

**PROPOSED
CONFIRMATORY SURVEY PLAN
FOR THE
BERT AVENUE CONTAINMENT CELL
AND SURROUNDING LAND AREA
CHEMETRON CORPORATION
NEWBURGH HEIGHTS, OHIO
(DOCKET NO. 040-08724, RFTA NO. 97-21)**

INTRODUCTION AND SITE HISTORY

In 1965, the Atomic Energy Commission (AEC), a predecessor of the U.S. Nuclear Regulatory Commission (NRC), issued to Chemetron Corporation Source Material License No. SUB-852, which authorized Chemetron's possession and use of depleted UF_6 for conversion to U_3O_8 at the Harvard Avenue facility. The facility was used to produce a chemical catalyst. Catalyst production was primarily performed in the south end of Building 21 at the Harvard Avenue site from 1965 until the manufacturing of the catalyst was terminated in 1972. The license was amended in December 1973 to authorize storage only for the remaining depleted uranium (DU). No activities involving source material, other than decontamination, have been conducted at the site since the termination of the catalyst production. In 1974, the catalyst production equipment housed in the south end of Building 21 was dismantled and shipped to a Chemetron subsidiary in Louisville, Kentucky.

The McGean Chemical Company, Inc., the predecessor to McGean-Rohco Incorporated (MCR), purchased the Harvard Avenue site and the industrial landfill on Bert Avenue in 1975. Chemetron, however, retained the license and responsibility for the depleted uranium at the facility. The Bert Avenue industrial landfill, until early 1977, was used by the Village of Newburgh Heights for the disposal of non-combustibles, and by the McGean Chemical Company and Chemetron Corporation for disposal of miscellaneous industrial wastes and building rubble. Some of the materials disposed of at the landfill by Chemetron were contaminated with low levels of DU. These materials were

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from the dismantling and decommissioning of the DU catalyst production facility (Building 21). In 1979, a revised license (License No. SUB-1357) was issued to Chemetron by the NRC which allowed Chemetron to possess DU in the form of contaminants at the Harvard Avenue site.

In March 1994, Chemetron requested that the NRC amend its license to authorize it to perform the remediation of the Harvard Avenue and Bert Avenue sites in accordance with its site remediation plan (Chemetron 1995). In the plan, Chemetron proposed to use onsite disposal within an engineered containment cell at the Harvard and Bert Avenue sites for wastes generated from the remediation of those sites. Wastes that exceed the release criteria as specified in Chemetron's NRC license, SUB-1357, Amendment No. 5, will be shipped to an offsite low-level waste disposal site. Decommissioning activities and containment cell construction activities have been completed at the Harvard Avenue site.

Chemetron collected approximately 900 surface and 600 subsurface soil samples during the characterization of the Bert Avenue site. Concentrations of DU in surface soils ranged from background levels to 2,341 pCi/g—the average surface soil concentration was 51 pCi/g. Much of the site exceeds the average contamination level of 35 pCi/g total uranium but is less than 100 pCi/g. A smaller portion of the site is contaminated with DU concentrations between 100 and 1,000 pCi/g. Two areas on the site were identified with subsurface soil DU concentrations greater than 100 pCi/g—these areas were labeled as Radioactive Waste Areas A and B (Chemetron 1995).

Previous remediation activities at the Bert Avenue site resulted in approximately 53,000 ft³ of contaminated soil being stockpiled in four soil piles (A, B, C, and D). These soil piles are located in the northwest, west, and southern portion of the site. Characterization of the excavated soil stockpiles resulted in an average DU soil concentration for soil piles A, B, C, and D of 32.2, 31.2, 11.9, and 15.5 pCi/g, respectively. The highest DU concentrations reported were from soil piles A and B and were 157 and 202 pCi/g, respectively.

Chemetron's planned remedial activities will include the excavation of radioactive solid wastes from Area A and a portion of Area B with the excavated material being stockpiled in the

remaining portion of Area B. After final release survey activities have been completed in all areas except those that contain stockpiled radioactive wastes, and after NRC approval, Chemetron will begin the construction of the containment cell.

