# Comparative Analysis of Proposed Plan Remedial Alternatives
*(Balancing Criteria)*

<table>
<thead>
<tr>
<th>CERCLA BALANCING CRITERIA</th>
<th>ALTERNATIVE 2: Enhanced containment of Subunits A, B, and C</th>
<th>ALTERNATIVE 3A: Excavation, treatment, and off-site disposal of Subunit A; enhanced containment of Subunits B and C</th>
<th>ALTERNATIVE 3B: Excavation, treatment, and off-site disposal of Subunit A; excavation and off-site disposal of Subunit B; enhanced containment of Subunit C</th>
<th>ALTERNATIVE 4: Excavation, treatment, and off-site disposal of Subunit A; excavation and off-site disposal of Subunits B and C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term Effectiveness and Permanence</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Reduction of Toxicity, Mobility, or Volume through Treatment</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
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<tr>
<td>Short-term Effectiveness</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
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<tr>
<td>Implementability</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Total Cost (Present Worth)</td>
<td>$67.4M</td>
<td>$303.6M</td>
<td>$362.4M</td>
<td>$490.6M</td>
</tr>
</tbody>
</table>
Niagara Falls Storage Site—Interim Waste Containment Structure Operable Unit

**SUBUNITS A, B, AND C**

Subunit A:
Residues and commingled wastes within Buildings 411, 413, and 414

Subunit B:
Debris and wastes in the south end of the IWCS

Subunit C:
Residues and wastes in the north end of the IWCS

Cross Section Orientation

NORTH

SOUTH

R-10 pile

Clay dike and cut-off wall

Building 411

Building 414

Building 413

Building 412

Brown Clay

Gray Clay

Clay dike and cut-off wall

Approximate cross section vertical exaggeration 2.5:1
Comparing waste volume remaining and radium remaining across remedial alternatives:

**Alternative 2**
Enhanced containment of Subunits A, B, and C with land-use controls and monitoring

- Percent of waste volume remaining in IWCS:
  - Subunit A: 15%
  - Subunit B: 22%
  - Subunit C: 63%
- 100% of waste volume remains

- Percent of Radium-226 remaining in IWCS:
  - Subunit A: 98%
  - Subunit B: 1%
  - Subunit C: 1%
- 100% of Ra-226 remains

**Alternative 3A**
Excavation, treatment, and off-site disposal of Subunit A; enhanced containment of Subunits B and C with land-use controls and monitoring

- Percent of waste volume remaining in IWCS:
  - Subunit A: 15%
  - Subunit B: 22%
  - Subunit C: 63%
- 76% of waste volume remains

- Percent of Radium-226 remaining in IWCS:
  - Subunit A: 98%
  - Subunit B: 1%
  - Subunit C: 1%
- 1% of Ra-226 remains

**Alternative 3B**
Excavation, treatment, and off-site disposal of Subunit A; excavation and off-site disposal of Subunit B; enhanced containment of Subunit C with land-use controls and monitoring

- Percent of waste volume remaining in IWCS:
  - Subunit A: 15%
  - Subunit B: 22%
  - Subunit C: 63%
- 65% of waste volume remains

- Percent of Radium-226 remaining in IWCS:
  - Subunit A: 98%
  - Subunit B: 1%
  - Subunit C: 1%
- 0.2% of Ra-226 remains

**Alternative 4**
Excavation, treatment, and off-site disposal of Subunit A; excavation and off-site disposal of Subunits B and C

- Percent of waste volume remaining in IWCS:
  - Subunit A: 15%
  - Subunit B: 22%
  - Subunit C: 63%
- 0% of waste volume remains

- Percent of Radium-226 remaining in IWCS:
  - Subunit A: 98%
  - Subunit B: 1%
  - Subunit C: 1%
- 0% of Ra-226 remains

Values for Alternative 3A include the removal of Subunits B and C materials to access Subunit A.

Note: Volume and radiological inventory based on historical record.
Niagara Falls Storage Site—Interim Waste Containment Structure Operable Unit

REMEDIAL ALTERNATIVE 2: ENHANCED CONTAINMENT OF SUBUNITS A, B, AND C

Current Conditions

- Brown Clay
- Gray Clay
- Drainage and biointrusion layers
- Contaminated soil and debris
- Subsurface soil, topsoil, and grass
- Clay cap, dikes, and cut-off wall
- K-65 residue
- Other residues

Conceptual Design of Remedial Alternative 2

Approximate cross section vertical exaggeration 2.5:1
Niagara Falls Storage Site—Interim Waste Containment Structure Operable Unit

**REMEDIAL ALTERNATIVE 3A: REMOVAL, TREATMENT, AND OFF-SITE DISPOSAL OF SUBUNIT A WITH ENHANCED CONTAINMENT OF SUBUNIT B AND C**

**Current Conditions**

**Conceptual Design of Remedial Alternative 3A**

Approximate cross section vertical exaggeration 2.5:1

- **Subsurface soil, topsoil, and grass**
- **Drainage and bioinvasion layers**
- **K-65 residue**
- **Building walls and floors**
- **Clay cap, dikes, and cut-off wall**
- **Contaminated soil and debris**
- **Other residues**
- **Clean fill**
Niagara Falls Storage Site—Interim Waste Containment Structure Operable Unit

**REMEDIAL ALTERNATIVE 3B: REMOVAL, TREATMENT, AND OFF-SITE DISPOSAL OF SUBUNITS A AND B WITH ENHANCED CONTAINMENT OF SUBUNIT C**

**Current Conditions**

**Conceptual Design of Remedial Alternative 3B**

Approximate scale in feet

![Diagram](image)
Niagara Falls Storage Site—Interim Waste Containment Structure Operable Unit

REMEDIAL ALTERNATIVE 4:
REMOVAL, TREATMENT, AND OFF-SITE DISPOSAL OF SUBUNITS A, B, AND C

Current Conditions

Conceptual Design of Remedial Alternative 4
Approximate cross section vertical exaggeration 2.5:1

- Subsurface soil, topsoil, and grass
- Drainage and bioinvasion layers
- K-65 residue
- Building walls and floors
- Clean fill
- Clay cap, dikes, and cut-off wall
- Contaminated soil and debris
- Other residues
Niagara Falls Storage Site
Interim Waste Containment Structure Operable Unit
Proposed Plan Remedial Alternative Summary

Alternative 2: Enhanced Containment of Subunits A, B, and C

- $67.4 Million**
- 2,144 Curies

Alternative 3A: Excavation, Treatment, and Off-Site Disposal of Subunit A with Enhanced Containment of Subunits B and C

- $303.6 Million**
- 22 Curies

Alternative 3B: Excavation, Treatment, and Off-Site Disposal of Subunit A; Excavation and Off-Site Disposal of Subunit B with Enhanced Containment of Subunit C

- $362.4 Million**
- 4 Curies

Preferred Alternative - Alternative 4: Excavation, Treatment, and Off-Site Disposal of Subunits A, B, and C

- $490.6 Million
- 0 Curies

* Curies reported are due to radioactivity from radium-226.
** Present value costs were calculated based on the current worth of today’s cost for operating and maintaining the enhanced containment part of the alternatives. The present value cost assumes that today’s cost is invested at a rate of 3.5 percent for 1,000 years.