



**US Army Corps
of Engineers®**
Buffalo District
BUILDING STRONG®

**Site Inspection of the Lewiston-Porter
School District Property
Former Lake Ontario Ordnance Works (LOOW)
Niagara County, New York**

May 2011
Formerly Utilized Sites Remedial Action Program

Table of Contents

1.0	Introduction	1
1.1	Background	2
1.1.1	Southwest Drainage Ditch.....	2
1.1.2	Mound on Lew-Port School Property	3
2.0	Investigation Activities	5
2.1	Field Sampling and Screening	5
2.1.1	Southwest Drainage Ditch.....	5
2.1.2	Mound on Lew-Port School Property	6
2.2	Analytical Testing	10
2.3	Data Comparison Methods	12
3.0	Investigation Results	14
3.1	Radiological Screening Results.....	14
3.2	Southwest Drainage Ditch.....	14
3.2.1	Field Observations	14
3.2.2	Screening and Analytical Results	15
3.3	Mound on Lew-Port School Property	17
3.3.1	Field Observations and Screening Results	17
3.1	Analytical Results	19
4.0	Interpretation of Results	22
5.0	References	23

TABLES

Table 1 Analytical Parameters for Analysis for SWDD and Mound Soil

Table 2 SWDD Water Quality Measurements

Table 3 SWDD Subsurface Soil Results

Table 4 SB1 Count Rates

Table 5 SB2 Count Rates

Table 6 Soil Boring 1 and 2 Analytical Results

FIGURES

Figure 1 Map Showing Mound on Lewiston-Porter Property and SWDD Sampling Locations

Figure 2 Down-Hole Gamma Survey Measurements from Soil Boring 1 and 2

MAPS

Map 1 Location of Lewiston-Porter Central School District in Relation to LOOW and NFSS

PHOTOGRAPHS

Photo 1 Mound on Lew-Port School Property, East of Soccer Field

Photo 2 Rock showing a Gamma Survey Count Rate of 18,282 CPM

Photo 3 Advancing Hand Auger at Soil Boring 1 to a Depth of 4 ft

Photo 4 Soil Removed from Boring Before Being Placed into Sample Container

Photo 5 Soil Boring 1 after Soil Was Removed

Photo 6 Lowering Sodium Iodide (NaI) Detector into Soil Boring 1

Photo 7 Background Measurement in Lew-Port Soccer Field

Photo 8 Gamma Survey Measurement of Bagged Rocks

APPENDICES

Appendix A - South West Drainage Ditch Sampling

Table A1	Samples collected along the South West Drainage Ditch
Table A2	Legend for Table A3 through A11
Table A3	SB01 and SB02 Sediment (0.0-0.5)
Table A4	SB03 and SB04 Sediment (0.0-0.5)
Table A5	SB05 and SB06 Sediment (0.0-0.5)
Table A6	SB01 and SB02 Sediment (0.5 – 1.0)
Table A7	SB03 and SB04 Sediment (0.5 – 1.0)
Table A8	SB05 and SB06 Sediment (0.5 – 1.0)
Table A9	SB01 and SB02 Subsurface Soil
Table A10	SB03 and SB04 Subsurface Soil
Table A11	SB05 and SB06 Subsurface Soil
Table A12	Legend for tables A13 and 14
Table A13-1 through A13-6	SWDD Unfiltered Surface Water Sample Results
Table A14-1 through A14-6	SWDD Filtered Surface Water Sample Results
Table A15 and A16	RESRAD Biota Output
Attachment A1	Location information for SWDD Sampling

Appendix B - Mound East of Lew-Port Soccer Field Sampling

Table B1	Soil Boring 1 (0.0 – 0.5)
Table B2	Soil Boring 1 (0.5 – 1.0)
Table B3	Soil Boring 1 (3.5 – 4.0)
Table B4	Soil Boring 2 (0.0 – 0.5)
Table B5	Soil Boring 2 (0.5 – 1.0)
Table B6	Soil Boring 2 (2.0 – 2.5)
Table B7	Rock Sample Results
Attachment B1 and B2	Soil Boring 1 and 2 Geologist Logs

LIST OF ACRONYMS

AEC	Atomic Energy Commission
ASTM	American Society for Testing and Materials
BCGs	Biota Concentration Guidelines
bgs	Below Ground Surface
BTV	Background Threshold Value
cpm	Counts Per Minute
DBSL	Dose-Based Screening Level
DERP	Defense Environmental Restoration Program
DO	Dissolved Oxygen
DoD-ELAP	Department of Defense Environmental Laboratory Accreditation Program
DOE	United States Department of Energy
EA	EA Engineering, Science, and Technology, Inc.
Eh	Specific Conductance
EPA	United States Environmental Protection Agency
ERT	Earth Resources Technology, Inc.
FUDS	Formerly Used Defense Sites
FURSRAP	Formerly Utilized Sites Remedial Action Program
GFPC	Gas Flow Proportional Counter
GWS	Gamma Walkover Survey
LOOW	Lake Ontario Ordinance Works
LPCSD	Lewiston-Porter Central School District
MCL	Maximum Contaminant Level
MED/AEC	Manhattan Engineer District
μR	Microroentgens
mg	Milligram
MS	Matrix Spike
MSD	Matrix Spike Duplicate
mV	Millivolt
NaI	Sodium Iodide
NTU	Nephelometric Turbidity Units
NFSS	Niagara Falls Storage Site
NRC	United States Nuclear Regulatory Commission
ORP	Oxidation-Reduction Potential
pCi/g	Pico Curies Per Gram
pCi/L	Pico Curies Per Liter
RI	Remedial Investigation
SB01	Soil Boring 1
SB02	Soil Boring 2
SWDD	South West Drainage Ditch
USACE	United States Army Corps of Engineers
UTL	95% Upper Tolerance Unit
UULs	Underground Utility Lines
WWTP	Waste Water Treatment Plant

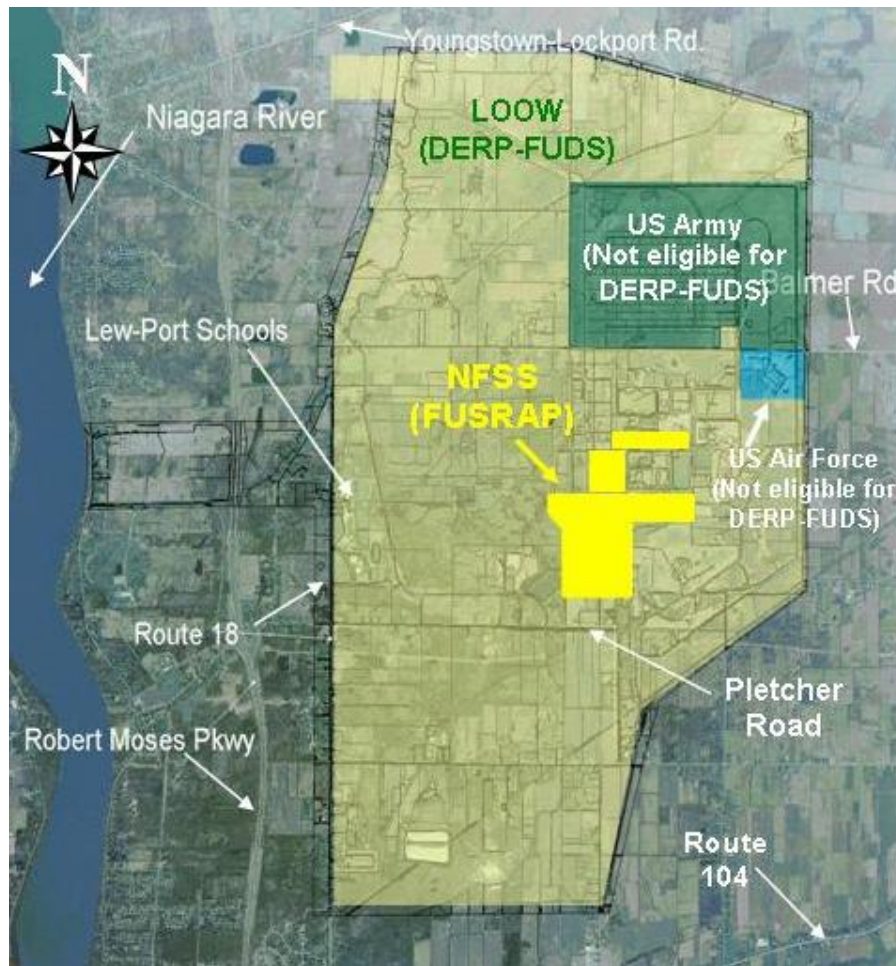
1.0 Introduction

A Site Inspection (SI) was performed by the United States Army Corps of Engineers (USACE), of the Lewiston-Porter School District following the process outlined in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). The purpose of this assessment was to collect and analyze environmental samples for radiological constituents related to Manhattan Engineer District (MED) activities and to determine the need for further action by USACE, under the Formerly Utilized Sites Remedial Action Program (FUSRAP), to ensure the protection of human health and the environment.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to address radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during development of the atomic weapons in the 1940s and 1950s.

The Lake Ontario Ordnance Works (LOOW) was used by the War Department in the 1940s to manufacture trinitrotoluene (TNT) in support of World War II. In July 1943, the War Department stopped production at LOOW due to an oversupply of TNT. In 1944, the MED began using the site for storage of radioactive residues that resulted from the processing of uranium ores during the development of atomic weapons.

The Niagara Falls Storage Site (NFSS) is located at 1397 Pletcher Road in the Township of Lewiston, New York, less than two miles east of the Lewiston-Porter Central School District (LPCSD) property. The NFSS is being investigated by the United States Army Corps of Engineers (USACE) under FUSRAP since the site has been used to store radioactive residues that resulted from the processing of uranium ores during the development of the atomic bomb. The NFSS is a 191-acre, Federally owned portion of the former 7,500 acre LOOW. Map 1 shows the location of LOOW and NFSS in relation to areas of Lewiston including the LPCSD property.



Map 1 – Location of Lewiston-Porter Central School District in relation to LOOW and NFSS

1.1 Background

This report covers two sampling events which took place on the LPCSD property, in August 2010, to determine the potential for impacts from past FUSRAP activities. One portion of the report covers sampling along the south west drainage ditch at locations behind the LPCSD property and the second focus of this report will discuss sampling of mounded material located east of the soccer field on LPCSD property. Sample locations were targeted (biased) towards areas most likely to be impacted based on previous site investigations, aerial photographs, or topography (drainage).

1.1.1 Southwest Drainage Ditch

Underground utility lines (UULs) were constructed in 1942 to support the TNT processing at the former LOOW. The UULs include, but are not limited to, acid waste, sanitary sewer, storm sewer, TNT waste, chemical waste, water, and fire suppression lines, and associated drains, pits, and sumps. During a multi-phase remedial investigation (RI) of the NFSS, radioactivity above background was measured in sediment and water in sanitary sewer and acid waste lines on the NFSS (USACE, 2007b).

UULs on the NFSS property extend north to a former LOOW wastewater treatment plant (WWTP) and subsequently to a 30-inch outfall that terminates at the Niagara River. The 30-inch outfall traverses a portion of the Southwest Drainage Ditch (SWDD) and the LPCSD property. The sanitary sewer and acid

waste lines on the northern boundary of the NFSS were grouted, in 2006, to prevent potential transport of radiological contamination off-site.

Under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), these UULs were investigated for potential DOD impacts (USACE, 2008). As part of this effort, split samples were obtained and analyzed under FUSRAP for radiological constituents.

Between August and October of 2006, USACE collected 60 samples for radiological analysis from 27 locations from within or adjacent to UULs on the former LOOW north and west of NFSS. Fifty-five samples consisted of sludge and wastewater within the lines and soil below the lines, including the 30-inch outfall. Co-located surface water, sediment and soil samples were collected beneath the 30-inch outfall line at a point where it traverses the SWDD on the LPCSD property. One sediment sample was also collected within a sludge bed on the former LOOW WWTP. All samples were analyzed for radiological constituents including isotopic uranium, isotopic thorium, radium-226, radium-228, and cesium-137.

Results of the UULs sampling and analysis indicated that uranium was detected above background in soil at three of the 27 locations and in wastewater at five of 18 locations. Uranium, radium, cesium, lead, and thorium were detected above background in sediment at 13 of 15 locations. A majority of the background exceedances were located in acid waste and sanitary sewer lines extending from NFSS and samples collected within the former LOOW WWTP. The collocated surface water, sediment and soil sample collected beneath the 30-inch outfall line at the SWDD did not contain radionuclides above background levels (USACE, 2007a).

USACE Buffalo District collected collocated filtered and unfiltered surface water, sediment, surface soil, and subsurface soil samples at six locations along the SWDD, shown in Figure 1, on the LPCSD property in August 2010 for radiological analysis.

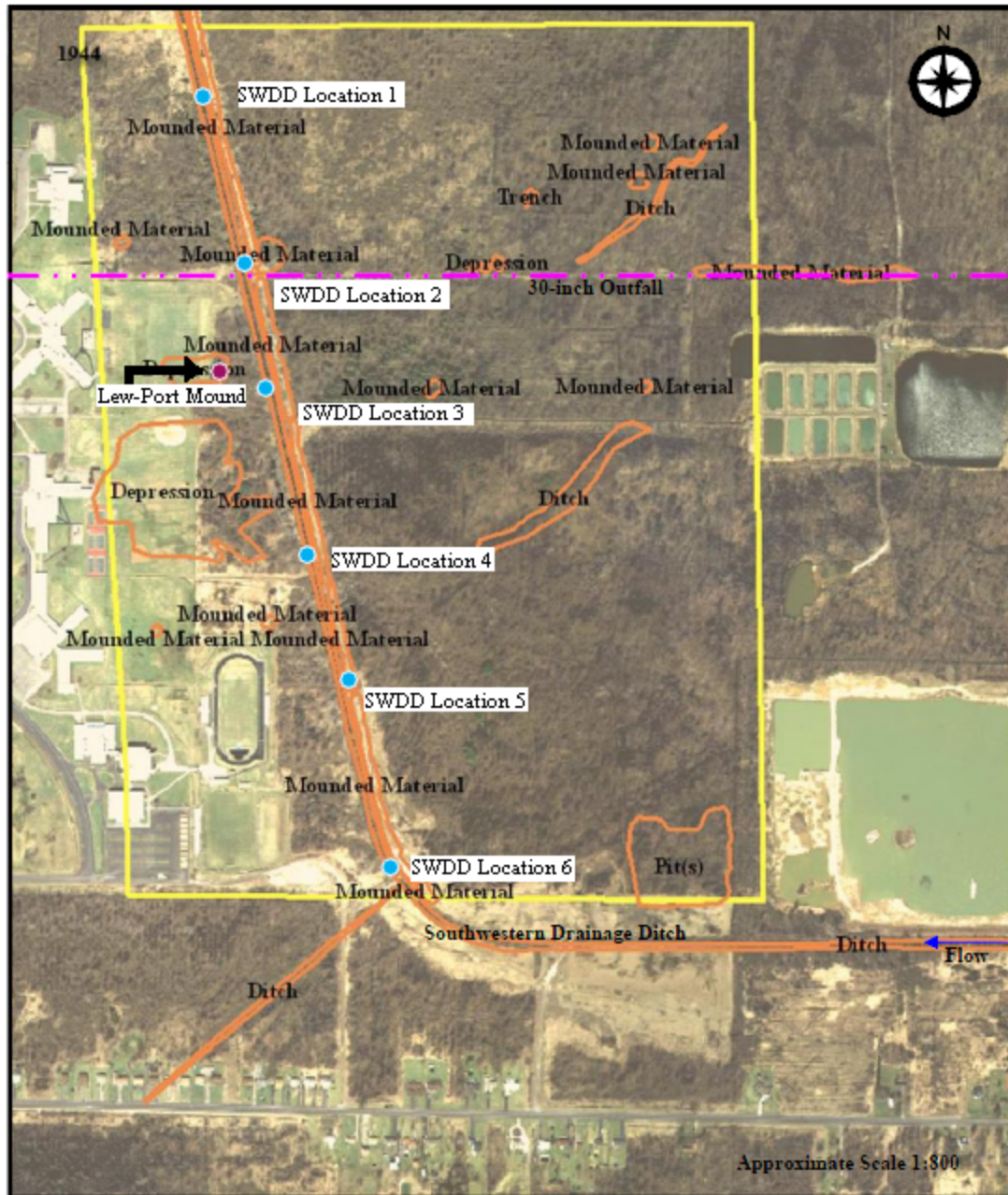
1.1.2 Mound on LPCSD Property

In December of 2001, in support of RI activities at the NFSS, a gamma walkover survey (GWS) was conducted on the LPCSD property to establish a background, or non-MED/AEC impacted, gamma walkover dataset for comparison with NFSS gamma walkover results. The results documenting this background investigation are provided in the *Final Gamma Walkover Survey Report* (USACE, 2002a).

