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193665	SLAPS LOADOUT	01/18/17	Gross Alpha/Beta	Gross Beta	3.652E-14	1.627E-14	1.842E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193666	SLAPS LOADOUT	01/18/17	Gross Alpha/Beta	Gross Alpha	-4.528E-15	2.051E-15	1.096E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193666	SLAPS LOADOUT	01/18/17	Gross Alpha/Beta	Gross Beta	4.13E-14	1.664E-14	1.825E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193667	SLAPS LOADOUT	01/19/17	Gross Alpha/Beta	Gross Alpha	-2.65E-15	4.604E-15	1.311E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193667	SLAPS LOADOUT	01/19/17	Gross Alpha/Beta	Gross Beta	1.011E-14	1.572E-14	2.182E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193668	SLAPS LOADOUT	01/19/17	Gross Alpha/Beta	Gross Alpha	-1.254E-15	5.31E-15	1.297E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193668	SLAPS LOADOUT	01/19/17	Gross Alpha/Beta	Gross Beta	1.432E-14	1.604E-14	2.159E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193669	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Alpha	-3.238E-15	3.569E-15	1.1E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193669	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Alpha	1.472E-15	5.906E-15	1.1E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193669	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Beta	2.651E-14	1.318E-14	1.798E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193669	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Beta	1.165E-14	1.126E-14	1.798E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193670	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Alpha	5.005E-15	7.186E-15	1.1E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193670	SLAPS LOADOUT	01/23/17	Gross Alpha/Beta	Gross Beta	4.212E-15	1.021E-14	1.798E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193671	SLAPS LOADOUT	01/24/17	Gross Alpha/Beta	Gross Alpha	4.914E-15	7.055E-15	1.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193671	SLAPS LOADOUT	01/24/17	Gross Alpha/Beta	Gross Beta	1.508E-14	1.155E-14	1.765E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193672	SLAPS LOADOUT	01/24/17	Gross Alpha/Beta	Gross Alpha	1.459E-15	5.852E-15	1.09E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193672	SLAPS LOADOUT	01/24/17	Gross Alpha/Beta	Gross Beta	1.08E-14	1.106E-14	1.781E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193673	SLAPS LOADOUT	01/25/17	Gross Alpha/Beta	Gross Alpha	1.472E-15	5.906E-15	1.1E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193673	SLAPS LOADOUT	01/25/17	Gross Alpha/Beta	Gross Beta	2.874E-14	1.345E-14	1.798E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193674	SLAPS LOADOUT	01/26/17	Gross Alpha/Beta	Gross Alpha	2.257E-15	5.549E-15	1.027E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193674	SLAPS LOADOUT	01/26/17	Gross Alpha/Beta	Gross Alpha	-1.276E-15	3.759E-15	1.027E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193674	SLAPS LOADOUT	01/26/17	Gross Alpha/Beta	Gross Beta	2.342E-14	1.316E-14	1.801E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193674	SLAPS LOADOUT	01/26/17	Gross Alpha/Beta	Gross Beta	2.119E-14	1.288E-14	1.801E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193675	SLAPS LOADOUT	01/30/17	Gross Alpha/Beta	Gross Alpha	2.278E-15	5.601E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193675	SLAPS LOADOUT	01/30/17	Gross Alpha/Beta	Gross Beta	1.913E-14	1.272E-14	1.818E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193676	SLAPS LOADOUT	01/31/17	Gross Alpha/Beta	Gross Alpha	6.841E-15	7.16E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193676	SLAPS LOADOUT	01/31/17	Gross Alpha/Beta	Gross Beta	2.007E-14	1.256E-14	1.768E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193677	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	1.021E-14	9.201E-15	1.017E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193677	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	1.021E-14	9.201E-15	1.017E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA193677	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	2.08E-14	1.302E-14	1.808E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193677	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	2.299E-14	1.329E-14	1.808E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193678	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	-2.505E-15	5.038E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193678	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	1.35E-14	1.213E-14	1.808E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193679	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	1.204E-15	8.042E-15	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193679	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	2.418E-14	1.606E-14	2.259E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193680	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	-2.44E-16	7.591E-15	1.286E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193680	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	1.892E-14	1.557E-14	2.285E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193681	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Alpha	4.29E-15	9.455E-15	1.332E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193681	SLAPS LOADOUT	02/01/17	Gross Alpha/Beta	Gross Beta	2.915E-14	1.728E-14	2.367E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193682	SLAPS LOADOUT	02/06/17	Gross Alpha/Beta	Gross Alpha	4.688E-15	8.022E-15	1.076E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193682	SLAPS LOADOUT	02/06/17	Gross Alpha/Beta	Gross Beta	2.2E-14	1.378E-14	1.912E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193683	SLAPS LOADOUT	02/06/17	Gross Alpha/Beta	Gross Alpha	8.047E-15	8.748E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193683	SLAPS LOADOUT	02/06/17	Gross Alpha/Beta	Gross Beta	4.869E-14	1.634E-14	1.841E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193684	SLAPS LOADOUT	02/07/17	Gross Alpha/Beta	Gross Alpha	-1.96E-16	6.115E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193684	SLAPS LOADOUT	02/07/17	Gross Alpha/Beta	Gross Beta	-1.524E-14	8.162E-15	1.841E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193685	SLAPS LOADOUT	02/08/17	Gross Alpha/Beta	Gross Alpha	8.277E-15	8.998E-15	1.066E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193685	SLAPS LOADOUT	02/08/17	Gross Alpha/Beta	Gross Beta	1.797E-14	1.318E-14	1.894E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193686	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Alpha	-5.329E-15	1.015E-15	1.905E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193686	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Alpha	1.435E-14	1.398E-14	1.905E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193686	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Beta	5.395E-15	4.017E-14	5.602E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193686	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Beta	1.171E-14	4.067E-14	5.602E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193687	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Alpha	1.924E-15	8.047E-15	1.788E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193687	SLAPS LOADOUT	02/14/17	Gross Alpha/Beta	Gross Beta	1.118E-13	4.599E-14	5.258E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193688	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Alpha	-2.409E-15	4.59E-16	8.614E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193688	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Beta	3.172E-14	2.046E-14	2.533E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193689	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Alpha	5.375E-15	5.911E-15	8.614E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193689	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Beta	6.171E-14	2.275E-14	2.533E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193690	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Alpha	3.814E-15	6.048E-15	1.043E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193690	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Beta	1.049E-13	2.983E-14	3.067E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193691	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Alpha	-2.22E-16	3.803E-15	1.032E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193691	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Beta	8.162E-14	2.784E-14	3.035E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193692	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Alpha	3.735E-15	5.923E-15	1.021E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193692	SLAPS LOADOUT	02/15/17	Gross Alpha/Beta	Gross Beta	8.416E-14	2.781E-14	3.003E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193693	SLAPS LOADOUT	02/16/17	Gross Alpha/Beta	Gross Alpha	1.055E-15	4.414E-15	9.808E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193693	SLAPS LOADOUT	02/16/17	Gross Alpha/Beta	Gross Beta	8.896E-14	2.732E-14	2.884E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193694	SLAPS LOADOUT	02/21/17	Gross Alpha/Beta	Gross Alpha	4.071E-15	6.456E-15	1.113E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193694	SLAPS LOADOUT	02/21/17	Gross Alpha/Beta	Gross Beta	1.157E-13	3.212E-14	3.273E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193695	SLAPS LOADOUT	02/21/17	Gross Alpha/Beta	Gross Alpha	5.508E-15	7.071E-15	1.113E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193695	SLAPS LOADOUT	02/21/17	Gross Alpha/Beta	Gross Beta	1.471E-13	3.446E-14	3.273E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193696	SLAPS LOADOUT	02/22/17	Gross Alpha/Beta	Gross Alpha	7.105E-15	6.923E-15	9.435E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193696	SLAPS LOADOUT	02/22/17	Gross Alpha/Beta	Gross Beta	7.306E-14	2.534E-14	2.774E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193697	SLAPS LOADOUT	02/22/17	Gross Alpha/Beta	Gross Alpha	-2.01E-16	3.444E-15	9.346E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193697	SLAPS LOADOUT	02/22/17	Gross Alpha/Beta	Gross Beta	9.871E-14	2.708E-14	2.748E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193698	SLAPS LOADOUT	02/23/17	Gross Alpha/Beta	Gross Alpha	-1.477E-15	2.581E-15	9.808E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193698	SLAPS LOADOUT	02/23/17	Gross Alpha/Beta	Gross Beta	8.814E-14	2.726E-14	2.884E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA193699	SLAPS LOADOUT	02/23/17	Gross Alpha/Beta	Gross Alpha	-1.492E-15	2.607E-15	9.907E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193699	SLAPS LOADOUT	02/23/17	Gross Alpha/Beta	Gross Beta	5.454E-14	2.491E-14	2.913E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193700	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Alpha	2.494E-15	5.939E-15	1.077E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193700	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Alpha	2.494E-15	5.939E-15	1.077E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193700	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Beta	2.414E-14	1.346E-14	1.903E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193700	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Beta	1.548E-14	1.234E-14	1.903E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193701	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Alpha	-1.957E-15	6.392E-15	1.69E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193701	SLAPS LOADOUT	02/27/17	Gross Alpha/Beta	Gross Beta	1.194E-14	1.766E-14	2.987E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193702	SLAPS LOADOUT	02/28/17	Gross Alpha/Beta	Gross Alpha	1.272E-15	5.496E-15	1.099E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193702	SLAPS LOADOUT	02/28/17	Gross Alpha/Beta	Gross Beta	3.506E-14	1.5E-14	1.941E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193703	SLAPS LOADOUT	02/28/17	Gross Alpha/Beta	Gross Alpha	0	4.871E-15	1.099E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193703	SLAPS LOADOUT	02/28/17	Gross Alpha/Beta	Gross Beta	2.061E-14	1.322E-14	1.941E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193704	SLAPS LOADOUT	03/01/17	Gross Alpha/Beta	Gross Alpha	0	4.97E-15	1.121E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193704	SLAPS LOADOUT	03/01/17	Gross Alpha/Beta	Gross Beta	3.495E-14	1.521E-14	1.981E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193705	SLAPS LOADOUT	03/01/17	Gross Alpha/Beta	Gross Alpha	-1.253E-15	4.093E-15	1.082E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193705	SLAPS LOADOUT	03/01/17	Gross Alpha/Beta	Gross Beta	2.663E-14	1.383E-14	1.913E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193706	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Alpha	9.599E-15	8.223E-15	1.036E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193706	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Beta	3.459E-14	1.433E-14	1.832E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193707	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Alpha	1.085E-14	8.613E-15	1.041E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193707	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Beta	3.247E-14	1.413E-14	1.84E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193708	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Alpha	-2.596E-15	8.479E-15	2.242E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193708	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Beta	4.041E-14	2.677E-14	3.962E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193709	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Alpha	-5.299E-15	6.851E-15	2.289E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193709	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Beta	3.289E-14	2.623E-14	4.045E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193710	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Alpha	-2.678E-15	8.747E-15	2.313E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193710	SLAPS LOADOUT	03/02/17	Gross Alpha/Beta	Gross Beta	5.69E-14	2.954E-14	4.087E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193711	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Alpha	2.72E-15	1.174E-14	1.215E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193711	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Alpha	1.594E-15	1.153E-14	1.215E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193711	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Beta	2.546E-14	1.388E-14	1.715E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193711	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Beta	2.688E-14	1.404E-14	1.715E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193712	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Alpha	-1.798E-15	1.094E-14	1.226E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193712	SLAPS LOADOUT	03/06/17	Gross Alpha/Beta	Gross Beta	1.995E-14	1.336E-14	1.73E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193713	SLAPS LOADOUT	03/07/17	Gross Alpha/Beta	Gross Alpha	-6.78E-16	1.143E-14	1.254E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193713	SLAPS LOADOUT	03/07/17	Gross Alpha/Beta	Gross Beta	1.674E-14	1.324E-14	1.77E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193714	SLAPS LOADOUT	03/07/17	Gross Alpha/Beta	Gross Alpha	-6.87E-16	1.159E-14	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193714	SLAPS LOADOUT	03/07/17	Gross Alpha/Beta	Gross Beta	2.441E-14	1.427E-14	1.794E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193715	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Alpha	5.12E-16	1.234E-14	1.327E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193715	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Beta	1.073E-14	1.317E-14	1.872E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193716	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Alpha	-4.22E-15	1.085E-14	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193716	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Beta	2.106E-15	1.16E-14	1.794E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193717	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Alpha	-8.286E-15	2.131E-14	2.497E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193717	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Beta	1.289E-14	2.389E-14	3.523E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193718	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Alpha	-5.974E-15	2.18E-14	2.497E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193718	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Beta	1.581E-14	2.425E-14	3.523E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193719	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Alpha	-5.974E-15	2.18E-14	2.497E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193719	SLAPS LOADOUT	03/08/17	Gross Alpha/Beta	Gross Beta	-7.542E-15	2.123E-14	3.523E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA193720	SLAPS LOADOUT	03/09/17	Gross Alpha/Beta	Gross Alpha	-7.65E-16	1.29E-14	1.416E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193720	SLAPS LOADOUT	03/09/17	Gross Alpha/Beta	Gross Beta	-3.449E-15	1.215E-14	1.998E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193721	SLAPS LOADOUT	03/16/17	Gross Alpha/Beta	Gross Alpha	-5.715E-15	1.122E-14	1.346E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193721	SLAPS LOADOUT	03/16/17	Gross Alpha/Beta	Gross Beta	2.23E-15	1.228E-14	1.9E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193722	SLAPS LOADOUT	03/20/17	Gross Alpha/Beta	Gross Alpha	1.05E-14	1.439E-14	1.346E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193722	SLAPS LOADOUT	03/20/17	Gross Alpha/Beta	Gross Beta	9.353E-14	2.193E-14	1.9E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193723	SLAPS LOADOUT	03/22/17	Gross Alpha/Beta	Gross Alpha	7.137E-15	7.082E-15	8.737E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193723	SLAPS LOADOUT	03/22/17	Gross Alpha/Beta	Gross Alpha	4.791E-15	6.246E-15	8.737E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193723	SLAPS LOADOUT	03/22/17	Gross Alpha/Beta	Gross Beta	1.036E-14	1.718E-14	2.825E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193723	SLAPS LOADOUT	03/22/17	Gross Alpha/Beta	Gross Beta	2.015E-14	1.806E-14	2.825E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193724	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Alpha	-1.066E-15	3.342E-15	8.658E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193724	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Beta	-4.666E-15	1.565E-14	2.799E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193725	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Alpha	3.552E-15	1.322E-14	2.442E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193725	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Beta	5.79E-15	4.589E-14	7.896E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193726	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Alpha	4.704E-15	6.133E-15	8.58E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193726	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Beta	-1.85E-16	1.592E-14	2.774E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193727	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Alpha	2.49E-15	5.382E-15	8.9E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193727	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Beta	5.18E-15	1.701E-14	2.878E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193728	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Alpha	7.203E-15	7.147E-15	8.818E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193728	SLAPS LOADOUT	03/28/17	Gross Alpha/Beta	Gross Beta	1.73E-14	1.795E-14	2.851E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193729	SLAPS LOADOUT	03/29/17	Gross Alpha/Beta	Gross Alpha	-1.085E-15	3.404E-15	8.818E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193729	SLAPS LOADOUT	03/29/17	Gross Alpha/Beta	Gross Beta	2.851E-15	1.664E-14	2.851E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193730	SLAPS LOADOUT	04/04/17	Gross Alpha/Beta	Gross Alpha	3.521E-15	4.631E-15	6.833E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193730	SLAPS LOADOUT	04/04/17	Gross Alpha/Beta	Gross Alpha	5.804E-15	5.655E-15	6.833E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193730	SLAPS LOADOUT	04/04/17	Gross Alpha/Beta	Gross Beta	2.187E-14	1.629E-14	2.596E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193730	SLAPS LOADOUT	04/04/17	Gross Alpha/Beta	Gross Beta	4.533E-14	1.849E-14	2.596E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193731	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Alpha	1.272E-14	1.673E-14	2.469E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193731	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Beta	1.81E-14	5.281E-14	9.377E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193732	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Alpha	1.066E-14	1.803E-14	3.061E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193732	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Beta	7.5E-14	7.073E-14	1.163E-13	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193733	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Alpha	-4.884E-15	3.418E-15	3.189E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193733	SLAPS LOADOUT	04/05/17	Gross Alpha/Beta	Gross Beta	1.996E-14	6.786E-14	1.211E-13	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193734	SLAPS LOADOUT	04/06/17	Gross Alpha/Beta	Gross Alpha	7.203E-15	6.331E-15	7.086E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193734	SLAPS LOADOUT	04/06/17	Gross Alpha/Beta	Gross Beta	2.801E-14	1.74E-14	2.692E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193735	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Alpha	4.704E-15	5.215E-15	6.895E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193735	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Beta	5.832E-14	1.979E-14	2.619E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193736	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Alpha	1.265E-15	3.387E-15	6.989E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193736	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Beta	3.362E-14	1.773E-14	2.655E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193737	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Alpha	1.592E-14	1.058E-14	9.449E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193737	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Beta	3.227E-14	2.272E-14	3.589E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193738	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Alpha	3.33E-15	5.635E-15	9.567E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193738	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Beta	3.883E-14	2.359E-14	3.634E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193739	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Alpha	1.7E-15	4.551E-15	9.391E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193739	SLAPS LOADOUT	04/10/17	Gross Alpha/Beta	Gross Beta	5.827E-14	2.504E-14	3.567E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193740	SLAPS LOADOUT	04/11/17	Gross Alpha/Beta	Gross Alpha	1.307E-15	3.499E-15	7.22E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193740	SLAPS LOADOUT	04/11/17	Gross Alpha/Beta	Gross Beta	1.924E-14	1.683E-14	2.743E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA193741	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Alpha	2.179E-15	5.642E-15	1.046E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193741	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Alpha	4.556E-15	6.574E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193741	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Beta	3.12E-14	1.446E-14	1.71E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA193741	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Beta	2.895E-14	1.42E-14	1.71E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193742	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Alpha	-3.661E-15	1.852E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193742	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Beta	1.21E-14	1.187E-14	1.664E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193743	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Alpha	-8.15E-16	1.864E-14	4.304E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193743	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Beta	3.885E-14	4.861E-14	7.039E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193744	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Alpha	1.625E-14	2.345E-14	3.731E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193744	SLAPS LOADOUT	04/17/17	Gross Alpha/Beta	Gross Beta	1.227E-14	3.926E-14	6.1E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193745	SLAPS LOADOUT	04/18/17	Gross Alpha/Beta	Gross Alpha	8.047E-15	7.699E-15	1.036E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA193745	SLAPS LOADOUT	04/18/17	Gross Alpha/Beta	Gross Beta	2.645E-14	1.381E-14	1.695E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA193746	SLAPS LOADOUT	04/19/17	Gross Alpha/Beta	Gross Alpha	3.133E-15	5.699E-15	9.732E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193746	SLAPS LOADOUT	04/19/17	Gross Alpha/Beta	Gross Beta	3.601E-14	1.424E-14	1.591E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193747	SLAPS LOADOUT	04/20/17	Gross Alpha/Beta	Gross Alpha	5.588E-15	6.804E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193747	SLAPS LOADOUT	04/20/17	Gross Alpha/Beta	Gross Beta	2.889E-14	1.39E-14	1.664E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA193748	SLAPS LOADOUT	04/24/17	Gross Alpha/Beta	Gross Alpha	4.353E-15	6.28E-15	9.992E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA193748	SLAPS LOADOUT	04/24/17	Gross Alpha/Beta	Gross Beta	2.264E-14	1.298E-14	1.634E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196251	SLAPS LOADOUT	04/25/17	Gross Alpha/Beta	Gross Alpha	3.246E-15	5.905E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196251	SLAPS LOADOUT	04/25/17	Gross Alpha/Beta	Gross Beta	5.25E-14	1.638E-14	1.649E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196252	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Alpha	6.493E-15	1.181E-14	2.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196252	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Beta	1.242E-14	2.201E-14	3.297E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196253	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Alpha	-7.257E-15	3.671E-15	2.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196253	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Beta	2.688E-14	2.389E-14	3.297E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196254	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Alpha	5.552E-15	1.438E-14	2.665E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196254	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Beta	3.17E-14	3.108E-14	4.357E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196255	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Alpha	1.055E-15	5.446E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196255	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Beta	2.843E-14	1.484E-14	1.821E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196256	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Alpha	1.244E-14	9.383E-15	1.114E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196256	SLAPS LOADOUT	04/26/17	Gross Alpha/Beta	Gross Beta	1.485E-14	1.319E-14	1.821E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196257	SLAPS LOADOUT	04/27/17	Gross Alpha/Beta	Gross Alpha	2.139E-15	5.539E-15	1.027E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196257	SLAPS LOADOUT	04/27/17	Gross Alpha/Beta	Gross Beta	1.221E-14	1.198E-14	1.679E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196258	SLAPS LOADOUT	05/02/17	Gross Alpha/Beta	Gross Alpha	-6.72E-16	2.652E-15	8.082E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196258	SLAPS LOADOUT	05/02/17	Gross Alpha/Beta	Gross Alpha	3.936E-15	5.324E-15	8.082E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196258	SLAPS LOADOUT	05/02/17	Gross Alpha/Beta	Gross Beta	2.842E-14	1.966E-14	2.651E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196258	SLAPS LOADOUT	05/02/17	Gross Alpha/Beta	Gross Beta	1.806E-14	1.88E-14	2.651E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196259	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Alpha	4.8E-16	3.513E-15	8.082E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196259	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Beta	2.472E-14	1.935E-14	2.651E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196260	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Alpha	3.936E-15	5.324E-15	8.082E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196260	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Beta	3.064E-14	1.984E-14	2.651E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196261	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Alpha	1.897E-15	4.885E-15	9.394E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196261	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Beta	4.657E-15	2.047E-14	3.081E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196262	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Alpha	7.105E-15	7.116E-15	9.201E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196262	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Beta	1.804E-14	2.119E-14	3.018E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196263	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Alpha	1.927E-15	4.963E-15	9.544E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196263	SLAPS LOADOUT	05/08/17	Gross Alpha/Beta	Gross Beta	1.259E-14	2.147E-14	3.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196264	SLAPS LOADOUT	05/09/17	Gross Alpha/Beta	Gross Alpha	2.862E-15	4.929E-15	8.306E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196264	SLAPS LOADOUT	05/09/17	Gross Alpha/Beta	Gross Beta	1.4E-14	1.894E-14	2.724E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196265	SLAPS LOADOUT	05/09/17	Gross Alpha/Beta	Gross Alpha	6.414E-15	6.424E-15	8.306E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196265	SLAPS LOADOUT	05/09/17	Gross Alpha/Beta	Gross Beta	2.693E-14	2.001E-14	2.724E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196266	SLAPS LOADOUT	05/10/17	Gross Alpha/Beta	Gross Alpha	9.442E-15	7.238E-15	7.869E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196266	SLAPS LOADOUT	05/10/17	Gross Alpha/Beta	Gross Beta	2.551E-14	1.896E-14	2.581E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196267	SLAPS LOADOUT	05/10/17	Gross Alpha/Beta	Gross Alpha	1.589E-15	4.092E-15	7.869E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196267	SLAPS LOADOUT	05/10/17	Gross Alpha/Beta	Gross Beta	3.92E-14	2.008E-14	2.581E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196268	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Alpha	5.73E-16	5.237E-15	1.044E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196268	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Alpha	4.01E-15	6.577E-15	1.044E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196268	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Beta	-1.21E-16	1.025E-14	1.706E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196268	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Beta	-4.46E-15	9.624E-15	1.706E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196269	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Alpha	1.734E-15	5.769E-15	1.054E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196269	SLAPS LOADOUT	05/11/17	Gross Alpha/Beta	Gross Beta	1.594E-14	1.245E-14	1.721E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196270	SLAPS LOADOUT	05/15/17	Gross Alpha/Beta	Gross Alpha	7.515E-15	7.764E-15	1.054E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196270	SLAPS LOADOUT	05/15/17	Gross Alpha/Beta	Gross Beta	2.615E-14	1.368E-14	1.721E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196271	SLAPS LOADOUT	05/15/17	Gross Alpha/Beta	Gross Alpha	1.766E-15	5.876E-15	1.073E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196271	SLAPS LOADOUT	05/15/17	Gross Alpha/Beta	Gross Beta	3.593E-15	1.105E-14	1.753E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196272	SLAPS LOADOUT	05/16/17	Gross Alpha/Beta	Gross Alpha	1.719E-15	5.717E-15	1.044E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196272	SLAPS LOADOUT	05/16/17	Gross Alpha/Beta	Gross Beta	2.953E-14	1.397E-14	1.706E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196273	SLAPS LOADOUT	05/16/17	Gross Alpha/Beta	Gross Alpha	8.832E-15	8.256E-15	1.073E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196273	SLAPS LOADOUT	05/16/17	Gross Alpha/Beta	Gross Beta	2.441E-14	1.367E-14	1.753E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196274	SLAPS LOADOUT	05/17/17	Gross Alpha/Beta	Gross Alpha	2.944E-15	6.333E-15	1.073E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196274	SLAPS LOADOUT	05/17/17	Gross Alpha/Beta	Gross Beta	7.31E-15	1.155E-14	1.753E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196275	SLAPS LOADOUT	05/17/17	Gross Alpha/Beta	Gross Alpha	1.001E-14	8.592E-15	1.073E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196275	SLAPS LOADOUT	05/17/17	Gross Alpha/Beta	Gross Beta	1.251E-14	1.222E-14	1.753E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196276	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Alpha	-7.64E-16	5.162E-15	1.061E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196276	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Alpha	1.184E-14	9.223E-15	1.061E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196276	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Beta	2.447E-14	1.443E-14	1.706E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196276	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Beta	2.085E-14	1.403E-14	1.706E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196277	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Alpha	1.542E-15	6.151E-15	1.071E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196277	SLAPS LOADOUT	05/22/17	Gross Alpha/Beta	Gross Beta	2.031E-14	1.408E-14	1.721E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196278	SLAPS LOADOUT	05/18/17	Gross Alpha/Beta	Gross Alpha	1.542E-15	6.151E-15	1.071E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196278	SLAPS LOADOUT	05/18/17	Gross Alpha/Beta	Gross Beta	6.337E-14	1.848E-14	1.721E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196279	SLAPS LOADOUT	05/18/17	Gross Alpha/Beta	Gross Alpha	1.556E-15	6.208E-15	1.081E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196279	SLAPS LOADOUT	05/18/17	Gross Alpha/Beta	Gross Beta	1.608E-14	1.371E-14	1.737E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196280	SLAPS LOADOUT	05/23/17	Gross Alpha/Beta	Gross Alpha	6.281E-15	7.849E-15	1.091E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196280	SLAPS LOADOUT	05/23/17	Gross Alpha/Beta	Gross Beta	3.184E-14	1.554E-14	1.753E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196281	SLAPS LOADOUT	05/23/17	Gross Alpha/Beta	Gross Alpha	3.925E-15	7.1E-15	1.091E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196281	SLAPS LOADOUT	05/23/17	Gross Alpha/Beta	Gross Beta	3.184E-14	1.554E-14	1.753E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196282	SLAPS LOADOUT	05/24/17	Gross Alpha/Beta	Gross Alpha	-3.055E-15	4.023E-15	1.061E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196282	SLAPS LOADOUT	05/24/17	Gross Alpha/Beta	Gross Beta	1.435E-14	1.33E-14	1.706E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196283	SLAPS LOADOUT	05/24/17	Gross Alpha/Beta	Gross Alpha	3.889E-15	7.035E-15	1.081E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196283	SLAPS LOADOUT	05/24/17	Gross Alpha/Beta	Gross Beta	2.271E-14	1.445E-14	1.737E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196284	SLAPS LOADOUT	05/25/17	Gross Alpha/Beta	Gross Alpha	-3.055E-15	4.023E-15	1.061E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196284	SLAPS LOADOUT	05/25/17	Gross Alpha/Beta	Gross Beta	2.158E-14	1.411E-14	1.706E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196285	SLAPS LOADOUT	05/25/17	Gross Alpha/Beta	Gross Alpha	3.79E-16	5.597E-15	1.052E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196285	SLAPS LOADOUT	05/25/17	Gross Alpha/Beta	Gross Beta	2.139E-14	1.399E-14	1.69E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196286	SLAPS LOADOUT	05/30/17	Gross Alpha/Beta	Gross Alpha	3.89E-16	5.751E-15	1.081E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196286	SLAPS LOADOUT	05/30/17	Gross Alpha/Beta	Gross Beta	2.713E-14	1.493E-14	1.737E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196287	SLAPS LOADOUT	05/30/17	Gross Alpha/Beta	Gross Alpha	3.93E-16	5.805E-15	1.091E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196287	SLAPS LOADOUT	05/30/17	Gross Alpha/Beta	Gross Beta	1.697E-14	1.392E-14	1.753E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196288	SLAPS LOADOUT	05/31/17	Gross Alpha/Beta	Gross Alpha	1.535E-15	6.123E-15	1.066E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196288	SLAPS LOADOUT	05/31/17	Gross Alpha/Beta	Gross Beta	2.168E-14	1.417E-14	1.713E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196289	SLAPS LOADOUT	05/31/17	Gross Alpha/Beta	Gross Alpha	6.083E-15	7.603E-15	1.057E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196289	SLAPS LOADOUT	05/31/17	Gross Alpha/Beta	Gross Beta	2.364E-14	1.428E-14	1.698E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196290	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Alpha	1.23E-15	5.403E-15	9.714E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196290	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Alpha	1.23E-15	5.403E-15	9.714E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196290	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Beta	1.075E-14	1.259E-14	1.727E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196290	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Beta	1.29E-14	1.285E-14	1.727E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196291	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Alpha	4.764E-15	6.874E-15	9.981E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196291	SLAPS LOADOUT	06/01/17	Gross Alpha/Beta	Gross Beta	2.357E-14	1.437E-14	1.774E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196292	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Alpha	2.284E-15	5.66E-15	9.379E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196292	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Beta	1.315E-14	1.248E-14	1.667E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196293	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Alpha	9.1E-17	4.692E-15	9.299E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196293	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Beta	5.489E-15	1.148E-14	1.653E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196294	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Alpha	1.61E-16	8.317E-15	1.648E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196294	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Beta	1.825E-14	2.137E-14	2.93E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196295	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Alpha	2.088E-15	9.168E-15	1.648E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196295	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Beta	1.946E-14	2.151E-14	2.93E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196296	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Alpha	9.796E-15	1.2E-14	1.648E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196296	SLAPS LOADOUT	06/05/17	Gross Alpha/Beta	Gross Beta	2.676E-14	2.236E-14	2.93E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196297	SLAPS LOADOUT	06/06/17	Gross Alpha/Beta	Gross Alpha	2.431E-15	6.023E-15	9.981E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196297	SLAPS LOADOUT	06/06/17	Gross Alpha/Beta	Gross Beta	1.473E-15	1.178E-14	1.774E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196298	SLAPS LOADOUT	06/06/17	Gross Alpha/Beta	Gross Alpha	9.6E-17	4.968E-15	9.846E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196298	SLAPS LOADOUT	06/06/17	Gross Alpha/Beta	Gross Beta	2.906E-15	1.18E-14	1.75E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196299	SLAPS LOADOUT	06/07/17	Gross Alpha/Beta	Gross Alpha	9.4E-17	4.879E-15	9.67E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196299	SLAPS LOADOUT	06/07/17	Gross Alpha/Beta	Gross Beta	5.709E-15	1.194E-14	1.719E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196300	SLAPS LOADOUT	06/07/17	Gross Alpha/Beta	Gross Alpha	-1.032E-15	4.305E-15	9.628E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196300	SLAPS LOADOUT	06/07/17	Gross Alpha/Beta	Gross Beta	1.989E-14	1.354E-14	1.712E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196301	SLAPS LOADOUT	06/08/17	Gross Alpha/Beta	Gross Alpha	9.7E-17	5.036E-15	9.981E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196301	SLAPS LOADOUT	06/08/17	Gross Alpha/Beta	Gross Beta	1.547E-14	1.346E-14	1.774E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196302	SLAPS LOADOUT	06/08/17	Gross Alpha/Beta	Gross Alpha	-1.06E-15	4.423E-15	9.89E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196302	SLAPS LOADOUT	06/08/17	Gross Alpha/Beta	Gross Beta	1.314E-14	1.308E-14	1.758E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196303	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Alpha	4.764E-15	6.874E-15	9.981E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196303	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Beta	1.473E-14	1.337E-14	1.774E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196304	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Alpha	1.849E-15	6.976E-15	9.377E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196304	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Alpha	3.017E-15	7.358E-15	9.377E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196304	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Beta	2.718E-14	1.91E-14	2.595E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196304	SLAPS LOADOUT	06/12/17	Gross Alpha/Beta	Gross Beta	3.918E-14	2.012E-14	2.595E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196305	SLAPS LOADOUT	06/13/17	Gross Alpha/Beta	Gross Alpha	5.582E-15	8.418E-15	9.779E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196305	SLAPS LOADOUT	06/13/17	Gross Alpha/Beta	Gross Beta	1.349E-14	1.864E-14	2.706E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196306	SLAPS LOADOUT	06/13/17	Gross Alpha/Beta	Gross Alpha	3.177E-15	7.748E-15	9.873E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196306	SLAPS LOADOUT	06/13/17	Gross Alpha/Beta	Gross Beta	4.362E-14	2.138E-14	2.732E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196307	SLAPS LOADOUT	06/14/17	Gross Alpha/Beta	Gross Alpha	5.582E-15	8.418E-15	9.779E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196307	SLAPS LOADOUT	06/14/17	Gross Alpha/Beta	Gross Beta	3.539E-14	2.052E-14	2.706E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196308	SLAPS LOADOUT	06/14/17	Gross Alpha/Beta	Gross Alpha	6.673E-15	8.603E-15	9.597E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196308	SLAPS LOADOUT	06/14/17	Gross Alpha/Beta	Gross Beta	1.861E-14	1.875E-14	2.655E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196309	SLAPS LOADOUT	06/15/17	Gross Alpha/Beta	Gross Alpha	-5.07E-16	6.406E-15	9.779E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196309	SLAPS LOADOUT	06/15/17	Gross Alpha/Beta	Gross Beta	2.053E-14	1.925E-14	2.706E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196310	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Alpha	3.18E-15	5.987E-15	1.027E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196310	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Alpha	4.336E-15	6.421E-15	1.027E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196310	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Beta	3.09E-14	1.378E-14	1.711E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196310	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Beta	1.995E-14	1.246E-14	1.711E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196311	SLAPS LOADOUT	06/16/17	Gross Alpha/Beta	Gross Alpha	2.023E-15	5.52E-15	1.027E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196311	SLAPS LOADOUT	06/16/17	Gross Alpha/Beta	Gross Beta	1.776E-14	1.219E-14	1.711E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196312	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Alpha	-1.178E-15	1.811E-14	4.183E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196312	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Beta	2.181E-14	4.291E-14	6.97E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196313	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Alpha	1.295E-14	2.439E-14	4.183E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196313	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Beta	3.965E-14	4.537E-14	6.97E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196314	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Alpha	3.533E-15	2.041E-14	4.183E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196314	SLAPS LOADOUT	06/19/17	Gross Alpha/Beta	Gross Beta	6.046E-14	4.813E-14	6.97E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196315	SLAPS LOADOUT	06/22/17	Gross Alpha/Beta	Gross Alpha	-3E-16	4.612E-15	1.065E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196315	SLAPS LOADOUT	06/22/17	Gross Alpha/Beta	Gross Beta	9.341E-15	1.146E-14	1.775E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196316	SLAPS LOADOUT	07/05/17	Gross Alpha/Beta	Gross Alpha	4.74E-16	4.375E-15	1.013E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196316	SLAPS LOADOUT	07/05/17	Gross Alpha/Beta	Gross Alpha	6.157E-15	7.185E-15	1.013E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196316	SLAPS LOADOUT	07/05/17	Gross Alpha/Beta	Gross Beta	9.048E-15	1.924E-14	3.162E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196316	SLAPS LOADOUT	07/05/17	Gross Alpha/Beta	Gross Beta	1.361E-14	1.969E-14	3.162E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196317	SLAPS LOADOUT	07/06/17	Gross Alpha/Beta	Gross Alpha	1.054E-14	8.827E-15	1.024E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196317	SLAPS LOADOUT	07/06/17	Gross Alpha/Beta	Gross Beta	4.975E-14	2.324E-14	3.198E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196318	SLAPS LOADOUT	07/10/17	Gross Alpha/Beta	Gross Alpha	2.386E-14	1.122E-14	8.362E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196318	SLAPS LOADOUT	07/10/17	Gross Alpha/Beta	Gross Beta	1.461E-13	2.782E-14	2.611E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196319	SLAPS LOADOUT	07/13/17	Gross Alpha/Beta	Gross Alpha	1.496E-15	4.12E-15	7.995E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196319	SLAPS LOADOUT	07/13/17	Gross Alpha/Beta	Gross Beta	2.587E-14	1.696E-14	2.497E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196320	SLAPS LOADOUT	07/13/17	Gross Alpha/Beta	Gross Alpha	5.179E-15	6.044E-15	8.518E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196320	SLAPS LOADOUT	07/13/17	Gross Alpha/Beta	Gross Beta	9.145E-15	1.634E-14	2.66E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196321	SLAPS LOADOUT	07/17/17	Gross Alpha/Beta	Gross Alpha	1.247E-14	8.53E-15	8.598E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196321	SLAPS LOADOUT	07/17/17	Gross Alpha/Beta	Gross Beta	6.113E-14	2.123E-14	2.685E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196322	SLAPS LOADOUT	07/19/17	Gross Alpha/Beta	Gross Alpha	4.022E-15	5.599E-15	8.598E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196322	SLAPS LOADOUT	07/19/17	Gross Alpha/Beta	Gross Beta	2.782E-14	1.825E-14	2.685E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196323	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Alpha	1.26E-14	1.47E-14	2.071E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196323	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Beta	4.837E-14	4.222E-14	6.469E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196324	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Alpha	1.26E-14	1.47E-14	2.071E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196324	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Beta	3.904E-14	4.133E-14	6.469E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196325	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Alpha	1.55E-14	1.582E-14	2.071E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196325	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Beta	3.717E-14	4.116E-14	6.469E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196326	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Alpha	1.457E-15	4.015E-15	7.79E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196326	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Beta	5.96E-14	1.96E-14	2.433E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196327	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Alpha	4.696E-15	5.48E-15	7.724E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196327	SLAPS LOADOUT	07/24/17	Gross Alpha/Beta	Gross Beta	3.543E-14	1.734E-14	2.412E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196328	SLAPS LOADOUT	07/26/17	Gross Alpha/Beta	Gross Alpha	1.835E-14	1.024E-14	9.615E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196328	SLAPS LOADOUT	07/26/17	Gross Alpha/Beta	Gross Alpha	2.072E-14	1.079E-14	9.615E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196328	SLAPS LOADOUT	07/26/17	Gross Alpha/Beta	Gross Beta	9.232E-14	2.411E-14	2.642E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196328	SLAPS LOADOUT	07/26/17	Gross Alpha/Beta	Gross Beta	1.03E-13	2.498E-14	2.642E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196329	SLAPS LOADOUT	07/27/17	Gross Alpha/Beta	Gross Alpha	1.827E-15	5.115E-15	9.89E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196329	SLAPS LOADOUT	07/27/17	Gross Alpha/Beta	Gross Beta	2.457E-14	1.881E-14	2.718E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196330	SLAPS LOADOUT	07/31/17	Gross Alpha/Beta	Gross Alpha	8.964E-15	7.736E-15	9.705E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196330	SLAPS LOADOUT	07/31/17	Gross Alpha/Beta	Gross Beta	1.49E-14	1.763E-14	2.667E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196331	SLAPS LOADOUT	08/01/17	Gross Alpha/Beta	Gross Alpha	6.03E-16	4.454E-15	9.797E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196331	SLAPS LOADOUT	08/01/17	Gross Alpha/Beta	Gross Beta	4.196E-15	1.68E-14	2.692E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196332	SLAPS LOADOUT	08/02/17	Gross Alpha/Beta	Gross Alpha	6.453E-15	6.818E-15	9.527E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196332	SLAPS LOADOUT	08/02/17	Gross Alpha/Beta	Gross Beta	5.154E-14	2.056E-14	2.618E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196333	SLAPS LOADOUT	08/03/17	Gross Alpha/Beta	Gross Alpha	6.394E-15	6.756E-15	9.441E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196333	SLAPS LOADOUT	08/03/17	Gross Alpha/Beta	Gross Beta	6.6E-14	2.164E-14	2.594E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196334	SLAPS LOADOUT	08/07/17	Gross Alpha/Beta	Gross Alpha	8.799E-15	7.594E-15	9.527E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196334	SLAPS LOADOUT	08/07/17	Gross Alpha/Beta	Gross Beta	4.476E-14	1.998E-14	2.618E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196335	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Alpha	1.146E-14	8.536E-15	9.797E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196335	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Beta	4.061E-14	2.007E-14	2.692E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196336	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Alpha	1.81E-15	5.067E-15	9.797E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196336	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Beta	1.504E-14	1.78E-14	2.692E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196337	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Alpha	9.787E-15	8.446E-15	1.06E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196337	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Beta	2.716E-14	2.023E-14	2.912E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196338	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Alpha	1.066E-14	8.501E-15	1.018E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196338	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Beta	2.932E-14	1.973E-14	2.798E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196339	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Alpha	9.403E-15	8.115E-15	1.018E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196339	SLAPS LOADOUT	08/08/17	Gross Alpha/Beta	Gross Beta	4.22E-14	2.086E-14	2.798E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196340	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	2.933E-15	5.46E-15	9.527E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196340	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	3.647E-14	1.926E-14	2.618E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196341	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	9.973E-15	7.955E-15	9.527E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196341	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	3.798E-14	1.939E-14	2.618E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196342	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	9.499E-15	8.686E-15	1.046E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196342	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	7.099E-15	7.984E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196342	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	4.424E-14	1.636E-14	1.837E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196342	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	3.061E-14	1.488E-14	1.837E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196343	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	-1.3E-15	4.817E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196343	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	3.44E-14	1.53E-14	1.837E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196344	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Alpha	4.699E-15	7.217E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196344	SLAPS LOADOUT	08/09/17	Gross Alpha/Beta	Gross Beta	2.834E-14	1.462E-14	1.837E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196345	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Alpha	6.948E-15	8.963E-15	1.232E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196345	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Beta	3.605E-14	1.752E-14	2.163E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196346	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Alpha	7.816E-15	1.008E-14	1.386E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196346	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Beta	2.651E-14	1.81E-14	2.434E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196347	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Alpha	2.197E-14	1.529E-14	1.607E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196347	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Beta	6.215E-14	2.451E-14	2.822E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196348	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Alpha	3.585E-15	9.919E-15	1.631E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196348	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Beta	5.834E-14	2.436E-14	2.863E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196349	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Alpha	3.533E-15	9.776E-15	1.607E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196349	SLAPS LOADOUT	08/10/17	Gross Alpha/Beta	Gross Beta	4.47E-14	2.259E-14	2.822E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196350	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Alpha	-1.38E-14	4.696E-14	1.226E-13	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196350	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Alpha	-2.653E-14	3.948E-14	1.226E-13	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196350	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Beta	-7.473E-15	1.379E-13	1.984E-13	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196350	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Beta	-1.563E-14	1.369E-13	1.984E-13	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196351	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Alpha	2.141E-15	5.653E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196351	SLAPS LOADOUT	08/14/17	Gross Alpha/Beta	Gross Beta	2.151E-14	1.456E-14	1.741E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196352	SLAPS LOADOUT	08/15/17	Gross Alpha/Beta	Gross Alpha	-1.266E-15	4.308E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196352	SLAPS LOADOUT	08/15/17	Gross Alpha/Beta	Gross Beta	3.447E-14	1.646E-14	1.82E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196353	SLAPS LOADOUT	08/16/17	Gross Alpha/Beta	Gross Alpha	3.439E-15	6.418E-15	1.135E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196353	SLAPS LOADOUT	08/16/17	Gross Alpha/Beta	Gross Beta	1.818E-14	1.489E-14	1.837E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196354	SLAPS LOADOUT	08/17/17	Gross Alpha/Beta	Gross Alpha	-9.6E-17	4.812E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196354	SLAPS LOADOUT	08/17/17	Gross Alpha/Beta	Gross Beta	2.577E-14	1.534E-14	1.788E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196355	SLAPS LOADOUT	08/17/17	Gross Alpha/Beta	Gross Alpha	-4.019E-15	5.982E-15	1.857E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196355	SLAPS LOADOUT	08/17/17	Gross Alpha/Beta	Gross Beta	1.122E-14	2.232E-14	3.007E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196356	SLAPS LOADOUT	08/21/17	Gross Alpha/Beta	Gross Alpha	1.024E-15	5.191E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196356	SLAPS LOADOUT	08/21/17	Gross Alpha/Beta	Gross Beta	2.938E-14	1.538E-14	1.741E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196357	SLAPS LOADOUT	08/21/17	Gross Alpha/Beta	Gross Alpha	-1.662E-15	5.657E-15	1.477E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196357	SLAPS LOADOUT	08/21/17	Gross Alpha/Beta	Gross Beta	1.285E-14	1.819E-14	2.391E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196358	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Alpha	-4.222E-15	3.251E-15	1.318E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196358	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Beta	2.462E-14	1.766E-14	2.134E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196359	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Alpha	3.994E-15	7.453E-15	1.318E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196359	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Beta	1.147E-14	1.624E-14	2.134E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196360	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Alpha	5.089E-15	7.539E-15	1.251E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196360	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Beta	1.837E-14	1.623E-14	2.025E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196361	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Alpha	3.79E-15	7.073E-15	1.251E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196361	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Beta	6.724E-15	1.494E-14	2.