U.S. Army Corps of Engineers
Buffalo District Office
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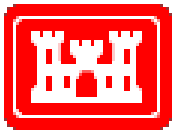
Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites

Tonawanda, New York

September 20, 2004



FUSRAP

Formerly Utilized Sites Remedial Action Program

Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites

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I. INTRODUCTION

The *Record of Decision (ROD) for the Ashland 1 (Including Seaway Area D) and Ashland 2 Sites* located in Tonawanda, New York was issued by the United States Army Corps of Engineers (USACE) on April 20th, 1998. The ROD identifies radium-226 (Ra-226), thorium-230 (Th-230) and uranium-238 (U-238) as radiological contaminants of concern (COCs) in soils.

In the ROD, USACE determined that Title 40, Part 192 of the *Code of Federal Regulations* [40 CFR Part 192] and Title 10, Part 20 of the *Code of Federal Regulations* [10 CFR 20] were applicable or relevant and appropriate requirements (ARAR) for the site. It further determined, based on the expected distribution of the COCs in the soil at the site, that if all the soil containing more than 40 picocuries/gram (pCi/g) Th-230 was removed from the Ashland sites, the residual concentrations of the other COCs at the site would be low enough to insure compliance with 40 CFR Part 192 and 10 CFR 20 and be protective of human health and the environment.

Rattlesnake Creek runs through the Ashland 2 site**.** As part of the remedial activities at the Ashland 2 site, soil samples were collected in Rattlesnake Creek. The results of the sampling indicated that the creek contained radionuclide contamination that had originated from the Ashland and Seaway properties. However, the distribution of the COCs in the sediments of the creek is different than the distribution of those same COCs in the soils at the Ashland sites.

In order to address the different distribution of COCs in the Rattlesnake Creek sediments USACE has developed site-specific derived concentration guideline levels (DCGLs) for use in the field during the remediation of the Rattlesnake Creek area. These DCGLs will result in residual concentrations of the COCs in the sediments that are consistent with the residual soil concentrations at the Ashland 2 and Ashland 1 sites that have already been remediated, and will meet the requirements of the ARARs and be protective to human health. In developing that guideline, USACE has used an approach similar to the one set forth in Title 10, Part 40 of the *Code of Federal Regulations* [10 CFR 40], the Nuclear Regulatory Commission's regulation pertaining to the decommissioning of licensed sites, and also followed the approach of the dose assessment for the Ashland sites, presented in *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997). 10 CFR 40 provides a benchmark dose method for achieving a criteria for residual radium in soil that is the same as that found in 40 CFR 192.

The DCGLs for Rattlesnake Creek for the three principal radionuclides of concern (Ra-226, Th-230, and U-238) are provided in Table 1. The DCGLs are incremental to background concentrations and represent average concentration guidelines for specific size areas. The derivation of the revised DCGLs is documented in the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

	DCGLs for Area Size (pCi/g)		
	10,000 square meters	100 square meters	1 square meter
Ra-226	4.3	5	16
Th-230	12	14	46
U-238	350	450	2000

Table 1. Revised Site-Specific Cleanup Levels

This Explanation of Significant Differences (ESD) is being prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 300.435(c)(2)(1) of the National Contingency Plan (NCP). The statute and regulation require that a lead agency document changes made during a remedial action after adoption of a final remedial action plan when such action differs in any significant respect from the final plan. The lead agency is also required to consult with the support agency regarding the ESD then make it available to the public. The lead agency for this site is USACE and the support agency is the New York State Department of Environmental Conservation (NYSDEC).