During the 2001 GWS of the LPCSD property, mounded debris were located in a wooded area east of the soccer field (identified as Anomaly D in the report) that contained rocks with potentially natural radioactivity up to 38,222 counts per minute (cpm). The coordinate for this location is x = 315145.22533m; y=357635.833361m or Latitude - 43.2194; Longitude - 79.0123. Figure 1 shows the location of "Anomaly D", labeled with a pink color, as shown in the 2002 report.

The 2002 report resulted in a representative background gamma walkover dataset which could be used for comparison to gamma scanning results obtained on the NFSS. Regardless of the source of activity, none of the areas surveyed during the course of the background study demonstrated radiation levels that would present a hazard to members of the public. Although the survey identified rocks likely containing elevated natural radioactivity (as opposed to a result of former MED/AEC activity), USACE collected three co-located debris and soil samples and a collection of rocks from this area during the August 2010 sampling event for radiological analysis.

Lew-Port School Sampling Locations (FUSRAP)



LEGEND

- Gamma Walkover Survey Anomaly Sampling Location (Soil Sampling; Full Suite Radiological Analysis)
- SWDD Sampling Location (Surface Water, Sediment, and Subsurface Soil Sampling; Full Suite Radiological Analysis)
- Aerial Anomaly – 1944

Figure 1 – Map Showing Mound on LPCSD Property and SWDD Sampling Locations

2.0 Investigation Activities

This section covers sample collection and sampling activities as well as an explanation of the screening criteria used to compare to analytical results.

2.1 Field Sampling and Screening

2.1.1 Southwest Drainage Ditch

Samples were collected from the SWDD to determine whether elevated radiological constituents were present in surface water, sediment, and subsurface soil on the LPCSD property. Field sampling and testing was performed concurrent with an investigation that evaluated the potential for chemical impacts attributed to previous government activities at LOOW. This concurrent investigation was performed under the DERP-FUDS program. The scope of the FUDS investigation was documented in the *Field Sampling Addendum for Occidental Chemical Corporation Property Data Gap and Lewiston-Porter Central School District Investigations at the Former LOOW (August, 2010b)*. Sample collection methods, field observations and measurements, and analytical results associated with the FUDS investigation are documented in the *Report for Lewiston-Porter Central School District Investigation at the Former LOOW (USACE, 2011)*.

The scope of the FUSRAP investigation was documented in the Investigation of the Lewiston-Porter Central School District Property Field Sampling Plan and presented to the Lewiston-Porter Central School District Board on June 15, 2010 and to the public on June 23, 2010.

USACE personnel along with subcontractors Earth Resources Technology, Inc. (ERT) and EA Engineering, Science, and Technology, Inc. (EA) conducted sampling along the SWDD on August 25 and 26, 2010.

Surface water, sediment and sub-surface soil samples were collected along the SWDD from six discrete locations as shown on Figure 1. Samples were collected from the most down-gradient location (north) to the most up-gradient location (south) along the SWDD. The upgradient location was selected to evaluate water, sediment, and soil from the point where the SWDD enters the LPCSD property. The down-gradient location was selected to evaluate water, sediment, and soil from a point where the SWDD exits the LPCSD property. The remaining four sample locations were evenly distributed along the length of the SWDD as it traverses the LPCSD property, except SWDD Location 2 which was moved (south) to the point where the 30-inch outfall crosses the SWDD.

Six surface water samples were collected from six discrete locations within the SWDD (Figure 1) by directly immersing sample containers into the water. Sample collection began at the furthest downstream location and progressed sequentially to the adjacent upstream location. Dedicated unpreserved sample containers were utilized to transfer aliquots to pre-preserved sample containers. Each surface water sample was collected away from the shoreline in an undisturbed area facing upstream. A portion of each surface water sample was filtered at the laboratory and was analyzed for the same parameters listed in Table 1 to address the influence of dissolved solids in the water.

Water quality parameters were also measured during the field work using a calibrated water quality meter. Field measurements included temperature, pH, turbidity, conductivity, oxidation-reduction potential (ORP), specific conductance (Eh) and dissolved oxygen (DO). Field measurements are provided in Section 3.1.1.

Additionally, at each of the six discrete locations within the SWDD two sediment and one sub-surface soil sample was collected (one sediment sample between 0-6 inches, one sediment sample between 6-12 inches and a third sub-surface soil sample in the interval of 12 inches to a maximum depth of 3 feet). The samples were analyzed for the same laboratory analysis detailed as surface water (listed in Table 1). A disposable acetate liner or pre-cleaned hand auger was used to collect each SWDD sediment and soil sample. The first foot of material in the SWDD was classified as sediment by field work personnel and the material below the first foot was classified as sub-surface soil. The boring logs are located at the end of Appendix A.

Additional quality control sample volumes were collected at select locations to verify field collection methods, laboratory analytical methods and ensure sample chain of custody integrity. Quality control samples collected included matrix spike (MS), matrix spike duplicate (MSD) and field duplicates (for each sample matrix) to ensure project data quality objectives were met. A description of samples collected at each location is presented in Appendix A.

Analytical results of SWDD sampling are presented in section 3.1.2.

2.1.2 Mound on LPCSD Property

In addition to sampling surface water, sediment, and subsurface soil in the SWDD, additional soil sampling was conducted to investigate mounded material (previously named Anomaly D), where elevated readings were encountered during the NFSS background GWS, documented in *Final Gamma Walkover Survey Report, Lewiston-Porter School Property, Youngstown, New York, U.S. Army Corps of Engineers Buffalo District, February 6, 2002*.

The mound of debris located at the LPCSD property is comprised of fine textured soils (silt and clay) and rocks that encompass an area of approximately 20 ft x 30 ft and reach a maximum height of approximately 4 ft. Photograph 1 shows the area of mounded material. USACE personnel performed a GWS to verify elevated readings encountered during the background gamma walkover survey and collected samples at the two locations exhibiting the highest instrument readings.



Photo 1 – Mounded Material on LPCSD property, east of soccer field

Based on the historical GWS and the new GWS, the two locations with the highest radiological detector measurements were selected for soil boring advancement. These two locations were called Soil Boring 1 and Soil Boring 2 with surface count rates of 45,000 cpm and 43,000 cpm respectively, which were consistent with historical count rates identified in 2002.

The two soil borings were advanced using a hand auger, which removed soil at six-inch intervals. Recovered soil samples were logged by a geologist and scanned with the GWS instrument. Each boring was terminated at the interface of the mounded soil/rocks and the native ground surface. Soil Boring 1 was advanced to a depth of 4 ft and Soil Boring 2 was advanced to a depth of 2.5 ft below ground surface (bgs), which refers to the depth below the surface of the mound.



Photo 2 – Rock showing a gamma survey count rate of 18,282 cpm



Photo 3 - Advancing hand auger at Soil Boring 1 to a depth of four feet



Photo 4 – Soil removed from boring before being placed into sample container



Photo 5 - Soil Boring 1 after soil was removed. Notice the rocks lined around the hole extending down approximately two feet. Rocks were encountered in every six-inch lift through the mound until reaching native soil.

Upon reaching native soil in each borehole, a downhole gamma scan was performed to measure the count rate as a Sodium Iodide detector was lowered in 6-inch increments down the borehole. The measurements were recorded on soil boring logs to identify trends in count rate versus depth below grade and in relation to the material encountered in the mound.



Photo 6 – Lowering Sodium Iodide (NaI) detector into Soil Boring 1 to determine count rates at depth

Soil boring logs were generated for each soil boring. American Society for Testing and Materials (ASTM) Method D2488-06 (Standard Practice for Description and Identification of Soils) was followed to describe the consistency, moisture content, color, etc. of the soil borings. Soil boring logs also include all radionuclide scan measurements for each six-inch sampling interval as well as the down-hole measurements. The soil boring logs are located in Appendix B.

The field sampling plan specified the collection of two soil samples for laboratory analysis from each soil boring as follows: one surface soil sample (0-0.5 ft bgs) and one subsurface soil sample. The depths of the collected subsurface soil sample were to be based on a six-inch interval exhibiting the highest radiological detector reading. Based on field observations, it was determined to collect three soil samples from each borehole from the following locations:

- The top six inches,
- The interval having the highest count rate, and
- The bottom of the boring.

Analytical results for the soil mound are located in Section 3.2.2.

2.2 Analytical Testing

Each sample matrix from the SWDD and the mounded material was analyzed for radiological constituents listed in Table 1 by a Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP) certified environmental analytical laboratory. The data also underwent data validation, by USACE, to verify the data quality prior to further evaluation. These analytical parameters were used for water, sediment and subsurface soil in the SWDD as well as soil and rocks in the mounded material.

Table 1– Analytical Parameters for Analysis of Mound Soil

Analytical Parameters (Each Sample)	Test Method	Minimum Detection Limit (pCi/g or pCi/L)
Radium 226	EPA 903 Mod-Lucas Cell/Emanation/GFPC	1.0
Radium 228	EPA 904 Mod-GFPC	1.0
Gross Alpha	GFPC	2.0 (aqueous)/0.5 (solid)
Gross Beta	GFPC	4.0 (aqueous)/1.0 (solid)
Gamma Spectroscopy	Gamma Spectroscopy - HASL 300	0.1 (Cesium 137)
Strontium 90	EPA 905.0 Mod	2.0
Isotopic Plutonium	Alpha Spectroscopy - HASL 300	1.0
Isotopic Uranium	Alpha Spectroscopy - HASL 300	0.5
Isotopic Thorium	Alpha Spectroscopy - HASL 300	0.5

Note:

EPA - [United State] Environmental Protection Agency

GFPC - Gas Flow Proportional Counter

pCi/g - Pico Curies Per Gram

pCi/L - Pico Curies Per Liter

Once laboratory data was received it underwent USACE data validation. The LPCSD sampling event consisted of twenty four (24) soil/sediment samples, one (1) rock sample and twelve (12) surface water samples (6-unfiltered and 6-filtered) were collected. The samples collected from the LPCSD mound were submitted to Outreach Laboratory (DOD ELAP Accredited) and analyzed for:

- Isotopic Thorium [Thorium (Th)-228, Th-230, and Th-232] by alpha spectroscopy (LANL ER 200 Modified]
- Isotopic Uranium [(Uranium (U)-234, U-235, and U-238) by alpha spectroscopy (ASTM 3972/DOE U-02)
- Radium-226 [(Ra-226) by alpha spectroscopy (SM7500Ra (M))]
- Radium-228 [(Ra-228) by gas proportional counting (Environmental Protection Agency (EPA) EPA 904/SW9320)]
- Isotopic Plutonium [(Plutonium (Pu) -238 and Pu-239/240) by alpha spectroscopy (LANL ER 160)]
- Strontium [(Strontium -90) by gas proportional counting (EPA 905)]
- Cesium [(Cesium -137 by gamma spectroscopy (EPA 901.1 and DOE Ga-01-R)]
- Gross Alpha/Beta [by a gas flow proportional counter (GFPC) (EPA900 and EPA SW-846 9310)]

A data qualification was performed to assess the quality of the soil and water sampling results. These assessments was to demonstrate whether environmental data generated are appropriate for their intended purpose, are technically defensible, and are of known and acceptable precision and accuracy.

Analytical data generated by the offsite lab has undergone a process of data verification and review. The analytical data was qualified by utilizing the guidance presented in MARLAP (NUREG-1576) guidance where practicable and in USACE Kansas City and St. Louis District Radionuclide Data Quality Evaluation Guidance for Alpha and Gamma Spectroscopy (USACE, 2002).

Data as presented has been qualified as usable. Those estimated values are qualified "J." Several samples for Ra-228 (soils) were rejected, qualified "R," due to method blank contamination. Non-detect parameters are qualified "U."

2.3 Data Comparison Methods

Analytical results from the samples were compared to project-specific human health and ecological risk-based screening levels. Screening levels are conservatively selected values used to identify areas of a site which may require further attention or evaluation. Results which are lower than screening levels would not pose a risk to human health or the environment. Screening levels are not cleanup standards and do not represent action levels that trigger remedial action.

SWDD Surface Water Screening Values

All surface water analytical results were compared to the following screening values:

1) Background Threshold Value

The surface water results from the SWDD were compared to background surface water criteria developed for the NFSS RI (USACE, 2007c). Those surface water samples were obtained from ditches upgradient of NFSS. The NFSS background screening criteria values are defined to be the lesser of the 95% upper tolerance limit (UTL) or the maximum value in the background dataset. This is identified as the Background Threshold Value (BTV). There are two sets of BTV for surface water; one set for filtered surface water (measuring constituents in the dissolved phase) and another set for unfiltered surface water (measuring constituents in the total aqueous phase, which includes suspended solids). An exceedance of a BTV by itself does not indicate an impact to human health or the environment; results which are greater than the BTV are also compared to values which are protective of human health and the environment. All data are provided in Appendix A.

2) Screening values for protection of human health

Surface water results were compared to federal drinking water standards. In 1974, Congress passed the Safe Drinking Water Act to protect the safety of public drinking water. This law requires the United States Environmental Protection Agency (USEPA) to determine the maximum contaminant level (MCL) of various contaminants in drinking water at which no adverse health effects are likely to occur. Using the drinking water standards as a screening value is conservative because the SWDD is not a source of drinking water.

3) Screening for protection of the environment (ecological protection)

The radionuclide concentrations measured in both surface water and also sediment were compared to generic Biota Concentration Guidelines (BCG). These Biota Concentration Guidelines were developed by the DOE as part of their *Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (DOE, 2002). They are used to evaluate whether or not populations of aquatic animals, terrestrial plants, and/or terrestrial animals have the potential to receive radiological doses in excess of acceptable limits due to exposure to radiation in the environment. Appendix A (Table A15 and A16) shows the generic BCGs, one screening criteria used to compare surface water and sediment concentrations as it applies to dose to aquatic life. The limiting organism value was used when screening against laboratory results.

SWDD Sediment and Sub Surface Soil Samples

All sediment and subsurface soil analytical results collected in the SWDD were compared to the following screening values:

1) Background Threshold Value

The sediment BTVs for surface water were calculated by using the RI sediment data from the NFSS database (USACE 2007c). These sediment samples were obtained from ditches upgradient of NFSS. The results from the sediment samples collected in the SWDD were compared to sediment BTVs and presented in Appendix A.