The Bert Avenue containment cell will be constructed by initially excavating and stockpiling the contaminated soil from within the containment cell footprint and surveying and sampling the cell area base to ensure DU levels are less than 35 pCi/g. A clay liner will then be installed, the contaminated material placed into the cell, and the waste covered with a compacted clay cap. Due to space limitations at the site, the construction of the cell will proceed in two phases. The North Area of the cell will be constructed first, then the onsite contaminated stockpile materials (waste) will be placed into the North Area of the cell. The South Area of the cell will be constructed after wastes have been placed in the North Area. The completed disposal cell will measure approximately 50 m by 100 m, with a contaminated soil depth of 2.5 m (8 feet). The general Bert Avenue site area is approximately 180 m by 200 m.

Chemetron will also perform final status surveys of the soil that is placed in the containment cell to include 100% surface scans of each 0.3 m (1 ft) lift of contaminated soil placed in the containment cell and the collection of one soil sample from each 100 m² area of each one-foot lift. The final survey data will be used to demonstrate that the average DU concentration of the soil within the cell and adjacent land areas do not exceed the release criteria specified in the Chemetron's NRC license. Chemetron will perform a final status survey for areas adjacent to the containment cell in accordance with guidance in NUREG/CR-5849, including the averaging conditions (NRC 1992).

The NRC's Division of Waste Management has requested that the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) perform confirmatory surveys of the Bert Avenue disposal cell and land areas adjacent to the cell.

SITE DESCRIPTION

The property required to be remediated by Chemetron Corporation is a former uncontrolled industrial landfill that is located at the east end of East 27th and East 29th streets and Bert Avenue in the suburb of Newburgh Heights, Ohio. Originally owned by the Cleveland Foundry-Grant Stove Company, the landfill was purchased by McGean Chemical Company in 1975. The site is located in a mixed industrial and residential area approximately six kilometers (4 miles) south of downtown Cleveland. The Bert Avenue site is comprised of approximately 3 hectares (7 acres) and is bordered on the north and east by industrial property and on the south and west sites by residential property.

OBJECTIVES

The objectives of the confirmatory survey are to provide independent contractor field data reviews and radiological data for use by the NRC in evaluating the adequacy and accuracy of the licensee's procedures and final status survey results, relative to established guidelines.

RESPONSIBILITY

Work described in this survey plan will be performed under the direction of William L. (Jack) Beck, Program Director and Wade Adams, Project Leader with ESSAP of the Environmental and Health Sciences Division of ORISE. The cognizant ORISE site supervisor has the authority to make appropriate changes to the survey procedures as determined to be necessary. After consultation with the NRC inspector, the scope of the survey may be altered based on findings as the survey progresses.

DOCUMENT/DATA REVIEW

ESSAP will review the licensee's final survey data for accuracy, completeness, and compliance with guidelines. Procedures and methods used by the licensee will be reviewed for adequacy and appropriateness.

PROCEDURES

A survey team from ESSAP will visit the Bert Avenue site and perform a visual inspection and independent measurements and sampling of the containment cell and surrounding soil area to be released for unrestricted use. ESSAP survey activities will be conducted in accordance with the ORISE/ESSAP Survey Procedures and Quality Assurance Manuals (ORISE 1995a, b). Specific survey procedures applicable to this survey are listed on pages 8 and 9 of this survey plan. Deviations to the survey plan or procedures will be documented in the site logbook.

SURVEY PROCEDURES

Confirmatory survey activities at the Bert Avenue site will occur during three separate site visits. The first site visit will consist of confirmatory surveys of the Radioactive Waste Area A excavation and base of the North Area portion of the containment cell. The second site visit will consist of confirmatory surveys of the Radioactive Waste Area B excavation. The third site visit will consist of confirmatory surveys of the base of the South Area portion of the containment cell.

REFERENCE GRID

ESSAP will use the survey grid established by the licensee to reference confirmatory survey measurements and sampling locations.

SURFACE SCANS

Surface soil scans for gamma activity within the containment cell will be performed over 75% to 100% of each containment cell area. Due to safety restrictions, surface scans will not be performed within the Radioactive Waste Area A and B excavations.¹ Surface scans will be performed using NaI scintillation detectors coupled to ratemeters with audible indicators. Locations of elevated direct radiation identified by surface scans will be marked for further investigation.

EXPOSURE RATE MEASUREMENTS

Background exposure rates obtained during a previous site survey will be used for data comparison (ORISE 1992). Exposure rates will be measured at a minimum of ten locations within the containment cell (five in the North Area base of the cell and five in the South Area base of the cell). Exposure rates will be measured at 1 meter above the surface using a microrem meter.

