



## Feasibility Study Technical Memorandum Overview:

Interim Waste Containment Structure Remedial Alternatives Technologies  
Development and Screening Technical Memorandum

**U.S. Army Corps of Engineers  
Buffalo District**

**Building Strong®**

### Formerly Utilized Sites Remedial Action Program (FUSRAP)

April 2013

#### Overview

The U.S. Army Corps of Engineers has prepared this memorandum to identify remedial alternatives for the Interim Waste Containment Structure (IWCS) Operable Unit Feasibility Study (FS). This technical memorandum is the fourth in a series of technical memoranda released during the development of the FS for the IWCS. The primary purpose of this technical memorandum is to screen potential remedial technologies and process options and assemble them into remedial alternatives that will be carried forward into the FS for detailed evaluation.



**Figure 1: Interim Waste Containment Structure (IWCS) at the NFSS.**

#### Project Background

The Niagara Falls Storage Site (NFSS) is a 191-acre Federal property in Lewiston, New York. The Manhattan Engineer District and Atomic Energy Commission brought radioactive materials to the site during the 1940s and 1950s. In the 1980s, the U.S. Department of Energy consolidated these materials into the IWCS, a 10-acre structure in the southwest portion of the site (Figure 1). Materials stored in the IWCS include the K-65 residues that contain high concentrations of radium-226. The IWCS was engineered to inhibit radon emissions (notably radon-222), infiltration of precipitation, and contaminant migration to groundwater. The Corps is evaluating the final disposition of the NFSS, including the IWCS, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. The site has been organized into three operable units for this process: the IWCS, which is being addressed first; the Balance of Plant, which includes all contaminated materials not contained in the IWCS, excluding groundwater; and Groundwater. The site is now in the FS phase of the CERCLA process for the IWCS Operable Unit.

#### Development of Remedial Alternatives

The Corps developed a range of remedial alternatives for the IWCS by following the steps defined in CERCLA. These steps are as follows:

##### **Step 1 – Identify Remedial Action Objectives**

The first step of the FS is to identify remedial action objectives. Remedial action objectives specify constituents and media of concern, potential exposure pathways, and remediation goals that are used to guide the selection of a remedy. The remedial action objectives for the IWCS Operable Unit are as follows:

- Prevent unacceptable exposure of receptors to the hazardous substances associated with uranium ore mill tailings (e.g., radium-226 and its short-lived decay products) inside the IWCS.
- Minimize/prevent the transport of hazardous substances within the IWCS to other environmental media (e.g., soil, groundwater, surface water, sediment, and air) outside of the IWCS.

- During implementation of the remedial alternatives(s), minimize/prevent releases and other impacts that could adversely affect human health and the environment, including ecological receptors.

## **Step 2 - Development of General Response Actions**

General Response Actions (GRAs) are defined as broad response actions that satisfy the remedial action objectives for the IWCS materials. GRAs include several remedial categories, such as containment, removal, disposal, and treatment. Individually, GRAs may meet the remedial action objectives; however, they also can be grouped together to form alternatives that have the potential to meet remedial action objectives. GRAs that satisfy the remedial action objectives for the IWCS Operable Unit are retained and appropriate remedial technology types and process options that are capable of addressing the contaminated media are organized under each GRA. The GRAs for the IWCS Operable Unit include the following:

- Land-use controls
- Containment
- Removal
- Demolition
- Treatment
- Disposal

## **Step 3 – Identify and Perform Initial Screening of Technologies and Process Options**

For each general response action, technologies and process options were identified and initially screened for technical implementability, which considers compatibility with site contaminants and other site characteristics, as well as implementation on a large scale. An example of a technology and process option for each GRA determined to be technically implementable is as follows:

- Land-use controls - institutional controls
- Containment – engineered caps
- Removal – mechanical removal
- Demolition – mechanical demolition
- Treatment - solidification
- Disposal – off-site disposal facility

## **Step 4 – Screen Technologies and Process Options for Effectiveness, Implementability, and Cost**

Each of the technically implementable remedial technologies and process options retained from the initial screening was qualitatively evaluated based on effectiveness, implementability, and cost. This evaluation resulted in a ranking of high, moderate, or low for each criterion. Those technology and process options that have demonstrated effectiveness in treating contaminants similar to those contained in the IWCS are rated high or moderate for effectiveness, while those options that do not provide adequate protection of human health and the environment are rated as low for effectiveness. Implementability assesses factors such as the ability to construct and operate the technology; the availability and capacity of treatment, storage, and disposal services; and the ease of undertaking additional steps that may be required to implement a technology such as pre-treatment or management of residual wastes. Process options that are infeasible are rated as low for implementability. Costs for each technology are rated qualitatively on the basis of engineering judgment and relative to the other process options in the same technology type.