2) Screening values for protection of human health

Sediment and soil analytical results from the SWDD were compared to surface soil screening levels which would allow a United States Nuclear Regulatory Commission (NRC) licensed site to be decommissioned since they would result in less than a 25 mrem/year radiological dose to a member of the public using the site for any purposes, including farming. Although the NFSS is not an NRC licensed site, these screening values are considered appropriately protective of human health. These screening values are found in the NRC document NUREG-1757 (NRC 2006). NUREG-1757 provides guidance on compliance with radiological criteria for NRC license termination in 10 Code of Federal Regulations (CFR) 20, Subpart E. These surface soil screening values were developed by the NRC in order to streamline the decommissioning process. The use of these screening values are overly protective to human health because actual exposures to sediment and soil on LPCSD property would be much lower than the intense and chronic exposure assumed in developing these screening values. Since these screening values are applied in addition to background (i.e. do not include background concentrations), average background levels from NFSS RI background sampling were added to these values for comparative purposes. In other words, average background levels were added to the dose-based screening values before comparing to sediment, surface soil or subsurface soil results from the SWDD. All results are presented in Appendix A.

NUREG-1757 concentrations are listed as the following:

Analysis	Dose-Based Screening Level (pCi/g)
Gross Alpha	N/A
Gross Beta	N/A
Cesium-137	11.0
Plutonium-238	2.5
Plutonium-239/240	2.9
Radium-228	N/A
Radium-226	0.7
Strontium-90	1.7
Thorium-228	4.7
Thorium-230	1.8
Thorium-232	1.1
Uranium-234	13.0
Uranium-235	8.0
Uranium-238	14.0

Average backgrounds were calculated for sediment from the NFSS RI data set and added to the Dose-Based Screen Level (DBSL) values for comparison.

3) Screening for protection of the environment (ecological protection)

The maximum radionuclide concentration found in sediment or subsurface soil was compared to sediment BCGs for protection of ecological receptors in an aquatic (or riparian) setting (DOE 2002).

Mound: Soil and Rock Samples

1) Background Threshold Value

The BTV was determined using the soil background data set from the NFSS RIR (USACE 2007c). The NFSS background screening criteria values are defined to be the lesser of the 95% upper tolerance limit (UTL) or the maximum value in the background dataset. This is identified as the Background Threshold Value (BTV). The results from both the soil and rocks collected from the soil mound were compared to the soil BTVs. All results are presented in Appendix A.

2) Screening values for protection of human health

The analytical results of the soil and rocks collected from the soil mound were compared to the surface soil screening values described in the section above regarding SWDD sediment and subsurface soil. An average background concentration was added to this dose-based screening level, as the dose limit is incremental to (above) background (ambient) dose levels. All results and a complete comparison to screening levels are presented in Appendix A.

3.0 Investigation Results

3.1 Radiological Screening Results

Radiological screening was conducted for all samples collected. In accordance to health and safety procedures, sample areas and brush were screened for radiological constituents (general area dose rate) using field instrumentation (Bicron MicroRem dose rate meter). In addition, each sample cooler was screened prior to shipment (for dose rate and direct count). None of the sample coolers exhibited radioactivity greater than the established background levels prior to shipment (7.7 $\mu\text{R/hr}$ and 8,000 cpm).

3.2 Southwest Drainage Ditch

3.2.1 Field Observations

Water quality parameters were measured using a calibrated meter at each location. The results are as presented in Table 2, below.

Table 2 – SWDD Water Quality Measurements

Sample Location	Sample Date Time	Temp (F) ¹	Specific Conductivity (uS/cm) ²	pH	ORP (mV) ³	DO (mg/L) ⁴	Turbidity (NTU) ⁵
SWDD-SW01	25 August 2010 2:08PM	78.90	1.33	7.50	147.00	10.31	382.00
SWDD-SW02	26 August 2010 8:20AM	67.20	1.60	7.51	170.00	4.75	24.30
SWDD-SW03	26 August 2010 11:05AM	69.10	1.66	7.34	174.00	5.14	14.00
SWDD-SW04	26 August 2010 11:20AM	70.50	1.62	8.05	142.00	9.04	13.20
SWDD-SW05	26 August 2010 2:40PM	81.10	1.62	7.97	152.00	7.85	11.00
SWDD-SW06	26 August 2010 3:15PM	78.80	1.60	8.19	131.00	8.70	51.40

Footnotes:

1. Fahrenheit (F)
2. Microsiemens per centimeter (uS/cm)
3. Millivolts (mV)
4. Milligrams per liter (mg/L)
5. Nephelometric Turbidity Units (NTU)

Radiological results from surface water, sediment, and subsurface soil were compared against the screening criteria described in Section 2.0.

3.2.2 Screening and Analytical Results

Only results which exceed both the background threshold value and a human health or ecological risk-based value are highlighted in the summary tables in this section of the report. Full comparison results from the SWDD sampling are presented in Appendix A, and full comparison of results from the mound are presented in Appendix B. A summary of the screening comparison is presented here.

Surface Water Screening Results

1) Background screening results

The complete comparison to background threshold criteria are presented in Appendix A. As seen in Tables A13, thorium-228, thorium-232, and uranium -235 were slightly above their respective BTVs in three of the unfiltered surface water samples. In addition, gross beta, thorium-230, thorium-232, uranium-234, and uranium-235 were also above the surface water BTV in one or more of the filtered surface water samples (Table A14). These slight exceedances of the BTV do not necessarily indicate any impact to the surface water from FUSRAP-related activities, as none of the constituents which exceeded the BTVs also exceeded screening values protective of human health and the environment.

2) Human health screening results

No surface water samples collected in August 2010 in the SWDD exceeded Federal drinking water MCL's, indicating that the water does not contain radionuclides at levels that would be harmful in drinking water. A complete comparison to MCLs is presented in Tables A13 and A14.

3) Ecological screening results

No surface water samples collected at the SWDD exceeded BCGs for aquatic or riparian life. This indicates that radionuclides are not present in surface water at levels that would harm ecological receptors such as raccoons, fish, or other wildlife which may be present in, or use, the ditch. The RESRAD BIOTA (a software program developed to assist in evaluating biota exposure to radiation) output is listed in Appendix A, Tables A15 and A16.

Sediment and Subsurface Soil Screening Results

1) Background screening results

The complete comparison to background BTV are presented in Appendix A. As seen in Tables A3 through A8, gross alpha, cesium-137, and uranium-235 were slightly above their respective BTV in one or more sediment samples. These slight exceedances of the BTV do not necessarily indicate any impact to the sediment from FUSRAP-related activities, as none of the constituents which exceeded the sediment BTVs also exceeded screening values protective of human health and the environment.

The complete comparison to BTVs for the subsurface soil samples obtained in the SWDD are presented in Tables A9 through A11. The following constituents had slight exceedances of the BTV in one or more subsurface soil samples from the SWDD: gross alpha, cesium-137, radium-226, and uranium-235. These slight exceedances of the BTV for gross alpha, cesium-137, and uranium-235 do not necessarily indicate any impact to the sediment from FUSRAP-related activities, as none of the constituents which exceeded the soil BTVs also exceeded screening values protective of human health and the environment. The radium-226 exceedance is discussed below.

2) Human health screening results

None of the sediment samples exceeded the human health screening criteria. Only one of the constituents (radium-226) was detected in one of the subsurface soil samples from the SWDD at a level greater than the surface soil screening value. The radium-226 result from this sample (SWDD SB5 1.0-1.5') and the other subsurface soil samples are presented in Table 4. The radium-226 concentration exceeded the screening value by a very slight amount (less than 0.5 pCi/g), and only in one of six samples obtained in the SWDD. The screening value was established to be protective in an agricultural setting in which someone has intense and chronic exposure to the soil, i.e., is living on and growing most of his/her food on the soil. The potential for occasional exposure that may occur at this area of the school property is much less than what is assumed in developing the screening level. Furthermore, the sample was collected over a foot below ground and exposures to soil at this depth/location do not currently exist. The slight exceedances of the screening value are not widespread, but rather are very localized. Therefore, the concentration that is slightly above the screening value does not indicate any potential risk and should not be a concern to the school community.

3) Aquatic and Riparian Biota Concentration Guideline

No sediment, surface soil, or subsurface soil samples collected in the SWDD exceeded biota concentration guidelines for aquatic or riparian life. This indicates that radionuclides are not present in sediment or subsurface soils at levels that would harm ecological receptors such as raccoons, fish, or other wildlife which may be present in, or use, the ditch. The RESRAD BIOTA output is listed in Appendix A.

Table 3 – Sub Surface Soil Results

Sub Surface Soil																
Sample Name						C2-SWDD -SB01		C2-SWDD -SB02		C2-SWDD -SB03		C2-SWDD -SB04		C2-SWDD -SB05		C2-SWDD -SB06
Sample Depth						2.0 - 3.0'		1.0 - 1.5'		12" - 16"		1.0 - 3.0'		1.0 - 1.5'		1.0 - 1.5'
Anal ysis	B T V	D B SL *	Back grou nd	DBS L + BKG	B C G	U ni ts		Qu alifi er		Qu alifi er		Qu alifi er		Qu alifi er		Qu alifi er
Radi um-226	1.2	0.7	0.806	1.51	101.00	pCi/g	0.579		0.778		1.18		0.706	1.96		1.12

All analytical data is included in Appendix A

Legend	Comment
Gray	Result is above both Dose-Based Screening Level (DBSL) and the average background concentration
Bold	Bold font indicates that the value exceeds the BTV
*	DBSL - US Nuclear Regulatory Commission NUREG 1757 (NRC, 2006)
Qualifier	"U" below detection limits, "J" estimated value, "R" rejected during data validation due to method blank contamination

3.3 Mound on LPCSD Property

The following section explains field observations during the sampling of the mounded material on the LPCSD property.

3.3.1 Field Observations and Screening Results

During the field work the sampling team confirmed that the mounded material east of LPCSD property contain rocks that produce gamma survey readings of to 38,000 cpm. The elevated readings found during the walkover survey coincided with rocks that were embedded into the soil. As a result a sample of rocks from the mound was also sent for radionuclide analysis, for the analytes in Table 1. Analytical results are provided in Appendix B, which indicate that the rocks contained naturally occurring levels of radium, thorium and uranium which was localized to the rocks and was present only in soil samples due to collocation of rock fragments.

To measure gamma radiation in each borehole, a Sodium Iodide (NaI) detector was lowered into the borehole as the instrument was advanced to lower depths. The NaI was not columnated to restrict the radiation readings to the bottom of the borehole, so the results represent gamma radiation from both the sidewalls and the bottom of the soil boring. This approach allowed for detections of gamma emissions from rocks in the sidewall, as shown in Figure 2, and resulted in readings that were elevated compared to the background since the background data collected readings from the bottom of the detector, exclusively, on the soccer field (minimal radiation coming into side wall of detector).

Figure 2 depicts an increase in count rate as the NaI gamma radiation detector was lowered in the fill material and a decrease in count rate as the detector reached a depth below the mounded material into native soils. The recorded measurements show that elevated gamma survey counts are present in the mound and reach maximum values at a depth of one foot bgs, when surrounded by soil/rocks and the count rate drops off as the detector is lowered into native soil (no influence of rocks).

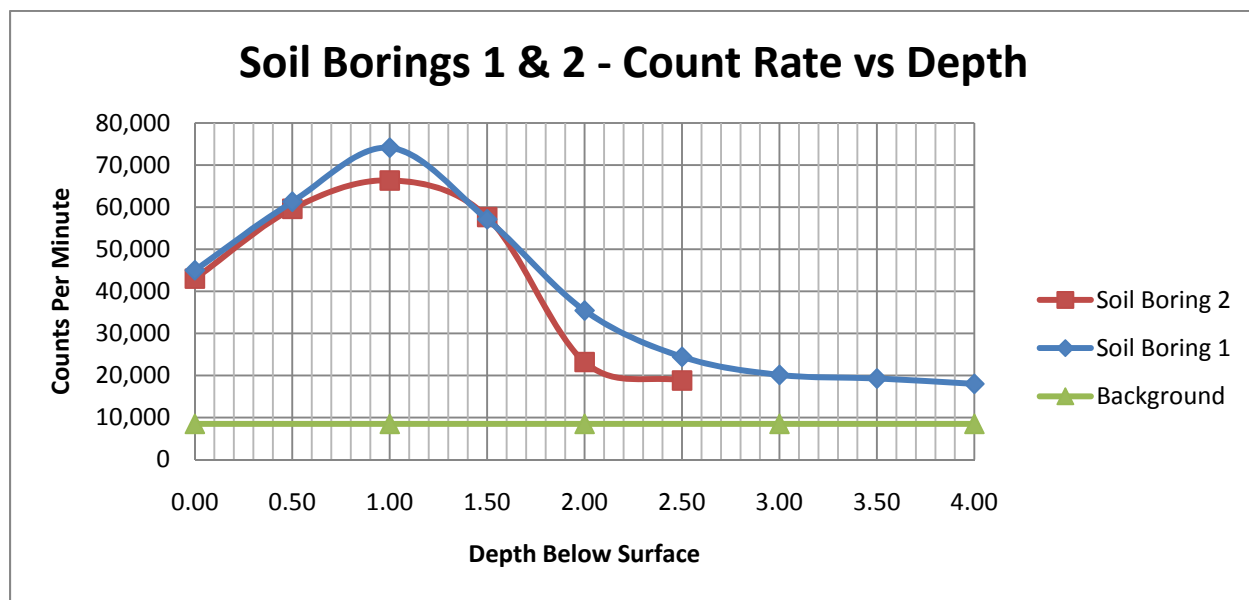


Figure 2 – Down-Hole Gamma Survey Measurements from Soil Borings 1 and 2.

After sampling was complete, a second background investigation occurred to look at the count rates associated with the sample of rocks. A one-minute count on the Lewiston-Porter School soccer field, as shown below (Photo 7), yielded an 8,500 cpm rate. A one-minute count in the same location with the bagged rock sample under the detector yielded a count rate in the range of 30,000 cpm, also shown below (Photo 8). This report documents that the elevated counts per minute found in the *Final Gamma Walkover Survey Report (USACE 2002a)*, described as “Anomaly D,” are solely associated with rocks and not the soil in the mounded material.



Photo 7 – Background measurement in Lewiston-Porter Soccer Field



Photo 8 – Gamma survey measurement of bagged rocks in the same location as Photo 7

Table 5 and 6 show count rates recorded on sample bags collected at both Soil Boring 1 and 2. These readings were collected on bagged soil samples in a low background area prior to shipment, which accounts for the lower count rate (compared to the readings in the field).

Table 4 - SB1 Count Rates

Depth (ft)	Count Rate (CPM)
0.0-0.5*	6,753
0.5-1.0*	8,619
1.0-1.5	8,356
1.5-2.0	5,972
2.0-2.5	5,418
2.5-3.0	5,251
3.0-3.5	5,269
3.5-4.0*	5,422

Table 5 – SB2 Count Rates

Depth (ft)	Count Rate (CPM)
0.0-0.5*	8,258
0.5-1.0*	8,446
1.0-1.5	6,888
1.5-2.0	5,162
2.0-2.5*	4,965

Note: The highest readings were found in the bagged samples which were collected toward the top of the mounded material, which confirms the down hole gamma graphic shown earlier. The samples marked with an asterisk () are the samples which were sent off site for analysis.*

3.4 Analytical Results and Comparison to Screening Levels

Soil Borings and Rock Results

1) Background screening results

The complete comparison to background BTV are presented in Appendix B. Gross alpha, gross beta, radium-226, thorium-230, uranium-234, uranium-235, and uranium-238 all were above their respective BTV in one or more soil or rock samples. The soil samples contain naturally

occurring radionuclides radium, thorium, and uranium in approximately equal abundance to each other, indicating that they are naturally occurring and not present due to contamination from any Manhattan Engineering District, and/or Atomic Energy Commission activities.