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196362	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Alpha	5.089E-15	7.539E-15	1.251E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196362	SLAPS LOADOUT	08/22/17	Gross Alpha/Beta	Gross Beta	1.338E-14	1.568E-14	2.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196363	SLAPS LOADOUT	08/23/17	Gross Alpha/Beta	Gross Alpha	2.931E-15	6.416E-15	1.114E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196363	SLAPS LOADOUT	08/23/17	Gross Alpha/Beta	Gross Alpha	1.718E-15	5.938E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196363	SLAPS LOADOUT	08/23/17	Gross Alpha/Beta	Gross Beta	2.407E-14	1.625E-14	1.974E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196363	SLAPS LOADOUT	08/23/17	Gross Alpha/Beta	Gross Beta	2.795E-14	1.665E-14	1.974E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196364	SLAPS LOADOUT	08/24/17	Gross Alpha/Beta	Gross Alpha	4.143E-15	6.862E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196364	SLAPS LOADOUT	08/24/17	Gross Alpha/Beta	Gross Beta	4.193E-14	1.803E-14	1.974E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196365	SLAPS LOADOUT	08/28/17	Gross Alpha/Beta	Gross Alpha	5.514E-15	7.496E-15	1.147E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196365	SLAPS LOADOUT	08/28/17	Gross Alpha/Beta	Gross Beta	5.515E-14	1.972E-14	2.032E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196366	SLAPS LOADOUT	08/29/17	Gross Alpha/Beta	Gross Alpha	-1.867E-15	4.08E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196366	SLAPS LOADOUT	08/29/17	Gross Alpha/Beta	Gross Beta	3.019E-15	1.362E-14	1.919E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196367	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Alpha	1.735E-15	5.995E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196367	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Beta	5.487E-15	1.44E-14	1.993E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196368	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Alpha	5.207E-15	7.08E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196368	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Beta	5.888E-14	1.926E-14	1.919E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196369	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Alpha	1.8E-14	1.095E-14	1.147E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196369	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Beta	5.035E-14	1.926E-14	2.032E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196370	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Alpha	9.259E-15	8.669E-15	1.147E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196370	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Beta	4.875E-14	1.911E-14	2.032E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196371	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Alpha	1.051E-14	9.028E-15	1.147E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196371	SLAPS LOADOUT	08/30/17	Gross Alpha/Beta	Gross Beta	5.435E-14	1.964E-14	2.032E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196372	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Alpha	7.664E-15	8.96E-15	1.3E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196372	SLAPS LOADOUT	08/31/17	Gross Alpha/Beta	Gross Beta	4.982E-14	2.113E-14	2.303E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196373	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Alpha	4.576E-15	8.282E-15	1.125E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196373	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Alpha	9.248E-15	9.525E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196373	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Beta	1.527E-14	1.42E-14	1.854E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196373	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Beta	2.724E-14	1.549E-14	1.854E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196374	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Alpha	7.935E-15	9.063E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196374	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Beta	3.336E-14	1.59E-14	1.821E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196375	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Alpha	-1.55E-15	7.861E-15	1.377E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196375	SLAPS LOADOUT	09/05/17	Gross Alpha/Beta	Gross Beta	3.794E-14	1.945E-14	2.271E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196376	SLAPS LOADOUT	09/06/17	Gross Alpha/Beta	Gross Alpha	-9.9E-17	6.958E-15	1.146E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196376	SLAPS LOADOUT	09/06/17	Gross Alpha/Beta	Gross Beta	2.241E-14	1.522E-14	1.889E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196377	SLAPS LOADOUT	09/06/17	Gross Alpha/Beta	Gross Alpha	3.471E-15	8.091E-15	1.146E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196377	SLAPS LOADOUT	09/06/17	Gross Alpha/Beta	Gross Beta	2.317E-14	1.53E-14	1.889E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196378	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Alpha	2.324E-15	7.878E-15	1.167E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196378	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Beta	3.06E-14	1.633E-14	1.925E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196379	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Alpha	3.504E-15	8.167E-15	1.156E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196379	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Beta	9.549E-15	1.392E-14	1.906E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196380	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Alpha	2.918E-15	1.967E-14	3.064E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196380	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Beta	-1.189E-15	3.377E-14	5.052E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196381	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Alpha	6.102E-15	2.068E-14	3.064E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196381	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Beta	4.976E-14	3.96E-14	5.052E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196382	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Alpha	1.565E-14	2.346E-14	3.064E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196382	SLAPS LOADOUT	09/07/17	Gross Alpha/Beta	Gross Beta	2.531E-14	3.688E-14	5.052E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196383	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Alpha	-1.64E-15	6.041E-15	1.146E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196383	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Alpha	-4.82E-16	6.468E-15	1.146E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196383	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Beta	1.828E-14	1.253E-14	1.792E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196383	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Beta	2.643E-14	1.353E-14	1.792E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196384	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Alpha	4.186E-15	8.033E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196384	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Beta	1.321E-14	1.198E-14	1.809E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196385	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Alpha	-4.91E-16	6.588E-15	1.168E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196385	SLAPS LOADOUT	09/12/17	Gross Alpha/Beta	Gross Beta	1.485E-14	1.228E-14	1.825E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196386	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Alpha	-2.772E-15	5.531E-15	1.136E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196386	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Beta	2.252E-14	1.296E-14	1.776E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196387	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Alpha	-1.611E-15	5.933E-15	1.126E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196387	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Beta	3.542E-14	1.438E-14	1.76E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196388	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Alpha	1.85E-15	7.317E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196388	SLAPS LOADOUT	09/13/17	Gross Alpha/Beta	Gross Beta	2.443E-14	1.338E-14	1.809E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196389	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Alpha	3.018E-15	7.683E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196389	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Beta	7.155E-14	1.85E-14	1.809E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196390	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Alpha	5.354E-15	8.369E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196390	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Beta	4.537E-14	1.578E-14	1.809E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196391	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Alpha	2.168E-15	8.576E-15	1.356E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196391	SLAPS LOADOUT	09/14/17	Gross Alpha/Beta	Gross Beta	4.441E-14	1.752E-14	2.12E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196392	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Alpha	-5.1E-16	6.842E-15	1.212E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196392	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Beta	2.561E-14	1.403E-14	1.896E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196393	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Alpha	1.939E-15	7.669E-15	1.212E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196393	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Beta	4.599E-14	1.636E-14	1.896E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196394	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Alpha	7.11E-15	9.475E-15	1.261E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196394	SLAPS LOADOUT	09/18/17	Gross Alpha/Beta	Gross Beta	4.049E-14	1.62E-14	1.971E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196395	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Alpha	9.375E-15	9.851E-15	1.224E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196395	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Beta	3.377E-14	1.51E-14	1.914E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196396	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Alpha	-1.735E-15	6.389E-15	1.212E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196396	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Beta	2.404E-14	1.384E-14	1.896E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196397	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Alpha	2.317E-15	9.168E-15	1.449E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196397	SLAPS LOADOUT	09/11/17	Gross Alpha/Beta	Gross Beta	2.03E-14	1.549E-14	2.266E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196398	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Alpha	-4.82E-16	6.468E-15	1.146E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196398	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Beta	1.235E-15	1.024E-14	1.792E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196399	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Alpha	-3.991E-15	5.129E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196399	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Beta	2.817E-14	1.383E-14	1.809E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196400	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Alpha	5.07E-15	9.729E-15	1.401E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196400	SLAPS LOADOUT	09/19/17	Gross Alpha/Beta	Gross Beta	3.865E-14	1.728E-14	2.19E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196401	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	9.47E-16	9.657E-15	1.193E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196401	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	3.221E-15	1.018E-14	1.193E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196401	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	1.983E-14	1.447E-14	1.788E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196401	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	3.366E-14	1.591E-14	1.788E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196402	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	-1.351E-15	9.272E-15	1.214E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196402	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	2.168E-14	1.489E-14	1.821E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196403	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	5.861E-15	1.139E-14	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196403	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	1.029E-14	1.424E-14	1.907E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196404	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	-1.415E-15	9.713E-15	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196404	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	1.262E-14	1.45E-14	1.907E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196405	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Alpha	1.011E-15	1.03E-14	1.272E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196405	SLAPS LOADOUT	09/20/17	Gross Alpha/Beta	Gross Beta	1.572E-14	1.484E-14	1.907E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196406	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Alpha	-2.442E-15	8.741E-15	1.182E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196406	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Beta	2.399E-14	1.48E-14	1.772E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196407	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Alpha	-1.89E-16	9.386E-15	1.193E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196407	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Beta	1.983E-14	1.447E-14	1.788E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196408	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Alpha	3.7E-15	1.17E-14	1.37E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196408	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Beta	3.031E-14	1.742E-14	2.054E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196409	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Alpha	1.088E-15	1.109E-14	1.37E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196409	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Beta	2.278E-14	1.662E-14	2.054E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196410	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Alpha	-2.18E-16	1.078E-14	1.37E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196410	SLAPS LOADOUT	09/21/17	Gross Alpha/Beta	Gross Beta	1.777E-14	1.608E-14	2.054E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196411	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Alpha	6.846E-15	1.128E-14	1.231E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196411	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Beta	6.33E-14	1.922E-14	1.846E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196412	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Alpha	9.69E-16	9.878E-15	1.22E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196412	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Beta	4.709E-14	1.754E-14	1.829E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196413	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Alpha	-3.1E-15	1.11E-14	1.501E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196413	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Beta	5.061E-14	2.086E-14	2.25E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196414	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Alpha	5.485E-15	1.313E-14	1.501E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196414	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Beta	5.61E-14	2.14E-14	2.25E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196415	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Alpha	6.915E-15	1.344E-14	1.501E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196415	SLAPS LOADOUT	09/25/17	Gross Alpha/Beta	Gross Beta	6.709E-14	2.247E-14	2.25E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196416	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Alpha	5.646E-15	1.098E-14	1.225E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196416	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Beta	5.778E-14	1.863E-14	1.837E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196417	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Alpha	-1.91E-16	9.47E-15	1.203E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196417	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Beta	5.747E-14	1.837E-14	1.804E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196418	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Alpha	3.838E-15	1.213E-14	1.421E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196418	SLAPS LOADOUT	09/26/17	Gross Alpha/Beta	Gross Beta	4.618E-14	1.957E-14	2.13E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196419	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Alpha	-1.142E-15	2.368E-15	8.619E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196419	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Alpha	1.142E-15	4.005E-15	8.619E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196419	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Beta	1.369E-14	1.633E-14	2.624E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196419	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Beta	1.735E-14	1.667E-14	2.624E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196420	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Alpha	3.425E-15	5.149E-15	8.619E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196420	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Beta	2.688E-14	1.755E-14	2.624E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196421	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Alpha	1.292E-15	4.531E-15	9.751E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196421	SLAPS LOADOUT	09/27/17	Gross Alpha/Beta	Gross Beta	2.461E-14	1.932E-14	2.968E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196422	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Alpha	7.105E-15	6.747E-15	8.939E-15	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196422	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Beta	5.829E-15	1.614E-14	2.721E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196423	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Alpha	1.195E-15	4.192E-15	9.022E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196423	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Beta	1.663E-14	1.731E-14	2.747E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196424	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Alpha	4.65E-15	5.739E-15	8.776E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196424	SLAPS LOADOUT	09/28/17	Gross Alpha/Beta	Gross Beta	1.244E-14	1.649E-14	2.672E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196425	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Alpha	1.195E-15	4.192E-15	9.022E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196425	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Beta	3.428E-14	1.893E-14	2.747E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196426	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Alpha	5.976E-15	6.371E-15	9.022E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196426	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Beta	3.581E-14	1.906E-14	2.747E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196427	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Alpha	1.195E-15	4.192E-15	9.022E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196427	SLAPS LOADOUT	10/02/17	Gross Alpha/Beta	Gross Beta	2.584E-14	1.816E-14	2.747E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196428	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Alpha	1.241E-14	9.769E-15	1.214E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196428	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Alpha	7.608E-15	8.479E-15	1.214E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196428	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Beta	1.839E-14	1.473E-14	1.896E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196428	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Beta	2.455E-14	1.54E-14	1.896E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196429	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Alpha	3.97E-16	6.025E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196429	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Beta	2.984E-15	1.284E-14	1.878E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196430	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Alpha	3.128E-15	7.776E-15	1.354E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196430	SLAPS LOADOUT	10/03/17	Gross Alpha/Beta	Gross Beta	1.452E-14	1.576E-14	2.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196431	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Alpha	3.859E-15	7.106E-15	1.17E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196431	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Beta	1.921E-14	1.435E-14	1.827E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196432	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Alpha	2.803E-15	6.969E-15	1.214E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196432	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Beta	2.993E-14	1.597E-14	1.896E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196433	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Alpha	4.42E-16	6.715E-15	1.34E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196433	SLAPS LOADOUT	10/04/17	Gross Alpha/Beta	Gross Beta	2.116E-14	1.635E-14	2.094E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196434	SLAPS LOADOUT	10/05/17	Gross Alpha/Beta	Gross Alpha	5.109E-15	7.615E-15	1.191E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196434	SLAPS LOADOUT	10/05/17	Gross Alpha/Beta	Gross Beta	2.183E-14	1.487E-14	1.861E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196435	SLAPS LOADOUT	10/05/17	Gross Alpha/Beta	Gross Alpha	3.97E-16	6.025E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196435	SLAPS LOADOUT	10/05/17	Gross Alpha/Beta	Gross Beta	2.279E-14	1.509E-14	1.878E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196436	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Alpha	-7.72E-16	5.384E-15	1.17E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196436	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Beta	2.588E-14	1.508E-14	1.827E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196437	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Alpha	-7.65E-16	5.335E-15	1.159E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196437	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Beta	2.711E-14	1.51E-14	1.811E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196438	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Alpha	-1.965E-15	4.952E-15	1.191E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196438	SLAPS LOADOUT	10/11/17	Gross Alpha/Beta	Gross Beta	1.428E-14	1.403E-14	1.861E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196439	SLAPS LOADOUT	10/12/17	Gross Alpha/Beta	Gross Alpha	2.425E-15	6.03E-15	1.05E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196439	SLAPS LOADOUT	10/12/17	Gross Alpha/Beta	Gross Beta	9.261E-15	1.199E-14	1.641E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196440	SLAPS LOADOUT	10/12/17	Gross Alpha/Beta	Gross Alpha	-7.79E-16	5.433E-15	1.18E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196440	SLAPS LOADOUT	10/12/17	Gross Alpha/Beta	Gross Beta	1.864E-14	1.44E-14	1.844E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196441	SLAPS LOADOUT	10/16/17	Gross Alpha/Beta	Gross Alpha	-1.947E-15	4.907E-15	1.18E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196441	SLAPS LOADOUT	10/16/17	Gross Alpha/Beta	Gross Beta	3.659E-14	1.631E-14	1.844E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196442	SLAPS LOADOUT	10/16/17	Gross Alpha/Beta	Gross Alpha	1.558E-15	6.36E-15	1.18E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196442	SLAPS LOADOUT	10/16/17	Gross Alpha/Beta	Gross Beta	5.08E-14	1.773E-14	1.844E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196443	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Alpha	4.032E-15	5.474E-15	7.949E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196443	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Alpha	9.793E-15	7.543E-15	7.949E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196443	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Beta	2.441E-14	1.801E-14	2.746E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA196443	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Beta	3.699E-15	1.613E-14	2.746E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196444	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Alpha	8.641E-15	7.175E-15	7.949E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA196444	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Beta	6.214E-14	2.126E-14	2.746E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196445	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Alpha	2.339E-15	5.945E-15	1.076E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196445	SLAPS LOADOUT	10/17/17	Gross Alpha/Beta	Gross Beta	2.504E-14	2.366E-14	3.717E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA196446	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Alpha	4.223E-15	5.732E-15	8.324E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196446	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Beta	6.275E-14	2.206E-14	2.876E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196447	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Alpha	5.378E-15	6.166E-15	8.247E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196447	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Beta	3.837E-14	1.983E-14	2.849E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196448	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Alpha	5.029E-15	6.827E-15	9.915E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196448	SLAPS LOADOUT	10/18/17	Gross Alpha/Beta	Gross Beta	5.72E-14	2.479E-14	3.425E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196449	SLAPS LOADOUT	10/19/17	Gross Alpha/Beta	Gross Alpha	1.292E-14	9.321E-15	9.387E-15	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA196449	SLAPS LOADOUT	10/19/17	Gross Alpha/Beta	Gross Beta	7.076E-14	2.488E-14	3.243E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA196450	SLAPS LOADOUT	10/19/17	Gross Alpha/Beta	Gross Alpha	6.122E-15	7.019E-15	9.387E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA196450	SLAPS LOADOUT	10/19/17	Gross Alpha/Beta	Gross Beta	7.163E-14	2.495E-14	3.243E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199592	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Alpha	6.358E-15	6.616E-15	8.22E-15	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199592	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Alpha	5.284E-15	6.253E-15	8.22E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199592	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Beta	-1.783E-15	3.903E-14	3.106E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199592	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Beta	5.808E-15	3.93E-14	3.106E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199593	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Alpha	-2.277E-15	2.624E-15	8.36E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199593	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Beta	3.538E-14	4.106E-14	3.159E-14	µCi/mL	UJ	T02	SLAPS (General Area)-Perimeter Air
SLA199594	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Alpha	-2.22E-16	9.876E-15	2.038E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199594	SLAPS LOADOUT	10/23/17	Gross Alpha/Beta	Gross Beta	4.134E-15	9.706E-14	7.699E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199595	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Alpha	-9.9E-17	4.389E-15	9.057E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199595	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Beta	2.389E-14	4.394E-14	3.422E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199596	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Alpha	-9.9E-17	4.389E-15	9.057E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199596	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Beta	1.78E-14	4.371E-14	3.422E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199597	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Alpha	1.051E-14	1.094E-14	1.359E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199597	SLAPS LOADOUT	10/24/17	Gross Alpha/Beta	Gross Beta	4.039E-14	6.608E-14	5.133E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199598	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Alpha	-1.02E-16	4.515E-15	9.316E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199598	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Beta	2.535E-14	4.522E-14	3.52E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199599	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Alpha	7.206E-15	7.499E-15	9.316E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199599	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Beta	4.49E-14	4.597E-14	3.52E-14	µCi/mL	UJ	T02	SLAPS (General Area)-Perimeter Air
SLA199600	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Alpha	6.834E-15	8.088E-15	1.063E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199600	SLAPS LOADOUT	10/25/17	Gross Alpha/Beta	Gross Beta	3.072E-14	5.168E-14	4.017E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199601	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Alpha	2.476E-15	6.025E-15	9.88E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199601	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Beta	3.684E-14	4.834E-14	3.733E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199602	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Alpha	1.184E-15	5.441E-15	9.88E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199602	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Beta	5.509E-14	4.904E-14	3.733E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199603	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Alpha	-1.08E-16	4.788E-15	9.88E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199603	SLAPS LOADOUT	10/26/17	Gross Alpha/Beta	Gross Beta	3.933E-14	4.843E-14	3.733E-14	µCi/mL	UJ	T02	SLAPS (General Area)-Perimeter Air
SLA199604	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	-9.8E-17	4.349E-15	8.974E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199604	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	2.291E-14	4.351E-14	3.39E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199605	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	1.066E-15	4.897E-15	8.892E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199605	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	1.375E-14	4.278E-14	3.36E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA199606	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	5.18E-15	1.548E-14	1.986E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199606	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	-2.841E-15	1.323E-14	1.986E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199606	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	2.354E-14	1.935E-14	3.045E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199606	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	1.583E-14	1.826E-14	3.045E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199607	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	9.264E-15	1.662E-14	2.002E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199607	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	4.96E-14	2.288E-14	3.07E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199608	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Alpha	-2.91E-15	1.355E-14	2.034E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199608	SLAPS LOADOUT	10/30/17	Gross Alpha/Beta	Gross Beta	2.674E-14	2.018E-14	3.119E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199609	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Alpha	-5.05E-16	8.36E-15	1.201E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199609	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Beta	1.501E-14	1.181E-14	1.842E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199610	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Alpha	7.07E-16	8.705E-15	1.201E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199610	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Beta	7.246E-15	1.07E-14	1.842E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199611	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Alpha	3.323E-15	9.926E-15	1.274E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199611	SLAPS LOADOUT	10/31/17	Gross Alpha/Beta	Gross Beta	2.004E-14	1.308E-14	1.953E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199612	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Alpha	2.368E-15	5.414E-15	1.023E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199612	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Alpha	4.736E-15	6.373E-15	1.023E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199612	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Beta	1.578E-14	2.524E-14	3.322E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199612	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Beta	3.612E-15	2.447E-14	3.322E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199613	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Alpha	3.552E-15	5.912E-15	1.023E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199613	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Beta	5.379E-14	2.767E-14	3.322E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199614	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Alpha	8.526E-15	8.65E-15	1.227E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199614	SLAPS LOADOUT	11/01/17	Gross Alpha/Beta	Gross Beta	5.817E-14	3.279E-14	3.986E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199615	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	0	5.217E-15	1.255E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199615	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	9.215E-14	3.565E-14	4.077E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199616	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	2.874E-15	6.57E-15	1.241E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199616	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	7.358E-14	3.411E-14	4.031E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199617	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	4.41E-15	7.34E-15	1.27E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199617	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	6.867E-14	3.447E-14	4.124E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199618	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Alpha	5.684E-15	7.647E-15	1.227E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199618	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Beta	7.824E-14	3.409E-14	3.986E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199619	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	3.996E-15	6.651E-15	1.151E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199619	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	7.164E-14	3.185E-14	3.737E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199620	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	1.254E-15	5.153E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199620	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	5.857E-14	2.94E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199621	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Alpha	1.003E-14	8.428E-15	1.083E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199621	SLAPS LOADOUT	11/02/17	Gross Alpha/Beta	Gross Beta	6.581E-14	2.987E-14	3.517E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199622	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Alpha	0	4.331E-15	1.042E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199622	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Beta	3.931E-14	2.72E-14	3.385E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199623	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Alpha	3.619E-15	6.024E-15	1.042E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199623	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Beta	5.636E-14	2.829E-14	3.385E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199624	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Alpha	3.875E-15	6.45E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199624	SLAPS LOADOUT	11/07/17	Gross Alpha/Beta	Gross Beta	4.624E-14	2.939E-14	3.624E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199625	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Alpha	6.394E-15	7.347E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA199625	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Beta	7.863E-14	3.121E-14	3.588E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199626	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Alpha	7.003E-15	7.826E-15	1.16E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199626	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Alpha	6.37E-16	5.347E-15	1.16E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199626	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Beta	3.539E-14	1.55E-14	1.955E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199626	SLAPS LOADOUT	11/06/17	Gross Alpha/Beta	Gross Beta	5.903E-14	1.812E-14	1.955E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199627	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Alpha	6.866E-15	7.673E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199627	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Beta	3.23E-14	1.492E-14	1.916E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199628	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Alpha	4.369E-15	6.802E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199628	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Beta	4.029E-14	1.584E-14	1.916E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199629	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Alpha	9.363E-15	8.457E-15	1.138E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199629	SLAPS LOADOUT	11/08/17	Gross Alpha/Beta	Gross Beta	3.47E-14	1.52E-14	1.916E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199630	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Alpha	1.408E-14	9.661E-15	1.116E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199630	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Beta	6.46E-14	1.824E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199631	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Alpha	1.837E-15	5.696E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199631	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Beta	4.736E-14	1.641E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199632	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Alpha	8.776E-15	8.04E-15	1.083E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199632	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Alpha	2.508E-15	5.733E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199632	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Beta	5.937E-14	2.945E-14	3.517E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199632	SLAPS LOADOUT	11/09/17	Gross Alpha/Beta	Gross Beta	5.132E-14	2.893E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199633	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Alpha	-1.142E-15	3.405E-15	9.862E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199633	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Beta	4.674E-14	2.635E-14	3.203E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199634	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Alpha	1.142E-15	4.693E-15	9.862E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199634	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Beta	3.574E-14	2.565E-14	3.203E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199635	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Alpha	1.184E-15	4.867E-15	1.023E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199635	SLAPS LOADOUT	11/13/17	Gross Alpha/Beta	Gross Beta	4.315E-14	2.699E-14	3.322E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199636	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Alpha	3.689E-15	6.14E-15	1.062E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199636	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Beta	3.218E-14	2.722E-14	3.45E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199637	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Alpha	1.23E-15	5.054E-15	1.062E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199637	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Beta	5.112E-14	2.843E-14	3.45E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199638	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Alpha	1.148E-14	1.051E-14	1.416E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199638	SLAPS LOADOUT	11/14/17	Gross Alpha/Beta	Gross Beta	3.658E-14	3.588E-14	4.6E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199639	SLAPS LOADOUT	11/15/17	Gross Alpha/Beta	Gross Alpha	1.254E-15	5.153E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199639	SLAPS LOADOUT	11/15/17	Gross Alpha/Beta	Gross Beta	4.327E-14	2.842E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199640	SLAPS LOADOUT	11/15/17	Gross Alpha/Beta	Gross Alpha	3.761E-15	6.26E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199640	SLAPS LOADOUT	11/15/17	Gross Alpha/Beta	Gross Beta	5.857E-14	2.94E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199641	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Alpha	6.269E-15	7.203E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199641	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Beta	6.179E-14	2.961E-14	3.517E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199642	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Alpha	2.508E-15	5.733E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199642	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Beta	7.708E-14	3.06E-14	3.517E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199643	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Alpha	5.015E-15	6.748E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199643	SLAPS LOADOUT	11/16/17	Gross Alpha/Beta	Gross Beta	6.098E-14	2.956E-14	3.517E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199644	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Alpha	6.269E-15	7.203E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199644	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Beta	4.488E-14	2.852E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA199645	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Alpha	3.761E-15	6.26E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199645	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Beta	4.327E-14	2.842E-14	3.517E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199646	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Alpha	5.51E-15	7.11E-15	1.116E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199646	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Alpha	4.285E-15	6.671E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199646	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Beta	3.247E-14	1.472E-14	1.879E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199646	SLAPS LOADOUT	11/20/17	Gross Alpha/Beta	Gross Beta	3.717E-14	1.527E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199647	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Alpha	4.285E-15	6.671E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199647	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Beta	4.893E-14	1.658E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199648	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Alpha	4.285E-15	6.671E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199648	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Beta	3.403E-14	1.491E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199649	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Alpha	1.935E-14	1.108E-14	1.138E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199649	SLAPS LOADOUT	11/21/17	Gross Alpha/Beta	Gross Beta	3.55E-14	1.529E-14	1.916E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199650	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Alpha	6.12E-16	5.141E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199650	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Beta	2.933E-14	1.435E-14	1.879E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199651	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Alpha	1.837E-15	5.696E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199651	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Beta	1.836E-14	1.3E-14	1.879E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199652	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Alpha	1.804E-14	1.5E-14	1.934E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199652	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Alpha	2.228E-14	1.618E-14	1.934E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199652	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Beta	4.676E-14	2.439E-14	3.258E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199652	SLAPS LOADOUT	11/22/17	Gross Alpha/Beta	Gross Beta	7.258E-14	2.739E-14	3.258E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199653	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Alpha	5.9E-16	4.951E-15	1.074E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199653	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Beta	2.447E-14	1.337E-14	1.81E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199654	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Alpha	1.769E-15	5.485E-15	1.074E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199654	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Beta	3.353E-14	1.444E-14	1.81E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199655	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Alpha	9.196E-15	9.151E-15	1.289E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199655	SLAPS LOADOUT	11/27/17	Gross Alpha/Beta	Gross Beta	4.476E-14	1.785E-14	2.172E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199656	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Alpha	7.782E-15	8.696E-15	1.289E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199656	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Beta	4.023E-14	1.733E-14	2.172E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199657	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Alpha	2.122E-15	6.582E-15	1.289E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199657	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Beta	2.665E-14	1.571E-14	2.172E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199658	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Alpha	4.952E-15	7.709E-15	1.289E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199658	SLAPS LOADOUT	11/28/17	Gross Alpha/Beta	Gross Beta	3.117E-14	1.626E-14	2.172E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199659	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Alpha	-4.369E-15	1.622E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199659	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Beta	1.232E-14	1.242E-14	1.916E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199660	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Alpha	6.24E-16	5.242E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199660	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Beta	8.325E-15	1.188E-14	1.916E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199661	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Alpha	7.07E-16	5.941E-15	1.289E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199661	SLAPS LOADOUT	11/29/17	Gross Alpha/Beta	Gross Beta	1.396E-14	1.408E-14	2.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199662	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Alpha	1.873E-15	5.807E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199662	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Beta	1.152E-14	1.232E-14	1.916E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199663	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Alpha	1.873E-15	5.807E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199663	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Beta	1.712E-14	1.305E-14	1.916E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199664	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Alpha	-2.653E-15	5.491E-15	1.612E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA199664	SLAPS LOADOUT	11/30/17	Gross Alpha/Beta	Gross Beta	3.217E-14	1.949E-14	2.715E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199665	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Alpha	1E-16	5.446E-15	1.139E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199665	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Alpha	1.211E-14	9.385E-15	1.139E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199665	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Beta	4.358E-14	1.611E-14	1.839E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199665	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Beta	7.742E-14	1.959E-14	1.839E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199666	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Alpha	6.107E-15	7.662E-15	1.139E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199666	SLAPS LOADOUT	12/04/17	Gross Alpha/Beta	Gross Beta	5.589E-14	1.742E-14	1.839E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199667	SLAPS LOADOUT	12/05/17	Gross Alpha/Beta	Gross Alpha	3.739E-15	6.924E-15	1.15E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199667	SLAPS LOADOUT	12/05/17	Gross Alpha/Beta	Gross Beta	3.701E-14	1.55E-14	1.856E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199668	SLAPS LOADOUT	12/05/17	Gross Alpha/Beta	Gross Alpha	-1.112E-15	4.935E-15	1.15E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199668	SLAPS LOADOUT	12/05/17	Gross Alpha/Beta	Gross Beta	1.061E-14	1.233E-14	1.856E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199669	SLAPS LOADOUT	12/06/17	Gross Alpha/Beta	Gross Alpha	2.503E-15	6.422E-15	1.139E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199669	SLAPS LOADOUT	12/06/17	Gross Alpha/Beta	Gross Beta	2.359E-14	1.384E-14	1.839E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199670	SLAPS LOADOUT	12/06/17	Gross Alpha/Beta	Gross Alpha	7.24E-15	7.959E-15	1.129E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199670	SLAPS LOADOUT	12/06/17	Gross Alpha/Beta	Gross Beta	1.498E-14	1.268E-14	1.821E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199671	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Alpha	2.39E-15	6.132E-15	1.088E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199671	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Beta	6.365E-15	1.118E-14	1.756E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199672	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Alpha	1.21E-15	5.536E-15	1.059E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199672	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Beta	2.121E-14	1.278E-14	1.71E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199673	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Alpha	3.401E-15	8.727E-15	1.548E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199673	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Beta	1.637E-14	1.687E-14	2.499E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199674	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Alpha	-3.211E-15	5.941E-15	1.589E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199674	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Beta	1.573E-14	1.717E-14	2.564E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199675	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Alpha	1.809E-14	1.318E-14	1.548E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199675	SLAPS LOADOUT	12/07/17	Gross Alpha/Beta	Gross Beta	3.623E-14	1.93E-14	2.499E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199676	SLAPS LOADOUT	12/11/17	Gross Alpha/Beta	Gross Alpha	2.576E-15	6.609E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199676	SLAPS LOADOUT	12/11/17	Gross Alpha/Beta	Gross Beta	4.01E-14	1.606E-14	1.892E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199677	SLAPS LOADOUT	12/11/17	Gross Alpha/Beta	Gross Alpha	1.326E-15	6.068E-15	1.161E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199677	SLAPS LOADOUT	12/11/17	Gross Alpha/Beta	Gross Beta	2.482E-14	1.42E-14	1.874E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199678	SLAPS LOADOUT	12/12/17	Gross Alpha/Beta	Gross Alpha	-3.471E-15	3.489E-15	1.129E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199678	SLAPS LOADOUT	12/12/17	Gross Alpha/Beta	Gross Beta	2.108E-14	1.344E-14	1.821E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199679	SLAPS LOADOUT	12/12/17	Gross Alpha/Beta	Gross Alpha	1.266E-15	5.79E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199679	SLAPS LOADOUT	12/12/17	Gross Alpha/Beta	Gross Beta	3.191E-14	1.451E-14	1.788E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199680	SLAPS LOADOUT	12/13/17	Gross Alpha/Beta	Gross Alpha	4.814E-15	7.136E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199680	SLAPS LOADOUT	12/13/17	Gross Alpha/Beta	Gross Beta	2.39E-14	1.367E-14	1.805E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199681	SLAPS LOADOUT	12/13/17	Gross Alpha/Beta	Gross Alpha	1.03E-16	5.605E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199681	SLAPS LOADOUT	12/13/17	Gross Alpha/Beta	Gross Beta	2.348E-14	1.415E-14	1.892E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199682	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Alpha	-2.239E-15	4.142E-15	1.108E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199682	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Alpha	2.434E-15	6.245E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199682	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Beta	6.482E-15	1.138E-14	1.788E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199682	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Beta	1.321E-14	1.226E-14	1.788E-14	µCi/mL	UJ	T04, T05	SLAPS (General Area)-Perimeter Air
SLA199683	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Alpha	1.243E-15	5.685E-15	1.088E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199683	SLAPS LOADOUT	12/14/17	Gross Alpha/Beta	Gross Beta	3.06E-14	1.416E-14	1.756E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-4. SLAPS Perimeter Air Data Results for CY 2017