## Step 5 – Identify Remedial Alternatives

The retained remedial technologies and process options were combined to develop the following remedial alternatives for the IWCS:

- Complete Removal
- Partial Removal with off-site disposal and enhanced containment for remaining materials
- Enhanced Containment of the entire IWCS
- No Action (Required<sup>1</sup>)

### Next Steps

The Corps is currently developing the final technical memorandum entitled *Applicable or Relevant and Appropriate Requirements for the IWCS Operable Unit*. This document is currently scheduled for release by the end of summer/early fall of this calendar year. The Corps will follow its standard practice of holding a public workshop to discuss this technical memorandum after public release. Results from this technical memorandum will provide one of the key CERCLA criteria for evaluating the identified remedial alternatives.

The remedial alternatives developed in the *Interim Waste Containment Structure Remedial Alternatives Technologies Development and Screening Technical Memorandum* will undergo a detailed evaluation in the FS and a comparative analysis by evaluating each alternative against the seven criteria from CERCLA as follows:

1. Overall protection of human health and the environment
2. Compliance with applicable or relevant and appropriate requirements
3. Long-term effectiveness and permanence
4. Short-term effectiveness
5. Reduction of toxicity, mobility, or volume through treatment
6. Implementability
7. Cost

The IWCS FS is currently scheduled for release in the fall of 2014. The results of the detailed analysis within the FS will provide the basis for identifying the Corps' preferred remedial alternative and developing a Proposed Plan. The Proposed Plan will be released for review and comment. The final two CERCLA criteria (i.e., community and state acceptance) will be evaluated at this time. After consideration of public comments, a remedial alternative will be selected and documented in a Record of Decision. The remedial alternative selected may or may not be the preferred remedial alternative identified in the Proposed Plan.

### Public Input Regarding this Technical Memorandum

The Corps is preparing a number of technical memoranda that will be made available to the public prior to the release of the IWCS Operable Unit FS. The Corps encourages input from the public regarding the analyses and findings of each technical memorandum. Public response to this technical memorandum should be provided to the Corps by July 5, 2013, to be considered during the development of the FS. Responses to public comments on this technical memorandum will be made available on the project website. Input can be sent via e-mail to [fusrap@usace.army.mil](mailto:fusrap@usace.army.mil) (please be sure to note "Remedial Alternatives Technical Memorandum" in the subject line) or mail your comments to the Environmental Project Management Team at the address noted on the next page.

---

<sup>1</sup> In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan [40 Code of Federal Regulations 300.430(3)(6)], the no action alternative must be evaluated as part of the FS process as a baseline for comparison to the other actions under consideration.

## Public Workshop

In addition to the opportunity to provide written comments, the Corps is hosting a public workshop on **June 5, 2013**, beginning at **6 pm** to present and discuss the results of this technical memorandum with the community. The workshop will be held at the **Lewiston Senior Center** located at **4361 Lower River Road, Youngstown, NY 14174**. The Corps will send out a *News from the Corps* detailing the agenda for this public meeting.

## Administrative Record File

The Administrative Record File for the NFSS FUSRAP Site contains the CERCLA-related documentation for the NFSS. Reports and documents in the Administrative Record may be viewed at the following locations:

### Electronic and Paper Versions:

Town of Lewiston Public Library  
305 South 8th Street  
Lewiston, NY 14092  
Phone: (716) 754-4720

(by appointment only)  
US Army Corps of Engineers  
1776 Niagara Street  
Buffalo, New York 14207  
Phone: 800-833-6390 (Option 4)

### Electronic Version:

Youngstown Free Library  
240 Lockport Street  
Youngstown, NY 14174  
Phone: (716) 745-3555

---

U.S. ARMY CORPS OF ENGINEERS – BUFFALO DISTRICT  
ENVIRONMENTAL PROJECT MANAGEMENT TEAM  
1776 NIAGARA STREET, BUFFALO, N.Y. 14207  
Phone: 800-833-6390 (Option 4)

Email: [fusrap@usace.army.mil](mailto:fusrap@usace.army.mil)

Website: [www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/NiagaraFallsStorageSite.aspx](http://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/NiagaraFallsStorageSite.aspx)