2) Human health screening results

Concentrations of radium-226 and thorium-230 are above human health screening values in the soil samples (Table 7). In addition, these two nuclides, as well as uranium-234, -235, and -238 are above human health screening values in the rock fragments sent for laboratory analysis. The slightly elevated results in the soil samples are most likely attributed to small fragments of rock co-located inside of the soil sample sent for laboratory analysis. The potential for occasional exposure that may occur at this area of the school property is much less than what is assumed in developing the human health screening levels. The rocks in this mound pose no risk to human health or the environment and are not detectable when a gamma radiation detector is used more than a few feet away from the surface.

Table 6 – Soil Boring 1 and 2 Analytical Results

Soil Boring 1 - Soil Boring 2 - Rocks																
		Sample Name		SB-1		SB-1		SB-1		SB-2		SB-2		SB-2		Rocks
		Sample Depth		0.0 - 0.5'		0.5 - 1.0'		3.5 - 4.0'		0.0 - 0.5'		0.5 - 1.0'		2.0 - 2.5'		N/A
Analysis	BTV	DBSL + BKG	Units		Flag		Flag		Flag		Flag		Flag		Flag	Flag
Radium-226	1.2	1.74	pCi/g	3.83		2.12		1.56		3.01		1.87		0.957		6.89
Thorium-230	1.39	3.46	pCi/g	3.65		2.25		1.34		3.18		1.65		0.235	U	28.4
Uranium-234	1.66	14.37	pCi/g	2.4		2.87		0.622		3.49		2.41		1.42		41.2
Uranium-235	0.08	8.13	pCi/g	0.181		0.259		0.283		1		0.535		0.264		3.32
Uranium-238	1.34	15.22	pCi/g	2.18		2.34		0.763		3.03		1.7		1		39.7

Legend	Comment
Gray	Result is above both DBSL and the average background concentration
Bold	Bold font indicates that the value exceeds the BTV

Note: Results highlighted in gray exceed dose-based screening values plus average background. Although there are samples exceeding the screening values the concentrations are likely attributed to small fragments of rock co-located inside of the soil sample sent for laboratory analysis.

4.0 Interpretation of Results

In August 2010, USACE Buffalo District conducted radiological sampling on portions of the LPCSD property to investigate potential environmental concerns resulting from possible past Federal Government activity. During this event, USACE collected surface water, sediment and sub surface soil samples along six locations on the South West Drainage Ditch. All results were compared to background screening criteria, screening values developed for protection of human health, and ecological risk screening values. No sample results were above ecological risk screening values.

One sub-surface soil result (SWDD SB5 1.0-1.5') was slightly above the background threshold value and the human health screening value for radium-226 by 0.45 pCi/g. The human health screening value was established to be protective in an agricultural setting in which someone has intense and chronic exposure to the soil, i.e., is living on and growing most of his/her food on the soil. The potential for occasional exposure that may occur at this area of the school property is much less than what is assumed in developing the DBSL. Furthermore, the sample was collected over a foot below ground and exposures to soil at this depth/location do not currently exist. The slight exceedances of the screening level are not widespread, but rather are very localized. Therefore, the concentrations that are slightly above the DBSL do not indicate any potential risk and should not be a concern to the school community.

Additionally, USACE investigated a mound east of the Lewiston-Porter School soccer field which had previously been identified as being elevated in a prior USACE background gamma walkover study. Two soil borings were advanced into the mound at locations exhibiting the highest count rates on the surface, and three soil samples were collected from each location. One sample of rocks was also collected for radiological analysis. All results were compared to background screening criteria and human health screening values. The soil samples which were above screening levels can be attributed to rock fragments which remained in samples analyzed by the laboratory. The rocks contain naturally occurring radionuclides which are elevated, compared to background, such as radium, thorium and uranium and similar material can be found all over Western New York. The rocks in this mound pose no risk to human health or the environment and are not detectable when a gamma radiation detector is used more than a few feet away from the surface.

Based upon the information provided in the background gamma walkover survey (USACE 2002a) and subsequent August 2010 sampling of the SWDD and soil mound, it can be concluded that there are no radiological concerns on the LPCSD property resulting from any past MED/AEC activity in its vicinity.

5.0 References

- U.S. Army Corps of Engineers (USACE), 1999. *Report for Phase I Remedial Investigation at the Former Lake Ontario Ordnance Works, Niagara County, NY*. Prepared by EA. July.
- USACE, 2002a. *Final Gamma Walkover Survey Report, Lewiston-Porter School Property, Youngtown, New York*. Prepared by SAIC. February
- USACE, 2002b. *Report of the Results for the Phase II Remedial Investigation at the Former Lake Ontario Ordnance Works (LOOW), Niagara County, New York*. Prepared by EA. February.
- USACE, 2007a. *Baseline Risk Assessment Report for the Niagara Falls Storage Site*. Prepared by SAIC. December.
- USACE, 2007b. Fact Sheet “Radiological Investigation of the Underground Utility Lines”. October <http://www.lrb.usace.army.mil/derpfuds/loow-nfss/index.htm>
- USACE, 2007c. *Remedial Investigation Report for the Niagara Falls Storage Site*. Prepared by SAIC. December.
- USACE, 2008. *Report of Results for the Remedial Investigation of Underground Utility Lines, Formerly Used by the Department of Defense, Lake Ontario Ordnance Works (LOOW), Niagara County, NY*. Prepared by EA. September.
- USACE, 2009a. *Field Sampling Plan Addendum for Phase IV Remedial Investigation/Feasibility Studies at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. January.
- USACE, 2009b. *Quality Assurance Project Plan Addendum for Phase IV Remedial Investigation/Feasibility Studies at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. January.
- USACE, 2009c. *Site Specific Health and Safety Plan for Phase IV Remedial Investigation/Feasibility Studies at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. January.
- USACE, 2010a. *Field Sampling Plan Addendum for Occidental Chemical Corporation Property Data Gap and Lewiston-Porter Central School District Investigations at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. August.
- USACE, 2010b. *Quality Assurance Project Plan Addendum for Occidental Chemical Corporation Property Data Gap and Lewiston-Porter Central School District Investigations at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. August.
- USACE, 2010c. *Site Safety and Health Plan Addendum for Occidental Chemical Corporation Property Data Gap and Lewiston-Porter Central School District Investigations at the Former Lake Ontario Ordnance Works, Niagara County, New York*. Prepared by ERT/EA. August.
- USACE, 2011. *Final Site Inspection Report for the Lewiston-Porter Central School District at the Former Lake Ontario Ordnance Works (LOWW) Niagara County, New York*. Prepared by ERT/EA. March
- U.S. Army Geospatial Center (USAGC), 2009. *Niagara Falls Storage Site Historical Photographical Analysis*. September.
- U.S. Army Topographic Engineering Center (USATEC). 2002. *Historic Photographic Analysis Report, Former Lake Ontario Ordnance Works*. September.

U.S. Department of Energy (USDOE), *Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*. 2002

U.S. Nuclear Regulatory Commission (USNRC), 2006. United States Nuclear Regulatory Commission Document NUREG-1757 "Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria, Vol.2, Rev.1. September.

Appendix A
South West Drainage Ditch Sampling

Appendix A Includes:

Table A1 - Samples collected along the South West Drainage Ditch
Table A2 – Legend for Table A3 through A11
Table A3 - SB01 and SB02 Sediment (0.0-0.5)
Table A4 – SB03 and SB04 Sediment (0.0-0.5)
Table A5 – SB05 and SB06 Sediment (0.0-0.5)
Table A6 – SB01 and SB02 Sediment (0.5 – 1.0)
Table A7 – SB03 and SB04 Sediment (0.5 – 1.0)
Table A8 – SB05 and SB06 Sediment (0.5 – 1.0)
Table A9 – SB01 and SB02 Subsurface Soil
Table A10 – SB03 and SB04 Subsurface Soil
Table A11– SB05 and SB06 Subsurface Soil
Table A12 – Legend for tables A13 and 14
Table A13-1 through A13-6 - SWDD Unfiltered Surface Water Sample Results
Table A14-1 through A14-6 – SWDD Filtered Surface Water Sample Results
Table A15 and A16 - RESRAD Biota Output
Attachment A1 – Location information for SWDD Sampling
Attachment A1 – Legend

APPENDIX A

Table A1 - Samples collected along the South West Drainage Ditch

Sample Location	Matrix Type	Amount
SWDD-SW01	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
	Sediment	
	Surface Soil	
	Subsurface Soil	
SWDD-SW02	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
	Sediment	
	Surface Soil	
	Subsurface Soil	
	Subsurface (MS)	
	Subsurface (MS/MSD)	
SWDD-SW03	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
	Sediment	
	Surface Soil	
	Subsurface Soil	
SWDD-SW04	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
	Sediment	
	Sediment (Duplicate)	
	Surface Soil	
	Subsurface Soil	
SWDD-SW05	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
		2 Gallon (Duplicate)
	Sediment	
	Surface Soil	
	Subsurface Soil	
SWDD-SW06	Surface Water	2 Gallon (Filtered)
		2 Gallon (Unfiltered)
		2 Gallon (Matrix Spike)
		2 Gallon (Matrix Spike Duplicate)
	Sediment	
	Surface Soil	
	Subsurface Soil	

Table A2 – Legend for Table A3 through A11

LEGEND	Comment
Gray	Result is above both dose-based screening level and BTV
BOLD	Red font indicates that the value exceeds BTV
<i>U</i>	U flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a BTV.
* *	Dose-Based Screening Level - US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2,Rev.1. September 2006.

A3 - SB01 and SB02 Sediment (0.0-0.5)

SWDD-SB01 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB01 (0 - 0.5)	Gross Alpha	4.67	1.15	0.545	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB01 (0 - 0.5)	Gross Beta	14.1	1.49	1.15	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB01 (0 - 0.5)	Cesium-137	0.256	0.059	0.086	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Plutonium-238	0	0.127	0.293	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB01 (0 - 0.5)	Plutonium-239/240	0	0.106	0.253	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Radium-228	0.835	0.04	0.374	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB01 (0 - 0.5)	Radium-226	0.923	0.193	0.209	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Strontium-90	0.154	0.374	0.634	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB01 (0 - 0.5)	Thorium-228	1.15	0.12	0.05	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Thorium-230	1.11	0.132	0.156	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Thorium-232	1.04	0.112	0.021	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Uranium-234	1.16	0.135	0.122	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Uranium-235	0.183	0.065	0.082	pCi/g		0.31	8.00	0.25	8.25	NO	NO
C2-SWDD-SB01 (0 - 0.5)	Uranium-238	0.964	0.117	0.091	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD-SB02 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB02 (0.0 - 0.5)	Gross Alpha	5.22	1.06	0.474	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB02 (0.0 - 0.5)	Gross Beta	14.1	1.28	1	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB02 (0.0 - 0.5)	Cesium-137	0.483	0.071	0.076	pCi/g		0.389	11	0.19	11.19	YES	NO
C2-SWDD-SB02 (0.0 - 0.5)	Plutonium-238	0	0.078	0.176	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB02 (0.0 - 0.5)	Plutonium-239/240	0.041	0.047	0.076	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Radium-228	0.625	0.049	0.271	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB02 (0.0 - 0.5)	Radium-226	0.757	0.135	0.166	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Strontium-90	0.174	0.223	0.38	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB02 (0.0 - 0.5)	Thorium-228	0.892	0.123	0.114	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Thorium-230	1.35	0.158	0.202	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Thorium-232	1.02	0.123	0.089	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Uranium-234	2.27	0.193	0.079	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB02 (0.0 - 0.5)	Uranium-235	0.476	0.089	0.041	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB02 (0.0 - 0.5)	Uranium-238	1.86	0.173	0.064	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A4 – SB03 and SB04 Sediment (0.0-0.5)

SWDD-SB03 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB03 (0.0 - 0.5)	Gross Alpha	13.3	1.95	0.698	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB03 (0.0 - 0.5)	Gross Beta	14.8	1.55	1.2	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB03 (0.0 - 0.5)	Cesium-137	0.174	0.074	0.124	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Plutonium-238	0.02	0.059	0.105	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB03 (0.0 - 0.5)	Plutonium-239/240	0.022	0.04	0.07	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Radium-228	0.51	0.037	0.266	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB03 (0.0 - 0.5)	Radium-226	0.944	0.179	0.137	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Strontium-90	0	0.205	0.428	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB03 (0.0 - 0.5)	Thorium-228	0.761	0.08	0.041	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Thorium-230	0.606	0.086	0.125	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Thorium-232	0.659	0.073	0.03	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Uranium-234	1.52	0.151	0.061	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB03 (0.0 - 0.5)	Uranium-235	0.321	0.072	0.045	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB03 (0.0 - 0.5)	Uranium-238	1.18	0.132	0.045	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD-SB04 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB04 (0.0 - 0.5)	Gross Alpha	27.2	3.2	0.921	pCi/g	J	22.4	N/A	15.69	NA	YES	-
C2-SWDD-SB04 (0.0 - 0.5)	Gross Beta	24.6	1.8	1.18	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB04 (0.0 - 0.5)	Cesium-137	0.219	0.073	0.125	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Plutonium-238	0	0.043	0.093	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB04 (0.0 - 0.5)	Plutonium-239/240	0.016	0.028	0.049	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Radium-228	1.04	0.046	0.333	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB04 (0.0 - 0.5)	Radium-226	0.264	0.19	0.349	pCi/g	U	2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Strontium-90	1.70	0.241	0.331	pCi/g		N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB04 (0.0 - 0.5)	Thorium-228	1.12	0.131	0.035	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Thorium-230	1.07	0.145	0.174	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Thorium-232	0.91	0.117	0.019	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Uranium-234	1.81	0.205	0.106	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB04 (0.0 - 0.5)	Uranium-235	0.567	0.115	0.064	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB04 (0.0 - 0.5)	Uranium-238	1.28	0.179	0.122	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A5 – SB05 and SB06 Sediment (0.0-0.5)

SWDD-SB05 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB05 (0.0 - 0.5)	Gross Alpha	7.44	1.31	0.524	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB05 (0.0 - 0.5)	Gross Beta	17.983	1.596	1.151	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB05 (0.0 - 0.5)	Cesium-137	0.168	0.052	0.081	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Plutonium-238	0.015	0.032	0.059	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB05 (0.0 - 0.5)	Plutonium-239/240	0.027	0.032	0.05	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Radium-228	1	0.047	0.269	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB05 (0.0 - 0.5)	Radium-226	0.91	0.171	0.168	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Strontium-90	0.471	0.299	0.487	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB05 (0.0 - 0.5)	Thorium-228	1.15	0.13	0.048	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Thorium-230	0.759	0.127	0.177	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Thorium-232	0.951	0.119	0.05	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Uranium-234	1.5	0.14	0.051	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Uranium-235	0.284	0.063	0.037	pCi/g		0.31	8.00	0.25	8.25	NO	NO
C2-SWDD-SB05 (0.0 - 0.5)	Uranium-238	1.55	0.142	0.042	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD-SB06 Sediment (0.0 - 0.5 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB06 (0.0 - 0.5)	Gross Alpha	12.4	2.21	0.919	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB06 (0.0 - 0.5)	Gross Beta	15.448	1.664	1.506	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB06 (0.0 - 0.5)	Cesium-137	0.238	0.096	0.141	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Plutonium-238	0.017	0.035	0.063	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB06 (0.0 - 0.5)	Plutonium-239/240	0.017	0.024	0.04	pCi/g	U	0.0437*	2.3	0.0437*	2.34	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Radium-228	0.316	0.041	0.254	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB06 (0.0 - 0.5)	Radium-226	0.385	0.131	0.205	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Strontium-90	0.262	0.213	0.366	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB06 (0.0 - 0.5)	Thorium-228	0.632	0.084	0.072	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Thorium-230	0.547	0.092	0.142	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Thorium-232	0.604	0.077	0.051	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Uranium-234	1.56	0.163	0.098	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Uranium-235	0.281	0.069	0.045	pCi/g		0.31	8.00	0.25	8.25	NO	NO
C2-SWDD-SB06 (0.0 - 0.5)	Uranium-238	1.56	0.161	0.089	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A6 – SB01 and SB02 Sediment (0.5 – 1.0)