Sample Name	Station Name	Collect Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Sampling Event
SLA199684	SLAPS LOADOUT	12/15/17	Gross Alpha/Beta	Gross Alpha	-2.179E-15	4.031E-15	1.078E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199684	SLAPS LOADOUT	12/15/17	Gross Alpha/Beta	Gross Beta	2.232E-14	1.31E-14	1.74E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199685	SLAPS LOADOUT	12/16/17	Gross Alpha/Beta	Gross Alpha	1.289E-15	5.898E-15	1.129E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199685	SLAPS LOADOUT	12/16/17	Gross Alpha/Beta	Gross Beta	8.584E-14	2.029E-14	1.821E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199686	SLAPS LOADOUT	12/16/17	Gross Alpha/Beta	Gross Alpha	3.635E-15	6.732E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199686	SLAPS LOADOUT	12/16/17	Gross Alpha/Beta	Gross Beta	5.561E-14	1.717E-14	1.805E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199687	SLAPS LOADOUT	12/17/17	Gross Alpha/Beta	Gross Alpha	-1.091E-15	4.843E-15	1.129E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199687	SLAPS LOADOUT	12/17/17	Gross Alpha/Beta	Gross Beta	2.641E-14	1.407E-14	1.821E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199688	SLAPS LOADOUT	12/17/17	Gross Alpha/Beta	Gross Alpha	1.254E-15	5.737E-15	1.098E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199688	SLAPS LOADOUT	12/17/17	Gross Alpha/Beta	Gross Beta	7.164E-15	1.138E-14	1.772E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199689	SLAPS LOADOUT	12/18/17	Gross Alpha/Beta	Gross Alpha	-2.239E-15	4.142E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199689	SLAPS LOADOUT	12/18/17	Gross Alpha/Beta	Gross Beta	2.144E-14	1.328E-14	1.788E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199690	SLAPS LOADOUT	12/18/17	Gross Alpha/Beta	Gross Alpha	9.7E-17	5.297E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199690	SLAPS LOADOUT	12/18/17	Gross Alpha/Beta	Gross Beta	2.593E-14	1.381E-14	1.788E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199691	SLAPS LOADOUT	12/15/17	Gross Alpha/Beta	Gross Alpha	3.537E-15	6.55E-15	1.088E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199691	SLAPS LOADOUT	12/15/17	Gross Alpha/Beta	Gross Beta	3.207E-14	1.433E-14	1.756E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199692	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Alpha	2E-16	5.001E-15	1.131E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199692	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Alpha	2E-16	5.001E-15	1.131E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199692	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Beta	9.101E-15	1.155E-14	1.792E-14	µCi/mL			SLAPS (General Area)-Perimeter Air
SLA199692	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Beta	6.793E-15	1.123E-14	1.792E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199693	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Alpha	5.005E-15	6.944E-15	1.131E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199693	SLAPS LOADOUT	12/26/17	Gross Alpha/Beta	Gross Beta	2.525E-14	1.363E-14	1.792E-14	µCi/mL	J	T04, T20	SLAPS (General Area)-Perimeter Air
SLA199694	SLAPS LOADOUT	12/27/17	Gross Alpha/Beta	Gross Alpha	2.02E-16	5.049E-15	1.141E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199694	SLAPS LOADOUT	12/27/17	Gross Alpha/Beta	Gross Beta	3.093E-14	1.441E-14	1.809E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199695	SLAPS LOADOUT	12/27/17	Gross Alpha/Beta	Gross Alpha	1.415E-15	5.602E-15	1.141E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA199695	SLAPS LOADOUT	12/27/17	Gross Alpha/Beta	Gross Beta	4.413E-14	1.592E-14	1.809E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA199696	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Alpha	1.544E-14	1.149E-14	1.229E-14	µCi/mL			SLAPS Loadout (General Area)-Perimeter Air
SLA199696	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Alpha	2.315E-14	1.316E-14	1.229E-14	µCi/mL	J	T04, T20	SLAPS Loadout (General Area)-Perimeter Air
SLA199696	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Beta	4.268E-14	1.719E-14	2.01E-14	µCi/mL			SLAPS Loadout (General Area)-Perimeter Air
SLA199696	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Beta	7.727E-14	2.073E-14	2.01E-14	µCi/mL	=		SLAPS Loadout (General Area)-Perimeter Air
SLA199697	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Alpha	9.584E-15	1.055E-14	1.308E-14	µCi/mL	UJ	T06	SLAPS Loadout (General Area)-Perimeter Air
SLA199697	SLAPS LOADOUT	12/28/17	Gross Alpha/Beta	Gross Beta	3.404E-14	1.704E-14	2.14E-14	µCi/mL	J	T04, T20	SLAPS Loadout (General Area)-Perimeter Air

