

# **Soil Treatment to Remove Uranium and Related Mixed Radioactive Heavy Metal Contaminants**

**Quarterly Report  
January - March 1995**

May 1995

Work Performed Under Contract No.: DE-FC21-92MC28245

U.S. Department of Energy  
Office of Environmental Management  
Office of Technology Development  
Washington, DC

For

U.S. Department of Energy  
Office of Fossil Energy  
Morgantown Energy Technology Center  
Morgantown, West Virginia

By  
Atomic Energy of Canada Limited (AECL)  
Chalk River, Ontario, Canada

**MASTER**

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Chalk River, Ontario, Canada KOJ 1JO

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## **Soil Treatment to Remove Uranium and Related Mixed Radioactive Heavy Metal Contaminants**

### **Ninth Quarter Technical and Financial Progress Report (Reporting Period: 01/01/95 - 03/31/95)**

**Cooperative Agreement No: DE-FC21-92MC28245**

**Participant:** Atomic Energy of Canada Limited (AECL)  
Chalk River, Ontario, Canada KOJ 1JO

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#### **Objectives:**

The objective of this project is to design and develop a physico-chemical treatment process for the removal of uranium and heavy metals from contaminated soil to achieve target contamination levels below 35 pCi/g of soil and a target for non-radioactive heavy metals below concentration levels permissible for release of the soil. The work will involve bench-scale and pilot-scale tests, using chelation-flotation, chemical leaching and ultrasonic leaching techniques, in conjunction with cross-flow microfiltration and filter-press operations. The effectiveness of an integrated process to treat leachates generated from soil processing will be demonstrated. Process flow-sheets suitable for in-situ and ex-situ applications will be developed and preliminary costs will be provided for the soil and leachate treatment technologies.

#### **Technical Progress:**

In accordance with 10CFR 600.31 (d)(1), an extension of the project period including final report submission to 31 July 1995 was made in anticipation of potential delays in receiving Fernald soil samples at Chalk River Laboratories for the planned pilot-scale verification tests.

Ex-situ pilot-scale soil decontamination and leachate treatment tests using Chalk River Chemical Pit soil are nearing completion. Soil decontamination tests using Fernald Incinerator Area soil originally scheduled for February 1995 was postponed to May 1995 as result of unexpected delays in the preparation of two drums of soils (~ 416 kg) by FERMCO and paperwork required to arrange for export/import licenses.

The planned pilot-scale soil decontamination tests using the Fernald Incinerator Area soil will be completed within one month after receipt of the soil from FERMCO. It is anticipated that the soil samples will be received at Chalk River River Laboratories by the middle of May 1995, so that the planned pilot-scale tests can be completed by June 15, 1995.

Based on the assumption that the Fernald soil samples will be received by 15 May 1995, the draft final report will not be ready before 30 June 1995.

### Financial Progress:

A summary of the expenditure incurred during 1995 January to March (9Q) together with the accumulated expenditure to date given in Tables 1 and 2.

**Table 1: Accumulated Expenditure To Date**

Performance Period	Quarter	Total	USDOE Share (in US \$)
1993 January 01 to March 30	1Q	1 545.00	1 158.75
1993 April 01 to June 30	2Q	10 096.89	7 573.05
1993 July 01 to September 30	3Q	4 644.08	3 483.07
1993 October 01 to December 31	4Q	47 712.30	35 784.23
1994 January 01 to March 31	5Q	91 591.58	68 693.69
1994 April 01 to June 30	6Q	115 279.31	86 459.49
1994 July 01 to September 30	7Q	118 915.32	89 186.51
1994 October 01 to December 31	8Q	6 180.28	4 635.21* (revised)
1995 January 01 to February 28		1 180.85	885.65
<b>SUBTOTAL</b> (1993 January 01 to 1995 February 28)		<b>397 119.57</b>	<b>297 839.68</b>
1995 March 01 to March 31 (to be invoiced in April billing)			758.21
<b>TOTAL (1993 January 01 to 1995 March 31)</b>		<b>398 130.52</b>	<b>298 597.89</b>
<b>NOTE:</b> The 8th Quarter amount invoiced was incorrectly reported as:			
(1994 October 01 to December 31)	8Q	(6 295.28)	(4 721.46)

**Table 2: Overall Financial Summary and Cost Breakdown**

<b>Project Period (revised) ...</b>	<b>January 1993 to July 1995</b>
<b>Total Project Value</b>	<b>US\$ 400 084.00</b>
Total USDOE Share (75 %) ....	300 063.00
Total AECL Share ...	100 021.00
<b>Total Spent from 01 January 1993 to ..... 31 March 1995</b>	<b>398 130.52</b>
<b>DOE Share Spent ...</b>	<b>298 597.89</b>
<b>Balance (TOTAL) Remaining ...</b>	<b>1 953.48</b>
<b>Balance DOE Share Remaining ...</b>	<b>1 465.11</b>

**Schedule Status:**

The final project report (draft) to METC for review will be made toward the end of June 1995. This represents a delay of about three months from the original project timeline.

**Issues:**

The scope of project remains unchanged. The submission of the final project report by 31 March 1995 could not be met because of unexpected delays in securing Fernald uranium soil samples from FERMCO for pilot-scale tests. It appears that the soil samples can only be secured at Chalk River Laboratories by the middle of May 1995.

**SOIL TREATMENT TO REMOVE URANIUM AND RELATED MIXED  
RADIOACTIVE HEAVY METAL CONTAMINANTS**



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