The administrative record file contains the ESD, ROD and all documentation used to prepare them, and is available at the following locations:

U.S. Army Corps of Engineers
Public Information Center
1776 Niagara Street
Buffalo, NY 14207-3199

Available Monday through Friday 8:30-4:00, closed on federal holidays

Tonawanda Public Library
333 Main Street
Tonawanda, NY 14150

Summer (last Saturday in June - Tuesday after Labor Day)
Monday, Tuesday, Thursday - 10-8:30
Wednesday, Friday - 10-5:30
Saturday, Sunday - Closed

Winter
Monday, Tuesday, Thursday - 10-8:30
Friday, Saturday - 10-5:30
Wednesday, Sunday - Closed

II. SITE HISTORY, CONTAMINATION AND SELECTED REMEDY

A. Site History

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to identify, investigate and clean up or control sites that were part of the Nation's early atomic energy program. Activities at these sites were performed by the Manhattan Engineer District (MED) (1944 – 1946) or under the Atomic Energy Commission (AEC)(1947 – 1975). Both the MED and AEC were predecessors of the U.S. Department of Energy (DOE). In 1997, Congress transferred the responsibility for the program from the DOE to the USACE.

The Buffalo District FUSRAP Ashland 1 (including Seaway Area D) and Ashland 2 Sites are located in Tonawanda, New York, as shown on Figure 1. During the early to mid-1940's, portions of the property located at the former Linde Site were used for the processing of uranium ores under Federal MED contracts. In 1943, when commercial operations began at the Linde Site, efforts were also underway to identify a storage site for waste residues produced during uranium processing at the Linde Site. In 1943, MED leased a 10-acre tract known as the Haist property, now called Ashland 1, to serve as a storage site for the uranium ore processing residues. Residues were deposited at Ashland 1 from 1944 to 1946 and consisted primarily of low-grade uranium ore tailings. In 1960, the property was transferred to the Ashland Oil Company and has been used as part of this company's oil refinery activities since that time. In 1974, Ashland Oil Company constructed a bermed area for two petroleum product storage tanks and a drainage ditch on the Ashland 1 property. The majority of the soil removed during construction of the bermed area and drainage ditch was transported by Ashland Oil Company to the Seaway landfill and Ashland 2 sites for disposal. Surface water from the Ashland sites drains via Rattlesnake Creek and Two Mile Creek to the Niagara River. Figure 2 shown the locations of Ashland 1, Ashland 2, Seaway, Linde and Rattlesnake Creek.

Drainage from Ashland 1 travels under the Seaway property through an underground concrete conduit. Rattlesnake Creek receives this drainage, along with all drainage from the Seaway landfill, and then crosses Niagara Mohawk property before entering the Ashland 2 property. The creek is approximately 10 feet wide and 3 feet deep at bank-full capacity, and has a 1% slope on the Ashland 2 property. The creek and the adjacent low-lying areas are vegetated with a thick growth of cattails and rushes, which limit flow velocities. The low-lying area is approximately 100 feet wide on Ashland 2. Three small drainage ditches join Rattlesnake Creek after it crosses Ashland 2. The creek then travels approximately 3,200 feet before its confluence with Two Mile Creek.

The Rattlesnake Creek portion of the Ashland sites can be broken into three zones. As shown in Figure 3, the first zone encompasses the upper reaches of the creek and includes the two branches of Rattlesnake Creek that bracket Ashland 2. The second zone is the reach of creek from the confluence of the two branches to the location where the creek disappears into a ponded area into an underground pipe. The third zone is from the discharge of the underground pipe to where Two Mile Creek joins the Niagara River. The maximum and the average contamination concentrations observed in soil samples decrease significantly moving from Zone 1, to Zone 2, and finally to Zone 3.

B. Original Remedy

The selected remedy for the Ashland sites required the excavation and offsite disposal of all soils necessary in order to comply with the selected ARARs. Specific components of the selected alternative are that would achieve compliance with the ARARs were:

- Excavate soils exceeding the site-specific derived guideline of 40 pCi/g Th-230 at the Ashland sites, as described in the document entitled *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997).

- Ship offsite for appropriately licensed or permitted disposal all soils excavated that exceed the 40 pCi/g Th-230 guidance.

- Restore the sites with clean backfill from an off-site commercial source, and seed to restore vegetative cover at the sites to their original state.