SWDD - SB01 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB01 (0.5 -1.0)	Gross Alpha	5.83	1.32	0.615	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB01 (0.5 -1.0)	Gross Beta	17.4	1.68	1.19	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB01 (0.5 -1.0)	Cesium-137	0	0.037	0.087	pCi/g	U	0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Plutonium-238	0	0.072	0.154	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB01 (0.5 -1.0)	Plutonium-239/240	0	0.03	0.072	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB01 (0.5 -1.0)	Radium-228	0.514	0.033	0.207	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB01 (0.5 -1.0)	Radium-226	0.572	0.126	0.139	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Strontium-90	0.031	0.134	0.239	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB01 (0.5 -1.0)	Thorium-228	0.948	0.106	0.067	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Thorium-230	0.54	0.099	0.156	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Thorium-232	0.91	0.103	0.06	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Uranium-234	1.02	0.111	0.08	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB01 (0.5 -1.0)	Uranium-235	0.313	0.063	0.051	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB01 (0.5 -1.0)	Uranium-238	0.815	0.098	0.063	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD - SB02 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB02 (0.5 -1.0)	Gross Alpha	12.6	1.54	0.46	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB02 (0.5 -1.0)	Gross Beta	15.9	1.4	1.11	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB02 (0.5 -1.0)	Cesium-137	0.008	0.032	0.075	pCi/g	U	0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB02 (0.5 -1.0)	Plutonium-238	0.03	0.064	0.114	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB02 (0.5 -1.0)	Plutonium-239/240	0.019	0.043	0.079	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB02 (0.5 -1.0)	Radium-228	0.408	0.036	0.287	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB02 (0.5 -1.0)	Radium-226	0.493	0.086	0.061	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB02 (0.5 -1.0)	Strontium-90	0.13	0.143	0.248	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB02 (0.5 -1.0)	Thorium-228	0.857	0.121	0.096	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB02 (0.5 -1.0)	Thorium-230	1.88	0.181	0.195	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB02 (0.5 -1.0)	Thorium-232	1.27	0.136	0.063	pCi/g		1.23	1.1	0.91	2.01	YES	NO
C2-SWDD-SB02 (0.5 -1.0)	Uranium-234	1.19	0.135	0.057	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB02 (0.5 -1.0)	Uranium-235	0.318	0.07	0.034	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB02 (0.5 -1.0)	Uranium-238	0.954	0.12	0.047	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A7 – SB03 and SB04 Sediment (0.5 – 1.0)

SWDD - SB03 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB03 (0.5 -1.0)	Gross Alpha	9.4	1.71	0.675	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB03 (0.5 -1.0)	Gross Beta	19.3	1.73	1.28	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB03 (0.5 -1.0)	Cesium-137	0.107	0.112	0.142	pCi/g	U	0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Plutonium-238	0	0.067	0.125	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB03 (0.5 -1.0)	Plutonium-239/240	0	0.047	0.09	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB03 (0.5 -1.0)	Radium-228	0.439	0.036	0.197	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB03 (0.5 -1.0)	Radium-226	0.964	0.162	0.159	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Strontium-90	0.303	0.257	0.443	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB03 (0.5 -1.0)	Thorium-228	0.778	0.094	0.054	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Thorium-230	0.546	0.099	0.155	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Thorium-232	0.699	0.089	0.051	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Uranium-234	1.38	0.136	0.079	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB03 (0.5 -1.0)	Uranium-235	0.326	0.066	0.039	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB03 (0.5 -1.0)	Uranium-238	1.29	0.128	0.052	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD - SB04 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB04 (0.5 - 1.0)	Gross Alpha	5.94	1.24	0.502	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB04 (0.5 - 1.0)	Gross Beta	10.5	1.26	1.01	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB04 (0.5 - 1.0)	Cesium-137	0.069	0.049	0.058	pCi/g		0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Plutonium-238	0	0.086	0.204	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB04 (0.5 - 1.0)	Plutonium-239/240	0	0.055	0.133	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB04 (0.5 - 1.0)	Radium-228	0.495	0.056	0.471	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB04 (0.5 - 1.0)	Radium-226	1.15	0.254	0.278	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Strontium-90	0.107	0.236	0.417	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB04 (0.5 - 1.0)	Thorium-228	0.743	0.103	0.063	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Thorium-230	0.664	0.124	0.19	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Thorium-232	0.833	0.106	0.049	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Uranium-234	1.57	0.143	0.071	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB04 (0.5 - 1.0)	Uranium-235	0.527	0.085	0.056	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB04 (0.5 - 1.0)	Uranium-238	0.971	0.114	0.068	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A8 – SB05 and SB06 Sediment (0.5 – 1.0)

SWDD - SB05 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB05 (0.5 -1.0)	Gross Alpha	7.12	1.28	0.486	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB05 (0.5 -1.0)	Gross Beta	14.303	1.406	1.081	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB05 (0.5 -1.0)	Cesium-137	0.022	0.024	0.05	pCi/g	U	0.389	11	0.19	11.19	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Plutonium-238	0	0.041	0.078	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB05 (0.5 -1.0)	Plutonium-239/240	0	0.052	0.103	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB05 (0.5 -1.0)	Radium-228	0.839	0.053	0.324	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB05 (0.5 -1.0)	Radium-226	0.915	0.284	0.414	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Strontium-90	0.241	0.245	0.411	pCi/g	U	N/A	1.7	N/A	1.70		NO
C2-SWDD-SB05 (0.5 -1.0)	Thorium-228	0.972	0.146	0.127	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Thorium-230	0.953	0.162	0.224	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Thorium-232	1	0.135	0.074	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Uranium-234	1.78	0.243	0.125	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB05 (0.5 -1.0)	Uranium-235	0.416	0.12	0.075	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB05 (0.5 -1.0)	Uranium-238	1.44	0.219	0.113	pCi/g		3.08	14	1.22	15.22	NO	NO
SWDD - SB06 Sediment (0.5 - 1.0 feet)												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DSL+BKG**
C2-SWDD-SB06 (0.5 -1)	Gross Alpha	4.34	1.32	0.74	pCi/g	J	22.4	N/A	15.69	NA	NO	-
C2-SWDD-SB06 (0.5 -1)	Gross Beta	17.967	1.818	1.371	pCi/g	J	38.6	N/A	26.18	NA	NO	-
C2-SWDD-SB06 (0.5 -1)	Cesium-137	0.525	0.097	0.089	pCi/g		0.389	11	0.19	11.19	YES	NO
C2-SWDD-SB06 (0.5 -1)	Plutonium-238	0	0.035	0.081	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB06 (0.5 -1)	Plutonium-239/240	0	0.021	0.046	pCi/g	U	0.0437*	2.3	0.0437*	2.34	-	NO
C2-SWDD-SB06 (0.5 -1)	Radium-228	0.656	0.055	0.469	pCi/g		1.14	N/A	0.96	0.96	NO	-
C2-SWDD-SB06 (0.5 -1)	Radium-226	1.65	0.286	0.324	pCi/g		2.43	0.7	1.04	1.74	NO	NO
C2-SWDD-SB06 (0.5 -1)	Strontium-90	0.038	0.298	0.527	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB06 (0.5 -1)	Thorium-228	1.08	0.151	0.088	pCi/g		1.31	4.7	1.05	5.75	NO	NO
C2-SWDD-SB06 (0.5 -1)	Thorium-230	0.899	0.164	0.232	pCi/g		5.58	1.8	2.02	3.82	NO	NO
C2-SWDD-SB06 (0.5 -1)	Thorium-232	1.11	0.15	0.074	pCi/g		1.23	1.1	0.91	2.01	NO	NO
C2-SWDD-SB06 (0.5 -1)	Uranium-234	2.15	0.191	0.041	pCi/g		3.57	13	1.37	14.37	NO	NO
C2-SWDD-SB06 (0.5 -1)	Uranium-235	0.56	0.098	0.031	pCi/g		0.31	8.00	0.25	8.25	YES	NO
C2-SWDD-SB06 (0.5 -1)	Uranium-238	1.51	0.16	0.026	pCi/g		3.08	14	1.22	15.22	NO	NO

Table A9 – SB01 and SB02 Subsurface Soil

SWDD - SB01 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB01 (2.0 -3.0)	Gross Alpha	4.62	1.14	0.528	pCi/g	J	15.1	N/A	11.99	NA	NO	-
C2-SWDD-SB01 (2.0 -3.0)	Gross Beta	12.8	1.34	1.03	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB01 (2.0 -3.0)	Cesium-137	0	0.028	0.066	pCi/g	U	0.343	11	0.15	11.15	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Plutonium-238	0	0.062	0.135	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB01 (2.0 -3.0)	Plutonium-239/240	0	0.03	0.061	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB01 (2.0 -3.0)	Radium-228	0.512	0.045	0.221	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB01 (2.0 -3.0)	Radium-226	0.579	0.11	0.093	pCi/g		1.2	0.7	0.806	1.51	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Strontium-90	0.484	0.302	0.491	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB01 (2.0 -3.0)	Thorium-228	0.722	0.104	0.052	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Thorium-230	0.575	0.114	0.169	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Thorium-232	0.729	0.103	0.038	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Uranium-234	1.3	0.237	0.159	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB01 (2.0 -3.0)	Uranium-235	0.552	0.158	0.123	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB01 (2.0 -3.0)	Uranium-238	1.18	0.219	0.123	pCi/g		1.34	14	0.796	14.80	NO	NO
SWDD - SB02 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB02 (1 - 1.5)	Gross Alpha	7.11	1.28	0.485	pCi/g	J	15.1	N/A	11.99	NA	NO	-
C2-SWDD-SB02 (1 - 1.5)	Gross Beta	14.3	1.34	1	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB02 (1 - 1.5)	Cesium-137	0	0.044	0.105	pCi/g	U	0.343	11	0.15	11.15	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Plutonium-238	0	0.047	0.088	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB02 (1 - 1.5)	Plutonium-239/240	0.01	0.024	0.044	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB02 (1 - 1.5)	Radium-228	0.347	0.034	0.212	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB02 (1 - 1.5)	Radium-226	0.778	0.142	0.157	pCi/g		1.2	0.7	0.806	1.51	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Strontium-90	0.19	0.341	0.341	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB02 (1 - 1.5)	Thorium-228	0.961	0.118	0.064	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Thorium-230	1.19	0.144	0.17	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Thorium-232	0.903	0.113	0.057	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Uranium-234	1.03	0.115	0.104	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB02 (1 - 1.5)	Uranium-235	0.198	0.063	0.083	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB02 (1 - 1.5)	Uranium-238	0.686	0.094	0.089	pCi/g		1.34	14	0.796	14.80	NO	NO

Table A10 – SB03 and SB04 Subsurface Soil

SWDD - SB03 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB03 (1' - 16")	Gross Alpha	19.6	2.33	0.701	pCi/g	J	15.1	N/A	11.99	NA	YES	-
C2-SWDD-SB03 (1' - 16")	Gross Beta	20.8	1.69	1.25	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB03 (1' - 16")	Cesium-137	0.033	0.04	0.096	pCi/g	U	0.343	11	0.15	11.15	NO	NO
C2-SWDD-SB03 (1' - 16")	Plutonium-238	0.012	0.037	0.068	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB03 (1' - 16")	Plutonium-239/240	0.003	0.02	0.041	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB03 (1' - 16")	Radium-228	0.703	0.041	0.311	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB03 (1' - 16")	Radium-226	1.18	0.18	0.223	pCi/g		1.2	0.7	0.806	1.51	NO	NO
C2-SWDD-SB03 (1' - 16")	Strontium-90	0.136	0.192	0.34	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB03 (1' - 16")	Thorium-228	0.924	0.123	0.071	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB03 (1' - 16")	Thorium-230	0.683	0.126	0.177	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB03 (1' - 16")	Thorium-232	0.88	0.123	0.085	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB03 (1' - 16")	Uranium-234	1.06	0.127	0.085	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB03 (1' - 16")	Uranium-235	0.233	0.059	0.041	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB03 (1' - 16")	Uranium-238	0.889	0.109	0.041	pCi/g		1.34	14	0.796	14.80	NO	NO
SWDD - SB04 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB04 (1' - 3')	Gross Alpha	10	1.54	0.561	pCi/g	J	15.1	N/A	11.99	NA	NO	-
C2-SWDD-SB04 (1' - 3')	Gross Beta	20.3	1.51	0.965	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB04 (1' - 3')	Cesium-137	0.03	0.039	0.093	pCi/g	U	0.343	11	0.15	11.15	NO	NO
C2-SWDD-SB04 (1' - 3')	Plutonium-238	0	0.035	0.084	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB04 (1' - 3')	Plutonium-239/240	0	0.032	0.078	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB04 (1' - 3')	Radium-228	1.01	0.047	0.361	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB04 (1' - 3')	Radium-226	0.706	0.212	0.318	pCi/g		1.2	0.7	0.806	1.51	NO	NO
C2-SWDD-SB04 (1' - 3')	Strontium-90	0	0.284	0.498	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB04 (1' - 3')	Thorium-228	0.905	0.102	0.049	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB04 (1' - 3')	Thorium-230	1	0.123	0.155	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB04 (1' - 3')	Thorium-232	1.18	0.113	0.024	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB04 (1' - 3')	Uranium-234	0.815	0.263	0.348	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB04 (1' - 3')	Uranium-235	0.352	0.173	0.23	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB04 (1' - 3')	Uranium-238	0.855	0.226	0.255	pCi/g		1.34	14	0.796	14.80	NO	NO