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. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Validation Reason Code:

F01 Blanks: Sample data were qualified as a result of the method blank.

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T05 Radionuclide Quantitation: Analytical result is less than the associated MDA, but greater than the counting uncertainty.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

T20 Radionuclide Quantitation: Analytical result is greater than the associated MDA, with uncertainty 50 to 100 percent of the result.

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APPENDIX C

STORM-WATER, WASTE-WATER AND EXCAVATION-WATER DATA

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Table C-1. NPDES Analytical Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code
SVP175727	Duchesne Park	01/18/17	SW846 6010B	Chouromium	4		4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 6020	Arsenic	4		4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 6020	Cadmium	0.2		0.2	µg/L	U	
SVP175727	Duchesne Park	01/18/17	EPA 1664	Oil and Grease	1.8		1.8	mg/L	U	
SVP175727	Duchesne Park	01/18/17	EPA 1664	TRPH	3.1		3.1	mg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1016	0.4		0.4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1221	0.4		0.4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1232	0.4		0.4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1242	0.4		0.4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1248	0.4		0.4	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1254	0.25		0.25	µg/L	U	
SVP175727	Duchesne Park	01/18/17	SW846 8082	Aroclor-1260	0.25		0.25	µg/L	U	
SVP175727	Duchesne Park	01/18/17	EPA 160.5	SS	0		0.1	mL/L/hour	U	
SVP175727	Duchesne Park	01/18/17	ML-024	pH	7.8		0.1	No Units	=	
SVP175727	Duchesne Park	01/18/17	ML-005	Th-228	2.51E-06	0.265	0.797	pCi/L	UJ	T06
SVP175727	Duchesne Park	01/18/17	ML-005	Th-230	1.14	0.757	0.651	pCi/L	J	T04, T20
SVP175727	Duchesne Park	01/18/17	ML-005	Th-232	0	0	0.293	pCi/L	U	
SVP175727	Duchesne Park	01/18/17	ML-006	Ra-226	0.0819	0.366	0.982	pCi/L	UJ	T06
SVP175727	Duchesne Park	01/18/17	ML-018	Gross Alpha	-0.0661	10.8	14.3	pCi/L	UJ	T06
SVP175727	Duchesne Park	01/18/17	ML-018	Gross Beta	20.1	18.4	21.4	pCi/L	UJ	T04, T05
SVP175727	Duchesne Park	01/18/17	ML-003	Ac-227	-4.27	4.73	7.16	pCi/L	UJ	T04, T06
SVP175727	Duchesne Park	01/18/17	ML-003	Pa-231	3.97	33.9	39.3	pCi/L	UJ	T04, T06
SVP175727	Duchesne Park	01/18/17	ML-021	Total U	-0.277	0.0253	2.45	pCi/L	UJ	T06
SVP175728	Palm Dr. Properties	05/04/17	EPA 160.5	SS	0		0.1	mL/L/hour	U	
SVP175728	Palm Dr. Properties	05/04/17	ML-024	pH	7.64		0.1	No Units	=	
SVP175728	Palm Dr. Properties	05/04/17	ML-005	Th-228	0.287	0.238	0.13	pCi/L	J	T04, T20
SVP175728	Palm Dr. Properties	05/04/17	ML-005	Th-230	1.12	0.499	0.312	pCi/L	J	F01
SVP175728	Palm Dr. Properties	05/04/17	ML-005	Th-232	0	0	0.13	pCi/L	U	
SVP175728	Palm Dr. Properties	05/04/17	ML-006	Ra-226	0.766	0.608	0.679	pCi/L	J	T04, T20

Table C-1. NPDES Analytical Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code
SVP175728	Palm Dr. Properties	05/04/17	ML-018	Gross Alpha	-2.52	11.8	15.7	pCi/L	UJ	T06
SVP175728	Palm Dr. Properties	05/04/17	ML-018	Gross Beta	-7.6	16.5	20.6	pCi/L	UJ	T06
SVP175728	Palm Dr. Properties	05/04/17	ML-003	Ac-227	-1.11	5.12	7.22	pCi/L	UJ	T04, T06
SVP175728	Palm Dr. Properties	05/04/17	ML-003	Pa-231	35.2	34.9	38.4	pCi/L	UJ	T04, T05
SVP175728	Palm Dr. Properties	05/04/17	ML-021	Total U	0.069	0.00629	0.489	pCi/L	U	T04, T05
SVP175729	Palm Dr. Properties	05/08/17	EPA 160.5	SS	0		0.1	mL/L/hour	U	
SVP175729	Palm Dr. Properties	05/08/17	ML-024	pH	7.41		0.1	No Units	=	
SVP175729	Palm Dr. Properties	05/08/17	ML-005	Th-228	0.228	0.259	0.395	pCi/L	UJ	T06
SVP175729	Palm Dr. Properties	05/08/17	ML-005	Th-230	2.3	0.746	0.133	pCi/L	J	F01
SVP175729	Palm Dr. Properties	05/08/17	ML-005	Th-232	0.147	0.171	0.133	pCi/L	UJ	T02
SVP175729	Palm Dr. Properties	05/08/17	ML-006	Ra-226	1.17	0.779	0.977	pCi/L	J	T04, T20
SVP175729	Palm Dr. Properties	05/08/17	ML-018	Gross Alpha	3.18	12.4	15.8	pCi/L	UJ	T06
SVP175729	Palm Dr. Properties	05/08/17	ML-018	Gross Beta	-1.03	16.9	20.8	pCi/L	UJ	T06
SVP175729	Palm Dr. Properties	05/08/17	ML-003	Ac-227	-1.05	4.05	6.06	pCi/L	UJ	T04, T06
SVP175729	Palm Dr. Properties	05/08/17	ML-003	Pa-231	11	26.6	30.7	pCi/L	UJ	T04, T06
SVP175729	Palm Dr. Properties	05/08/17	ML-021	Total U	0.1	0.00912	0.489	pCi/L	U	T04, T05
SVP175730	NPDES Outfall 002	10/10/17	SW846 6020	Arsenic	8.6		4	µg/L	=	
SVP175730	NPDES Outfall 002	10/10/17	SW846 6020	Cadmium	0.51		0.2	µg/L	=	
SVP175730	NPDES Outfall 002	10/10/17	SW846 6020	Chouromium	21		4	µg/L	=	
SVP175730	NPDES Outfall 002	10/10/17	EPA 410.4	COC	45		4.1	mg/L	=	
SVP175730	NPDES Outfall 002	10/10/17	EPA 1664	Oil and Grease	1.5		1.5	mg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	EPA 1664	TRPH	2.6		2.6	mg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1016	0.35		0.35	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1221	0.35		0.35	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1232	0.35		0.35	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1242	0.35		0.35	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1248	0.35		0.35	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1254	0.29		0.29	µg/L	U	
SVP175730	NPDES Outfall 002	10/10/17	SW846 8082	Aroclor-1260	0.29		0.29	µg/L	U	

Table C-1. NPDES Analytical Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code
SVP175730	NPDES Outfall 002	10/10/17	EPA 160.5	SS	0.1		0.1	mL/L/hour	U	
SVP175730	NPDES Outfall 002	10/10/17	ML-024	pH	7.21		0.1	No Units	=	
SVP175730	NPDES Outfall 002	10/10/17	ML-005	Th-228	0.576	0.422	0.406	pCi/L	J	T04, T20
SVP175730	NPDES Outfall 002	10/10/17	ML-005	Th-230	0.848	0.511	0.407	pCi/L	J	T04, T20
SVP175730	NPDES Outfall 002	10/10/17	ML-005	Th-232	0.271	0.274	0.183	pCi/L	UJ	T02
SVP175730	NPDES Outfall 002	10/10/17	ML-006	Ra-226	0.561	0.572	0.748	pCi/L	UJ	T06
SVP175730	NPDES Outfall 002	10/10/17	ML-018	Gross Alpha	-5.75	11	15.3	pCi/L	UJ	T06
SVP175730	NPDES Outfall 002	10/10/17	ML-018	Gross Beta	8.5	17.1	20.4	pCi/L	UJ	T06
SVP175730	NPDES Outfall 002	10/10/17	ML-003	Ac-227	-1.14	4.05	6.05	pCi/L	UJ	T04, T06
SVP175730	NPDES Outfall 002	10/10/17	ML-003	Pa-231	27.7	27.6	31.9	pCi/L	UJ	T04, T05
SVP175730	NPDES Outfall 002	10/10/17	ML-021	Total U	0.239	0.0218	0.489	pCi/L	U	T04, T05
SVP175730	NPDES Outfall 002	10/10/17	SM 7500 Rn B	Rn-222	-4.74	46	82.6	pCi/L	UJ	T06
SVP175731	NPDES Outfall 002	10/11/17	EPA 160.5	SS	0		0.1	mL/L/hour	U	
SVP175731	NPDES Outfall 002	10/11/17	ML-021	Total U	0.087	0.00793	4.89	pCi/L	U	T04, T05
SVP175732	NPDES Outfall 002	10/12/17	EPA 160.5	SS	0.1		0.1	mL/L/hour	U	
SVP175732	NPDES Outfall 002	10/12/17	ML-024	pH	7.51		0.1	No Units	=	
SVP175732	NPDES Outfall 002	10/12/17	ML-005	Th-228	0.0672	0.316	0.724	pCi/L	UJ	T06
SVP175732	NPDES Outfall 002	10/12/17	ML-005	Th-230	1.25	0.622	0.404	pCi/L	=	
SVP175732	NPDES Outfall 002	10/12/17	ML-005	Th-232	0.269	0.272	0.182	pCi/L	UJ	T02
SVP175732	NPDES Outfall 002	10/12/17	ML-006	Ra-226	0.809	0.736	0.882	pCi/L	UJ	T04, T05
SVP175732	NPDES Outfall 002	10/12/17	ML-018	Gross Alpha	-1.26	11.5	15.3	pCi/L	UJ	T06
SVP175732	NPDES Outfall 002	10/12/17	ML-018	Gross Beta	-2.06	16.7	20.5	pCi/L	UJ	T06
SVP175732	NPDES Outfall 002	10/12/17	ML-003	Ac-227	2.33	3.88	6.17	pCi/L	UJ	T04, T06
SVP175732	NPDES Outfall 002	10/12/17	ML-003	Pa-231	-9.63	27.9	34.3	pCi/L	UJ	T04, T06
SVP175732	NPDES Outfall 002	10/12/17	ML-021	Total U	0.276	0.0252	0.489	pCi/L	U	T04, T05
SVP175733	NPDES Outfall 002	10/16/17	EPA 160.5	SS	0.1		0.1	mL/L/hour	U	
SVP175733	NPDES Outfall 002	10/16/17	ML-024	pH	7.4		0.1	No Units	=	
SVP175733	NPDES Outfall 002	10/16/17	ML-005	Th-228	-3.09E-05	0.27	0.684	pCi/L	UJ	T06
SVP175733	NPDES Outfall 002	10/16/17	ML-005	Th-230	0.573	0.392	0.172	pCi/L	J	T04, T20

Table C-1. NPDES Analytical Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code
SVP175733	NPDES Outfall 002	10/16/17	ML-005	Th-232	0.318	0.288	0.172	pCi/L	J	T04, T20
SVP175733	NPDES Outfall 002	10/16/17	ML-006	Ra-226	0.883	0.723	0.399	pCi/L	J	T04, T20
SVP175733	NPDES Outfall 002	10/16/17	ML-018	Gross Alpha	0.604	11.7	15.3	pCi/L	UJ	T06
SVP175733	NPDES Outfall 002	10/16/17	ML-018	Gross Beta	9.53	17.3	20.6	pCi/L	UJ	T06
SVP175733	NPDES Outfall 002	10/16/17	ML-003	Ac-227	-66.8	12.8	17.2	pCi/L	UJ	T04, T06, T07
SVP175733	NPDES Outfall 002	10/16/17	ML-003	Pa-231	-22.9	77.7	93.5	pCi/L	UJ	T04, T06
SVP175733	NPDES Outfall 002	10/16/17	ML-021	Total U	0.23	0.021	0.489	pCi/L	U	T04, T05

TRPH – total recoverable petroleum hydrocarbon

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.

Validation Reason Codes:

F01 Blanks: Sample data were qualified as a result of the method blank.

T02 Analytical uncertainties were not met and/or not reported.

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T05 Radionuclide Quantitation: Analytical result is less than the associated MDA, but greater than the counting uncertainty.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

T07 Radionuclide Quantitation: Negative analytical result where the absolute value exceeds two times (2x) the associated MDA.

T20 Radionuclide Quantitation: Analytical result is greater than the associated MDA, with uncertainty 50 percent to 100 percent of the result.

Table C-2. North St. Louis County Sites Rainfall Data for CY 2017 – First Quarter

Date	Rainfall (inches)	Outfall	Outfall Duchesne Park
2017	**24-Hour Total**	**002[a]**	**Un-Named[b]**
1-Jan			
2-Jan	0.20		
3-Jan	0.02		
4-Jan			
5-Jan			
6-Jan	0.20		
7-Jan			
8-Jan			
9-Jan			
10-Jan	0.01		
11-Jan	trace		
12-Jan	trace		
13-Jan	0.16		
14-Jan	0.64		
15-Jan	0.21		
16-Jan	0.11		
17-Jan	trace		
18-Jan	trace		0.006
19-Jan	0.37		
20-Jan	trace		
21-Jan			
22-Jan			
23-Jan			
24-Jan			
25-Jan			
26-Jan	trace		
27-Jan	trace		
28-Jan			
29-Jan	trace		
30-Jan			
31-Jan			
Monthly Total	**1.92**		**0.006**

Date	Rainfall (inches)	Outfall	Outfall Duchesne Park
2017	**24-Hour Total**	**002[a]**	**Un-Named[b,c]**
1-Feb			
2-Feb			
3-Feb			
4-Feb			
5-Feb			
6-Feb	0.01		
7-Feb	0.01		
8-Feb	0.20		
9-Feb			
10-Feb			
11-Feb			
12-Feb			
13-Feb			
14-Feb	trace		
15-Feb			
16-Feb			
17-Feb			
18-Feb	trace		
19-Feb			
20-Feb	trace		
21-Feb	0.43		
22-Feb			
23-Feb			
24-Feb	trace		
25-Feb	trace		
26-Feb	trace		
27-Feb	0.02		
28-Feb	trace		
Monthly Total	**0.67**		

Date	Rainfall (inches)	Outfall
2017	**24-Hour Total**	**002[a]**
1-Mar	0.54	
2-Mar		
3-Mar		
4-Mar		
5-Mar		
6-Mar	trace	
7-Mar	0.44	
8-Mar		
9-Mar	0.15	
10-Mar		
11-Mar	0.40	
12-Mar	trace	
13-Mar		
14-Mar	0.10	
15-Mar		
16-Mar		
17-Mar	0.08	
18-Mar		
19-Mar		
20-Mar		
21-Mar	trace	
22-Mar		
23-Mar	0.11	
24-Mar	0.18	
25-Mar	0.91	
26-Mar		
27-Mar	0.33	
28-Mar	trace	
29-Mar	0.09	
30-Mar	1.17	
31-Mar	0.02	
Monthly Total	**4.52**	

[a] Per USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.

[b] Un-Named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

[c] Remediation work was completed at Duchesne Park on February 7, 2017.

Notes:

Flow measurements for the outfalls are reported in MGD. All blank spaces represent zero flow.

Rainfall data are obtained from the www.wunderground.com site (Weather Underground, Inc. 2017).

Table C-2. North St. Louis County Sites Rainfall Data for CY 2017 – Second Quarter

Date	Rainfall (inches)	Outfall
2017	24-Hour Total	002[a]
1-Apr		
2-Apr	0.01	
3-Apr	0.34	
4-Apr	0.02	
5-Apr	2.01	
6-Apr	0.03	
7-Apr		
8-Apr		
9-Apr		
10-Apr	0.03	
11-Apr		
12-Apr		
13-Apr		
14-Apr	0.04	
15-Apr		
16-Apr	0.24	
17-Apr	0.01	
18-Apr		
19-Apr		
20-Apr		
21-Apr	0.06	
22-Apr	0.07	
23-Apr		
24-Apr		
25-Apr		
26-Apr	1.44	
27-Apr	0.05	
28-Apr	0.88	
29-Apr	3.15	
30-Apr	1.99	
Monthly Total	**10.37**	

Date	Rainfall (inches)	Outfall	Outfall Palm Drive Properties
2017	24-Hour Total	002[a]	Un-Named[b,c]
1-May	0.02		
2-May	trace		
3-May	1.84		
4-May	0.90		0.102
5-May			
6-May			
7-May			
8-May			0.005
9-May			
10-May	0.38		
11-May	0.04		
12-May			
13-May			
14-May			
15-May			
16-May			
17-May	trace		
18-May			
19-May	0.52		
20-May	1.32		
21-May			
22-May			
23-May	0.18		
24-May			
25-May	trace		
26-May			
27-May	0.41		
28-May	trace		
29-May	0.39		
30-May			
31-May			
Monthly Total	**6.00**		**0.107**

Date	Rainfall (inches)	Outfall	Outfall Palm Drive Properties
2017	24-Hour Total	002[a]	Un-Named[b]
1-Jun			
2-Jun			
3-Jun			
4-Jun	0.25		
5-Jun			
6-Jun			
7-Jun			
8-Jun			
9-Jun			
10-Jun			
11-Jun			
12-Jun			
13-Jun			
14-Jun	0.63		
15-Jun	0.29		
16-Jun			
17-Jun	0.21		
18-Jun	1.06		
19-Jun			
20-Jun			
21-Jun			
22-Jun			
23-Jun	trace		
24-Jun			
25-Jun			
26-Jun	trace		
27-Jun			
28-Jun			
29-Jun	0.02		
30-Jun	0.26		
Monthly Total	**2.72**		

[a] Per USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.

[b] Un-Named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

[c] Remediation started at the Palm Drive Properties on May 1, 2017.

Notes:

Flow measurements for the outfalls are reported in MGD. All blank spaces represent zero flow.

Rainfall data are obtained from the www.wunderground.com site (Weather Underground, Inc. 2017).

Table C-2. North St. Louis County Sites Rainfall Data for CY 2017 – Third Quarter

Date	Rainfall (inches)	Outfall	Outfall Palm Drive Properties	Date	Rainfall (inches)	Outfall	Outfall Palm Drive Properties	Date	Rainfall (inches)	Outfall
2017	**24-Hour Total**	**002[a]**	**Un-Named[b]**	**2017**	**24-Hour Total**	**002[a,c]**	**Un-Named[b,d]**	**2017**	**24-Hour Total**	**002[a]**
1-Jul				1-Aug				1-Sep		
2-Jul				2-Aug				2-Sep		
3-Jul				3-Aug	trace			3-Sep		
4-Jul				4-Aug				4-Sep	0.01	
5-Jul	0.07			5-Aug	0.01			5-Sep		
6-Jul	0.01			6-Aug	0.09			6-Sep		
7-Jul	trace			7-Aug	trace			7-Sep		
8-Jul	trace			8-Aug				8-Sep		
9-Jul				9-Aug				9-Sep		
10-Jul				10-Aug				10-Sep		
11-Jul				11-Aug	0.04			10-Sep		
12-Jul				12-Aug				10-Sep	0.01	
13-Jul	trace			13-Aug				10-Sep	0.05	
14-Jul	0.17			14-Aug	0.04			10-Sep		
15-Jul				15-Aug				10-Sep		
16-Jul	0.01			16-Aug	1.92			16-Sep		
17-Jul				17-Aug	0.08			10-Sep	trace	
18-Jul				18-Aug	trace			10-Sep	0.20	
19-Jul				19-Aug				10-Sep		
20-Jul				20-Aug				20-Sep		
21-Jul				21-Aug	trace			21-Sep		
22-Jul	0.02			22-Aug	0.25			22-Sep		
23-Jul	0.32			23-Aug				23-Sep		
24-Jul				24-Aug				24-Sep		
25-Jul				25-Aug				25-Sep		
26-Jul	0.05			26-Aug				26-Sep		
27-Jul	0.72			27-Aug	trace			27-Sep		
28-Jul				28-Aug	0.87			28-Sep		
29-Jul				29-Aug	trace			29-Sep		
30-Jul				30-Aug				30-Sep		
31-Jul	trace			31-Aug						
Monthly Total	**1.37**			**Monthly Total**	**3.30**			**Monthly Total**	**0.27**	

[a] Per USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.

[b] Un-Named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

[c] On August 30, 2017, the USACE notified the MDNR that remediation had resumed at the Ballfields (IA-09) and monthly sampling resumed at Outfall 002.

[d] Remediation was completed at the Palm Drive Properties on August 15, 2017.

Notes:

Flow measurements for the outfalls are reported in MGD. All blank spaces represent zero flow.

Rainfall data are obtained from the www.wunderground.com site (Weather Underground, Inc. 2017).

Table C-2. North St. Louis County Sites Rainfall Data for CY 2017 – Fourth Quarter

Date	Rainfall (inches)	Outfall	Date	Rainfall (inches)	Outfall	Date	Rainfall (inches)	Outfall
2017	**24-Hour Total**	**002[a,b]**	**2017**	**24-Hour Total**	**002[a]**	**2017**	**24-Hour Total**	**002[a,c]**
1-Oct			1-Nov	0.01		1-Dec		
2-Oct			2-Nov			2-Dec		
3-Oct	0.12		3-Nov			3-Dec		
4-Oct	0.03		4-Nov	trace		4-Dec	0.15	
5-Oct	0.04		5-Nov	0.91		5-Dec		
6-Oct	0.01		6-Nov	0.14		6-Dec		
7-Oct	0.13		7-Nov	trace		7-Dec	trace	
8-Oct			8-Nov			8-Dec		
9-Oct	1.72		9-Nov			9-Dec		
10-Oct	0.48	0.017	10-Nov			10-Dec		
11-Oct	trace	0.012	11-Nov	trace		11-Dec		
12-Oct	trace	0.007	12-Nov	0.01		12-Dec		
13-Oct			13-Nov			13-Dec		
14-Oct			14-Nov	trace		14-Dec		
15-Oct	0.61		15-Nov	0.15		15-Dec		
16-Oct		0.005	16-Nov			16-Dec		
17-Oct			17-Nov	trace		17-Dec	trace	
18-Oct			18-Nov	0.24		18-Dec	trace	
19-Oct			19-Nov			19-Dec		
20-Oct	trace		20-Nov			20-Dec		
21-Oct	0.01		21-Nov			21-Dec		
22-Oct	0.50		22-Nov			22-Dec	0.23	
23-Oct	0.05		23-Nov			23-Dec	2.10	
24-Oct	trace		24-Nov			24-Dec	1.10	
25-Oct			25-Nov			25-Dec		
26-Oct			26-Nov			26-Dec	0.09	
27-Oct	trace		27-Nov			27-Dec		
28-Oct	trace		28-Nov			28-Dec		
29-Oct			29-Nov	trace		29-Dec	trace	
30-Oct	0.01		30-Nov	0.07		30-Dec	trace	
31-Oct	trace					31-Dec	trace	
Monthly Total	**3.71**	**0.041**	**Monthly Total**	**1.53**		**Monthly Total**	**3.67**	

[a] Per a USACE email dated June 17, 2014, sampling at Outfall 002 has been reduced to once per year.

[b] On October 31, 2017, the USACE notified the MDNR that remediation had temporarily stopped at the Ballfields (IA-09) and annual sampling resumed.

[c] On December 4, 2017, the USACE notified the MDNR that remediation had resumed at IA-09 and monthly sampling resumed.

Notes:

Flow measurements for the outfalls are reported in MGD. All blank spaces represent zero flow.

Rainfall data are obtained from the www.wunderground.com site (Weather Underground, Inc. 2017).

Table C-3. First Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2017

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-311	02/13/17 - 02/16/17 (SLAPS VP-57, VP-58, and Pershall Road)	<16.1	pCi/L	233,398	7.1E-06	3,000	pCi/L	0.00
Gross Beta			<21.7	pCi/L		9.6E-06	NA		
Th-228			<0.6	pCi/L		2.5E-07	2,000	pCi/L	
Th-230			1.1	pCi/L		1.0E-06	1,000	pCi/L	
Uranium (KPA)			<2.5	pCi/L		1.1E-06	3,000	pCi/L	
Ra-226[c]			<1.9	pCi/L		8.2E-07	10	pCi/L	
Ra-228[d,e]			<0.6	pCi/L		2.5E-07	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<16.1	pCi/L			-		
TSS			8.3	mg/L			-		

Total Activity Discharged in First Quarter of CY 2017 (Ci)

Th-228	2.5E-07
Th-230	1.0E-06
Uranium (KPA)	1.1E-06
Ra-226	8.2E-07
Ra-228[b]	2.5E-07

Total Activity Discharged through 03/31/17 (Ci)

Th-228	2.5E-07
Th-230	1.0E-06
Uranium (KPA)	1.1E-06
Ra-226	8.2E-07
Ra-228[b]	2.5E-07

Total Volume for First Quarter of CY 2017 (gallons)

Gallons 233,398

Total Volume Discharged through 03/31/17 (gallons)

Gallons 233,398

[a] Non-detect sample results are converted to half the DL for total activity.
[b] The weighted average was used to calculate the total activity.
[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.
[d] Ra-228 assumed to be in equilibrium with Th-228.
[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.
[f] The limit for selenium can be a daily total mass of 76 g, with a concentration not to exceed 0.90 mg/L.
[g] MSD surcharges apply for BOD concentration greater than 300 mg/L and COD concentration greater than 600 mg/L.
[h] Analysis for metals is not required per the MSD letter dated May 24, 2012 (MSD 2012).

Notes:

- No data/No limit
BOD – biological oxygen demand
COD - chemical oxygen demand
NA – Not applicable
SOR - sum of ratios
TSS – total suspended solid(s)

Table C-3. Second Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites CY 2017

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-312	04/24/17 - 04/25/17 (SLAPS VP Ballfields [IA-09])	<13.7	pCi/L	198,955	5.2E-06	3,000	pCi/L	0.00
Gross Beta			<20.8	pCi/L		7.8E-06	NA		
Th-228			<0.5	pCi/L		1.9E-07	2,000	pCi/L	
Th-230			0.4	pCi/L		3.0E-07	1,000	pCi/L	
Uranium (KPA)			1.7	pCi/L		1.3E-06	3,000	pCi/L	
Ra-226[c]			<0.8	pCi/L		2.9E-07	10	pCi/L	
Ra-228[d,e]			<0.5	pCi/L		1.9E-07	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<13.7	pCi/L			-		
TSS			4.0	mg/L			-		
Gross Alpha (raw water)	SLAPS-313	05/01/17 - 05/08/17 (SLAPS VP Ballfields [IA-09])	<13.8	pCi/L	385,048	1.0E-05	3,000	pCi/L	0.00
Gross Beta			<20.6	pCi/L		1.5E-05	NA		
Th-228			<0.4	pCi/L		2.9E-07	2,000	pCi/L	
Th-230			3.0	pCi/L		4.3E-06	1,000	pCi/L	
Uranium (KPA)			0.9	pCi/L		1.3E-06	3,000	pCi/L	
Ra-226[c]			<1	pCi/L		7.4E-07	10	pCi/L	
Ra-228[d,e]			<0.4	pCi/L		2.9E-07	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<13.7	pCi/L			-		
TSS			86.3	mg/L			-		
Gross Alpha (raw water)	SLAPS-316[i]	06/20/17 - 06/21/17 (SLAPS VP Ballfields [IA-09])	<13.4	pCi/L	181,325	4.6E-06	3,000	pCi/L	0.00
Gross Beta			<20.4	pCi/L		7.0E-06	NA		
Th-228			<0.5	pCi/L		1.7E-07	2,000	pCi/L	
Th-230			<0.4	pCi/L		1.4E-07	1,000	pCi/L	
Uranium (KPA)			1.4	pCi/L		9.3E-07	3,000	pCi/L	
Ra-226[c]			<1.1	pCi/L		3.9E-07	10	pCi/L	
Ra-228[d,e]			<0.5	pCi/L		1.7E-07	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<13.4	pCi/L			-		
TSS			9.4	mg/L			-		

Total Activity Discharged in Second Quarter of CY 2017 (Ci)		Total Activity Discharged through 06/30/17 (Ci)	
Th-228	6.5E-07	**Th-228**	9.0E-07
Th-230	4.8E-06	**Th-230**	5.8E-06
Uranium (KPA)	3.5E-06	**Uranium (KPA)**	4.6E-06
Ra-226	1.4E-06	**Ra-226**	2.3E-06
Ra-228[b]	6.5E-07	**Ra-228[b]**	9.0E-07

Total Volume for Second Quarter of CY 2017 (gallons)		Total Volume Discharged through 06/30/17 (gallons)	
Gallons	765,328	**Gallons**	998,726

[a] Non-detect sample results are converted to half the DL for total activity.
[b] The weighted average was used to calculate the total activity.
[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.
[d] Ra-228 assumed to be in equilibrium with Th-228.
[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.
[f] The limit for selenium can be a daily total mass of 76 g, with a concentration not to exceed 0.90 mg/L.
[g] MSD surcharges apply for BOD concentration greater than 300 mg/L and COD concentration greater than 600 mg/L.
[h] Analysis for metals is not required per the MSD letter dated May 24, 2012 (MSD 2012).
[i] Batch 316 was discharged prior to Batch 314 and Batch 315. Batch 314 and 315 were sampled on May 23, 2017, but held until the USACE received approval to discharge from the MSD in the third quarter.

Notes:
- No data/No limit
BOD – biological oxygen demand
COD - chemical oxygen demand
NA – Not applicable
SOR - sum of ratios
TSS – total suspended solid(s)

Table C-3. Third Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2017

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-314[i]	07/17/17 (SLAPS VP Palm Drive Properties)	<15.7	pCi/L	200	5.9E-09	3,000	pCi/L	0.00
Gross Beta			<21.8	pCi/L		8.3E-09	NA		
Th-228			<0.5	pCi/L		1.9E-10	2,000	pCi/L	
Th-230			0.9	pCi/L		6.7E-10	1,000	pCi/L	
Uranium (KPA)			<4.9	pCi/L		1.9E-09	3,000	pCi/L	
Ra-226[c]			<1	pCi/L		3.6E-10	10	pCi/L	
Ra-228[d,e]			<0.5	pCi/L		1.9E-10	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<15.7	pCi/L			-		
TSS			28.4	mg/L			-		
Gross Alpha (raw water)	SLAPS-315[i]	07/18/17 (SLAPS VP Palm Drive Properties)	<15.7	pCi/L	200	5.9E-09	3,000	pCi/L	0.00
Gross Beta			<21.7	pCi/L		8.2E-09	NA		
Th-228			<0.4	pCi/L		1.6E-10	2,000	pCi/L	
Th-230			0.8	pCi/L		5.8E-10	1,000	pCi/L	
Uranium (KPA)			<4.9	pCi/L		1.9E-09	3,000	pCi/L	
Ra-226[c]			<0.9	pCi/L		3.5E-10	10	pCi/L	
Ra-228[d,e]			<0.4	pCi/L		1.6E-10	30	pCi/L	
Barium			[h]	mg/L			10	mg/L	
Lead			[h]	mg/L			0.4	mg/L	
Selenium[f]			[h]	mg/L			0.2	mg/L[f]	
BOD[g]				mg/L			-		
COD[g]				mg/L			-		
Gross Alpha (TSS filtrate)			<15.8	pCi/L			-		
TSS			8.3	mg/L			-		

Total Activity Discharged in Third Quarter of CY 2017 (Ci)		**Total Activity Discharged through 09/30/17 (Ci)**	
Th-228	3.5E-10	**Th-228**	9.0E-07
Th-230	1.3E-09	**Th-230**	5.8E-06
Uranium (KPA)	3.7E-09	**Uranium (KPA)**	4.6E-06
Ra-226	7.1E-10	**Ra-226**	2.3E-06
Ra-228[b]	3.5E-10	**Ra-228[b]**	9.0E-07

Total Volume for Third Quarter of CY 2017 (gallons)		**Total Volume Discharged through 09/30/17 (gallons)**	
Gallons	400	**Gallons**	999,126

[a] Non-detect sample results are converted to half the DL for total activity.
[b] The weighted average was used to calculate the total activity.
[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.
[d] Ra-228 assumed to be in equilibrium with Th-228.
[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.
[f] The limit for selenium can be a daily total mass of 76 g, with a concentration not to exceed 0.90 mg/L.
[g] MSD surcharges apply for BOD concentration greater than 300 mg/L and COD concentration greater than 600 mg/L.
[h] Analysis for metals is not required per the MSD letter dated May 24, 2012 (MSD 2012).
[i] These batches were sampled on May 23, 2017, but held until the USACE received approval to discharge from the MSD.