III. BASIS FOR THIS DOCUMENT

A. Summary of Additional Information

1. Agencies responsible for remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) must ensure that selected remedies meet applicable or relevant and appropriate requirements (ARARs). USACE determined that the following statue and regulations are ARARS for the cleanup of the radionuclides present in soils at the Ashland sites:

- The material will be controlled in a safe and environmentally sound manner (Uranium Mill Tailings Act (UMTRCA), 42 U.S.C 7901 et. seq.)

- Ra-226 concentrations shall not exceed background levels by more than 5 pCi/g in the top 15 cm (6 in.) or by more than 15 pCi/g in any subsequent 15 cm (6 in.) layer, averaged over 100 m^2 (Subpart B of 40 CFR 192).

- The release of Rn-222 and Rn-220 into the atmosphere resulting from the management of uranium and thorium by-product materials shall not exceed an average release rate of 20 pCi/m^2-s (Subpart D of 40 CFR 192).

- The radiological dose to a potential residential receptor must be equal to or less than 25 millirem (mrem)/yr (Subpart E of 10 CFR 20).

Analysis of the soil data collected during the remedial investigation at the Ashland sites showed that the selected remedy identified in the ROD, excavation and offsite disposal of soils containing 40 pCi/g Th-230 or more would result in residual concentrations that would satisfy all the CERCLA risk criteria, and comply with the ARARs listed above. Additionally, the analysis described in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997), showed that removal of soils exceeding 40 pCi/g Th-230 would allow the Ashland sites to be released without land use restrictions (DOE 1997).

Prior to the ROD being signed, there was little evidence that Rattlesnake Creek had radionuclide concentrations at levels of concern. However, the results of the soil samples collected during the Ashland 2 remedial action in and around Rattlesnake Creek indicated that radionuclide concentrations in the creek did exceed levels of concern. The data also indicated that the transport mechanism for the radionuclide-contaminated material was migration via erosional processes into Rattlesnake Creek from contaminated ore residuals placed on the Seaway and Ashland properties as opposed to direct placement of the material into the creek. Due to way the material was transported and differences in solubility of the contaminants and dilution, the distribution of COCs in the sediments of the creek is different than the distribution of those same COCs in the Ashland site soils. In order to better address the distribution of COCs in the Rattlesnake Creek area, DCGLs were developed. The DCGLs were derived by using RESidual RADioactivity computer code (RESRAD) version 6.10 and site-specific parameters and scenarios detailed in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997), and to be consistent with the specified activity concentrations contained in the first ARAR listed above. The derivation of the DCGLs is documented in Appendix B of the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

The DCGLs presented in this ESD have specific area sizes assigned to them, are consistent with the cleanup criteria in the ROD, and provide equal protectiveness of human health and the environment. The ROD requires that soils exceeding 40 pCi/g Th-230 be excavated. The not-to-exceed value of 40 pCi/g Th-230 is the result of rounding down from DOE's calculated value of 47 pCi/g Th-230 (DOE 1997). This value is consistent with the DCGL for a 1 square meter area of 46 pCi/g (Table 1). The Th-230 DCGL for the large area (i.e., 10,000 square meters) presented in Table 1 is 12 pCi/g, the same required site wide average residual concentration developed and documented in the *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997). Implementation of the 40 pCi/g Th-230 ROD requirement at the Ashland 2 and Ashland 1 sites resulted in post-remedial action, site-wide average Th-230 concentrations of 5.17 pCi/g and 2.91 pCi/g, respectively. To ensure meeting the site-wide average criterion and the required ARARs, the USACE is presenting DCGLs for the implementation of the remedial action at the Rattlesnake Creek portion of the site.

2. There is also new information regarding the volume of materials to be removed from the site in order to meet the requirements of the ROD and the cost of that work. The original estimate of volume for excavation and offsite disposal of contaminated soil at Ashland 1 (including Seaway Area D), and Ashland 2 was 42,000 yd^3 at a cost of 38 million dollars. To date, with excavation at the Ashland 1 and 2 sites completed, 186,000 yd^3 of contaminated soil have been removed in order to meet the requirements of the ROD and approximately at a cost of about 90 million dollars. The lower and upper bound of estimated (in situ) contaminated soil at Rattlesnake Creek is 15,000 yd^3 and 33,000 yd^3, with a best estimate of 22,000 yd^3. It is estimated that the remediation of the Rattlesnake Creek area will cost an additional 20 million dollars for the excavation and disposal of an estimated (in situ) contaminated soil volume of 22,000 yd^3.