Table A11– SB05 and SB06 Subsurface Soil

SWDD - SB05 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB05 (1 - 1.5)	Gross Alpha	3.34	1.01	0.551	pCi/g	J	15.1	N/A	11.99	NA	NO	-
C2-SWDD-SB05 (1 - 1.5)	Gross Beta	8.573	1.409	1.176	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB05 (1 - 1.5)	Cesium-137	0	0.076	0.096	pCi/g	U	0.343	11	0.15	11.15	NO	NO
C2-SWDD-SB05 (1 - 1.5)	Plutonium-238	0	0.08	0.161	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB05 (1 - 1.5)	Plutonium-239/240	0	0.058	0.125	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB05 (1 - 1.5)	Radium-228	1.17	0.045	0.403	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB05 (1 - 1.5)	Radium-226	1.96	0.353	0.218	pCi/g		1.2	0.7	0.806	1.51	YES	YES
C2-SWDD-SB05 (1 - 1.5)	Strontium-90	0.107	0.26	0.444	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB05 (1 - 1.5)	Thorium-228	0.793	0.121	0.125	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB05 (1 - 1.5)	Thorium-230	0.388	0.121	0.209	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB05 (1 - 1.5)	Thorium-232	1.05	0.121	0.076	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB05 (1 - 1.5)	Uranium-238	1.16	0.169	0.115	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB05 (1 - 1.5)	Uranium-234	1.11	0.167	0.122	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB05 (1 - 1.5)	Uranium-235	0.452	0.105	0.073	pCi/g		1.34	14	0.796	14.80	NO	NO
SWDD - SB06 Sub Surface Soil												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Qualifier	BTV	DBSL**	Background	DBSL + BKG	Result > BTV	Result > DBSL+BKG**
C2-SWDD-SB06 (1 - 1.5)	Gross Alpha	7.21	1.8	0.864	pCi/g	J	15.1	N/A	11.99	NA	NO	-
C2-SWDD-SB06 (1 - 1.5)	Gross Beta	15.5	2.41	2.17	pCi/g	J	28.9	N/A	25.57	NA	NO	-
C2-SWDD-SB06 (1 - 1.5)	Cesium-137	0.479	0.131	0.133	pCi/g		0.343	11	0.15	11.15	YES	NO
C2-SWDD-SB06 (1 - 1.5)	Plutonium-238	0.035	0.043	0.071	pCi/g	U	N/A	2.5	N/A	2.50	-	NO
C2-SWDD-SB06 (1 - 1.5)	Plutonium-239/240	0.031	0.034	0.055	pCi/g	U	0.0437*	2.3	N/A	2.3	-	NO
C2-SWDD-SB06 (1 - 1.5)	Radium-228	0.773	0.035	0.259	pCi/g		1.26	N/A	0.935	0.96	NO	-
C2-SWDD-SB06 (1 - 1.5)	Radium-226	1.12	0.234	0.264	pCi/g		1.2	0.7	0.806	1.51	NO	NO
C2-SWDD-SB06 (1 - 1.5)	Strontium-90	0.276	0.249	0.416	pCi/g	U	N/A	1.7	N/A	1.70	-	NO
C2-SWDD-SB06 (1 - 1.5)	Thorium-228	0.892	0.118	0.077	pCi/g		1.64	4.7	1.108	5.81	NO	NO
C2-SWDD-SB06 (1 - 1.5)	Thorium-230	0.819	0.131	0.184	pCi/g		1.39	1.8	0.888	2.69	NO	NO
C2-SWDD-SB06 (1 - 1.5)	Thorium-232	0.911	0.113	0.044	pCi/g		1.24	1.1	0.908	2.01	NO	NO
C2-SWDD-SB06 (1 - 1.5)	Uranium-234	1.17	0.142	0.157	pCi/g		1.66	13	0.798	13.80	NO	NO
C2-SWDD-SB06 (1 - 1.5)	Uranium-235	0.306	0.075	0.089	pCi/g		0.08	8.00	0.08	8.08	YES	NO
C2-SWDD-SB06 (1 - 1.5)	Uranium-238	1.14	0.122	0.1	pCi/g		1.34	14	0.796	14.80	NO	NO

Table A12 – Legend for tables A13 and 14

LEGEND	Comment
N/A	Value Not Available
Bold	Bold font indicates that the value exceeds BTV
U	U flag indicates a non-detect.
* Asterisk *	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a BTV.
Radium MCL	The Radium MCL of 5 pCi/L is for total radium (all isotopes combined)
Strontium-90 MCL	Strontium 90 is a beta emitter and is being compared to the Gross Beta MCL
Thorium MCL	Thorium is an alpha emitter and is being compared to the Gross Alpha MCL.
Uranium MCL	The Uranium MCL of 27pCi/L is for total uranium (all isotopes combined)

Table A13-1 – SWDD Unfiltered Surface Water Sample Results

SWDD SW01 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW01	Gross Alpha	2.42	1.88	1.57	pCi/l	Y		12.2	15	N/A	NO	NO	-
C2-SWDD-SW01	Gross Beta	9.94	2.79	2.58	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW01	Cesium-137	1.71	3.14	7.46	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW01	Plutonium-238	0.006	0.056	0.102	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW01	Plutonium-239/240	0.065	0.049	0.076	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW01	Radium-228	0.433	0.066	0.392	pCi/l	Y		1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW01	Radium-226	0	0.176	0.393	pCi/l	N	U	0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW01	Strontium-90	0.007	0.185	0.326	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW01	Thorium-228	0.089	0.082	0.117	pCi/l	N	U	0.262*	15	3.74E+02	NO	NO	NO
C2-SWDD-SW01	Thorium-230	0.265	0.131	0.238	pCi/l	Y		0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW01	Thorium-232	0.197	0.091	0.107	pCi/l	Y		0.0699*	15	3.07E+02	YES	NO	NO
C2-SWDD-SW01	Uranium-234	1.85	0.723	1.05	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW01	Uranium-235	1.12	0.444	0.581	pCi/l	Y		0.53	27	2.18E+02	YES	NO	NO
C2-SWDD-SW01	Uranium-238	1.88	0.534	0.659	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A13-2 – SWDD Unfiltered Surface Water Sample Results (Continued)

SWDD SW02 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW02	Gross Alpha	7.43	3.37	2.2	pCi/l	Y		12.2	15	N/A	NO	NO	-
C2-SWDD-SW02	Gross Beta	8.72	2.88	2.73	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW02	Cesium-137	0	1.44	3.41	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW02	Plutonium-238	0.136	0.09	0.143	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW02	Plutonium-239/240	0.056	0.073	0.123	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW02	Radium-228	0.415	0.075	0.497	pCi/l	N	U	1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW02	Radium-226	0.12	0.147	0.279	pCi/l	N	U	0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW02	Strontium-90	0.283	0.194	0.324	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW02	Thorium-228	0.285	0.147	0.204	pCi/l	Y		0.262*	15	3.74E+02	YES	NO	NO
C2-SWDD-SW02	Thorium-230	0	0.195	0.391	pCi/l	N	U	0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW02	Thorium-232	0.158	0.138	0.209	pCi/l	N	U	0.0699*	15	3.07E+02	YES	NO	NO
C2-SWDD-SW02	Uranium-234	2.82	0.352	0.214	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW02	Uranium-235	0.545	0.159	0.115	pCi/l	Y		0.53	27	2.18E+02	YES	NO	NO
C2-SWDD-SW02	Uranium-238	1.15	0.22	0.115	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A13-3 – SWDD Unfiltered Surface Water Sample Results (Continued)

SWDD SW03 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW03	Gross Alpha	6.57	4.55	3.72	pCi/l	Y		12.2	15	N/A	NO	NO	-
C2-SWDD-SW03	Gross Beta	4.91	3.25	3.31	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW03	Cesium-137	0	1.95	4.63	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW03	Plutonium-238	0	0.105	0.221	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW03	Plutonium-239/240	0	0.054	0.122	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW03	Radium-228	0.415	0.054	0.415	pCi/l	N		1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW03	Radium-226	0	0.29	0.604	pCi/l	N	U	0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW03	Strontium-90	0	0.227	0.398	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW03	Thorium-228	0.123	0.098	0.132	pCi/l	N	U	0.262*	15	3.74E+02	NO	NO	NO
C2-SWDD-SW03	Thorium-230	0.363	0.175	0.302	pCi/l	Y		0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW03	Thorium-232	0.156	0.077	0.06	pCi/l	Y		0.0699*	15	3.07E+02	YES	NO	NO
C2-SWDD-SW03	Uranium-234	2.36	0.389	0.228	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW03	Uranium-235	0.583	0.197	0.134	pCi/l	Y		0.53	27	2.18E+02	YES	NO	NO
C2-SWDD-SW03	Uranium-238	1.09	0.275	0.206	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A13-4 – SWDD Unfiltered Surface Water Sample Results (Continued)

SWDD SW04 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW04	Gross Alpha	4.19	3.34	2.77	pCi/l	Y		12.2	15	N/A	NO	NO	-
C2-SWDD-SW04	Gross Beta	5.97	3.27	3.28	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW04	Cesium-137	0	2.17	2.93	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW04	Plutonium-238	0	0.109	0.212	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW04	Plutonium-239/240	0.046	0.054	0.089	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW04	Radium-228	0.346	0.068	0.398	pCi/l	N	U	1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW04	Radium-226	0	0.136	0.31	pCi/l	N	U	0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW04	Strontium-90	0.267	0.183	0.306	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW04	Thorium-228	0.183	0.138	0.187	pCi/l	N	U	0.262*	15	3.74E+02	NO	NO	NO
C2-SWDD-SW04	Thorium-230	0	0.125	0.35	pCi/l	N	U	0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW04	Thorium-232	0.022	0.094	0.156	pCi/l	N	U	0.0699*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW04	Uranium-234	2.9	0.314	0.12	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW04	Uranium-235	0.506	0.136	0.084	pCi/l	Y		0.53	27	2.18E+02	NO	NO	NO
C2-SWDD-SW04	Uranium-238	1.33	0.215	0.098	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A13-5 – SWDD Unfiltered Surface Water Sample Results (Continued)

SWDD SW05 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW05	Gross Alpha	6.41	2.69	1.82	pCi/l	Y		12.2	15	N/A	NO	NO	-
C2-SWDD-SW05	Gross Beta	6.95	2.73	2.65	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW05	Cesium-137	1.27	0.851	2.23	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW05	Plutonium-238	0	0.064	0.12	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW05	Plutonium-239/240	0	0.039	0.079	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW05	Radium-228	0.116	0.067	0.458	pCi/l	N	U	1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW05	Radium-226	0.43	0.21	0.348	pCi/l	Y		0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW05	Strontium-90	0	0.271	0.491	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW05	Thorium-228	0.06	0.165	0.274	pCi/l	N	U	0.262*	15	3.74E+02	NO	NO	NO
C2-SWDD-SW05	Thorium-230	0.059	0.185	0.361	pCi/l	N	U	0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW05	Thorium-232	0.028	0.125	0.21	pCi/l	N	U	0.0699*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW05	Uranium-234	1.94	0.319	0.184	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW05	Uranium-235	0.242	0.13	0.132	pCi/l	Y		0.53	27	2.18E+02	NO	NO	NO
C2-SWDD-SW05	Uranium-238	0.884	0.216	0.132	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A13-6 – SWDD Unfiltered Surface Water Sample Results (Continued)

SWDD SW06 - UNFILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW06	Gross Alpha	2.96	3.54	3.25	pCi/l	N	U	12.2	15	N/A	NO	NO	-
C2-SWDD-SW06	Gross Beta	6.01	3.23	3.24	pCi/l	Y		12.3	50	N/A	NO	NO	-
C2-SWDD-SW06	Cesium-137	1.08	1.45	3.43	pCi/l	N	U	1.56	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW06	Plutonium-238	0.175	0.167	0.264	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW06	Plutonium-239/240	0.015	0.111	0.219	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW06	Radium-228	0.135	0.049	0.417	pCi/l	N	U	1.43	5	3.39E+00	NO	NO	NO
C2-SWDD-SW06	Radium-226	0.08	0.173	0.344	pCi/l	N	U	0.49	5	4.08E+00	NO	NO	NO
C2-SWDD-SW06	Strontium-90	0.151	0.175	0.294	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW06	Thorium-228	0.004	0.067	0.116	pCi/l	N	U	0.262*	15	3.74E+02	NO	NO	NO
C2-SWDD-SW06	Thorium-230	0	0.069	0.274	pCi/l	N	U	0.61	15	2.57E+03	NO	NO	NO
C2-SWDD-SW06	Thorium-232	0.016	0.064	0.106	pCi/l	N	U	0.0699*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW06	Uranium-234	3.69	0.653	0.511	pCi/l	Y		5.78	27	2.02E+02	NO	NO	NO
C2-SWDD-SW06	Uranium-235	1.3	0.386	0.297	pCi/l	Y		0.53	27	2.18E+02	YES	NO	NO
C2-SWDD-SW06	Uranium-238	2.05	0.516	0.48	pCi/l	Y		4.81	27	2.24E+02	NO	NO	NO

Table A14-1 – SWDD Filtered Surface Water Sample Results

SWDD SW01 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW01 (F)	Gross Alpha	3.47	2.03	1.51	pCi/l	Y		16.7	15	N/A	NO	NO	-
C2-SWDD-SW01 (F)	Gross Beta	10	2.59	2.36	pCi/l	Y		9.87	50	N/A	YES	NO	-
C2-SWDD-SW01 (F)	Cesium-137	0	1.41	3.2	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW01 (F)	Plutonium-238	0	0.074	0.14	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW01 (F)	Plutonium-239/240	0.004	0.039	0.076	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW01 (F)	Radium-228	0.227	0.06	0.351	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW01 (F)	Radium-226	0	0.164	0.495	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW01 (F)	Strontium-90	0	0.237	0.408	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW01 (F)	Thorium-228	0.079	0.058	0.062	pCi/l	Y		0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW01 (F)	Thorium-230	0	0.091	0.257	pCi/l	N	U	0.29	15	2.57E+03	NO	NO	NO
C2-SWDD-SW01 (F)	Thorium-232	0.026	0.031	0.031	pCi/l	N	U	0.0425*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW01 (F)	Uranium-234	1.63	0.296	0.192	pCi/l	Y		6.07	27	2.02E+02	NO	NO	NO
C2-SWDD-SW01 (F)	Uranium-235	0.445	0.147	0.062	pCi/l	Y		0.63	27	2.18E+02	NO	NO	NO
C2-SWDD-SW01 (F)	Uranium-238	0.855	0.228	0.192	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Table A14-2 – SWDD Filtered Surface Water Sample Results

SWDD SW02 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW02 (F)	Gross Alpha	6.18	3.1	2.12	pCi/l	Y		16.7	15	N/A	NO	NO	-
C2-SWDD-SW02 (F)	Gross Beta	6.31	2.76	2.71	pCi/l	Y		9.87	50	N/A	NO	NO	-
C2-SWDD-SW02 (F)	Cesium-137	0	2.88	4.14	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW02 (F)	Plutonium-238	0.036	0.056	0.096	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW02 (F)	Plutonium-239/240	0	0.042	0.089	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW02 (F)	Radium-228	0	0.054	0.371	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW02 (F)	Radium-226	0	0.239	0.56	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW02 (F)	Strontium-90	0	0.263	0.463	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW02 (F)	Thorium-228	0.125	0.08	0.106	pCi/l	Y		0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW02 (F)	Thorium-230	0.057	0.153	0.337	pCi/l	N	U	0.29	15	2.57E+03	NO	NO	NO
C2-SWDD-SW02 (F)	Thorium-232	0.417	0.106	0.08	pCi/l	Y		0.0425*	15	3.07E+02	YES	NO	NO
C2-SWDD-SW02 (F)	Uranium-234	3.41	0.362	0.135	pCi/l	Y		6.07	27	2.02E+02	NO	NO	NO
C2-SWDD-SW02 (F)	Uranium-235	0.764	0.176	0.095	pCi/l	Y		0.63	27	2.18E+02	YES	NO	NO
C2-SWDD-SW02 (F)	Uranium-238	1.78	0.263	0.11	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Table A14-3 – SWDD Filtered Surface Water Sample Results

SWDD SW03 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW03 (F)	Gross Alpha	7.08	3.94	2.87	pCi/l	Y		16.7	15	N/A	NO	NO	-
C2-SWDD-SW03 (F)	Gross Beta	10.9	3.4	3.2	pCi/l	Y		9.87	50	N/A	YES	NO	-
C2-SWDD-SW03 (F)	Cesium-137	0.775	3.04	7.21	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW03 (F)	Plutonium-238	0	0.096	0.17	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW03 (F)	Plutonium-239/240	0.073	0.049	0.075	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW03 (F)	Radium-228	0	0.056	0.459	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW03 (F)	Radium-226	0.05	0.107	0.218	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW03 (F)	Strontium-90	0.471	0.301	0.491	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW03 (F)	Thorium-228	0.119	0.146	0.234	pCi/l	N	U	0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW03 (F)	Thorium-230	0	0.127	0.336	pCi/l	N	U	0.29	15	2.57E+03	NO	NO	NO
C2-SWDD-SW03 (F)	Thorium-232	0.052	0.087	0.141	pCi/l	N	U	0.0425*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW03 (F)	Uranium-234	1.84	0.254	0.168	pCi/l	Y		6.07	27	2.02E+02	NO	NO	NO
C2-SWDD-SW03 (F)	Uranium-235	0.648	0.158	0.132	pCi/l	Y		0.63	27	2.18E+02	YES	NO	NO
C2-SWDD-SW03 (F)	Uranium-238	0.65	0.168	0.162	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Table A14-4 – SWDD Filtered Surface Water Sample Results