Notes:

- No data/No limit
BOD – biological oxygen demand
COD - chemical oxygen demand
NA – Not applicable
SOR - sum of ratios
TSS – total suspended solid(s)

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ATTACHMENT C-1

PN02 ANNUAL SAMPLING FREQUENCY SCHEDULE EMAIL, DATED DECEMBER 7, 2017

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

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-----Original Message-----
From: Carey, Dan
Sent: Thursday, December 07, 2017 9:26 AM
To: Skoba, Gwenan
Cc: Susan Adams; Dave Evans; William Viehweg
Subject: RE: Update regarding SLAPS Outfall 002

Thanks for the update Gwenan. Dan

-----Original Message-----
From: Skoba, Gwenan
Sent: Thursday, December 07, 2017 8:26 AM
To: Carey, Daniel
Cc: Susan Adams; Dave Evans; William Viehweg
Subject: RE: Update regarding SLAPS Outfall 002

Hi Dan,
Dave wanted to let you know that we resumed excavation activities at the Ballfields on Monday, December 4th. We have resumed the sampling per the NPDES permit equivalent.

Thank you!
Gwenan

Gwenan Skoba, MBA, CHMM
Principal Regulatory Specialist
HGL

-----Original Message-----
From: Skoba, Gwenan
Sent: Tuesday, October 31, 2017 3:57 PM
To: Carey, Dan
Cc: William Viehweg; Susan Adams; Dave Evans
Subject: FW: Update regarding SLAPS Outfall 002

Hi Dan,
We have temporarily stopped working at the Ballfields (SLAPS Outfall 002). Ballfields SU-11B was just confirmed.
We will notify MDNR when remediation resumes.

Dave Evans will be back next week if you have any questions.

Thank you!
Gwenan

Gwenan Skoba, MBA, CHMM
Principal Regulatory Specialist
HGL

> On Sep 8, 2017, at 10:09 AM, Carey, Daniel wrote:
>
> Thanks Gwenan,
>
> I will follow up next week with you and Dave.
>
> Dan
> -----Original Message-----
> From: Skoba, Gwenan
> Sent: Wednesday, September 06, 2017 10:31 AM
> To: Carey, Daniel
> Cc: Evans, David
> Subject: RE: Update regarding SLAPS Outfall 002
>
> Hi Dan,
> I just wanted to follow-up with you regarding SLAPS Outfall 002. On Wednesday afternoon (08/30/17), we started removing contaminated soil at the Ballfields Phase 2B. We have resumed the sampling per the NPDES permit equivalent.
>
> Please let us know if you have any questions.
>
> Thank you!
> Gwenan
>
> Gwenan Skoba, MBA, CHMM
> Principal Regulatory Specialist
> HGL
>
> -----Original Message-----
> From: Skoba, Gwenan
> Sent: Monday, August 28, 2017 6:53 AM
> To: Carey, Dan
> Cc: Evans, David
> Subject: [EXTERNAL] RE: Update regarding SLAPS Outfall 002
>
> UPDATE….Per operations, they still have a lot of overburden to remove at the Ballfields Phase 2B. I will keep you updated.
>
> Thank you!
> Gwenan
>
> Gwenan Skoba, MBA, CHMM
> Principal Regulatory Specialist
> HGL
>
>
>
>
>

> From: Skoba, Gwenan
> Sent: Wednesday, August 23, 2017 3:19 PM
> To: Dan Carey
> Cc: Dave Evans
> Subject: Update regarding SLAPS Outfall 002
>
>
>
> Hello Dan,
> We started removing the overburden on Phase 2B today. Operations plans to start remediation of contaminated material early next week and we will resume sampling per the NPDES permit equivalent. Please let us know if you have any questions.
>
> Thank you!
> Gwenan
>
> Gwenan Skoba, MBA, CHMM
> Principal Regulatory Specialist
> HGL
>
>
>
>
>
>
> From: Skoba, Gwenan
> Sent: Tuesday, August 01, 2017 1:09 PM
> To: Skoba, Gwenan
> Subject: DRAFT - SLAPS Outfall 002
>
>
>
> Hello Dan,
>
> We plan to reopen Outfall 002 next week. We will follow all the sampling requirements of the NPDES permit equivalent.
>
> Please let us know if you have any questions. Gwenan
>
> Thank you!
> Gwenan
>
> Gwenan Skoba, MBA, CHMM
> Principal Regulatory Specialist
> HGL

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APPENDIX D

COLDWATER CREEK SURFACE-WATER AND SEDIMENT DATA

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Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC195835	CWC002	03/16/17	Metals	Barium	120		0.9	µg/L	=
CWC195835	CWC002	03/16/17	Metals	Molybdenum	7.9		2	µg/L	=
CWC195835	CWC002	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Nickel	2		2	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Selenium	2		2	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195835	CWC002	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	Ra-226	0.731	0.746	0.975	pCi/L	
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	Th-230	0.422	0.287	0.127	pCi/L	J
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	U-234	0.994	0.51	0.158	pCi/L	J
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	U-238	1.05	0.524	0.158	pCi/L	=
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	Th-228	0.109	0.174	0.304	pCi/L	UJ
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	Th-232	0	0	0.127	pCi/L	U
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	Ra-226	-0.242	0.624	1.84	pCi/L	UJ
CWC195835	CWC002	03/16/17	Alpha Spectroscopy	U-235	0.144	0.205	0.195	pCi/L	UJ
CWC195837	CWC003	03/16/17	Metals	Barium	110		0.9	µg/L	=
CWC195837	CWC003	03/16/17	Metals	Molybdenum	8.9		2	µg/L	=
CWC195837	CWC003	03/16/17	Metals	Selenium	2.4		2	µg/L	=
CWC195837	CWC003	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Nickel	2		2	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195837	CWC003	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	U-234	0.897	0.475	0.41	pCi/L	J
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	U-238	1.01	0.48	0.137	pCi/L	=
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	Th-228	0.267	0.274	0.413	pCi/L	UJ
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	Th-230	0.282	0.246	0.29	pCi/L	UJ
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	Th-232	0.0148	0.107	0.289	pCi/L	UJ
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	Ra-226	0.278	0.393	0.376	pCi/L	UJ
CWC195837	CWC003	03/16/17	Alpha Spectroscopy	U-235	0.0626	0.126	0.17	pCi/L	UJ
CWC195839	CWC004	03/16/17	Metals	Barium	120		0.9	µg/L	=

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC195839	CWC004	03/16/17	Metals	Molybdenum	9		2	µg/L	=
CWC195839	CWC004	03/16/17	Metals	Nickel	2		2	µg/L	=
CWC195839	CWC004	03/16/17	Metals	Selenium	2.3		2	µg/L	=
CWC195839	CWC004	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195839	CWC004	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195839	CWC004	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195839	CWC004	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195839	CWC004	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195839	CWC004	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	Th-230	0.69	0.382	0.134	pCi/L	J
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	U-234	1.04	0.547	0.51	pCi/L	J
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	U-238	1.17	0.552	0.356	pCi/L	=
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	Th-228	0.164	0.209	0.32	pCi/L	UJ
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	Th-232	0.0164	0.118	0.32	pCi/L	UJ
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	Ra-226	0.444	0.629	1.09	pCi/L	UJ
CWC195839	CWC004	03/16/17	Alpha Spectroscopy	U-235	0	0	0.184	pCi/L	U
CWC195841	CWC005	03/16/17	Metals	Barium	130		0.9	µg/L	=
CWC195841	CWC005	03/16/17	Metals	Molybdenum	9.2		2	µg/L	=
CWC195841	CWC005	03/16/17	Metals	Nickel	2		2	µg/L	=
CWC195841	CWC005	03/16/17	Metals	Selenium	2		2	µg/L	=
CWC195841	CWC005	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195841	CWC005	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195841	CWC005	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195841	CWC005	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195841	CWC005	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195841	CWC005	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	U-234	1.28	0.575	0.151	pCi/L	=
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	U-238	1.06	0.514	0.151	pCi/L	=
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	Th-228	0.224	0.308	0.533	pCi/L	UJ
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	Th-230	0.121	0.27	0.533	pCi/L	UJ
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	Th-232	-0.103	0.12	0.48	pCi/L	UJ
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	Ra-226	0.266	0.594	1.23	pCi/L	UJ
CWC195841	CWC005	03/16/17	Alpha Spectroscopy	U-235	0.0688	0.138	0.187	pCi/L	UJ
CWC195843	CWC006	03/16/17	Metals	Barium	120		0.9	µg/L	=
CWC195843	CWC006	03/16/17	Metals	Molybdenum	8.2		2	µg/L	=
CWC195843	CWC006	03/16/17	Metals	Nickel	2.3		2	µg/L	=

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC195843	CWC006	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Selenium	2		2	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195843	CWC006	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	Th-230	0.259	0.235	0.14	pCi/L	J
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	U-234	1.39	0.611	0.157	pCi/L	=
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	U-238	0.518	0.356	0.156	pCi/L	J
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	Th-228	0.172	0.22	0.337	pCi/L	UJ
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	Th-232	0.0517	0.104	0.14	pCi/L	UJ
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	Ra-226	0.605	0.71	1.11	pCi/L	UJ
CWC195843	CWC006	03/16/17	Alpha Spectroscopy	U-235	0.0238	0.171	0.464	pCi/L	UJ
CWC195845	CWC007	03/16/17	Metals	Barium	120		0.9	µg/L	=
CWC195845	CWC007	03/16/17	Metals	Molybdenum	8.4		2	µg/L	=
CWC195845	CWC007	03/16/17	Metals	Nickel	2.2		2	µg/L	=
CWC195845	CWC007	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Selenium	2		2	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195845	CWC007	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	U-234	1.22	0.594	0.392	pCi/L	=
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	U-238	0.979	0.527	0.39	pCi/L	J
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	Th-228	0.126	0.201	0.351	pCi/L	UJ
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	Th-230	0.36	0.327	0.437	pCi/L	UJ
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	Th-232	0	0	0.146	pCi/L	U
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	Ra-226	0.213	0.425	0.85	pCi/L	UJ
CWC195845	CWC007	03/16/17	Alpha Spectroscopy	U-235	0	0	0.201	pCi/L	U
CWC195847	CWC008	03/16/17	Metals	Barium	110		0.9	µg/L	=
CWC195847	CWC008	03/16/17	Metals	Molybdenum	8.6		2	µg/L	=
CWC195847	CWC008	03/16/17	Metals	Nickel	2		2	µg/L	=
CWC195847	CWC008	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195847	CWC008	03/16/17	Metals	Arsenic	4		4	µg/L	U

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC195847	CWC008	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195847	CWC008	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195847	CWC008	03/16/17	Metals	Selenium	2		2	µg/L	U
CWC195847	CWC008	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195847	CWC008	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	U-234	1.47	0.631	0.362	pCi/L	=
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	U-238	0.554	0.362	0.15	pCi/L	J
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	Th-228	0.0484	0.202	0.45	pCi/L	UJ
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	Th-230	0.226	0.256	0.392	pCi/L	UJ
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	Th-232	0	0	0.131	pCi/L	U
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	Ra-226	0.0789	0.353	0.947	pCi/L	UJ
CWC195847	CWC008	03/16/17	Alpha Spectroscopy	U-235	0.0229	0.165	0.447	pCi/L	UJ
CWC195849	CWC009	03/16/17	Metals	Barium	95		0.9	µg/L	=
CWC195849	CWC009	03/16/17	Metals	Molybdenum	7		2	µg/L	=
CWC195849	CWC009	03/16/17	Metals	Antimony	2		2	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Arsenic	4		4	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Chromium	4		4	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Nickel	2		2	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Selenium	2		2	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC195849	CWC009	03/16/17	Metals	Vanadium	4		4	µg/L	U
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	Th-228	0.318	0.264	0.144	pCi/L	J
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	Th-230	0.512	0.373	0.428	pCi/L	J
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	U-234	0.562	0.35	0.138	pCi/L	J
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	U-238	0.458	0.314	0.138	pCi/L	J
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	Th-232	0.124	0.197	0.344	pCi/L	UJ
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	Ra-226	0.138	0.436	1.02	pCi/L	UJ
CWC195849	CWC009	03/16/17	Alpha Spectroscopy	U-235	0.063	0.126	0.171	pCi/L	UJ
CWC199425	CWC002	10/12/17	Metals	Barium	100		0.9	µg/L	=
CWC199425	CWC002	10/12/17	Metals	Molybdenum	23		2	µg/L	=
CWC199425	CWC002	10/12/17	Metals	Arsenic	4		4	µg/L	=
CWC199425	CWC002	10/12/17	Metals	Nickel	2.8		2	µg/L	=
CWC199425	CWC002	10/12/17	Metals	Selenium	2.7		2	µg/L	=
CWC199425	CWC002	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199425	CWC002	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC199425	CWC002	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199425	CWC002	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199425	CWC002	10/12/17	Metals	Vanadium	4		4	µg/L	U
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	Ra-226	0.444	0.629	1.09	pCi/L	
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	Ra-226	1.33	0.955	0.939	pCi/L	J
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	U-234	0.853	0.542	0.445	pCi/L	J
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	U-238	0.775	0.515	0.443	pCi/L	J
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	Th-228	0.247	0.293	0.422	pCi/L	UJ
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	Th-230	0.176	0.256	0.423	pCi/L	UJ
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	Th-232	0.0704	0.141	0.191	pCi/L	UJ
CWC199425	CWC002	10/12/17	Alpha Spectroscopy	U-235	-0.0458	0.0919	0.549	pCi/L	UJ
CWC199427	CWC003	10/12/17	Metals	Barium	93		0.9	µg/L	=
CWC199427	CWC003	10/12/17	Metals	Molybdenum	32		2	µg/L	=
CWC199427	CWC003	10/12/17	Metals	Nickel	4.6		2	µg/L	=
CWC199427	CWC003	10/12/17	Metals	Selenium	3		2	µg/L	=
CWC199427	CWC003	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199427	CWC003	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199427	CWC003	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199427	CWC003	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199427	CWC003	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199427	CWC003	10/12/17	Metals	Vanadium	4		4	µg/L	U
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	Th-228	0.279	0.283	0.189	pCi/L	UJ
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	Th-230	0.21	0.244	0.189	pCi/L	UJ
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	Ra-226	0.415	0.479	0.375	pCi/L	UJ
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	U-234	0.466	0.365	0.372	pCi/L	J
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	U-238	0.618	0.432	0.455	pCi/L	J
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	Th-232	0.0698	0.14	0.189	pCi/L	UJ
CWC199427	CWC003	10/12/17	Alpha Spectroscopy	U-235	0.0766	0.154	0.208	pCi/L	UJ
CWC199429	CWC004	10/12/17	Metals	Barium	93		0.9	µg/L	=
CWC199429	CWC004	10/12/17	Metals	Molybdenum	29		2	µg/L	=
CWC199429	CWC004	10/12/17	Metals	Nickel	4.3		2	µg/L	=
CWC199429	CWC004	10/12/17	Metals	Selenium	2.2		2	µg/L	=
CWC199429	CWC004	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199429	CWC004	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199429	CWC004	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199429	CWC004	10/12/17	Metals	Chromium	4		4	µg/L	U

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC199429	CWC004	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199429	CWC004	10/12/17	Metals	Vanadium	4		4	µg/L	U
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	Th-230	0.501	0.368	0.41	pCi/L	J
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	Ra-226	0.444	0.513	0.401	pCi/L	UJ
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	U-234	0.929	0.571	0.578	pCi/L	J
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	U-238	0.343	0.312	0.186	pCi/L	J
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	Th-228	0.111	0.284	0.598	pCi/L	UJ
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	Th-232	0.111	0.158	0.151	pCi/L	UJ
CWC199429	CWC004	10/12/17	Alpha Spectroscopy	U-235	0	0	0.23	pCi/L	U
CWC199431	CWC005	10/12/17	Metals	Barium	92		0.9	µg/L	=
CWC199431	CWC005	10/12/17	Metals	Molybdenum	25		2	µg/L	=
CWC199431	CWC005	10/12/17	Metals	Nickel	4.1		2	µg/L	=
CWC199431	CWC005	10/12/17	Metals	Selenium	2.2		2	µg/L	=
CWC199431	CWC005	10/12/17	Metals	Vanadium	4.1		4	µg/L	=
CWC199431	CWC005	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199431	CWC005	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199431	CWC005	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199431	CWC005	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199431	CWC005	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	U-234	0.583	0.46	0.466	pCi/L	J
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	U-238	0.464	0.389	0.21	pCi/L	J
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	Th-228	0.115	0.297	0.644	pCi/L	UJ
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	Th-230	0.46	0.427	0.565	pCi/L	UJ
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	Th-232	0	0	0.208	pCi/L	U
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	Ra-226	0.196	0.6	1.32	pCi/L	UJ
CWC199431	CWC005	10/12/17	Alpha Spectroscopy	U-235	0.192	0.361	0.706	pCi/L	UJ
CWC199433	CWC006	10/12/17	Metals	Barium	98		0.9	µg/L	=
CWC199433	CWC006	10/12/17	Metals	Molybdenum	23		2	µg/L	=
CWC199433	CWC006	10/12/17	Metals	Nickel	4		2	µg/L	=
CWC199433	CWC006	10/12/17	Metals	Vanadium	4.3		4	µg/L	=
CWC199433	CWC006	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199433	CWC006	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199433	CWC006	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199433	CWC006	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199433	CWC006	10/12/17	Metals	Selenium	2		2	µg/L	U
CWC199433	CWC006	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	Th-230	0.242	0.245	0.164	pCi/L	UJ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	U-234	0.505	0.392	0.195	pCi/L	J
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	Th-228	0.0908	0.182	0.363	pCi/L	UJ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	Th-232	0.0302	0.135	0.363	pCi/L	UJ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	Ra-226	0.234	0.468	0.936	pCi/L	UJ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	U-235	0.0889	0.179	0.241	pCi/L	UJ
CWC199433	CWC006	10/12/17	Alpha Spectroscopy	U-238	0.395	0.366	0.431	pCi/L	UJ
CWC199435	CWC007	10/12/17	Metals	Barium	90		0.9	µg/L	=
CWC199435	CWC007	10/12/17	Metals	Molybdenum	19		2	µg/L	=
CWC199435	CWC007	10/12/17	Metals	Nickel	3.7		2	µg/L	=
CWC199435	CWC007	10/12/17	Metals	Vanadium	4.4		4	µg/L	=
CWC199435	CWC007	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199435	CWC007	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199435	CWC007	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199435	CWC007	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199435	CWC007	10/12/17	Metals	Selenium	2		2	µg/L	U
CWC199435	CWC007	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	Th-228	-0.0416	0.0835	0.499	pCi/L	UJ
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	Th-230	0.333	0.395	0.613	pCi/L	UJ
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	Th-232	0	0	0.225	pCi/L	U
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	Ra-226	0.521	0.802	1.5	pCi/L	UJ
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	U-234	0.535	0.499	0.656	pCi/L	UJ
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	U-235	0.055	0.246	0.66	pCi/L	UJ
CWC199435	CWC007	10/12/17	Alpha Spectroscopy	U-238	0.488	0.454	0.533	pCi/L	UJ
CWC199437	CWC008	10/12/17	Metals	Barium	78		0.9	µg/L	=
CWC199437	CWC008	10/12/17	Metals	Molybdenum	15		2	µg/L	=
CWC199437	CWC008	10/12/17	Metals	Nickel	3.1		2	µg/L	=
CWC199437	CWC008	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Selenium	2		2	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199437	CWC008	10/12/17	Metals	Vanadium	4		4	µg/L	U
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	Th-230	0.502	0.363	0.17	pCi/L	J
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	U-234	0.629	0.46	0.213	pCi/L	J

Table D-1. CWC Surface-Water Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Error	DL	Units	VQ
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	U-238	0.509	0.432	0.47	pCi/L	J
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	Th-228	0.439	0.402	0.583	pCi/L	UJ
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	Th-232	0.0627	0.126	0.17	pCi/L	UJ
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	Ra-226	0.565	0.653	1.06	pCi/L	UJ
CWC199437	CWC008	10/12/17	Alpha Spectroscopy	U-235	0.097	0.195	0.263	pCi/L	UJ
CWC199439	CWC009	10/12/17	Metals	Barium	73		0.9	µg/L	=
CWC199439	CWC009	10/12/17	Metals	Molybdenum	14		2	µg/L	=
CWC199439	CWC009	10/12/17	Metals	Nickel	2.9		2	µg/L	=
CWC199439	CWC009	10/12/17	Metals	Antimony	2		2	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Arsenic	4		4	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Cadmium	0.2		0.2	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Chromium	4		4	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Selenium	2		2	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Thallium	0.9		0.9	µg/L	U
CWC199439	CWC009	10/12/17	Metals	Vanadium	4		4	µg/L	U
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	Th-230	0.868	0.524	0.417	pCi/L	J
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	U-238	0.206	0.24	0.186	pCi/L	UJ
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	Th-228	0.416	0.385	0.511	pCi/L	UJ
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	Th-232	0	0	0.188	pCi/L	U
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	Ra-226	0.138	0.437	1.02	pCi/L	UJ
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	U-234	0.344	0.356	0.507	pCi/L	UJ
CWC199439	CWC009	10/12/17	Alpha Spectroscopy	U-235	0.212	0.309	0.51	pCi/L	UJ

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. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195836	CWC002	03/16/17	Metals	Arsenic	5.3	1.5	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Cadmium	0.4	0.089	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Chromium	16	1.7	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Nickel	17	0.74	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Vanadium	19	1.5	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Barium	180	1.9	mg/kg	J	H01
CWC195836	CWC002	03/16/17	Metals	Molybdenum	1.1	0.74	mg/kg	=	
CWC195836	CWC002	03/16/17	Metals	Selenium	1.2	1.2	mg/kg	U	
CWC195836	CWC002	03/16/17	Metals	Thallium	0.74	0.74	mg/kg	U	
CWC195836	CWC002	03/16/17	Metals	Antimony	0.74	0.74	mg/kg	UJ	H02
CWC195836	CWC002	03/16/17	Alpha Spectroscopy	Th-228	0.522	0.167	pCi/g	J	F01, T04, T20
CWC195836	CWC002	03/16/17	Alpha Spectroscopy	Th-230	2.26	0.0899	pCi/g	J	F01
CWC195836	CWC002	03/16/17	Alpha Spectroscopy	Th-232	0.894	0.0897	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Cs-137	0.0306	0.0272	pCi/g	J	T04, T20
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	K-40	12.5	0.209	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Ra-226	1.3	0.0768	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Ra-228	0.889	0.0916	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Th-228	0.889	0.0916	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Th-232	0.889	0.0916	pCi/g	=	
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	U-238	2.62	1.07	pCi/g	J	T04, T20
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Ac-227	0.000753	0.163	pCi/g	UJ	T04, T06
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Am-241	0.0552	0.135	pCi/g	UJ	T04, T06
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Pa-231	-0.704	0.936	pCi/g	UJ	T04, T06
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	Th-230	2.64	10.2	pCi/g	UJ	T04, T06
CWC195836	CWC002	03/16/17	Gamma Spectroscopy	U-235	0.258	0.391	pCi/g	UJ	T04, T05
CWC195838	CWC003	03/16/17	Metals	Arsenic	5.9	1.3	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Barium	150	1.7	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Cadmium	0.58	0.08	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Chromium	20	1.5	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Nickel	17	0.66	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Selenium	3.4	1.1	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Vanadium	20	1.3	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Molybdenum	0.97	0.66	mg/kg	=	
CWC195838	CWC003	03/16/17	Metals	Antimony	0.66	0.66	mg/kg	U	
CWC195838	CWC003	03/16/17	Metals	Thallium	0.66	0.66	mg/kg	U	
CWC195838	CWC003	03/16/17	Alpha Spectroscopy	Th-228	1.33	0.235	pCi/g	J	F01
CWC195838	CWC003	03/16/17	Alpha Spectroscopy	Th-230	2.85	0.176	pCi/g	J	F01

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195838	CWC003	03/16/17	Alpha Spectroscopy	Th-232	1.11	0.0943	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	K-40	13.9	0.175	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Ra-226	1.1	0.0429	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Ra-228	0.762	0.0603	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Th-228	0.762	0.0603	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Th-232	0.762	0.0603	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	U-238	0.828	0.342	pCi/g	=	
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Ac-227	0.084	0.107	pCi/g	UJ	T04, T05
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Am-241	-0.000157	0.0371	pCi/g	UJ	T04, T06
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Cs-137	0.0144	0.0151	pCi/g	UJ	T04, T05
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Pa-231	-0.201	0.654	pCi/g	UJ	T04, T06
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	Th-230	1.53	3.67	pCi/g	UJ	T04, T06
CWC195838	CWC003	03/16/17	Gamma Spectroscopy	U-235	0.241	0.239	pCi/g	UJ	T02, T04
CWC195840	CWC004	03/16/17	Metals	Arsenic	6.3	1.6	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Barium	180	2	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Cadmium	0.88	0.095	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Chromium	22	1.8	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Nickel	19	0.79	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Vanadium	21	1.6	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Molybdenum	0.97	0.79	mg/kg	=	
CWC195840	CWC004	03/16/17	Metals	Antimony	0.79	0.79	mg/kg	U	
CWC195840	CWC004	03/16/17	Metals	Selenium	1.3	1.3	mg/kg	U	
CWC195840	CWC004	03/16/17	Metals	Thallium	0.79	0.79	mg/kg	U	
CWC195840	CWC004	03/16/17	Alpha Spectroscopy	Th-228	1.14	0.277	pCi/g	J	F01
CWC195840	CWC004	03/16/17	Alpha Spectroscopy	Th-230	3.27	0.0894	pCi/g	=	
CWC195840	CWC004	03/16/17	Alpha Spectroscopy	Th-232	1.24	0.166	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Cs-137	0.0366	0.0279	pCi/g	J	T04, T20
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	K-40	13.2	0.222	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Ra-226	1.12	0.061	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Ra-228	0.873	0.0854	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Th-228	0.873	0.0854	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Th-232	0.873	0.0854	pCi/g	=	
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	U-238	0.82	0.454	pCi/g	J	T04, T20
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Ac-227	0.314	0.167	pCi/g	UJ	T04
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Am-241	0.003	0.0473	pCi/g	UJ	T04, T06
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Pa-231	-0.294	0.91	pCi/g	UJ	T04, T06
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	Th-230	2.08	4.71	pCi/g	UJ	T04, T06

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195840	CWC004	03/16/17	Gamma Spectroscopy	U-235	0.0988	0.307	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Metals	Arsenic	6.1	1.5	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Barium	210	1.9	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Cadmium	0.44	0.089	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Chromium	16	1.7	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Nickel	21	0.75	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Vanadium	24	1.5	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Selenium	1.3	1.2	mg/kg	=	
CWC195842	CWC005	03/16/17	Metals	Antimony	0.75	0.75	mg/kg	U	
CWC195842	CWC005	03/16/17	Metals	Molybdenum	0.75	0.75	mg/kg	U	
CWC195842	CWC005	03/16/17	Metals	Thallium	0.75	0.75	mg/kg	U	
CWC195842	CWC005	03/16/17	Alpha Spectroscopy	Th-228	1.31	0.222	pCi/g	J	F01
CWC195842	CWC005	03/16/17	Alpha Spectroscopy	Th-230	2.48	0.1	pCi/g	J	F01
CWC195842	CWC005	03/16/17	Alpha Spectroscopy	Th-232	1.22	0.1	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	K-40	14.8	0.129	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Ra-226	1.08	0.0442	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Ra-228	0.913	0.0574	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Th-228	0.913	0.0574	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Th-232	0.913	0.0574	pCi/g	=	
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Ac-227	0.174	0.137	pCi/g	UJ	T04
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Am-241	-0.0205	0.0458	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Cs-137	-0.00561	0.0171	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Pa-231	0.473	0.767	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	Th-230	2.34	4.72	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	U-235	-0.0351	0.265	pCi/g	UJ	T04, T06
CWC195842	CWC005	03/16/17	Gamma Spectroscopy	U-238	0.489	0.511	pCi/g	UJ	T04, T05
CWC195844	CWC006	03/16/17	Metals	Arsenic	7.4	1.4	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Barium	170	1.8	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Cadmium	0.89	0.084	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Chromium	22	1.6	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Nickel	19	0.7	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Vanadium	22	1.4	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Molybdenum	1.2	0.7	mg/kg	=	
CWC195844	CWC006	03/16/17	Metals	Antimony	0.7	0.7	mg/kg	U	
CWC195844	CWC006	03/16/17	Metals	Selenium	1.1	1.1	mg/kg	U	
CWC195844	CWC006	03/16/17	Metals	Thallium	0.7	0.7	mg/kg	U	
CWC195844	CWC006	03/16/17	Alpha Spectroscopy	Th-228	1.84	0.259	pCi/g	J	F01