B. References

The Rattlesnake Creek portion of the Ashland sites was part of the *Remedial Investigation/Feasibility Study for the Tonawanda Site* conducted by the Department of Energy (DOE 1993), and the *Record of Decision for the Ashland 1 (including Seaway Area D) and Ashland 2 Sites, Tonawanda, New York (ROD)* (USACE 1998). The *Radionuclide Cleanup Guideline Derivation for Ashland 1, Ashland 2, and Seaway* (DOE 1997) describes the process used to develop the cleanup criteria documented in the ROD. Radiological data from the *Rattlesnake Creek Investigation Report – Uranium Sediment Concentrations and Dose Impact Analysis* (USACE 1999) indicated the need for surveys along Rattlesnake Creek. Other sources of information used to support the need for this ESD include the *Remedial Investigation for the Tonawanda Site* (DOE 1993), the *Uranium-238 Investigation, Rattlesnake Creek—Phase I* (USACE 1998), *Rattlesnake Creek Follow-up Sampling Plan* (IT 2001), *Rattlesnake Creek Investigation Summary Report* (IT 2001), *Rattlesnake Creek Follow-Up Investigation Report* (IT 2001), and the *Rattlesnake Creek Final Status Survey Plan* (USACE 2004).

IV. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The remedy of excavation and offsite disposal as described in the Proposed Plan (PP) and ROD remains unchanged for the sediments in Rattlesnake Creek, although these sediments were not included in the PP and ROD. In addition, the same COCs will be addressed and the same remediation methods will be employed. The significant

differences are that a different cleanup guideline will be used in the field to insure that residual concentration of the COCs remaining at the site after excavation comply with the requirements of the ROD and the volume of material to be excavated and disposed and in order to comply with the requirements of the ROD will increase from the original estimated amount as will the cost to undertake the work.

V. SUPPORT AGENCY COMMENTS

Comments and responses from NYSDEC are presented in Appendix A.

VI. STATUTORY DETERMINATIONS

The selected remedy as modified in this ESD is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to hazardous substances which are part of this response action, and is cost-effective.

VII. PUBLIC PARTICIPATION COMPLIANCE

In accordance with National Contingency Plan 300.435 (C)(2)(ii), a notice, briefly summarizing the ESD was published in the *Tonawanda News* and *Kenmore Record* on September 20, 2004.