SWDD SW04 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW04 (F)	Gross Alpha	1.7	3.89	3.87	pCi/l	N	U	16.7	15	N/A	NO	NO	-
C2-SWDD-SW04 (F)	Gross Beta	4.87	3.27	3.33	pCi/l	Y		9.87	50	N/A	NO	NO	-
C2-SWDD-SW04 (F)	Cesium-137	1.95	2.09	4.95	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW04 (F)	Plutonium-238	0	0.087	0.157	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW04 (F)	Plutonium-239/240	0.012	0.038	0.07	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW04 (F)	Radium-228	0	0.057	0.357	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW04 (F)	Radium-226	0.153	0.139	0.254	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW04 (F)	Strontium-90	0	0.287	0.503	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW04 (F)	Thorium-228	0.085	0.118	0.189	pCi/l	N	U	0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW04 (F)	Thorium-230	0.366	0.161	0.279	pCi/l	Y		0.29	15	2.57E+03	YES	NO	NO
C2-SWDD-SW04 (F)	Thorium-232	0.127	0.093	0.131	pCi/l	N	U	0.0425*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW04 (F)	Uranium-234	1.82	0.263	0.143	pCi/l	Y		6.07	27	2.02E+02	NO	NO	NO
C2-SWDD-SW04 (F)	Uranium-235	0.455	0.127	0.047	pCi/l	Y		0.63	27	2.18E+02	NO	NO	NO
C2-SWDD-SW04 (F)	Uranium-238	1.21	0.22	0.143	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Table A14-5 – SWDD Filtered Surface Water Sample Results

SWDD SW05 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW05 (F)	Gross Alpha	5.12	2.95	2.27	pCi/l	Y		16.7	15	N/A	NO	NO	-
C2-SWDD-SW05 (F)	Gross Beta	6.04	2.44	2.36	pCi/l	Y		9.87	50	N/A	NO	NO	-
C2-SWDD-SW05 (F)	Cesium-137	2.6	3.1	7.36	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW05 (F)	Plutonium-238	0.108	0.106	0.176	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW05 (F)	Plutonium-239/240	0	0.069	0.126	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW05 (F)	Radium-228	0.197	0.062	0.428	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW05 (F)	Radium-226	0	0.089	0.194	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW05 (F)	Strontium-90	0.003	0.232	0.395	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW05 (F)	Thorium-228	0.162	0.108	0.131	pCi/l	Y		0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW05 (F)	Thorium-230	0.261	0.168	0.308	pCi/l	N	U	0.29	15	2.57E+03	NO	NO	NO
C2-SWDD-SW05 (F)	Thorium-232	0.113	0.083	0.091	pCi/l	Y		0.0425*	15	3.07E+02	YES	NO	NO
C2-SWDD-SW05 (F)	Uranium-234	1.85	0.276	0.09	pCi/l	Y		6.07	27	2.02E+02	NO	NO	NO
C2-SWDD-SW05 (F)	Uranium-235	0.338	0.121	0.065	pCi/l	Y		0.63	27	2.18E+02	NO	NO	NO
C2-SWDD-SW05 (F)	Uranium-238	0.945	0.196	0.054	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Table A14-6 – SWDD Filtered Surface Water Sample Results

SWDD SW06 - FILTERED SURFACE WATER													
Location	Analysis	Result	Uncertainty	Detection Limit	Units	Detect	Qualifier	BTV	Federal Drinking Water MCLs	Biota Concentration Guideline	Result > BTV	Result > MCL	Result > BCG
C2-SWDD-SW06 (F)	Gross Alpha	3.01	4.4	4.17	pCi/l	N	U	16.7	15	N/A	NO	NO	-
C2-SWDD-SW06 (F)	Gross Beta	4.01	3.27	3.36	pCi/l	Y		9.87	50	N/A	NO	NO	-
C2-SWDD-SW06 (F)	Cesium-137	0	3.73	5.41	pCi/l	N	U	0.889*	N/A	4.27E+01	NO	-	NO
C2-SWDD-SW06 (F)	Plutonium-238	0.114	0.085	0.135	pCi/l	N	U	N/A	N/A	1.76E+02	-	-	NO
C2-SWDD-SW06 (F)	Plutonium-239/240	0.049	0.043	0.066	pCi/l	N	U	N/A	N/A	1.87E+02	-	-	NO
C2-SWDD-SW06 (F)	Radium-228	0.255	0.057	0.312	pCi/l	N	U	1.09	5	3.39E+00	NO	NO	NO
C2-SWDD-SW06 (F)	Radium-226	0.185	0.277	0.539	pCi/l	N	U	1.37	5	4.08E+00	NO	NO	NO
C2-SWDD-SW06 (F)	Strontium-90	0.193	0.196	0.333	pCi/l	N	U	N/A	8	2.79E+02	-	NO	NO
C2-SWDD-SW06 (F)	Thorium-228	0.023	0.097	0.163	pCi/l	N	U	0.41	15	3.74E+02	NO	NO	NO
C2-SWDD-SW06 (F)	Thorium-230	0	0.09	0.275	pCi/l	N	U	0.29	15	2.57E+03	NO	NO	NO
C2-SWDD-SW06 (F)	Thorium-232	0.019	0.056	0.09	pCi/l	N	U	0.0425*	15	3.07E+02	NO	NO	NO
C2-SWDD-SW06 (F)	Uranium-234	6.34	0.635	0.243	pCi/l	Y		6.07	27	2.02E+02	YES	NO	NO
C2-SWDD-SW06 (F)	Uranium-235	2.15	0.37	0.143	pCi/l	Y		0.63	27	2.18E+02	YES	NO	NO
C2-SWDD-SW06 (F)	Uranium-238	3.5	0.478	0.22	pCi/l	Y		5.23	27	2.24E+02	NO	NO	NO

Tables A15 and A16- RESRAD BIOTA OUTPUT

	Aquatic Animal							
	Water				Sediment			
Nuclide	Concentration (pCi/L)	BCG (pCi/L)	Ratio	Limiting Organism	Concentration (pCi/g)	BCG (pCi/g)	Ratio	Limiting Organism
Cs-137	1.71	1.05E+03	1.63E-03	No	0.525	4.93E+04	1.06E-05	No
Pu-238	0.136	1.76E+02	7.72E-04	Yes	0.035	3.95E+06	8.87E-09	No
Pu-239	0.104	1.87E+02	5.57E-04	Yes	0.041	7.05E+06	5.82E-09	No
Ra-226	0.43	1.02E+01	4.22E-02	No	1.96	1.45E+04	1.35E-04	No
Ra-228	0.433	8.47E+00	5.11E-02	No	1.17	2.90E+04	4.03E-05	No
Sr-90	0.283	5.39E+04	5.25E-06	No	1.7	3.52E+04	4.83E-05	No
Th-228	0.285	3.74E+02	7.63E-04	Yes	1.15	1.60E+04	7.17E-05	No
Th-230	0.363	2.57E+03	1.41E-04	Yes	1.88	2.74E+06	6.85E-07	No
Th-232	0.197	3.07E+02	6.42E-04	Yes	1.27	3.29E+06	3.86E-07	No
U-234	3.69	2.02E+02	1.83E-02	Yes	2.27	3.08E+06	7.36E-07	No
U-235	1.3	2.18E+02	5.97E-03	Yes	0.567	1.05E+05	5.41E-06	No
U-238	2.05	2.24E+02	9.17E-03	Yes	1.86	4.29E+04	4.34E-05	No
Summed	-	-	1.31E-01	-	-	-	3.57E-04	-

	Riparian Animal							
	Water				Sediment			
Nuclide	Concentration (pCi/L)	BCG (pCi/L)	Ratio	Limiting Organism	Concentration (pCi/g)	BCG (pCi/g)	Ratio	Limiting Organism
Cs-137	1.71	4.27E+01	4.01E-02	Yes	0.525	3.13E+03	1.68E-04	Yes
Pu-238	0.136	5.51E+02	2.47E-04	No	0.035	5.73E+03	6.11E-06	Yes
Pu-239	0.104	6.22E+02	1.67E-04	No	0.041	5.87E+03	6.98E-06	Yes
Ra-226	0.43	4.08E+00	1.05E-01	Yes	1.96	1.01E+02	1.94E-02	Yes
Ra-228	0.433	3.39E+00	1.28E-01	Yes	1.17	8.76E+01	1.34E-02	Yes
Sr-90	0.283	2.79E+02	1.02E-03	Yes	1.7	5.83E+02	2.92E-03	Yes
Th-228	0.285	2.04E+03	1.40E-04	No	1.15	7.95E+02	1.45E-03	Yes
Th-230	0.363	1.39E+04	2.62E-05	No	1.88	1.04E+04	1.80E-04	Yes
Th-232	0.197	1.69E+03	1.17E-04	No	1.27	1.22E+03	1.04E-03	Yes
U-234	3.69	6.84E+02	5.40E-03	No	2.27	5.27E+03	4.30E-04	Yes
U-235	1.3	7.37E+02	1.76E-03	No	0.567	3.73E+03	1.52E-04	Yes
U-238	2.05	7.57E+02	2.71E-03	No	1.86	2.49E+03	7.47E-04	Yes
Summed	-	-	2.85E-01	-	-	-	3.98E-02	-

Attachment A1 – Location Information for SWDD Sampling

Locations Investigated in SWDD											
Location		Coordinates ⁽²⁾		Lithology	Field Screening Measurements				Samples for Lab Analysis ⁽⁷⁾		
ID	Description ⁽¹⁾	Northing	Easting		Explosives ⁽³⁾	PID ⁽⁴⁾ (ppm)	Rad Detector ^{(5) (6)} (uR/hr) (cpm)		ID	Depth (ft bgs)	Rationale
SWDD-1	Downgradient location, intersection of SWDD and LPSCD property boundary	1174801.7289	1033816.9557	0-0.1 ft: Peat	ND	0			SW-01	---	Water
				0.1-1.0 ft: Sand		0			SO-01-1	0.5-1	Sediment
				1.0-3.0 ft: Clay		0			SO-01-1 (dup)	0.5-1	Sediment, duplicate
						0			SO-01-3	2.5-3	Soil
SWDD-2	Intersection of SWDD and 30-inch outfall line, between SWDD-1 and SWDD-3	1173911.1226	1034025.6916	0-1.0 ft: Sand	ND	0			SW-02	---	Water
				1.0-3.0 ft: Clay		0			SO-02-1	0.5-1	Sediment
						0			SO-02-3	2.5-3	Soil
SWDD-3	Between SWDD-2 and SWDD-4.	1173319.7043	1034168.3278	0-1.0 ft: Sand	ND	0			SW-03	---	Water
				1.0-3.0 ft: Clay		0			SO-03-1	0.5-1	Sediment
						0			SO-03-3	2.5-3	Soil
SWDD-4	Between SWDD-3 and SWDD-5.	1172436.0558	1034373.5847	0-0.5 ft: Peat	ND	0			SW-04	---	Water
				0.5-1.0 ft: Sand		0			SO-04-1	0.5-1	Sediment
				1.0-3.0 ft: Clay		0			SO-04-3	2.5-3	Soil
						0					
SWDD-5	Between SWDD-4 and SWDD-6.	1171746.0000	1034547.0000	0-0.2 ft: Peat	ND	0			SW-05	---	Water
				0.2-1.0 ft: Sand		0			SO-05-1	0.5-1	Sediment
				1.0-3.0 ft: Clay		0			SO-05-3	2.5-3	Soil
SWDD-6	Upgradient location, intersection of SWDD and LPSCD property boundary.	1170787.0424	1034822.3668	0-0.5 ft: Gravel & Cobbles	ND	0			SW-06	---	Water
				0.5-1.0 ft: Sand		0			SO-06-1	0.5-1	Sediment
				1.0-3.0 ft: Clay		0			SO-06-3	2.5-3	Soil

Attachment A1 – Legend

Notes:

- 1 Refer to Figure 4-1.
- 2 NAD 1983, State Plane New York West - US Survey feet
- 3 Where multiple soil borings were drilled, coordinates are presented for the boring where soil samples were collected for lab analysis.
- 4 Refer to Section 2.1 (USAGC, 2009)
- 5 DropEx[®] field screening kit
- 6 Photoionization detector with 10.6 electron volt (eV) lamp
- 7 Bicon MicroRem dose rate meter
- 8 Site background is 7.7 uR/hr and 8,000 cpm
- 9 VOCs, SVOCs, PCBs, explosives, metals, & hexavalent chromium (refer to Section 4.3)

Abbreviations

bkgd	background
cpm	counts per minute
ft bgs	feet below ground surface
ft ³	cubic feet
NAD	North American Datum
ND	Not detected
NM	Not measured
PID	photoionization detector
ppm	parts per million
uR/hr	microRoentgens per hour

Appendix B

Mound East of Lewiston-Porter School Soccer Field Sampling

Appendix B Includes:

Table B1 - Soil Boring 1 (0.0 – 0.5)

Table B2 - Soil Boring 1 (0.5 – 1.0)

Table B3 - Soil Boring 1 (3.5 – 4.0)

Table B4 – Soil Boring 2 (0.0 – 0.5)

Table B5 – Soil Boring 2 (0.5 – 1.0)

Table B6 – Soil Boring 2 (2.0 – 2.5)

Table B7 – Rock Sample Results

Attachment B1 and B2 – Soil Boring 1 and 2 Geologist Logs

Table B1 - Soil Boring 1 (0.0 – 0.5)

SOIL BORING - 1											
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Result > UTL	Result > Dose Based Screening Level**
SB-1 (0.0-0.5)	Gross Alpha	16.3	2.92	1.15	pCi/g	15.1	N/A	Y	J	YES	-
SB-1 (0.0-0.5)	Gross Beta	20.7	2.9	2.34	pCi/g	28.9	N/A	Y	J	NO	-
SB-1 (0.0-0.5)	Cs-137	0.332	0.064	0.067	pCi/g	0.343	11	Y		NO	NO
SB-1 (0.0-0.5)	Pu-238	0	0.078	0.149	pCi/g	N/A	2.5	N	U	-	NO
SB-1 (0.0-0.5)	Pu-239/240	0.008	0.035	0.067	pCi/g	0.0437*	2.3	N	U	-	NO
SB-1 (0.0-0.5)	Radium-228	0.866	0.047	0.339	pCi/g	1.26	N/A	Y	J	NO	-
SB-1 (0.0-0.5)	Radium-226	3.83	0.255	0.182	pCi/g	1.2	0.7	Y		YES	YES
SB-1 (0.0-0.5)	Strontium-90	0	0.229	0.43	pCi/g	N/A	1.7	N	U	-	NO
SB-1 (0.0-0.5)	Thorium-228	0.944	0.165	0.129	pCi/g	1.64	4.7	Y		NO	NO
SB-1 (0.0-0.5)	Thorium-230	3.65	0.314	0.237	pCi/g	1.39	1.8	Y		YES	YES
SB-1 (0.0-0.5)	Thorium-232	0.851	0.151	0.093	pCi/g	1.24	1.1	Y		NO	NO
SB-1 (0.0-0.5)	Uranium-234	2.4	0.146	0.057	pCi/g	1.66	13	Y		YES	NO
SB-1 (0.0-0.5)	Uranium-235	0.181	0.042	0.029	pCi/g	0.08	8.00	Y		YES	NO
SB-1 (0.0-0.5)	Uranium-238	2.18	0.138	0.039	pCi/g	1.34	14	Y		YES	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
**	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B2 - Soil Boring 1 (0.5 – 1.0)