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195844	CWC006	03/16/17	Alpha Spectroscopy	Th-230	6.62	0.117	pCi/g	=	
CWC195844	CWC006	03/16/17	Alpha Spectroscopy	Th-232	1.38	0.117	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Cs-137	0.0368	0.0269	pCi/g	J	T04, T20
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	K-40	14	0.141	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Ra-226	1.21	0.071	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Ra-228	0.874	0.101	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Th-228	0.874	0.101	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Th-232	0.874	0.101	pCi/g	=	
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	U-238	1.4	1.17	pCi/g	J	T04, T20
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Ac-227	0.0983	0.182	pCi/g	UJ	T04, T06
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Am-241	-0.0607	0.14	pCi/g	UJ	T04, T06
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Pa-231	0.187	1.18	pCi/g	UJ	T04, T06
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	Th-230	8.34	11.7	pCi/g	UJ	T04, T05
CWC195844	CWC006	03/16/17	Gamma Spectroscopy	U-235	-0.000498	0.393	pCi/g	UJ	T04, T06
CWC195846	CWC007	03/16/17	Metals	Arsenic	6.8	1.2	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Barium	100	1.5	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Cadmium	0.71	0.073	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Chromium	24	1.4	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Nickel	15	0.61	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Vanadium	20	1.2	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Molybdenum	0.88	0.61	mg/kg	=	
CWC195846	CWC007	03/16/17	Metals	Antimony	0.61	0.61	mg/kg	U	
CWC195846	CWC007	03/16/17	Metals	Selenium	0.98	0.98	mg/kg	U	
CWC195846	CWC007	03/16/17	Metals	Thallium	0.61	0.61	mg/kg	U	
CWC195846	CWC007	03/16/17	Alpha Spectroscopy	Th-228	1.18	0.2	pCi/g	J	F01
CWC195846	CWC007	03/16/17	Alpha Spectroscopy	Th-230	5.79	0.168	pCi/g	=	
CWC195846	CWC007	03/16/17	Alpha Spectroscopy	Th-232	1.02	0.167	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	K-40	11.6	0.177	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Ra-226	0.954	0.0431	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Ra-228	0.663	0.0491	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Th-228	0.663	0.0491	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Th-232	0.663	0.0491	pCi/g	=	
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	U-238	0.733	0.346	pCi/g	J	T04, T20
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Ac-227	0.0122	0.117	pCi/g	UJ	T04, T06
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Am-241	-0.00349	0.036	pCi/g	UJ	T04, T06
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Cs-137	0.0061	0.0188	pCi/g	UJ	T04, T06
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Pa-231	-0.137	0.733	pCi/g	UJ	T04, T06

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	Th-230	3.17	3.57	pCi/g	UJ	T04, T06
CWC195846	CWC007	03/16/17	Gamma Spectroscopy	U-235	0.055	0.229	pCi/g	UJ	T04, T06
CWC195848	CWC008	03/16/17	Metals	Arsenic	4.7	1.5	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Barium	170	1.9	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Cadmium	0.35	0.089	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Chromium	14	1.7	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Nickel	18	0.74	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Vanadium	19	1.5	mg/kg	=	
CWC195848	CWC008	03/16/17	Metals	Antimony	0.74	0.74	mg/kg	U	
CWC195848	CWC008	03/16/17	Metals	Molybdenum	0.74	0.74	mg/kg	U	
CWC195848	CWC008	03/16/17	Metals	Selenium	1.2	1.2	mg/kg	U	
CWC195848	CWC008	03/16/17	Metals	Thallium	0.74	0.74	mg/kg	U	
CWC195848	CWC008	03/16/17	Alpha Spectroscopy	Th-228	1.22	0.264	pCi/g	J	F01
CWC195848	CWC008	03/16/17	Alpha Spectroscopy	Th-230	2.68	0.302	pCi/g	J	F01
CWC195848	CWC008	03/16/17	Alpha Spectroscopy	Th-232	1.26	0.241	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	K-40	16.4	0.161	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Ra-226	1.13	0.0495	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Ra-228	1.06	0.0653	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Th-228	1.06	0.0653	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Th-232	1.06	0.0653	pCi/g	=	
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	U-238	0.932	0.495	pCi/g	J	T04, T20
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Ac-227	0.236	0.154	pCi/g	UJ	T04
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Am-241	0.0147	0.0526	pCi/g	UJ	T04, T06
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Cs-137	-0.00573	0.0189	pCi/g	UJ	T04, T06
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Pa-231	0.099	0.873	pCi/g	UJ	T04, T06
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	Th-230	2.54	5.18	pCi/g	UJ	T04, T06
CWC195848	CWC008	03/16/17	Gamma Spectroscopy	U-235	0.064	0.307	pCi/g	UJ	T04, T06
CWC195850	CWC009	03/16/17	Metals	Arsenic	4.6	1.6	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Barium	120	2	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Cadmium	0.48	0.096	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Chromium	18	1.8	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Nickel	16	0.8	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Vanadium	18	1.6	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Antimony	0.91	0.8	mg/kg	=	
CWC195850	CWC009	03/16/17	Metals	Molybdenum	0.8	0.8	mg/kg	U	
CWC195850	CWC009	03/16/17	Metals	Selenium	1.3	1.3	mg/kg	U	
CWC195850	CWC009	03/16/17	Metals	Thallium	0.8	0.8	mg/kg	U	

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC195850	CWC009	03/16/17	Alpha Spectroscopy	Th-228	0.815	0.085	pCi/g	J	F01
CWC195850	CWC009	03/16/17	Alpha Spectroscopy	Th-230	2.95	0.0851	pCi/g	J	F01
CWC195850	CWC009	03/16/17	Alpha Spectroscopy	Th-232	0.877	0.0849	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Cs-137	0.0307	0.0224	pCi/g	J	T04, T20
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	K-40	13.8	0.267	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Ra-226	1.1	0.0823	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Ra-228	0.857	0.104	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Th-228	0.857	0.104	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Th-232	0.857	0.104	pCi/g	=	
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	U-238	0.828	0.464	pCi/g	J	T04, T20
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Ac-227	0.192	0.185	pCi/g	UJ	T04
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Am-241	0.0341	0.0472	pCi/g	UJ	T04, T05
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Pa-231	-0.0384	1.08	pCi/g	UJ	T04, T06
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	Th-230	1.8	4.97	pCi/g	UJ	T04, T06
CWC195850	CWC009	03/16/17	Gamma Spectroscopy	U-235	0.1	0.324	pCi/g	UJ	T04, T06
CWC199424	CWC002	10/12/17	Metals	Arsenic	7.7	1.2	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Cadmium	0.63	0.069	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Nickel	13	0.58	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Vanadium	15	1.2	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Molybdenum	2.9	0.58	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Barium	220	1.4	mg/kg	J	H02
CWC199424	CWC002	10/12/17	Metals	Chromium	14	1.3	mg/kg	J	H01, H04
CWC199424	CWC002	10/12/17	Metals	Selenium	1.1	0.93	mg/kg	=	
CWC199424	CWC002	10/12/17	Metals	Antimony	0.58	0.58	mg/kg	U	
CWC199424	CWC002	10/12/17	Metals	Thallium	0.58	0.58	mg/kg	U	
CWC199424	CWC002	10/12/17	Alpha Spectroscopy	Th-228	0.53	0.0845	pCi/g	J	T04, T20
CWC199424	CWC002	10/12/17	Alpha Spectroscopy	Th-230	1.26	0.187	pCi/g	=	
CWC199424	CWC002	10/12/17	Alpha Spectroscopy	Th-232	0.405	0.0845	pCi/g	J	T04, T20
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	K-40	11.7	0.174	pCi/g	=	
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Ra-226	1.22	0.0441	pCi/g	=	
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Ra-228	0.507	0.0442	pCi/g	=	
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Th-228	0.507	0.0442	pCi/g	=	
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Th-232	0.507	0.0442	pCi/g	=	
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	U-238	0.758	0.35	pCi/g	J	T04, T20
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Ac-227	-0.0184	0.107	pCi/g	UJ	T04, T06
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Am-241	-0.00334	0.0369	pCi/g	UJ	T04, T06
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Cs-137	0.012	0.0191	pCi/g	UJ	T04, T05

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Pa-231	-0.293	0.531	pCi/g	UJ	T04, T06
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	Th-230	0.78	3.53	pCi/g	UJ	T04, T06
CWC199424	CWC002	10/12/17	Gamma Spectroscopy	U-235	0.0355	0.239	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Metals	Arsenic	6.8	1.4	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Barium	150	1.7	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Cadmium	0.63	0.083	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Chromium	17	1.6	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Nickel	17	0.69	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Vanadium	20	1.4	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Selenium	1.1	1.1	mg/kg	=	
CWC199426	CWC003	10/12/17	Metals	Molybdenum	1.6	0.69	mg/kg	J	F01
CWC199426	CWC003	10/12/17	Metals	Antimony	0.69	0.69	mg/kg	U	
CWC199426	CWC003	10/12/17	Metals	Thallium	0.69	0.69	mg/kg	U	
CWC199426	CWC003	10/12/17	Alpha Spectroscopy	Th-228	1.01	0.151	pCi/g	=	
CWC199426	CWC003	10/12/17	Alpha Spectroscopy	Th-230	1.29	0.151	pCi/g	=	
CWC199426	CWC003	10/12/17	Alpha Spectroscopy	Th-232	0.683	0.151	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	K-40	11.8	0.403	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Ra-226	1.29	0.142	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Ra-228	0.644	0.139	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Th-228	0.644	0.139	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Th-232	0.644	0.139	pCi/g	=	
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Ac-227	0.0993	0.339	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Am-241	-0.0131	0.0972	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Cs-137	-0.00489	0.0555	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Pa-231	1.04	1.41	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	Th-230	2.13	9.26	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	U-235	-0.181	0.588	pCi/g	UJ	T04, T06
CWC199426	CWC003	10/12/17	Gamma Spectroscopy	U-238	0.721	1.09	pCi/g	UJ	T04, T05
CWC199428	CWC004	10/12/17	Metals	Arsenic	6	1.7	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Barium	200	2.2	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Cadmium	0.57	0.1	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Chromium	17	1.9	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Nickel	17	0.86	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Vanadium	21	1.7	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Selenium	1.6	1.4	mg/kg	=	
CWC199428	CWC004	10/12/17	Metals	Molybdenum	1.2	0.86	mg/kg	J	F01
CWC199428	CWC004	10/12/17	Metals	Antimony	0.86	0.86	mg/kg	U	

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199428	CWC004	10/12/17	Metals	Thallium	0.86	0.86	mg/kg	U	
CWC199428	CWC004	10/12/17	Alpha Spectroscopy	Th-228	1.19	0.21	pCi/g	=	
CWC199428	CWC004	10/12/17	Alpha Spectroscopy	Th-230	2.3	0.157	pCi/g	=	
CWC199428	CWC004	10/12/17	Alpha Spectroscopy	Th-232	1.05	0.157	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	K-40	14.9	0.222	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Ra-226	1.14	0.0712	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Ra-228	0.846	0.0652	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Th-228	0.846	0.0652	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Th-232	0.846	0.0652	pCi/g	=	
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	U-238	0.89	0.5	pCi/g	J	T04, T20
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Ac-227	0.229	0.17	pCi/g	UJ	T04
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Am-241	0.0312	0.0543	pCi/g	UJ	T04, T06
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Cs-137	0.0101	0.0281	pCi/g	UJ	T04, T06
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Pa-231	-0.315	0.733	pCi/g	UJ	T04, T06
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	Th-230	0.753	5.13	pCi/g	UJ	T04, T06
CWC199428	CWC004	10/12/17	Gamma Spectroscopy	U-235	0.092	0.321	pCi/g	UJ	T04, T06
CWC199430	CWC005	10/12/17	Metals	Arsenic	6.4	1.5	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Barium	170	1.8	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Cadmium	0.5	0.087	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Chromium	21	1.6	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Nickel	18	0.73	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Vanadium	21	1.5	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Selenium	1.2	1.2	mg/kg	=	
CWC199430	CWC005	10/12/17	Metals	Molybdenum	0.97	0.73	mg/kg	J	F01
CWC199430	CWC005	10/12/17	Metals	Antimony	0.73	0.73	mg/kg	U	
CWC199430	CWC005	10/12/17	Metals	Thallium	0.73	0.73	mg/kg	U	
CWC199430	CWC005	10/12/17	Alpha Spectroscopy	Th-228	1.25	0.181	pCi/g	=	
CWC199430	CWC005	10/12/17	Alpha Spectroscopy	Th-230	2.24	0.0819	pCi/g	=	
CWC199430	CWC005	10/12/17	Alpha Spectroscopy	Th-232	0.784	0.0818	pCi/g	=	

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	K-40	14.9	0.19	pCi/g	=	
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Ra-226	1.6	0.0511	pCi/g	=	
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Ra-228	0.994	0.0494	pCi/g	=	
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Th-228	0.994	0.0494	pCi/g	=	
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Th-230	8.67	4.15	pCi/g	J	T04, T20
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Th-232	0.994	0.0494	pCi/g	=	
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	U-238	0.812	0.401	pCi/g	J	T04, T20
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Ac-227	0.00836	0.129	pCi/g	UJ	T04, T06
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Am-241	0.0299	0.0455	pCi/g	UJ	T04, T05
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Cs-137	0.0149	0.0245	pCi/g	UJ	T04, T05
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	Pa-231	0.297	0.591	pCi/g	UJ	T04, T06
CWC199430	CWC005	10/12/17	Gamma Spectroscopy	U-235	-0.015	0.264	pCi/g	UJ	T04, T06
CWC199432	CWC006	10/12/17	Metals	Arsenic	5.1	1.4	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Barium	140	1.7	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Cadmium	0.58	0.083	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Chromium	15	1.5	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Nickel	16	0.69	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Vanadium	19	1.4	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Selenium	1.1	1.1	mg/kg	=	
CWC199432	CWC006	10/12/17	Metals	Molybdenum	0.71	0.69	mg/kg	J	F01
CWC199432	CWC006	10/12/17	Metals	Antimony	0.69	0.69	mg/kg	U	
CWC199432	CWC006	10/12/17	Metals	Thallium	0.69	0.69	mg/kg	U	
CWC199432	CWC006	10/12/17	Alpha Spectroscopy	Th-228	1.21	0.21	pCi/g	=	
CWC199432	CWC006	10/12/17	Alpha Spectroscopy	Th-230	3.84	0.21	pCi/g	=	
CWC199432	CWC006	10/12/17	Alpha Spectroscopy	Th-232	1.33	0.0948	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	K-40	13	0.21	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Ra-226	1.19	0.0655	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Ra-228	0.854	0.0651	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Th-228	0.854	0.0651	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Th-232	0.854	0.0651	pCi/g	=	
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	U-238	0.889	0.499	pCi/g	J	T04, T20
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Ac-227	0.216	0.173	pCi/g	UJ	T04
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Am-241	0.0258	0.0523	pCi/g	UJ	T04, T06
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Cs-137	0.00546	0.0305	pCi/g	UJ	T04, T06
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Pa-231	-0.145	0.73	pCi/g	UJ	T04, T06
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	Th-230	5.52	5.13	pCi/g	UJ	T04
CWC199432	CWC006	10/12/17	Gamma Spectroscopy	U-235	-0.0495	0.309	pCi/g	UJ	T04, T06

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199434	CWC007	10/12/17	Metals	Arsenic	7.7	1.4	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Barium	170	1.8	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Cadmium	0.97	0.085	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Chromium	27	1.6	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Nickel	21	0.71	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Vanadium	23	1.4	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Selenium	1.4	1.1	mg/kg	=	
CWC199434	CWC007	10/12/17	Metals	Molybdenum	1.3	0.71	mg/kg	J	F01
CWC199434	CWC007	10/12/17	Metals	Antimony	0.71	0.71	mg/kg	U	
CWC199434	CWC007	10/12/17	Metals	Thallium	0.71	0.71	mg/kg	U	
CWC199434	CWC007	10/12/17	Alpha Spectroscopy	Th-228	1.29	0.17	pCi/g	=	
CWC199434	CWC007	10/12/17	Alpha Spectroscopy	Th-230	2.98	0.171	pCi/g	=	
CWC199434	CWC007	10/12/17	Alpha Spectroscopy	Th-232	0.879	0.203	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	K-40	12.7	0.178	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Ra-226	1.33	0.042	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Ra-228	0.634	0.0448	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Th-228	0.634	0.0448	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Th-230	4.3	3.58	pCi/g	J	T04, T20
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Th-232	0.634	0.0448	pCi/g	=	
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	U-238	0.667	0.365	pCi/g	J	T04, T20
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Ac-227	0.106	0.119	pCi/g	UJ	T04, T05
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Am-241	-0.0273	0.0356	pCi/g	UJ	T04, T06
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Cs-137	0.0038	0.02	pCi/g	UJ	T04, T06
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	Pa-231	-0.25	0.483	pCi/g	UJ	T04, T06
CWC199434	CWC007	10/12/17	Gamma Spectroscopy	U-235	0.0716	0.242	pCi/g	UJ	T04, T06
CWC199436	CWC008	10/12/17	Metals	Arsenic	4.2	1.4	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Barium	150	1.8	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Cadmium	0.34	0.085	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Chromium	15	1.6	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Nickel	19	0.71	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Vanadium	19	1.4	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Selenium	1.1	1.1	mg/kg	=	
CWC199436	CWC008	10/12/17	Metals	Antimony	0.71	0.71	mg/kg	U	
CWC199436	CWC008	10/12/17	Metals	Molybdenum	0.71	0.71	mg/kg	U	

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199436	CWC008	10/12/17	Metals	Thallium	0.71	0.71	mg/kg	U	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	K-40	13.1	0.272	pCi/g		
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Am-241	0.0138	0.0556	pCi/g		
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Cs-137	-0.007	0.0296	pCi/g		
CWC199436	CWC008	10/12/17	Alpha Spectroscopy	Th-228	0.99	0.162	pCi/g	=	
CWC199436	CWC008	10/12/17	Alpha Spectroscopy	Th-230	1.82	0.193	pCi/g	=	
CWC199436	CWC008	10/12/17	Alpha Spectroscopy	Th-232	0.804	0.0872	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	K-40	12.8	0.259	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Ra-226	1.3	0.0665	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Ra-228	0.944	0.078	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Th-228	0.944	0.078	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Th-232	0.944	0.078	pCi/g	=	
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	U-238	0.767	0.544	pCi/g	J	T04, T20
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Ac-227	0.212	0.196	pCi/g	UJ	T04
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Am-241	0.0128	0.0577	pCi/g	UJ	T04, T06
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Cs-137	0.00389	0.0309	pCi/g	UJ	T04, T06
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Pa-231	-0.705	0.841	pCi/g	UJ	T04, T06
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	Th-230	3.79	5.49	pCi/g	UJ	T04, T05
CWC199436	CWC008	10/12/17	Gamma Spectroscopy	U-235	0.193	0.357	pCi/g	UJ	T04, T06
CWC199438	CWC009	10/12/17	Metals	Arsenic	3.7	1.3	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Barium	90	1.6	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Cadmium	0.35	0.079	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Chromium	12	1.5	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Nickel	12	0.66	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Vanadium	14	1.3	mg/kg	=	
CWC199438	CWC009	10/12/17	Metals	Antimony	0.66	0.66	mg/kg	U	
CWC199438	CWC009	10/12/17	Metals	Molybdenum	0.66	0.66	mg/kg	U	
CWC199438	CWC009	10/12/17	Metals	Selenium	1.1	1.1	mg/kg	U	
CWC199438	CWC009	10/12/17	Metals	Thallium	0.66	0.66	mg/kg	U	
CWC199438	CWC009	10/12/17	Alpha Spectroscopy	Th-228	0.864	0.199	pCi/g	=	
CWC199438	CWC009	10/12/17	Alpha Spectroscopy	Th-230	2.28	0.0801	pCi/g	=	
CWC199438	CWC009	10/12/17	Alpha Spectroscopy	Th-232	0.531	0.08	pCi/g	J	T04, T20
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	K-40	13.1	0.158	pCi/g	=	
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Ra-226	1.27	0.0411	pCi/g	=	
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Ra-228	0.641	0.0404	pCi/g	=	
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Th-228	0.641	0.0404	pCi/g	=	

Table D-2. CWC Sediment Data for CY 2017

Sample Name	Station Name	Collection Date	Method	Analyte	Result	DL	Units	VQ	Validation Reason Code
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Th-230	5.98	3.34	pCi/g	J	T04, T20
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Th-232	0.641	0.0404	pCi/g	=	
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	U-238	0.914	0.327	pCi/g	=	
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Ac-227	0.0336	0.113	pCi/g	UJ	T04, T06
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Am-241	0.0107	0.0349	pCi/g	UJ	T04, T06
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Cs-137	-0.00077	0.0171	pCi/g	UJ	T04, T06
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	Pa-231	-0.0413	0.497	pCi/g	UJ	T04, T06
CWC199438	CWC009	10/12/17	Gamma Spectroscopy	U-235	0.0576	0.218	pCi/g	UJ	T04, T06

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.

Validation Reason Codes:

F01 Blanks: Sample data were qualified as a result of the method blank.

H01 Matrix Spike/Matrix Spike Duplicate: Matrix Spike/Matrix Spike Duplicate recovery was above the upper control limit.

H02 Matrix Spike/Matrix Spike Duplicate: Matrix Spike/Matrix Spike Duplicate recovery was above the lower control limit.

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T05 Radionuclide Quantitation: Analytical result is less than the associated MDA, but greater than the counting uncertainty.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

T20 Radionuclide Quantitation: Analytical result is greater than the associated MDA, with uncertainty 50 percent to 100 percent of the result.

APPENDIX E

GROUND-WATER FIELD PARAMETER DATA AND ANALYTICAL DATA RESULTS FOR CALENDAR YEAR 2017

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

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Table E-1. Ground-Water Monitoring
First Quarter 2017 - Field Parameters for the Latty Avenue Properties

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 02/13/17
HISS-01	---	---	---	---	---	---	---	---	---	---	8.26
HISS-06A	02/14/17	70	1260	7.19	0.194	52.4	0.49	14.2	135	8.45	8.25
HISS-10	---	---	---	---	---	---	---	---	---	---	7.76
HISS-11A	---	---	---	---	---	---	---	---	---	---	13.04
HISS-17S	---	---	---	---	---	---	---	---	---	---	7.98
HISS-19S	---	---	---	---	---	---	---	---	---	---	14.52
HW22	---	---	---	---	---	---	---	---	---	---	13.53
HW23	---	---	---	---	---	---	---	---	---	---	9.44

Table E-1. Ground-Water Monitoring
Second Quarter 2017 - Field Parameters for the Latty Avenue Properties

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 05/22/17
HISS-01	---	---	---	---	---	---	---	---	---	---	8.28
HISS-06A	---	---	---	---	---	---	---	---	---	---	7.74
HISS-10	---	---	---	---	---	---	---	---	---	---	4.80
HISS-11A	---	---	---	---	---	---	---	---	---	---	10.38
HISS-17S	---	---	---	---	---	---	---	---	---	---	4.26
HISS-19	05/23/17	60	720	7.02	0.102	5	0.73	16.8	-74	14.21	13.56
HW22	05/23/17	35	525	7.11	0.183	2.2	0.84	15.6	60	13.42	12.51
HW23	05/23/17	80	960	7.88	0.111	46.2	8.23	16.4	-100	9.3	9.27

Table E-1. Ground-Water Monitoring
Third Quarter 2017 - Field Parameters for the Latty Avenue Properties

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (μS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 08/14/17
HISS-01	08/17/17	120	1080	7.09	0.144	0	2.41	21.2	142	14.65	14.47
HISS-06A	---	---	---	---	---	---	---	---	---	---	10.32
HISS-10	08/14/17	150	2250	7.22	0.097	0	0.05	19.1	152	10.41	9.92
HISS-11A	08/17/17	50	450	6.82	0.104	5.6	4.14	22.1	147	10.95	14.63
HISS-17S	---	---	---	---	---	---	---	---	---	---	9.45
HISS-19	---	---	---	---	---	---	---	---	---	---	14.68
HW22	---	---	---	---	---	---	---	---	---	---	18.05
HW23	---	---	---	---	---	---	---	---	---	---	9.74

Table E-1. Ground-Water Monitoring
Fourth Quarter 2017 - Field Parameters for the Latty Avenue Properties

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 11/13/17
HISS-01	---	---	---	---	---	---	---	---	---	---	13.81
HISS-06A	---	---	---	---	---	---	---	---	---	---	10.36
HISS-10	---	---	---	---	---	---	---	---	---	---	8.58
HISS-11A	---	---	---	---	---	---	---	---	---	---	13.23
HISS-17S	---	---	---	---	---	---	---	---	---	---	7.95
HISS-19S	---	---	---	---	---	---	---	---	---	---	14.6
HW22	---	---	---	---	---	---	---	---	---	---	17.75
HW23	---	---	---	---	---	---	---	---	---	---	9.76

No ground-water samples were collected at the HISS during the fourth quarter of 2017.

--- Monitoring well was not sampled during this event.