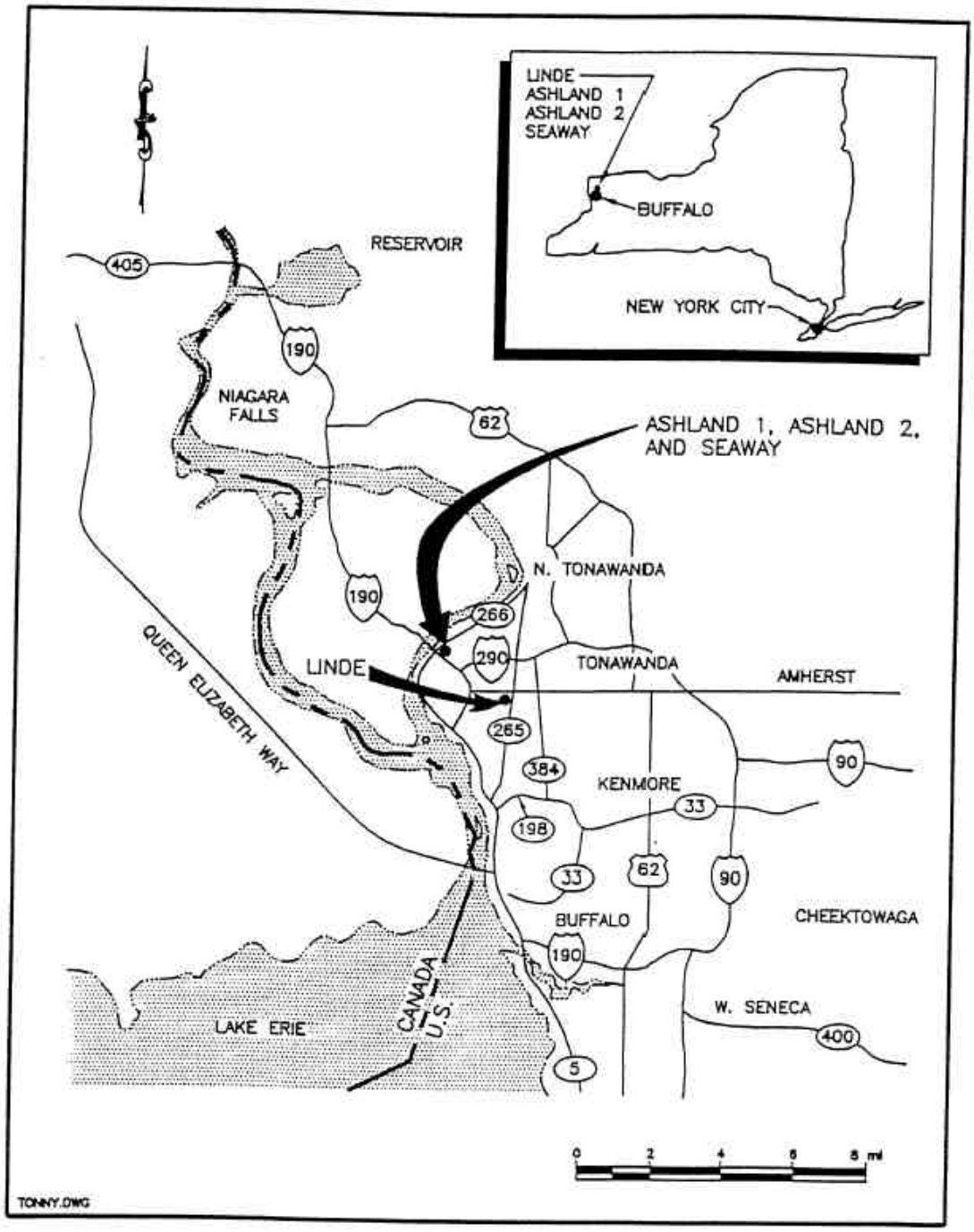

Figure 1. Location of the Town of Tonawanda, NY and the Ashland Sites

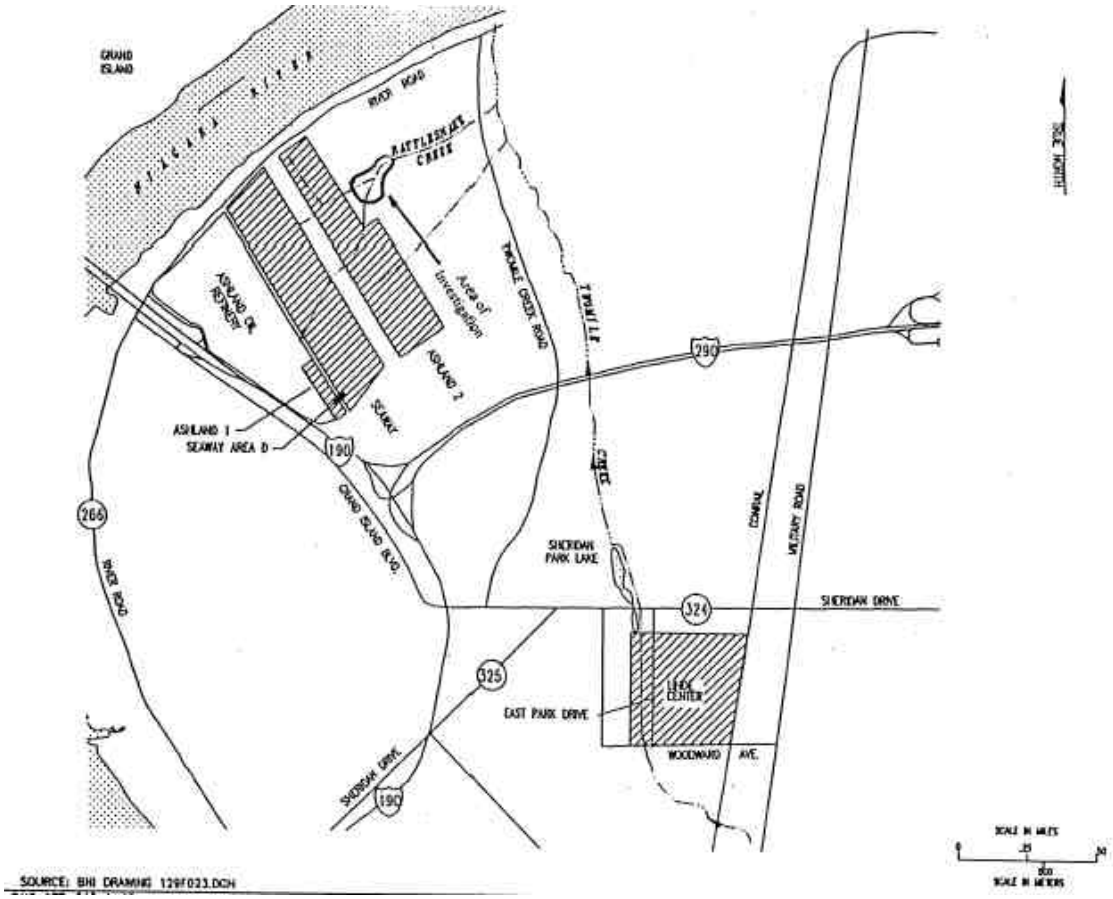

Figure 2. Locations of Ashland 1& 2, Seaway, Linde and Rattlesnake Creek

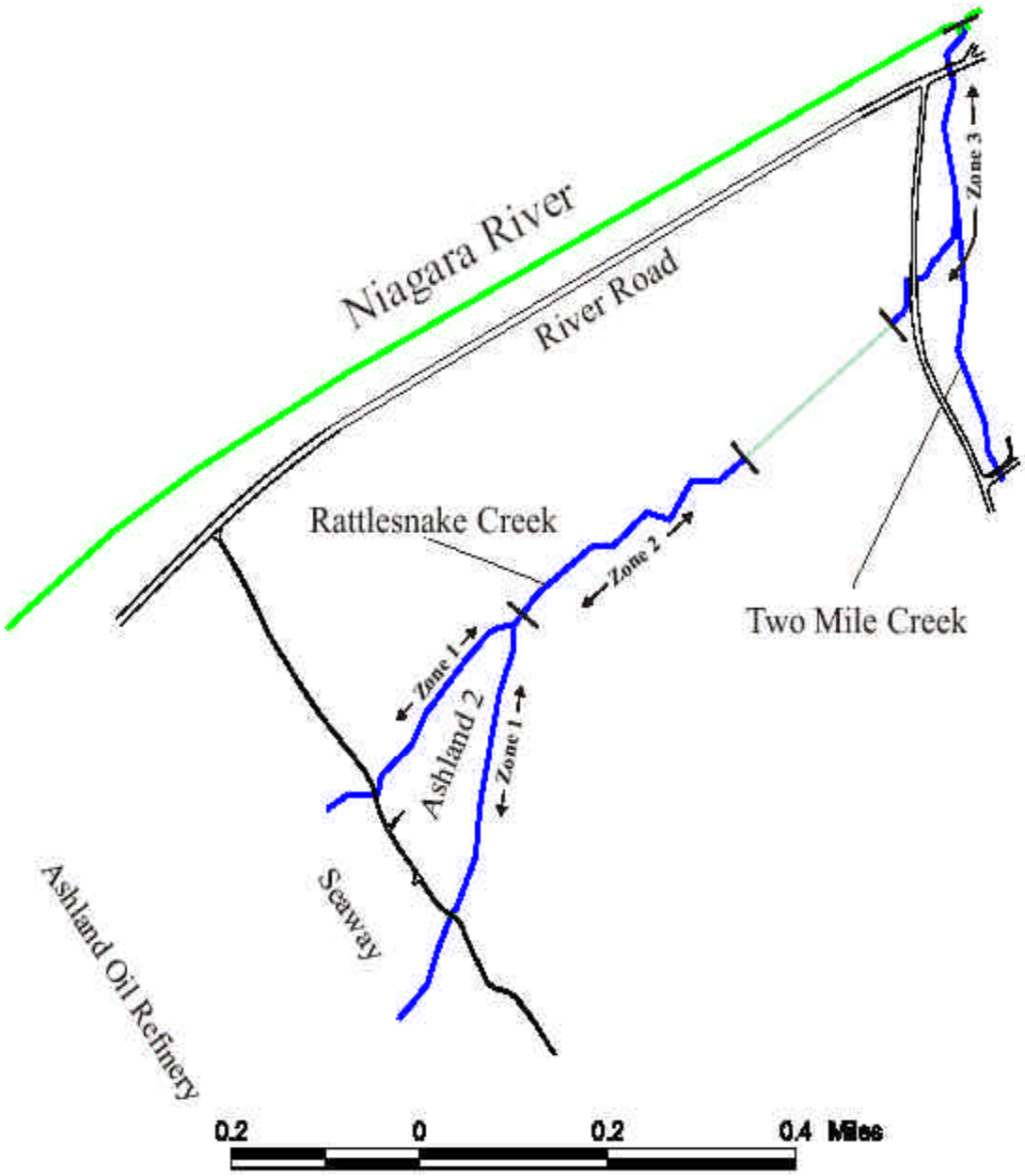

Figure 3. Rattlesnake Creek

APPENDIX A
SUPPORT AGENCY COMMENTS AND RESPONSES

I. INTRODUCTION

On October 17, 2003, the Buffalo District of the U.S. Army Corps of Engineers provided the *Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites, Tonawanda, New York*, dated October 20, 2003, to the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) for review and comment. This Responsiveness Summary addresses the written comments received on the document from EPA on November 3, 2003, and NYSDEC on November 17, 2003.

II. COMMENTS AND RESPONSES

New York State Department of Environmental Conservation (NYSDEC) Comment #1

The New York State Department of Environmental Conservation has reviewed the "Explanation of Significant Differences for the Rattlesnake Creek Portion of the Ashland Sites," which we received on October 22, 2003.

We agree that further investigation and remediation are needed in the Rattlesnake Creek area, and we support the Corps' intention to characterize and remediate contaminated soils there. However, we do not agree with the remediation criteria presented in this Explanation of Significant Differences. The Derived Concentration Guidance Levels (DCGL) for uranium-238 exceed the concentration at which uranium is subject to radioactive materials licensing, under both State and federal regulations [see 10 CFR 40.3 and 40.13(a)]. We recognize that some of the uranium contamination would be removed regardless of the uranium DCGL, because it is collocated with thorium-230. However, the Explanation of Significant Difference implies that the Corps would release the site for unrestricted use with generally licensed source material remaining on site. Therefore, we cannot concur with this Explanation of Significant Difference.

We recommend that the Corps revise the DCGL for uranium-238 to be consistent with applicable regulations for radioactive materials licensing and to ensure that the site will be suitable for unrestricted release.