SOIL BORING - 1											
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Result > UTL	Result > Dose Based Screening Level**
SB-1 (0.5-1.0)	Gross Alpha	33.3	3.6	0.847	pCi/g	15.1	N/A	Y	J	YES	-
SB-1 (0.5-1.0)	Gross Beta	21.7	2.47	1.84	pCi/g	28.9	N/A	Y	J	NO	-
SB-1 (0.5-1.0)	Cs-137	0.272	0.106	0.117	pCi/g	0.343	11	Y		NO	NO
SB-1 (0.5-1.0)	Pu-238	0	0.08	0.189	pCi/g	N/A	2.5	N	U	-	NO
SB-1 (0.5-1.0)	Pu-239/240	0	0.035	0.082	pCi/g	0.0437*	2.3	N	U	-	NO
SB-1 (0.5-1.0)	Radium-228	0.591	0.042	0.273	pCi/g	1.26	N/A	Y	J	NO	-
SB-1 (0.5-1.0)	Radium-226	2.12	0.2	0.107	pCi/g	1.2	0.7	Y		YES	YES
SB-1 (0.5-1.0)	Strontium-90	0	0.394	0.741	pCi/g	N/A	1.7	N	U	-	NO
SB-1 (0.5-1.0)	Thorium-228	0.854	0.189	0.135	pCi/g	1.64	4.7	Y		NO	NO
SB-1 (0.5-1.0)	Thorium-230	2.25	0.31	0.3	pCi/g	1.39	1.8	Y		YES	YES
SB-1 (0.5-1.0)	Thorium-232	0.886	0.182	0.079	pCi/g	1.24	1.1	Y		NO	NO
SB-1 (0.5-1.0)	Uranium-234	2.87	0.191	0.05	pCi/g	1.66	13	Y		YES	NO
SB-1 (0.5-1.0)	Uranium-235	0.259	0.059	0.036	pCi/g	0.08	8.00	Y		YES	NO
SB-1 (0.5-1.0)	Uranium-238	2.34	0.172	0.041	pCi/g	1.34	14	Y		YES	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
* *	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B3 - Soil Boring 1 (3.5 – 4.0)

SOIL BORING - 1											
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Result > UTL	Result > Dose Based Screening Level**
SB-1 (3.5-4.0)	Gross Alpha	46.8	4.21	0.971	pCi/g	15.1	N/A	Y	J	YES	-
SB-1 (3.5-4.0)	Gross Beta	28.3	2.7	1.84	pCi/g	28.9	N/A	Y	J	NO	-
SB-1 (3.5-4.0)	Cs-137	0.018	0.045	0.106	pCi/g	0.343	11	N	U	NO	NO
SB-1 (3.5-4.0)	Pu-238	0.132	0.095	0.144	pCi/g	N/A	2.5	N	U	-	NO
SB-1 (3.5-4.0)	Pu-239/240	0.01	0.058	0.113	pCi/g	0.0437*	2.3	N	U	-	NO
SB-1 (3.5-4.0)	Radium-228	0.559	0.049	0.318	pCi/g	1.26	N/A	Y	J	NO	-
SB-1 (3.5-4.0)	Radium-226	1.56	0.21	0.136	pCi/g	1.2	0.7	Y		YES	YES
SB-1 (3.5-4.0)	Strontium-90	0.52	0.519	0.852	pCi/g	N/A	1.7	N	U	-	NO
SB-1 (3.5-4.0)	Thorium-228	1.19	0.217	0.099	pCi/g	1.64	4.7	Y		NO	NO
SB-1 (3.5-4.0)	Thorium-230	1.34	0.252	0.278	pCi/g	1.39	1.8	Y		NO	NO
SB-1 (3.5-4.0)	Thorium-232	1.05	0.203	0.091	pCi/g	1.24	1.1	Y		NO	NO
SB-1 (3.5-4.0)	Uranium-234	0.622	0.303	0.264	pCi/g	1.66	13	Y	J	NO	NO
SB-1 (3.5-4.0)	Uranium-235	0.283	0.192	0.133	pCi/g	0.08	8.00	Y		YES	NO
SB-1 (3.5-4.0)	Uranium-238	0.763	0.318	0.229	pCi/g	1.34	14	Y	J	NO	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
* *	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B4 – Soil Boring 2 (0.0 – 0.5)

SOIL BORING - 2												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Comment	Result > UTL	Result > Dose Based Screening Level**
SB-2 (0-0.5)	Gross Alpha	14.3	2.25	0.771	pCi/g	15.1	N/A	Y	J		NO	-
SB-2 (0-0.5)	Gross Beta	16.9	2.32	1.82	pCi/g	28.9	N/A	Y	J		NO	-
SB-2 (0-0.5)	Cs-137	0.228	0.034	0.038	pCi/g	0.343	11	Y			NO	NO
SB-2 (0-0.5)	Pu-238	0.004	0.039	0.086	pCi/g	N/A	2.5	N	U		-	NO
SB-2 (0-0.5)	Pu-239/240	0.043	0.044	0.063	pCi/g	0.0437*	2.3	N	U		-	NO
SB-2 (0-0.5)	Radium-228	0.506	0.048	0.32	pCi/g	1.26	N/A	Y	J		NO	-
SB-2 (0-0.5)	Radium-226	3.01	0.236	0.082	pCi/g	1.2	0.7	Y			YES	YES
SB-2 (0-0.5)	Strontium-90	0.205	0.24	0.405	pCi/g	N/A	1.7	N	U		-	NO
SB-2 (0-0.5)	Thorium-228	1.05	0.205	0.087	pCi/g	1.64	4.7	Y			NO	NO
SB-2 (0-0.5)	Thorium-230	3.18	0.371	0.305	pCi/g	1.39	1.8	Y			YES	YES
SB-2 (0-0.5)	Thorium-232	0.854	0.187	0.09	pCi/g	1.24	1.1	Y			NO	NO
SB-2 (0-0.5)	Uranium-234	3.49	0.374	0.161	pCi/g	1.66	13	Y			YES	NO
SB-2 (0-0.5)	Uranium-235	1	0.199	0.08	pCi/g	0.08	8.00	Y			YES	NO
SB-2 (0-0.5)	Uranium-238	3.03	0.342	0.08	pCi/g	1.34	14	Y			YES	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
**	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B5 – Soil Boring 2 (0.5 – 1.0)

SOIL BORING - 2												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Comment	Result > UTL	Result > Dose Based Screening Level**
SB-2 (0.5-1.0)	Gross Alpha	14.6	2.58	0.965	pCi/g	15.1	N/A	Y	J		NO	-
SB-2 (0.5-1.0)	Gross Beta	9.52	2.34	2.12	pCi/g	28.9	N/A	Y	J		NO	-
SB-2 (0.5-1.0)	Cs-137	0.103	0.029	0.042	pCi/g	0.343	11	Y			NO	NO
SB-2 (0.5-1.0)	Pu-238	0	0.108	0.211	pCi/g	N/A	2.5	N	U		-	NO
SB-2 (0.5-1.0)	Pu-239/240	0	0.086	0.182	pCi/g	0.0437*	2.3	N	U		-	NO
SB-2 (0.5-1.0)	Radium-228	0.411	0.042	0.233	pCi/g	1.26	N/A	Y	R	MB > RESULT	NO	-
SB-2 (0.5-1.0)	Radium-226	1.87	0.173	0.108	pCi/g	1.2	0.7	Y			YES	YES
SB-2 (0.5-1.0)	Strontium-90	0	0.209	0.385	pCi/g	N/A	1.7	N	U		-	NO
SB-2 (0.5-1.0)	Thorium-228	0.802	0.192	0.174	pCi/g	1.64	4.7	Y			NO	NO
SB-2 (0.5-1.0)	Thorium-230	1.65	0.279	0.325	pCi/g	1.39	1.8	Y			YES	NO
SB-2 (0.5-1.0)	Thorium-232	0.973	0.191	0.104	pCi/g	1.24	1.1	Y			NO	NO
SB-2 (0.5-1.0)	Uranium-234	2.41	0.396	0.194	pCi/g	1.66	13	Y			YES	NO
SB-2 (0.5-1.0)	Uranium-235	0.535	0.19	0.118	pCi/g	0.08	8.00	Y			YES	NO
SB-2 (0.5-1.0)	Uranium-238	1.7	0.343	0.222	pCi/g	1.34	14	Y			YES	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
* *	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B6 – Soil Boring 2 (2.0 – 2.5)

SOIL BORING - 2												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Comment	Result > UTL	Result > Dose Based Screening Level**
SB-2 (2.0-2.5)	Gross Alpha	13.5	2.64	1.18	pCi/g	15.1	N/A	Y			NO	-
SB-2 (2.0-2.5)	Gross Beta	13.2	2.54	2.23	pCi/g	28.9	N/A	Y			NO	-
SB-2 (2.0-2.5)	Cs-137	0.009	0.045	0.106	pCi/g	0.343	11	N	U		NO	NO
SB-2 (2.0-2.5)	Pu-238	0.082	0.066	0.102	pCi/g	N/A	2.5	N	U		-	NO
SB-2 (2.0-2.5)	Pu-239/240	0	0.063	0.132	pCi/g	0.0437*	2.3	N	U		-	NO
SB-2 (2.0-2.5)	Radium-228	0.391	0.041	0.221	pCi/g	1.26	N/A	Y	R	MB > RESULT	NO	-
SB-2 (2.0-2.5)	Radium-226	0.957	0.188	0.193	pCi/g	1.2	0.7	Y			NO	YES
SB-2 (2.0-2.5)	Strontium-90	0	0.259	0.453	pCi/g	N/A	1.7	N	U		-	NO
SB-2 (2.0-2.5)	Thorium-228	0.802	0.152	0.145	pCi/g	1.64	4.7	Y			NO	NO
SB-2 (2.0-2.5)	Thorium-230	0.235	0.134	0.25	pCi/g	1.39	1.8	N	U		NO	NO
SB-2 (2.0-2.5)	Thorium-232	0.674	0.128	0.092	pCi/g	1.24	1.1	Y			NO	NO
SB-2 (2.0-2.5)	Uranium-234	1.42	0.144	0.059	pCi/g	1.66	13	Y			NO	NO
SB-2 (2.0-2.5)	Uranium-235	0.264	0.064	0.044	pCi/g	0.08	8.00	Y			YES	NO
SB-2 (2.0-2.5)	Uranium-238	1	0.12	0.044	pCi/g	1.34	14	Y			NO	NO

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
**	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.

Table B7 – Rock Sample Results

Rocks												
Location	Analysis	Result	Uncertainty	Detection Limit	Units	BTV	Dose Based Screening Level**	Detect	Qualifier	Comment	Result > UTL	Result > Dose Based Screening Level**
Rocks	Gross Alpha	180	8.58	1.07	pCi/g	15.1	N/A	Y	J		YES	-
Rocks	Gross Beta	77.5	3.99	2.19	pCi/g	28.9	N/A	Y	J		YES	-
Rocks	Cs-137	0	0.075	0.178	pCi/g	0.343	11	N	U		NO	NO
Rocks	Pu-238	0.007	0.137	0.264	pCi/g	N/A	2.5	N	U		-	NO
Rocks	Pu-239/240	0.047	0.185	0.336	pCi/g	0.0437*	2.3	N	U		-	NO
Rocks	Radium-228	0.456	0.04	0.272	pCi/g	1.26	N/A	Y	R	MB>Result	NO	-
Rocks	Radium-226	6.89	0.382	0.129	pCi/g	1.2	0.7	Y			YES	YES
Rocks	Strontium-90	0	0.251	0.427	pCi/g	N/A	1.7	N	U		-	NO
Rocks	Thorium-228	0.35	0.343	0.396	pCi/g	1.64	4.7	N	U		NO	NO
Rocks	Thorium-230	28.4	2.33	1.5	pCi/g	1.39	1.8	Y			YES	YES
Rocks	Thorium-232	0.7	0.412	0.36	pCi/g	1.24	1.1	Y			NO	NO
Rocks	Uranium-234	41.2	3.15	1.43	pCi/g	1.66	13	Y			YES	YES
Rocks	Uranium-235	3.32	1.03	0.939	pCi/g	0.08	8.00	Y			YES	NO
Rocks	Uranium-238	39.7	3.04	1.04	pCi/g	1.34	14	Y			YES	YES

LEGEND	Comment
N/A	Value Not Available
Gray	Result is above both Dose Based Screening Level (DBSL) and the Background Threshold Value (BTV)
BOLD	Bold font indicates that the value exceeds the BTV
U	A "U" flag indicates that the result was a non-detect
*	Background investigation did not yield any detects, the highest recorded MDL from the background investigation was used in place of a UTL.
* *	US Nuclear Regulatory Commission. Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria. NUREG-1757, Vol.2, Rev.1. September 2006.



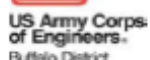
US Army Corps
of Engineers
Buffalo District

BORING LOG: SB-1

SHEET 1 OF 1

PROJECT NAME: LOOW	PROJECT NUMBER: NA	DATE: 27-AUG-2011
LOCATION: Mound East of Soccer Field	ADDRESS: Town of Lewiston, Niagara County, New York	
DRILLING CONTRACTOR: NA	DRILLER: [REDACTED]	
DRILL RIG TYPE: Hand Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: NA	
BORING: 4-FT BGS	DIAMETER: 2-IN	RISER INTERVAL NA TO FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: [REDACTED]	

DEPTH: FT	Geologic Description and Observations	CPM	Recovery (inches)
	Medium GRAVEL. Some Peat, Moist, Weak cementation, Very soft consistency	61,288	
1	Medium GRAVEL. Some Peat, Moist, Weak cementation, Very soft consistency	74,129	
	Brown SILT, Firm consistency, Moist, Homogeneous, Moderate cementation	57,120	
2	Brown SILT, Firm consistency, Moist, Homogeneous, Moderate cementation	35,430	
	Brown SILT and Clay, Firm consistency, Moist, Homogeneous, Moderate cementation	24,438	
3	Brown CLAY, Firm consistency, Homogeneous	20,136	
	Brown CLAY, Firm consistency, Homogeneous	19,279	
4	Brown CLAY, Firm consistency, Homogeneous	18,000	
5			
6			
7			



SHEET 1 OF 1

PROJECT NAME: LOOW	PROJECT NUMBER: NA	DATE: 27AUG2010
LOCATION: Mound east of soccer field	ADDRESS: Town of Lewiston, Niagara County, New York	
DRILLING CONTRACTOR: NA	DRILLER: [REDACTED]	
DRILL RIG TYPE: Hand geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: NA	
BORING: 2.5-FT BGS	DIAMETER: 2-IN	
WELL DEPTH: NA	RISER INTERVAL NA	TO FT BGS
WELL DIAMETER: NA	SCREEN INTERVAL NA	TO FT BGS
	GEOLOGIST: [REDACTED]	

DEPTH: FT	Geologic Description and Observations	CPM (PPM)	Recovery (inches)
1	Medium GRAVEL. Some Peat, Moist, Weak cementation, Very soft consistency	34,869	
	Medium GRAVEL. Some Peat, Moist, Weak cementation, Very soft consistency	59,597	
2	Dark Brown SILT and CLAY, Saturated, No Apparent Impacts	66,352	
	Brown CLAY, Firm consistency, Homogeneous	57,655	
3	Brown CLAY, Firm consistency, Homogeneous	23,195	
	Brown CLAY, Firm consistency, Homogeneous	18,814	
4			