BTOC – below top of casing

Table E-2. Ground-Water Monitoring
First Quarter 2017 - Field Parameters for SLAPS and SLAPS VPs

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 02/13/17
B53W01D	---	---	---	---	---	---	---	---	---	---	9.9
B53W01S	---	---	---	---	---	---	---	---	---	---	12.98
B53W06S	---	---	---	---	---	---	---	---	---	---	14.34
B53W07D	02/14/17	40	840	7.34	0.109	43.2	0.73	12.7	-144	10.22	10.19
B53W07S	---	---	---	---	---	---	---	---	---	---	18.34
B53W09S	02/14/17	30	360	6.94	0.147	22.2	3	12.1	194	14.85	14.44
B53W13S	---	---	---	---	---	---	---	---	---	---	11.14
B53W17S	---	---	---	---	---	---	---	---	---	---	10.28
B53W18S	---	---	---	---	---	---	---	---	---	---	13.48
B53W19S	---	---	---	---	---	---	---	---	---	---	7.29
MW31-98	---	---	---	---	---	---	---	---	---	---	12.02
MW32-98	---	---	---	---	---	---	---	---	---	---	13.75
PW35	---	---	---	---	---	---	---	---	---	---	10.22
PW36	---	---	---	---	---	---	---	---	---	---	9.33
PW42	---	---	---	---	---	---	---	---	---	---	10.11
PW43	---	---	---	---	---	---	---	---	---	---	14.68
PW44	---	---	---	---	---	---	---	---	---	---	5.41
PW45	---	---	---	---	---	---	---	---	---	---	8.43
PW46	02/14/17	50	750	6.68	0.285	0.7	0.63	12	192	12.41	12.07

Table E-2. Ground-Water Monitoring
Second Quarter 2017 - Field Parameters for SLAPS and SLAPS VPs

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 05/22/17
B53W01D	---	---	---	---	---	---	---	---	---	---	9.67
B53W01S	05/23/17	50	900	7.35	0.108	68.4	0	15.2	-149	9.86	10.58
B53W06S	05/23/17	25	375	7.09	0.128	15.5	1.36	15.5	163	12.44	11.32
B53W07D	---	---	---	---	---	---	---	---	---	---	10.05
B53W07S	---	---	---	---	---	---	---	---	---	---	14.45
B53W09S	05/23/17	30	540	7.26	0.127	12	2.08	15.7	114	13.43	12.67
B53W13S	---	---	---	---	---	---	---	---	---	---	5.81
B53W17S	05/23/17	55	660	6.99	0.38	2.7	0.79	15.5	135	5.44	5.28
B53W18S	---	---	---	---	---	---	---	---	---	---	13.03
B53W19S	---	---	---	---	---	---	---	---	---	---	6.30
MW31-98	---	---	---	---	---	---	---	---	---	---	3.91
MW32-98	---	---	---	---	---	---	---	---	---	---	9.64
PW35	---	---	---	---	---	---	---	---	---	---	10.18
PW36	---	---	---	---	---	---	---	---	---	---	9.27
PW42	---	---	---	---	---	---	---	---	---	---	9.89
PW43	---	---	---	---	---	---	---	---	---	---	6.81
PW44	---	---	---	---	---	---	---	---	---	---	4.00
PW45	---	---	---	---	---	---	---	---	---	---	6.10
PW46	---	---	---	---	---	---	---	---	---	---	11.53

Table E-2. Ground-Water Monitoring
Third Quarter 2017 - Field Parameters for SLAPS and SLAPS VPs

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 08/14/17
B53W01D	08/15/17	120	1800	7.38	0.114	48.9	4.18	18.1	-158	10.14	10.02
B53W01S	08/15/17	50	450	7.11	91.6	1.7	7.62	22.3	182	18.89	18.3
B53W06S	08/14/17	25	375	6.88	0.141	23.8	1.58	18.1	187	15.89	14.75
B53W07D	08/15/17	40	480	7.43	0.116	48	3.14	18.5	-153	10.54	10.49
B53W07S	---	---	---	---	---	---	---	---	---	---	19.25
B53W09S	---	---	---	---	---	---	---	---	---	---	15.78
B53W13S	---	---	---	---	---	---	---	---	---	---	13.48
B53W17S	---	---	---	---	---	---	---	---	---	---	12.00
B53W18S	---	---	---	---	---	---	---	---	---	---	13.54
B53W19S	---	---	---	---	---	---	---	---	---	---	8.55
MW31-98	---	---	---	---	---	---	---	---	---	---	13.61
MW32-98	---	---	---	---	---	---	---	---	---	---	15.10
PW35	---	---	---	---	---	---	---	---	---	---	10.34
PW36	---	---	---	---	---	---	---	---	---	---	9.71
PW42	---	---	---	---	---	---	---	---	---	---	10.52
PW43	08/15/17	50	600	6.98	0.107	0	3.36	20.7	60	17.05	16.63
PW44	---	---	---	---	---	---	---	---	---	---	7.62
PW45	---	---	---	---	---	---	---	---	---	---	9.60
PW46	---	---	---	---	---	---	---	---	---	---	17.94

Table E-2. Ground-Water Monitoring
Fourth Quarter 2017 - Field Parameters for SLAPS and SLAPS VPs

Station ID	Date Sampled	Purge Rate (mL/minute)	Volume Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 11/13/17
B53W01D	---	---	---	---	---	---	---	---	---	---	10.2
B53W01S	11/14/17	50	450	6.94	90.3	6.4	4.92	14.7	159	18.5	18.03
B53W06S	11/14/17	25	300	6.69	0.208	17.8	6.01	14	147	17.54	16.59
B53W07D	---	---	---	---	---	---	---	---	---	---	10.66
B53W07S	---	---	---	---	---	---	---	---	---	---	20.3
B53W09S	11/14/17	30	360	6.94	0.145	45.9	5.32	14.3	168	17.71	16.91
B53W13S	---	---	---	---	---	---	---	---	---	---	15.21
B53W17S	---	---	---	---	---	---	---	---	---	---	15.62
B53W18S	---	---	---	---	---	---	---	---	---	---	13.75
B53W19S	---	---	---	---	---	---	---	---	---	---	8.05
MW31-98	---	---	---	---	---	---	---	---	---	---	18.53
MW32-98	---	---	---	---	---	---	---	---	---	---	17.76
PW35	11/14/17	45	540	7.92	0.164	19.9	5.44	16.2	-115	11.63	9.75
PW36	11/14/17	300	3600	7.2	0.104	104	5.32	17.4	-140	9.77	9.87
PW42	---	---	---	---	---	---	---	---	---	---	10.74
PW43	---	---	---	---	---	---	---	---	---	---	19.33
PW44	---	---	---	---	---	---	---	---	---	---	6.7
PW45	---	---	---	---	---	---	---	---	---	---	10.49
PW46	---	---	---	---	---	---	---	---	---	---	16.15

--- Monitoring well was not sampled during this event.

Table E-3. CY 2017 Ground-Water Sampling Data for the Latty Avenue Properties

Site: Latty Avenue Properties

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
HIS198066	HISS-01	08/17/17	ML-006	Ra-226	0.191	0.382	0.763	pCi/L	UJ	T06	No
HIS198066	HISS-01	08/17/17	ML-005	Th-228	-3.08E-06	0.23	0.618	pCi/L	UJ	T06	No
HIS198066	HISS-01	08/17/17	ML-005	Th-230	0.167	0.242	0.4	pCi/L	UJ	T06	No
HIS198066	HISS-01	08/17/17	ML-005	Th-232	0	0	0.18	pCi/L	U		No
HIS198066	HISS-01	08/17/17	ML-015	U-234	9.18	1.92	0.371	pCi/L	=		No
HIS198066	HISS-01	08/17/17	ML-015	U-235	0.246	0.267	0.369	pCi/L	UJ	T06	No
HIS198066	HISS-01	08/17/17	ML-015	U-238	8.69	1.83	0.124	pCi/L	=		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Antimony	10		10	µg/L	U		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Arsenic	20		20	µg/L	U		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Barium	78		4.5	µg/L	=		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Cadmium	1		1	µg/L	U		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Chromium	20		20	µg/L	U		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Molybdenum	10		10	µg/L	U		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Nickel	10		10	µg/L	U		No
HIS195319	HISS-06A	02/14/17	ML-006	Ra-226	-0.106	0.762	2.13	pCi/L	UJ	T06	No
HIS195319	HISS-06A	02/14/17	SW846 6020	Selenium	300		10	µg/L	=		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Thallium	4.5		4.5	µg/L	U		No
HIS195319	HISS-06A	02/14/17	ML-005	Th-228	0.298	0.34	0.553	pCi/L	UJ	T06	No
HIS195319	HISS-06A	02/14/17	ML-005	Th-230	0.745	0.471	0.501	pCi/L	J	F01, T04, T20	No
HIS195319	HISS-06A	02/14/17	ML-005	Th-232	0.0893	0.179	0.357	pCi/L	UJ	T06	No
HIS195319	HISS-06A	02/14/17	ML-015	U-234	2.37E+00	0.87	0.169	pCi/L	=		No
HIS195319	HISS-06A	02/14/17	ML-015	U-235	0.116	0.232	0.462	pCi/L	UJ	T06	No
HIS195319	HISS-06A	02/14/17	ML-015	U-238	2.86	0.974	0.169	pCi/L	=		No
HIS195319	HISS-06A	02/14/17	SW846 6020	Vanadium	20		20	µg/L	U		No
HIS198068	HISS-10	08/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
HIS198068	HISS-10	08/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
HIS198068	HISS-10	08/14/17	SW846 6020	Barium	79		0.9	µg/L	=		No
HIS198068	HISS-10	08/14/17	SW846 6020	Cadmium	0.2		0.2	µg/L	=		No
HIS198068	HISS-10	08/14/17	SW846 6020	Chromium	4		4	µg/L	U		No
HIS198068	HISS-10	08/14/17	SW846 6020	Molybdenum	27		2	µg/L	=		No
HIS198068	HISS-10	08/14/17	SW846 6020	Nickel	2		2	µg/L	U		No
HIS198068	HISS-10	08/14/17	ML-006	Ra-226	-0.145	0.41	1.35	pCi/L	UJ	T06	No
HIS198068	HISS-10	08/14/17	SW846 6020	Selenium	2		2	µg/L	U		No

Table E-3. CY 2017 Ground-Water Sampling Data for the Latty Avenue Properties

Site: Latty Avenue Properties

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
HIS198068	HISS-10	08/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
HIS198068	HISS-10	08/14/17	ML-005	Th-228	0.162	0.23	0.397	pCi/L	UJ	T06	No
HIS198068	HISS-10	08/14/17	ML-005	Th-230	0.459	0.335	0.324	pCi/L	J	F01, T04, T20	No
HIS198068	HISS-10	08/14/17	ML-005	Th-232	-0.0539	0.0766	0.397	pCi/L	UJ	T06	No
HIS198068	HISS-10	08/14/17	ML-015	U-234	5.39	1.62	0.209	pCi/L	=		No
HIS198068	HISS-10	08/14/17	ML-015	U-235	0	0	0.699	pCi/L	U		No
HIS198068	HISS-10	08/14/17	ML-015	U-238	4.14	1.36	0.208	pCi/L	=		No
HIS198068	HISS-10	08/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Antimony	2		2	µg/L	U		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Arsenic	4		4	µg/L	U		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Barium	120		0.9	µg/L	=		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Cadmium	0.5		0.2	µg/L	U	F06	No
HIS198067	HISS-11A	08/17/17	SW846 6020	Chromium	4		4	µg/L	U		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Molybdenum	3		2	µg/L	=		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Nickel	2		2	µg/L	U		No
HIS198067	HISS-11A	08/17/17	ML-006	Ra-226	0.406	0.574	0.996	pCi/L	UJ	T06	No
HIS198067	HISS-11A	08/17/17	SW846 6020	Selenium	31		2	µg/L	=		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
HIS198067	HISS-11A	08/17/17	ML-005	Th-228	0.303	0.279	0.33	pCi/L	UJ	T04, T05	No
HIS198067	HISS-11A	08/17/17	ML-005	Th-230	0.138	0.2	0.331	pCi/L	UJ	T06	No
HIS198067	HISS-11A	08/17/17	ML-005	Th-232	0.055	0.11	0.149	pCi/L	UJ	T06	No
HIS198067	HISS-11A	08/17/17	ML-015	U-234	1.74	0.641	0.131	pCi/L	=		No
HIS198067	HISS-11A	08/17/17	ML-015	U-235	0.139	0.223	0.388	pCi/L	UJ	T06	No
HIS198067	HISS-11A	08/17/17	ML-015	U-238	1.49	0.585	0.131	pCi/L	=		No
HIS198067	HISS-11A	08/17/17	SW846 6020	Vanadium	4		4	µg/L	U		No
HIS196685	HISS-19S	05/23/17	ML-006	Ra-226	1.33	0.959	1.09	pCi/L	J	T04, T20	No
HIS196685	HISS-19S	05/23/17	ML-005	Th-228	0.0913	0.236	0.512	pCi/L	UJ	T06	No
HIS196685	HISS-19S	05/23/17	ML-005	Th-230	0.701	0.439	0.366	pCi/L	J	F01, T04, T20	No
HIS196685	HISS-19S	05/23/17	ML-005	Th-232	0.0608	0.122	0.165	pCi/L	UJ	T06	No
HIS196685	HISS-19S	05/23/17	ML-015	U-234	0.833	0.507	0.4	pCi/L	J	F01, T04, T20	No
HIS196685	HISS-19S	05/23/17	ML-015	U-235	-0.0411	0.0826	0.493	pCi/L	UJ	T06	No
HIS196685	HISS-19S	05/23/17	ML-015	U-238	0.963	0.545	0.398	pCi/L	J	F01, T04, T20	No
HIS196686	HW22	05/23/17	SW846 6020	Antimony	5		5	µg/L	U		No

Table E-3. CY 2017 Ground-Water Sampling Data for the Latty Avenue Properties

Site: Latty Avenue Properties											
Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
HIS196686	HW22	05/23/17	SW846 6020	Arsenic	10		10	µg/L	U		No
HIS196686	HW22	05/23/17	SW846 6020	Barium	210		2.3	µg/L	=		No
HIS196686	HW22	05/23/17	SW846 6020	Cadmium	0.5		0.5	µg/L	U		No
HIS196686	HW22	05/23/17	SW846 6020	Chromium	10		10	µg/L	U		No
HIS196686	HW22	05/23/17	SW846 6020	Molybdenum	5		5	µg/L	U		No
HIS196686	HW22	05/23/17	SW846 6020	Nickel	5		5	µg/L	U		No
HIS196686	HW22	05/23/17	ML-006	Ra-226	0.625	0.737	1.07	pCi/L	UJ	T06	No
HIS196686	HW22	05/23/17	SW846 6020	Selenium	6.9		5	µg/L	=		No
HIS196686	HW22	05/23/17	SW846 6020	Thallium	2.3		2.3	µg/L	U		No
HIS196686	HW22	05/23/17	ML-005	Th-228	0.0677	0.214	0.499	pCi/L	UJ	T06	No
HIS196686	HW22	05/23/17	ML-005	Th-230	0.441	0.372	0.407	pCi/L	J	F01, T04, T20	No
HIS196686	HW22	05/23/17	ML-005	Th-232	-3.13E-06	0.166	0.498	pCi/L	UJ	T06	No
HIS196686	HW22	05/23/17	ML-015	U-234	5.08	1.47	0.403	pCi/L	=		No
HIS196686	HW22	05/23/17	ML-015	U-235	0.622	0.489	0.497	pCi/L	J	T04, T20	No
HIS196686	HW22	05/23/17	ML-015	U-238	4.12	1.28	0.402	pCi/L	=		No
HIS196686	HW22	05/23/17	SW846 6020	Vanadium	10		10	µg/L	U		No
HIS196687	HW23	05/23/17	SW846 6020	Antimony	2		2	µg/L	U		No
HIS196687	HW23	05/23/17	SW846 6020	Arsenic	230		4	µg/L	=		No
HIS196687	HW23	05/23/17	SW846 6020	Barium	540		0.9	µg/L	=		No
HIS196687	HW23	05/23/17	SW846 6020	Cadmium	0.2		0.2	µg/L	=		No
HIS196687	HW23	05/23/17	SW846 6020	Chromium	4		4	µg/L	U		No
HIS196687	HW23	05/23/17	SW846 6020	Molybdenum	8.2		2	µg/L	=		No
HIS196687	HW23	05/23/17	SW846 6020	Nickel	6.3		2	µg/L	=		No
HIS196687	HW23	05/23/17	ML-006	Ra-226	0.25	0.5	0.999	pCi/L	UJ	T06	No
HIS196687	HW23	05/23/17	SW846 6020	Selenium	2		2	µg/L	U		No
HIS196687	HW23	05/23/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
HIS196687	HW23	05/23/17	ML-005	Th-228	0.122	0.228	0.447	pCi/L	UJ	T06	No
HIS196687	HW23	05/23/17	ML-005	Th-230	0.487	0.352	0.165	pCi/L	J	F01, T04, T20	No
HIS196687	HW23	05/23/17	ML-005	Th-232	0.182	0.212	0.165	pCi/L	UJ	T02	No
HIS196687	HW23	05/23/17	ML-015	U-234	0.228	0.267	0.206	pCi/L	UJ	T02	No
HIS196687	HW23	05/23/17	ML-015	U-235	0	0	0.254	pCi/L	U		No

Table E-3. CY 2017 Ground-Water Sampling Data for the Latty Avenue Properties

Site: Latty Avenue Properties											
Sample Name	**Station Name**	**Collection Date**	**Method**	**Analyte**	**Result**	**Measurement Error**	**DL**	**Units**	**VQ**	**Validation Reason Code**	**Filtered**
HIS196687	HW23	05/23/17	ML-015	U-238	0.227	0.265	0.205	pCi/L	UJ	T02	No
HIS196687	HW23	05/23/17	SW846 6020	Vanadium	7.1		4	µg/L	=		No

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.

Validation Reason Codes:

F01 Blanks: Sample data were qualified as a result of the method blank.

T02 Analytical uncertainties were not met and/or not reported.

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T05 Radionuclide Quantitation: Analytical result is less than the associated MDA, but greater than the counting uncertainty.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

T20 Radionuclide Quantitation: Analytical result is greater than the associated MDA, with uncertainly 50% to 100% of the result

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
SVP198070	B53W01D	08/15/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP198070	B53W01D	08/15/17	SW846 6020	Arsenic	100		4	µg/L	=		No
SVP198070	B53W01D	08/15/17	SW846 6020	Barium	490		0.9	µg/L	=		No
SVP198070	B53W01D	08/15/17	SW846 6020	Cadmium	0.3		0.2	µg/L	=		No
SVP198070	B53W01D	08/15/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP198070	B53W01D	08/15/17	SW846 6020	Molybdenum	2		2	µg/L	U		No
SVP198070	B53W01D	08/15/17	SW846 6020	Nickel	2.1		2	µg/L	=		No
SVP198070	B53W01D	08/15/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP198070	B53W01D	08/15/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP198070	B53W01D	08/15/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Arsenic	110		4	µg/L	=		No
SVP196688	B53W01S	05/23/17	SW846 6020	Barium	500		0.9	µg/L	=		No
SVP196688	B53W01S	05/23/17	SW846 6020	Cadmium	0.2		0.2	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Molybdenum	2		2	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Nickel	2		2	µg/L	U		No
SVP196688	B53W01S	05/23/17	ML-006	Ra-226	0.607	0.713	1.12	pCi/L	UJ	T06	No
SVP196688	B53W01S	05/23/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP196688	B53W01S	05/23/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP196688	B53W01S	05/23/17	ML-005	Th-228	0.335	0.304	0.182	pCi/L	J	T04, T20	No
SVP196688	B53W01S	05/23/17	ML-005	Th-230	0.235	0.279	0.403	pCi/L	UJ	T06	No
SVP196688	B53W01S	05/23/17	ML-005	Th-232	0.168	0.243	0.402	pCi/L	UJ	T06	No
SVP196688	B53W01S	05/23/17	ML-015	U-234	0	0	0.261	pCi/L	U		No
SVP196688	B53W01S	05/23/17	ML-015	U-235	0	0	0.322	pCi/L	U		No
SVP196688	B53W01S	05/23/17	ML-015	U-238	-0.0479	0.0963	0.574	pCi/L	UJ	T06	No
SVP196688	B53W01S	05/23/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Antimony	2		2	µg/L	U		No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs											
Sample Name	**Station Name**	**Collection Date**	**Method**	**Analyte**	**Result**	**Measurement Error**	**DL**	**Units**	**VQ**	**Validation Reason Code**	**Filtered**
SVP198071	B53W01S	08/15/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Barium	150		0.9	µg/L	=		No
SVP198071	B53W01S	08/15/17	SW846 6020	Cadmium	0.8		0.2	µg/L	=		No
SVP198071	B53W01S	08/15/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Molybdenum	2		2	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Nickel	8.4		2	µg/L	=		No
SVP198071	B53W01S	08/15/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP198071	B53W01S	08/15/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Barium	120		0.9	µg/L	=		No
SVP199809	B53W01S	11/14/17	SW846 6020	Cadmium	0.22		0.2	µg/L	=		No
SVP199809	B53W01S	11/14/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Molybdenum	2		2	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Nickel	11		2	µg/L	=		No
SVP199809	B53W01S	11/14/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP199809	B53W01S	11/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP196689	B53W06S	05/23/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP196689	B53W06S	05/23/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP196689	B53W06S	05/23/17	SW846 6020	Barium	110		0.9	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Cadmium	1.6		0.2	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Chromium	6.5		4	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Molybdenum	7.2		2	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Nickel	6.7		2	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Selenium	59		2	µg/L	=		No
SVP196689	B53W06S	05/23/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs											
Sample Name	**Station Name**	**Collection Date**	**Method**	**Analyte**	**Result**	**Measurement Error**	**DL**	**Units**	**VQ**	**Validation Reason Code**	**Filtered**
SVP196689	B53W06S	05/23/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP198069	B53W06S	08/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP198069	B53W06S	08/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP198069	B53W06S	08/14/17	SW846 6020	Barium	92		0.9	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Cadmium	1.8		0.2	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Chromium	12		4	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Molybdenum	7.5		2	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Nickel	9.2		2	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Selenium	17		2	µg/L	=		No
SVP198069	B53W06S	08/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP198069	B53W06S	08/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP199810	B53W06S	11/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP199810	B53W06S	11/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP199810	B53W06S	11/14/17	SW846 6020	Barium	93		0.9	µg/L	=		No
SVP199810	B53W06S	11/14/17	SW846 6020	Cadmium	4.4		0.2	µg/L	=		No
SVP199810	B53W06S	11/14/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP199810	B53W06S	11/14/17	SW846 6020	Molybdenum	12		2	µg/L	=		No
SVP199810	B53W06S	11/14/17	SW846 6020	Nickel	13		2	µg/L	=		No
SVP199810	B53W06S	11/14/17	SW846 6020	Selenium	14		2	µg/L	=		No
SVP199810	B53W06S	11/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP199810	B53W06S	11/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP195320	B53W07D	02/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP195320	B53W07D	02/14/17	SW846 6020	Arsenic	81		4	µg/L	=		No
SVP195320	B53W07D	02/14/17	SW846 6020	Barium	340		0.9	µg/L	=		No
SVP195320	B53W07D	02/14/17	SW846 6020	Cadmium	0.4		0.2	µg/L	=		No
SVP195320	B53W07D	02/14/17	SW846 6020	Chromium	4		4	µg/L	=		No
SVP195320	B53W07D	02/14/17	SW846 6020	Molybdenum	2		2	µg/L	U		No
SVP195320	B53W07D	02/14/17	SW846 6020	Nickel	8.6		2	µg/L	=		No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs											
Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
SVP195320	B53W07D	02/14/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP195320	B53W07D	02/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP195320	B53W07D	02/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Arsenic	90		4	µg/L	=		No
SVP198072	B53W07D	08/15/17	SW846 6020	Barium	390		0.9	µg/L	=		No
SVP198072	B53W07D	08/15/17	SW846 6020	Cadmium	0.2		0.2	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Molybdenum	2.10E+00		2	µg/L	=		No
SVP198072	B53W07D	08/15/17	SW846 6020	Nickel	7.8		2	µg/L	=		No
SVP198072	B53W07D	08/15/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP198072	B53W07D	08/15/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP195321	B53W09S	02/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP195321	B53W09S	02/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP195321	B53W09S	02/14/17	SW846 6020	Barium	420		0.9	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Cadmium	0.38		0.2	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Chromium	26		4	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Molybdenum	4.3		2	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Nickel	460		2	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Selenium	2.7		2	µg/L	=		No
SVP195321	B53W09S	02/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP195321	B53W09S	02/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP196690	B53W09S	05/23/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP196690	B53W09S	05/23/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP196690	B53W09S	05/23/17	SW846 6020	Barium	360		0.9	µg/L	=		No
SVP196690	B53W09S	05/23/17	SW846 6020	Cadmium	0.36		0.2	µg/L	=		No
SVP196690	B53W09S	05/23/17	SW846 6020	Chromium	18		4	µg/L	=		No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
SVP196690	B53W09S	05/23/17	SW846 6020	Molybdenum	5.7		2	µg/L	=		No
SVP196690	B53W09S	05/23/17	SW846 6020	Nickel	73		2	µg/L	=		No
SVP196690	B53W09S	05/23/17	SW846 6020	Selenium	10		2	µg/L	=		No
SVP196690	B53W09S	05/23/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP196690	B53W09S	05/23/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP199813	B53W09S	11/14/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP199813	B53W09S	11/14/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP199813	B53W09S	11/14/17	SW846 6020	Barium	320		0.9	µg/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Cadmium	0.5		0.2	µg/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Chromium	15		4	µg/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Molybdenum	3.4		2	µg/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Nickel	180		2	µg/L	=		No
SVP199813	B53W09S	11/14/17	ML-006	Ra-226	0.615	0.844	1.48	pCi/L	UJ	T06	No
SVP199813	B53W09S	11/14/17	SW846 6020	Selenium	4.7		2	µg/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP199813	B53W09S	11/14/17	ML-005	Th-228	0.0667	0.267	0.62	pCi/L	UJ	T06	No
SVP199813	B53W09S	11/14/17	ML-005	Th-230	0.367	0.339	0.401	pCi/L	UJ	T04, T05	No
SVP199813	B53W09S	11/14/17	ML-005	Th-232	0	0	0.181	pCi/L	U		No
SVP199813	B53W09S	11/14/17	ML-015	U-234	1.99	0.801	0.414	pCi/L	=		No
SVP199813	B53W09S	11/14/17	ML-015	U-235	0.236	0.275	0.213	pCi/L	UJ	T02	No
SVP199813	B53W09S	11/14/17	ML-015	U-238	1.65	0.705	0.172	pCi/L	=		No
SVP199813	B53W09S	11/14/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Antimony	10		10	µg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Arsenic	20		20	µg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Barium	260		4.5	µg/L	=		No
SVP196691	B53W17S	05/23/17	SW846 6020	Cadmium	1		1	µg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Chromium	20		20	µg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Molybdenum	10		10	µg/L	U		No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs

Sample Name	Station Name	Collection Date	Method	Analyte	Result	Measurement Error	DL	Units	VQ	Validation Reason Code	Filtered
SVP196691	B53W17S	05/23/17	SW846 6020	Nickel	10		10	μg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Selenium	94		10	μg/L	=		No
SVP196691	B53W17S	05/23/17	SW846 6020	Thallium	4.5		4.5	μg/L	U		No
SVP196691	B53W17S	05/23/17	SW846 6020	Vanadium	20		20	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Antimony	2		2	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Arsenic	29		4	μg/L	=		No
SVP199811	PW35	11/13/17	SW846 6020	Barium	2000		0.9	μg/L	=		No
SVP199811	PW35	11/13/17	SW846 6020	Cadmium	2		0.2	μg/L	=		No
SVP199811	PW35	11/13/17	SW846 6020	Chromium	4		4	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Molybdenum	3.8		2	μg/L	=		No
SVP199811	PW35	11/13/17	SW846 6020	Nickel	2		2	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Selenium	2		2	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Thallium	0.9		0.9	μg/L	U		No
SVP199811	PW35	11/13/17	SW846 6020	Vanadium	4		4	μg/L	U		No
SVP199812	PW36	11/13/17	SW846 6020	Antimony	2		2	μg/L	U		No
SVP199812	PW36	11/13/17	SW846 6020	Arsenic	120		4	μg/L	=		No
SVP199812	PW36	11/13/17	SW846 6020	Barium	450		0.9	μg/L	=		No
SVP199812	PW36	11/13/17	SW846 6020	Cadmium	0.43		0.2	μg/L	=		No
SVP199812	PW36	11/13/17	SW846 6020	Chromium	4		4	μg/L	U		No
SVP199812	PW36	11/13/17	SW846 6020	Molybdenum	2		2	μg/L	U		No
SVP199812	PW36	11/13/17	SW846 6020	Nickel	4.3		2	μg/L	=		No
SVP199812	PW36	11/13/17	ML-006	Ra-226	1.43	0.916	0.816	pCi/L	J	T04, T20	No
SVP199812	PW36	11/13/17	SW846 6020	Selenium	2		2	μg/L	U		No
SVP199812	PW36	11/13/17	SW846 6020	Thallium	0.9		0.9	μg/L	U		No
SVP199812	PW36	11/13/17	ML-005	Th-228	0.277	0.285	0.369	pCi/L	UJ	T06	No
SVP199812	PW36	11/13/17	ML-005	Th-230	0.493	0.387	0.454	pCi/L	J	F01, T04, T20	No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs											
Sample Name	**Station Name**	**Collection Date**	**Method**	**Analyte**	**Result**	**Measurement Error**	**DL**	**Units**	**VQ**	**Validation Reason Code**	**Filtered**
SVP199812	PW36	11/13/17	ML-005	Th-232	0.123	0.175	0.167	pCi/L	UJ	T06	No
SVP199812	PW36	11/13/17	ML-015	U-234	0.117	0.166	0.158	pCi/L	UJ	T06	No
SVP199812	PW36	11/13/17	ML-015	U-235	0	0.173	0.468	pCi/L	UJ	T06	No
SVP199812	PW36	11/13/17	ML-015	U-238	0.0387	0.198	0.469	pCi/L	UJ	T06	No
SVP199812	PW36	11/13/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Antimony	2		2	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Arsenic	4		4	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Barium	210		0.9	µg/L	=		No
SVP198073	PW43	08/15/17	SW846 6020	Cadmium	0.89		0.2	µg/L	=		No
SVP198073	PW43	08/15/17	SW846 6020	Chromium	4		4	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Molybdenum	2.3		2	µg/L	=		No
SVP198073	PW43	08/15/17	SW846 6020	Nickel	18		2	µg/L	=		No
SVP198073	PW43	08/15/17	SW846 6020	Selenium	2		2	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Thallium	0.9		0.9	µg/L	U		No
SVP198073	PW43	08/15/17	SW846 6020	Vanadium	4		4	µg/L	U		No
SLA195322	PW46	02/13/17	SW846 6020	Antimony	10		10	µg/L	U		No
SLA195322	PW46	02/13/17	SW846 6020	Arsenic	20		20	µg/L	U		No
SLA195322	PW46	02/13/17	SW846 6020	Barium	66		4.5	µg/L	=		No
SLA195322	PW46	02/13/17	SW846 6020	Cadmium	1.2		1	µg/L	=		No
SLA195322	PW46	02/13/17	SW846 6020	Chromium	20		20	µg/L	U		No
SLA195322	PW46	02/13/17	SW846 6020	Molybdenum	10		10	µg/L	U		No
SLA195322	PW46	02/13/17	SW846 6020	Nickel	10		10	µg/L	U		No
SLA195322	PW46	02/13/17	ML-006	Ra-226	-0.375	0.336	1.51	pCi/L	UJ	T06	No
SLA195322	PW46	02/13/17	SW846 6020	Selenium	44		10	µg/L	=		No
SLA195322	PW46	02/13/17	SW846 6020	Thallium	4.5		4.5	µg/L	U		No
SLA195322	PW46	02/13/17	ML-005	Th-228	0.315	0.367	0.589	pCi/L	UJ	T06	No
SLA195322	PW46	02/13/17	ML-005	Th-230	0.737	0.485	0.421	pCi/L	J	F01, T04, T20	No

Table E-4. CY 2017 Ground-Water Sampling Data for the SLAPS and SLAPS VPs

Site: SLAPS and SLAPS VPs											
Sample Name	**Station Name**	**Collection Date**	**Method**	**Analyte**	**Result**	**Measurement Error**	**DL**	**Units**	**VQ**	**Validation Reason Code**	**Filtered**
SLA195322	PW46	02/13/17	ML-005	Th-232	0.105	0.211	0.42	pCi/L	UJ	T06	No
SLA195322	PW46	02/13/17	ML-015	U-234	587	97.1	0.153	pCi/L	=		No
SLA195322	PW46	02/13/17	ML-015	U-235	27.9	5.37	0.189	pCi/L	=		No
SLA195322	PW46	02/13/17	ML-015	U-238	602	99.6	0.153	pCi/L	=		No
SLA195322	PW46	02/13/17	SW846 6020	Vanadium	20		20	µg/L	U		No

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.