U.S. Corps of Engineers – Buffalo District Response to NYSDEC Comment #1

We appreciate the concerns raised in this letter relative to the DCGL for uranium-238 in the Explanation of Significant Differences (ESD). The ESD was prepared consistent with EPA guidance for implementing actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and describes the adjustments to be made to the planned remedial action identified in the approved Record of Decision (ROD) to address new information for the site. Consistent with EPA guidance, the ESD only addresses those elements that need to be modified based on new information to implement the action identified in the ROD in a manner protective of human health and the environment. The radioactive contamination in the Rattlesnake Creek sediments was not known at the time the ROD was approved, and hence is addressed in this ESD. The DCGLs for the Rattlesnake Creek sediments were developed in a manner that followed the approach of the dose assessment for the Ashland sites, but was adjusted to be site-specific to account for a different activity distribution. This approach is consistent with EPA CERCLA guidance, and the details on the derivation of these DCGLs are provided in a separate document referenced in the ESD.

It is the intent of the U.S. Army Corps of Engineers (USACE) to conduct remedial actions in Rattlesnake Creek in a manner that is fully protective of human health and the environment consistent with current and projected future land uses. Previous cleanup actions at the Ashland 1 and 2 sites have resulted in residual radionuclide concentrations significantly below the DCGLs given in the ESD. At the Ashland 1 site, the post-remedial, site-wide average residual thorium-230, uranium-238, and radium-226 concentrations were 2.91pCi/g, 3.15 pCi/g, and 0.63 pCi/g respectively. The post-remedial, site-wide average residual thorium-230, uranium-238, and radium-226

concentrations were 5.17 pCi/g, 2.71 pCi/g, and 0.85 pCi/g respectively, at the Ashland 2 site. In addition, the USACE will conduct remedial actions in the Rattlesnake Creek area consistent with the "as low as reasonably achievable" policy required for federal actions involving exposures to radioactive materials. As such, it is expected that the resulting residual radionuclide concentrations will be significantly below the DCGLs identified in the ESD. In particular, the uranum-238 concentration is expected to be well below the 0.05% (by weight) concentration given in 10 CFR 40 (as identified in this letter) following remedial actions, as illustrated by previous remedial actions at the Ashland 1 and 2 sites.

U.S. Environmental Protection Agency (EPA) Comment #1

Section I, 4th and 5th paragraphs – It is unclear what is meant by the word "similar" when stating that USACE has used an approach similar to the one set forth in Title 10 Part 40 of the Code of Federal regulations. The benchmark dose method does not appear to be appropriate using the residual radium Ra-226 in soil found in 40 CFR 192. The DCGLs should be re-evaluated and a detailed risk assessment scenario ensuring that public dose does not exceed 25 mrem/yr TEDE should be submitted for review.

U.S. Corps of Engineers – Buffalo District Response to EPA Comment #1

Although the benchmark dose approach is not specifically mentioned in the Final Status Survey Plan (FSSP), Appendix B of the FSSP ("DCGL Development") does indicate that the dose assessment used to produce the DCGLs is "consistent with the other ARARs stated in the ROD, i.e., 40 CFR 192, which limits the concentration of radium-226 to 5 pCi/g within a 100 m^2 area". The benchmark dose approach is outlined in Appendix A of 10 CFR 40, and it directs that cleanup goals for radionuclides other than radium-226 found at uranium mill tailing sites be based on the dose associated with 5 pCi/g radium-226 in soil, which is the benchmark dose.

We did not use a benchmark dose approach in the ROD for the Ashland sites. Rather, DCGLs were based on a dose limit of 25 mrem/year for a residential scenario. This approach resulted in a DCGL of 5 pCi/g of radium-226 in 100 m^2 of soil. Therefore, using the benchmark dose approach specified in Appendix A of 10 CFR 40 would have resulted in the same DCGLs derived in the FSSP for radionuclides other than radium-226.

EPA Comment #2

Section II.B, 2nd bullet—The 15 pCi/g Ra-226 concentration in subsurface soil should not be used as a cleanup level, it is meant to be a finding tool.

U.S. Corps of Engineers – Buffalo District Response to EPA Comment #2

As noted in the response to NYSDEC Comment #1, the ESD is limited to those elements that need to be modified on the basis of new information to implement the action in the approved ROD in a manner protective of human health and the environment. The 15 pCi/g subsurface cleanup level for radium-226 was listed in Section 4.2 because it is identified in the ROD.