Validation Reason Codes:

F01 Blanks: Sample data were qualified as a result of the method blank.

T02 Radionuclide Quantitation: Analytical uncertainties were not met and/or not reported.

T04 Radionuclide Quantitation: Professional judgment was used to qualify the data.

T05 Radionuclide Quantitation: Analytical result is less than the associated MDA, but greater than the counting uncertainty.

T06 Radionuclide Quantitation: Analytical result is less than both the associated counting uncertainty and MDA.

T20 Radionuclide Quantitation: Analytical result is greater than the associated MDA, with uncertainly 50 to 100 percent of the result.

APPENDIX F

CALCULATION OF THE RECORD OF DECISION GROUND-WATER EVALUATION GUIDELINES

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CALCULATION OF THE RECORD OF DECISION GROUND-WATER MONITORING GUIDELINES

This appendix briefly outlines the methodology used to develop the ground-water monitoring guidelines for select wells and analytes at the NC Sites. The development of these guidelines was necessary to meet the requirements of response-action monitoring and long-term monitoring specified in the ROD (USACE 2005). These requirements are also identified in the EMICY17 (USACE 2016). The results of these calculations are used in the EMDAR to evaluate ground-water monitoring data at the Latty Avenue Properties and the SLAPS and SLAPS VPs for CY 2017.

INTRODUCTION

Response-action monitoring is conducted for HZ-A and HZ-C ground water at the NC Sites to assess if water quality has improved due to source removals or if ground-water conditions have significantly degraded. Based on the ROD, a significantly degraded ground-water condition requires all of the following:

1) that soil COC concentrations have statistically increased in ground water (relative to the well's historical data and accounting for uncertainty) for more than a 12-month period. Significantly increased concentrations are defined as doubling of an individual COC concentration above the UCL of the mean (based on the historical concentration before remedial activity) for a period of 12 months;
2) that the degraded well is close enough to impact CWC; and
3) that a significant degradation of CWC surface water is anticipated (USACE 2005).

In addition to the previous requirements, the ROD specifies that the maximum contaminant level for total U of 30 µg/L be used as a monitoring guideline for both response-action and long-term monitoring of ground water. If ground-water monitoring indicates the presence of COCs at significantly increased concentrations and total U significantly above 30 µg/L, then an evaluation of potential response actions would be conducted.

METHODOLOGY

In order to evaluate ground water for significant degradation, the UCL must be calculated using the historical ground-water data (i.e., data collected before remedial activity). The UCL is used to represent a historical average concentration for an analyte in a particular well. As stated in the USEPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term,* "because of the uncertainty associated with estimating the true average concentration at a site, the UCL_{95} of the arithmetic mean should be used for this variable" (USEPA 1992). Based on the previously specified guidance, a 95 percent confidence interval was used in the UCL calculations.

Consistent with the ROD, UCL_{95} values for the soil COCs are used in the EMDAR to evaluate if concentrations have statistically increased in ground water for more than a 12-month period. The soil COCs defined in the ROD include antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238. Because the SLAPS well PW46 is a replacement well, pre-2006 data from PW38 were used to develop the ground-water monitoring guideline to compare with the PW46 results. PW46 was installed in April of 2006 near the former location of PW38 and is screened across the same interval. Similarly, pre-2006 data from HISS-06 and HISS-11 were used to develop the ground-water monitoring guidelines for the two replacement wells (HISS-06A and HISS-11A) installed in CY 2011 at the HISS. For wells located in areas in which a response action has occurred, significant degradation is defined as occurring if the concentration of any COC in a recent sample from that well is double its UCL_{95}, and the total U is significantly above 30 µg/L. The ROD ground-water monitoring guideline for the soil COC for a particular well is defined as equivalent to two times the UCL_{95} value.

The dataset used for this evaluation was reduced prior to performing the statistical analysis. Filtered data, results qualified with an "R" designation, and QC samples were removed from each of the datasets. The analytical result was used when the VQ was assigned an "=" or a "J". For nondetect chemical data (i.e., the VQ was assigned a "U" or "UJ"), the value used in the UCL_{95} calculation was half the DL. For nondetect radiological data, the reported value was used, except in cases in which the value reported was negative. In those cases, a value of zero was substituted for the negative value.

RESULTS

The USEPA software package ProUCL (Version 5.0) was used to calculate the UCL_{95} value. ProUCL computes parametric UCLs (for normal, lognormal, and gamma distributions) and nonparametric UCLs using several nonparametric methods (USEPA 2013). Based upon the data distribution and the associated skewness, ProUCL performs and recommends the appropriate UCL.

The UCL_{95} values are those recommended by ProUCL with the following exceptions.

- If the calculated UCL_{95} exceeded the maximum detected value, then the maximum detected value was used, as recommended in the USEPA's *Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A)* (USEPA 1989c).
- If no values were detected for the COC in the historical database for that well, then the UCL_{95} was not determined. If only one value of the COC was detected, then the detected value was used.

The ground-water monitoring guidelines based on these UCL_{95} values are listed in Tables F-1 and F-2 for the Latty Avenue Properties and the SLAPS and SLAPS VPs, respectively.

APPENDIX G

WELL MAINTENANCE CHECKLISTS FOR THE ANNUAL GROUND-WATER MONITORING WELL INSPECTIONS CONDUCTED AT THE NORTH ST. LOUIS COUNTY SITES IN CALENDAR YEAR 2017

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CALENDAR YEAR 2017 WELL MAINTENANCE CHECKLISTS FOR THE HAZELWOOD INTERIM STORAGE SITE

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Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1215

Monitoring Well Station Identification: HISS-01 ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1225

Monitoring Well Station Identification: HISS-06A ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1220

Monitoring Well Station Identification: HISS-10 ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☒	☐	☐

Comments / Observations regarding this well.

Paint casing and bollards, clear brush, and re-label.

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1210

Monitoring Well Station Identification: HISS-11A ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1230

Monitoring Well Station Identification: HISS-17S ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☒	☐	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1205

Monitoring Well Station Identification: HISS-19S ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☐	☒
2.	Is well identification visible on top of well casing for flush mount well?	☐	☒	☐
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☐	☐	☒
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1240

Monitoring Well Station Identification: HW22 ☐SLAPS* ☐SLDS ☒HISS

	Question	Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☐	☒	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1245

Monitoring Well Station Identification: HW23 ☐SLAPS* ☐SLDS ☒HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☐	☒	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

WELL MAINTENANCE CHECKLISTS FOR CALENDAR YEAR 2017
THE ST. LOUIS AIRPORT SITE

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Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1003

Monitoring Well Station Identification: B53W01D ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1003

Monitoring Well Station Identification: B53W01S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0950

Monitoring Well Station Identification: B53W06S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☐	☒
2.	Is well identification visible on top of well casing for flush mount well?	☒	☐	☐
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0945

Monitoring Well Station Identification: B53W07D ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0950

Monitoring Well Station Identification: B53W07S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0940

Monitoring Well Station Identification: B53W09S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☒	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☒	☐	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 1000

Monitoring Well Station Identification: B53W13S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☒	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☐	☒	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☒	☐	☐

Comments / Observations regarding this well.

Addition of protective bollards recommended.

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0930

Monitoring Well Station Identification: B53W17S ☒SLAPS* ☐SLDS ☐HISS

#	Question	Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☒	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☒	☐	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1010

Monitoring Well Station Identification: B53W18S ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross   Date: 03/08/17   Time: 1040

Monitoring Well Station Identification: B53W19S   ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☐	☒
2.	Is well identification visible on top of well casing for flush mount well?	☐	☒	☐
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☐	☐	☒
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0900

Monitoring Well Station Identification: MW31-98 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0935

Monitoring Well Station Identification: MW32-98 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1035

Monitoring Well Station Identification: PW35 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☐	☒
2.	Is well identification visible on top of well casing for flush mount well?	☐	☒	☐
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☒	☐	☐
6.	Is the weep hole open? If not, clear blockage.	☐	☐	☒
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☒	☐	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☐	☒	☐
10.	Does the pad move or is it unstable?	☒	☐	☐
11.	Are there gaps between pad and well casing?	☒	☐	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☒	☐	☐

Comments / Observations regarding this well.

Well pad is cracked and needs replacement. Vault fills with water.

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1035

Monitoring Well Station Identification: PW36 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☐	☐	☒
2.	Is well identification visible on top of well casing for flush mount well?	☐	☒	☐
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☐	☐	☒
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☐	☒	☐
10.	Does the pad move or is it unstable?	☒	☐	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☐	☒	☐
18.	Are the locks rusted?	☒	☐	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☒	☐	☐

Comments / Observations regarding this well.

Well pad is loose and needs repair/replacement

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0935

Monitoring Well Station Identification: PW42 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/08/17 Time: 0940

Monitoring Well Station Identification: PW43 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1030

Monitoring Well Station Identification: PW44 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☐	☒	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☒	☐	☐
11.	Are there gaps between pad and well casing?	☒	☐	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross　Date: 03/07/17　Time: 1025

Monitoring Well Station Identification: PW45　☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☐	☒	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

Well Maintenance Checklist

Name of Observer(s): L. Hoover, N. Gross Date: 03/07/17 Time: 1015

Monitoring Well Station Identification: PW46 ☒SLAPS* ☐SLDS ☐HISS

		Yes	No	N/A
1.	Is well identification number visible on outer casing for a stick up well?	☒	☐	☐
2.	Is well identification visible on top of well casing for flush mount well?	☐	☐	☒
3.	Is well accessible?	☒	☐	☐
4.	Is well covered/surrounded by vegetation?	☐	☒	☐
5.	Is there standing water or debris inside well casing? If so, remove water.	☐	☒	☐
6.	Is the weep hole open? If not, clear blockage.	☒	☐	☐
7.	Is the protective casing dented, damaged, rusted, or covered in other matter (i.e., bird droppings)?	☐	☒	☐
8.	Is the riser casing dented or damaged?	☐	☒	☐
9.	Is the concrete pad intact (free of cracks, chips, etc.)?	☒	☐	☐
10.	Does the pad move or is it unstable?	☐	☒	☐
11.	Are there gaps between pad and well casing?	☐	☒	☐
12.	Are there signs of erosion around the well or pad?	☐	☒	☐
13.	Is riser cap present?	☒	☐	☐
14.	Do the wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☒	☐	☐
15.	Do the flush mount wells in the Mississippi River and Coldwater Creek floodplain have a properly working pressure cap?	☐	☐	☒
16.	Is the well secure (shut properly or locked, if applicable)?	☒	☐	☐
17.	Do the locks work properly?	☒	☐	☐
18.	Are the locks rusted?	☒	☐	☐
19.	Does surface water flow away from well casing (i.e., no ponding)?	☒	☐	☐
20.	Is TOC elevation mark clearly visible?	☒	☐	☐
21.	Has there been a change in land use that impacts the well? If yes, describe in comment section.	☐	☒	☐
22.	Will the well need any type of attention before the next groundwater surface measurement? If yes, describe in comment section.	☐	☒	☐

Comments / Observations regarding this well.

None

* - SLAPS and SLAPS Vicinity Properties (VPs)

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APPENDIX H

DOSE ASSESSMENT ASSUMPTIONS

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DOSE ASSESSMENT ASSUMPTIONS

DOSE FROM THE LATTY AVENUE PROPERTIES TO A MAXIMALLY EXPOSED INDIVIDUAL

Although RA did not occur on the Latty Avenue Properties in CY 2017, the TEDE to a hypothetical maximally exposed individual was calculated for an area adjacent to the VP-40A railroad tracks. No excavation or loadout activities were performed at the Latty Avenue Properties during CY 2017; therefore, dose from the remainder of the Latty Avenue Properties is considered negligible.

This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to work in an area directly adjacent to the railroad tracks on VP-40A near the fence on the boundary of VP-40A and Futura. No private residences are adjacent to the site. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A full-time-employee business receptor was considered the maximally exposed individual for VP-40A. The receptor could be either a railroad worker or a full-time employee who works outside on Futura.

The exposure scenario assumptions are:

- Exposure to radiation from all VP-40A sources occurs to the maximally exposed individual while working full-time outside at the receptor location facility situated approximately 75 m east from the area identified as having the highest external gamma level in the area adjacent to Futura. Exposure time is 2,000 hours per year (Leidos 2018e).
- Exposure from external gamma radiation was calculated using environmental TLD monitoring data at the perimeter between the source and the receptor. The site is assumed to represent a line-source to the receptor (Leidos 2018e).
- Exposure from Rn-222 (and progeny) was calculated using a dispersion factor and Rn-222 (ATD) monitoring data at the site perimeter between the source and the receptor (Leidos 2018e).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual working outside at the receptor facility 75 m east of the area adjacent to Futura identified as having the highest external gamma level would have received less than 0.1 mrem per year from external gamma, and 1.4 mrem per year from Rn-222, for a TEDE of 1.4 mrem per year (Leidos 2018e).

DOSE FROM THE ST. LOUIS AIRPORT SITE TO A MAXIMALLY EXPOSED INDIVIDUAL

A full-time-employee business receptor was evaluated to determine the maximally exposed individual from the SLAPS. The business receptor worked full time outside of the facility, located approximately 500 m west-southwest of the center of the SLAPS Loadout area. Exposure time was 2,000 hours per year (250 days per year).

Gamma radiation and radon exposure measured at the SLAPS perimeter assumes a hypothetical member of the public would be at the same location 24 hours per day, 365 days per year. Off-site dose to the nearest member of the public is dependent upon the member’s proximity to the gamma source and amount of time spent at the affected site. A more realistic approach to project dose is to evaluate members of the public as either residence-based or off-site-worker-based receptors. A residence-based, off-site exposure assumes a 100-percent occupancy rate at a given location. No public areas or residences exist near the SLAPS; therefore, exposure to a residence-based receptor is greatly reduced due to the distance relative to the site. An off-site-worker exposure assumes that a worker's occupancy rate is 23 percent, based on 40 hours per week for 50 weeks per year. The off-site-worker-based receptor is a more realistic choice to represent the hypothetical maximally exposed individual, because of the proximity of the receptor. A realistic assessment of dose can be performed using conservative assumptions of occupancy rate and distance from the source.

The following dose assessment is for a maximally exposed individual who works full time (2,000 hours per year) at a location approximately 500 m west-southwest of the center of the SLAPS Loadout area.

Airborne Radioactive Particulates

The EDE of less than 0.1 mrem per year to the receptor was calculated using activity fraction and air particulate monitoring data to determine a source term, and then using the USEPA CAP88-PC modeling code to calculate dose to the receptor at 770 m northeast of the center of the SLAPS Loadout area (Leidos 2018b). Details related to calculation of EDEs for the exposed receptors are presented in Appendix A of this EMDAR.

External Gamma Pathway

The SLAPS TLDs measured an average above background annual exposure of 11 mrem per year based on 8,760 hours of continuous exposure. The dose equivalent due to gamma exposure for the maximally exposed individual is estimated by assuming the site approximates a line source with a source strength (H_1) that is the average of the TLD measurements between the source and the receptor (Cember 1996).

$$H_1 = 11.5 \text{ mrem/year}$$

Based on a 100-percent occupancy rate, the exposure rate (H_2) to the receptor was calculated.

$$H_2 = H_1 \times \frac{h_1}{h_2} * \frac{\tan^{-1}(L/h_2)}{\tan^{-1}(L/h_1)}$$

$$H_2 = 2.3\text{E-03 mrem/year}$$

where:

H_2 = exposure rate to the receptor (continuous exposure)
H_1 = exposure rate to TLDs
h_2 = distance from source to receptor = 500 m
h_1 = distance from source to TLDs = 1.6 m
L = average distance from centerline of the line source (H_1) to the end of the line source = 50 m

The actual dose to the maximally exposed individual, who is present during a normal work year only, was calculated.

$$H_{MEI} = H_2 \times \frac{2{,}000 \text{ hours per work year}}{8{,}760 \text{ hours per total year}} = 5\text{E-04 mrem/year}$$

$$H_{MEI} = <0.1 \text{ mrem/year}$$

Airborne Radon Pathway

The SLAPS ATDs measured an average above background annual exposure of 0.03 pCi/L based on 8,760 hours of continuous exposure. Exposure to the receptor from radon (and progeny) was estimated using a dispersion factor (C_2) and the average ATD monitoring data (S_1) at the site perimeter between the source and the receptor (Leidos 2018b).

In order to calculate the dispersion factor, the radon concentrations were determined to a receptor located at 1.0 m and 500 m, southwest of the SLAPS by inputting a radon release rate of 1.0 Ci per year, the St. Louis – Lambert International Airport wind file, and a surface area of 460 m^2 into the CAP88-PC model. Effective surface area was determined by summing the time-weighted average annual open surface areas for the SLAPS Loadout. The CAP88-PC input data and the result of the CAP88-PC run are highlighted and presented in Appendix A. The radon dispersion factor (C_2) for the site was calculated as follows:

$$C_2 = (9.26E\text{-}05)/(4.32E\text{-}02) = 0.002$$

The average of ATD monitoring data (S_1) at the site perimeter (SLAPS Loadout area) was calculated as follows:

$$S_1 = 0.03 \text{ pCi/L}$$

The actual radon exposure dose to the hypothetical maximally exposed individual was calculated.

$$S_{MEI} = S_1 \times F \times DCF \times T \times C_1 \times C_2$$

S_{MEI} = 0.03 pCi/L*0.07 WL/pCi.L*1250 mrem/WLM*2000 hours/year*1 month/170 hours* 0.002

$$S_{MEI} = < 0.10 \text{ mrem/year}$$

where:

S_{MEI} = radon exposure to the hypothetical maximally exposed individual
S_1 = fenceline average of ATD measurements between source and receptor
F = equilibrium fraction based on Section 4 of *Measurement of Radon and Radon Daughters in Air,* 1.0 WL = 100 pCi/L and 0.7 outdoor equilibrium factor (NRCP 1988)
DCF = dose conversion factor (USEPA 1989b) = 1,250 mrem per working level month (WLM)
T = exposure time = 2,000 hours per year
C_1 = occupancy factor constant = 1 month per 170 hours
C_2 = constant derived using CAP88-PC Version 4.0, the Lambert – St. Louis International Airport wind file (assuming a distance of 500 m), and an impacted surface area of 460 m^2). Calculation assumes a 1.0 Ci per year radon release rate, then ratios the concentrations at 1.0 m and 500 m to determine the constant.
WL = working level (concentration unit)
WLM = working level month (exposure unit)

Total Effective Dose Equivalent

TEDE = CEDE (airborne particulates) + H_{MEI} (external gamma) + S_{MEI} (airborne radon)

TEDE = <0.1 mrem/year + <0.1 mrem/year + <0.1 mrem/year = < 0.1 mrem/year

DOSE FROM THE ST. LOUIS AIRPORT SITE VICINITY PROPERTIES TO A MAXIMALLY EXPOSED INDIVIDUAL

A full-time, residence-based receptor was evaluated to determine the maximally exposed individual from the SLAPS VPs, because the RA work conducted on the SLAPS VPs occurred in the vicinity of the receptor. The residence-based receptors lived full-time between the three areas remediated during 2017 at a location approximately 150 m northeast of the Duchesne Park excavation area, approximately 20 m south of the Palm Drive excavation area, and approximately 720 m northeast of the IA-09 Ballfields excavation area. Exposure time was 8,760 hours per year (365 days per year).

Gamma radiation and radon exposure were considered negligible at the excavation area. Therefore, only exposure to airborne radioactive particulates was considered in the dose estimate calculation.

Airborne Radioactive Particulates

The EDE of 5.4 mrem per year to the receptor was calculated using activity fraction and air particulate monitoring data to determine a source term, and then using the USEPA CAP88-PC modeling code to calculate dose to the receptor at 20 m south of the center of the Palm Drive excavation area (Leidos 2018b). The same process was followed to calculate a dose to the receptor from the other two excavation areas. Details related to calculation of EDEs for the exposed receptors are presented in Appendix A of this EMDAR.

Total Effective Dose Equivalent

$$\text{TEDE} = \text{CEDE (airborne particulates)} + H_{\text{MEI}} \text{ (external gamma)} + S_{\text{MEI}} \text{ (airborne radon)}$$

$$\text{TEDE} = 5.4 \text{ mrem/year} + 0 \text{ mrem/year} + 0 \text{ mrem/year} = 5.4 \text{ mrem/year}$$

DOSE FROM COLDWATER CREEK TO A MAXIMALLY EXPOSED INDIVIDUAL

The following dose assessment is for a maximally exposed individual assumed to be a youth (10-year-old child) who spends time at CWC for recreational purposes.

Contaminated Water Ingestion (Leidos 2018c)

The UCL_{95} values of the average contamination values measured in CWC surface water in CY 2017 at each monitoring station (Table H-1) were used to calculate the EDE to the receptor from an intake of contaminated water. Assumptions follow:

The receptor visits CWC as a recreational user once every 2 weeks (26 visits per year), and the receptor drinks 2 L per day of contaminated water from CWC during each visit (USEPA 1989c).

The TEDE due to ingestion of surface water ($TEDE_w$) was calculated.

$$\text{TEDE}_W = \Sigma\ (\text{TEDE}_{\text{Tot-U}}, \text{TEDE}_{\text{Th-228}}, \text{TEDE}_{\text{Th-230}}, \text{TEDE}_{\text{Th-232}}, \text{TEDE}_{\text{Ra-226}}, \text{TEDE}_{\text{Ra-228}})$$

$$TEDE_i = (\text{UCL}_{95}) \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times \text{DCF mrem/pCi}$$

Table H-1. UCL_{95} Values for Radionuclides for CY 2017

Radionuclides	UCL_{95} Concentration	Unit
Ra-226	1.20	pCi/L
Th-228	0.49	pCi/L
Th-230	0.54	pCi/L
Th-232	0.29	pCi/L
Total U	2.44	pCi/L

The DCFs (ORNL 2014) for radionuclides present in CWC surface water are presented in Table H-2.

Table H-2. Radionuclide Dose Conversion Factors for CY 2017

Radionuclides	DCF[a]	Unit
Ra-226	2.97E-03	mrem/pCi
Th-228	5.07E-04	mrem/pCi
Th-230	9.10E-04	mrem/pCi
Th-232	1.07E-03	mrem/pCi
Total U	2.63E-04	mrem/pCi

[a] For a youth (10-year-old child).

The USEPA software ProUCL, Version 5.0, software was used to determine the UCL_{95} values for radiological contaminants present in CWC (Leidos 2018c). The UCL_{95} values are presented in Table H-1.

Therefore:

$$TEDE_{Ra\text{-}226} = 1.20 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 2.97\text{E-}03 \text{ mrem/pCi}$$
$$= 1.85\text{E-}01 \text{ mrem/year}$$

$$TEDE_{Th\text{-}228} = 0.49 \text{ pCi/L} \times 2.0 \text{ L/ day} \times 26 \text{ days/year} \times 5.07\text{E-}04 \text{ mrem/pCi}$$
$$= 1.29\text{E-}02 \text{ mrem/year}$$

$$TEDE_{Th\text{-}230} = 0.54 \text{ pCi/L} \times 2.0 \text{ L/ day} \times 26 \text{ days/year} \times 9.10\text{E-}04\text{mrem/pCi}$$
$$= 2.56\text{E-}02 \text{ mrem/year}$$

$$TEDE_{Th\text{-}232} = 0.29 \text{ pCi/L} \times 2.0 \text{ L/ day} \times 26 \text{ days/year} \times 1.07\text{E-}3 \text{ mrem/pCi}$$
$$= 1.61\text{E-}02 \text{ mrem/year}$$

$$TEDE_{Tot\text{-}U} = 2.44 \text{ pCi/L} \times 2.0 \text{ L/ day} \times 26 \text{ days/year} \times 2.63\text{E-}04 \text{ mrem/pCi}$$
$$= 3.34\text{E-}02 \text{ mrem/year}$$

$$TEDE_W = 2.73\text{E-}01 \text{ mrem/year}$$

Contaminated Sediment Ingestion (Leidos 2107d)

The UCL_{95} values of the average contamination values measured in CWC sediment in CY 2017 at each monitoring station (Table H-3) were used to calculate the EDE to the receptor from an intake of contaminated sediment. Assumptions follow:

The receptor visits CWC as a recreational user once every 2 weeks (26 visits per year). The receptor ingests 50 mg per day of contaminated sediment from CWC during each visit (USEPA 1989c).

The TEDE due to ingestion of contaminated sediment ($TEDE_S$) was calculated.

$$TEDE_S = \Sigma\,(TEDE_{Tot\text{-}U}, TEDE_{Th\text{-}228}, TEDE_{Th\text{-}230}, TEDE_{Th\text{-}232}, TEDE_{Ra\text{-}226}, TEDE_{Ra\text{-}228})$$

$$TEDE_i = (UCL_{95})\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times \text{DCF mrem/pCi}$$

Table H-3. UCL_{95} Values for Radionuclide for CY 2017

Radionuclides	UCL_{95} Concentration	Unit
Ra-226	1.27	pCi/g
Ra-228	0.88	pCi/g
Th-228	1.27	pCi/g
Th-230	7.36	pCi/g
Th-232	1.14	pCi/g
Total U	2.71	pCi/g

The DCFs (ORNL 2014) for radionuclides present in CWC sediment are presented in Table H-4.

Table H-4. Radionuclide Dose Conversion Factors for CY 2017

Radionuclides	DCF[a]	Unit
Ra-226	2.97E-03	mrem/pCi
Ra-228	1.45E-02	mrem/pCi
Th-228	5.07E-04	mrem/pCi
Th-230	9.10E-04	mrem/pCi
Th-232	1.07E-03	mrem/pCi
Total U	2.63E-04	mrem/pCi

[a] For a youth (10-year-old child).

The USEPA ProUCL, Version 5.0, software was used to determine UCL_{95} values for radiological contaminants present in CWC sediment (Leidos 2018c). The UCL_{95} values are presented in Table H-3.

Therefore:

$$TEDE_{Ra\text{-}226} = 1.27\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 2.97\text{E-}03\ \text{mrem/pCi} = 4.90\text{E-}03\ \text{mrem/year}$$

$$TEDE_{Ra\text{-}228} = 0.88\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 1.45\text{E-}02\ \text{mrem/pCi} = 1.66\text{E-}02\ \text{mrem/year}$$

$$TEDE_{Th\text{-}228} = 1.27\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 5.07\text{E-}04\ \text{mrem/pCi} = 8.37\text{E-}04\ \text{mrem/year}$$

$$TEDE_{Th\text{-}230} = 7.36\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 9.10\text{E-}04\ \text{mrem/pCi} = 8.71\text{E-}03\ \text{mrem/year}$$

$$TEDE_{Th\text{-}232} = 1.14\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 1.07\text{E-}3\ \text{mrem/pCi} = 1.59\text{E-}03\ \text{mrem/year}$$

$$TEDE_{Tot\text{-}U} = 2.71\ \text{pCi/g} \times 0.05\ \text{g/day} \times 26\ \text{days/year} \times 2.63\text{E-}4\ \text{mrem/pCi} = 9.27\text{E-}04\ \text{mrem/year}$$

$$TEDE_S = 3.36\text{E-}02\ \text{mrem/year}$$

Total Effective Dose Equivalent

$$TEDE = TEDE_W + TEDE_S$$

$$TEDE = 2.73\text{E-}01\ \text{mrem/year} + 3.36\text{E-}02\ \text{mrem/year} = 0.3\ \text{mrem/year}$$