SOIL SAMPLING

Background soil samples collected during a previous site survey will be used for data comparison (ORISE 1992). Surface (0-15 cm) soil samples will be collected from six randomly selected grid blocks within the base (bottom) of the containment cell—three grid blocks from the North Area and three grid blocks from the South Area. Five soil samples will be collected from each selected grid; one at the center and at four locations equidistant from the center and grid corners. Surface and subsurface soil samples will also be collected from locations of elevated direct radiation identified by surface scans. Fifteen soil samples (5 from Area A and 10 from Area B) will be collected indirectly from the bottom of the excavation of Radioactive Waste Areas A and B by collecting the soil samples directly from the excavator bucket.² Subsurface soil samples will be

¹Personal communication between T. Johnson (NRC) and W. Adams (ORISE) by telephone, June 27, 1997.

²Personal communication between T. Johnson (NRC) and W. Adams (ORISE) by telephone, June 27, 1997.

collected at depths up to one meter from a minimum of six surface soil sampling locations within the containment cell.³ ESSAP will also request a minimum of three of Chemetron's final status survey samples for confirmatory analysis.

SAMPLE ANALYSIS AND DATA INTERPRETATION

Samples and data will be returned to ORISE's ESSAP laboratory in Oak Ridge, Tennessee for analysis and interpretation. Soil samples will be analyzed by solid state gamma spectrometry. Sample analyses will be performed in accordance with the ORISE/ESSAP Laboratory Procedures Manual (ORISE 1995c). The radionuclide of interest is uranium; however, spectra also will be reviewed for any other identifiable photopeaks. Analytical results for soil samples will be reported in units of picocuries per gram (pCi/g). Exposure rates will be reported in microroentgens per hour ($\mu\text{R/h}$). The data generated will be compared with the licensee's documentation and NRC guidelines established for release for unrestricted use. The results from Surveys 1 and 2 will be presented in interim letter reports provided to the NRC for review. At the completion of Survey 3, all survey results will be presented in a draft report and provided to the NRC for review and comment.

GUIDELINES

The primary contaminant at this site is depleted uranium. The guideline for residual concentrations of depleted uranium in soil for land areas adjacent to the containment cell is 35 pCi/g (NRC 1981). Because depleted uranium characterized at this site has an average activity level concentration ratio for total uranium to U-238 of 1.5 to 1, the U-238 concentration will be multiplied by a factor of 1.5 to determine total uranium concentrations.

The average exposure rate guideline is 10 $\mu\text{R/h}$ above background at one meter above soil, with a maximum of 20 $\mu\text{R/h}$ above background at one meter (NRC 1996).

³Personal communication between T. Johnson (NRC) and W. Adams (ORISE) by telephone, June 25, 1997.

TENTATIVE SCHEDULE

Survey 1 (North Area Containment Cell and Area A)

Measurement and Sampling	July 8-10, 1997
Sample Analysis	July 1997
Interim Letter Report	August 29, 1997

Survey 2 (Area B)

Measurement and Sampling	August 1997 (To be determined)
Sample Analysis	August/September 1997
Interim Letter Report	September 30, 1997

Survey 3 (South Area Containment Cell)

Measurement and Sampling	September 1997 (To be determined)
Sample Analysis	September 1997
Draft Report	October 31, 1997

LIST OF CURRENT PROCEDURES

Applicable procedures from the ORISE ESSAP Survey Procedures Manual (Revision 9; April 30, 1995) include:

- Section 5.0 Instrument Calibration and Operational Check-Out
 - 5.1 General Information
 - 5.2 Electronic Calibration of Ratemeters
 - 5.3 Gamma Scintillation Detector Check-Out and Cross-Calibration
 - 5.13 Field Measuring Tape Calibration
- Section 6.0 Site Preparation
 - 6.2 Reference Grid System

- Section 7.0 Scanning and Measurement Techniques
 - 7.1 Surface Scanning
 - 7.5 Gamma Radiation (Exposure Rate) Measurement

- Section 8.0 Sampling Procedures
 - 8.1 Surface Soil Sampling
 - 8.2 Subsurface Soil Sampling
 - 8.9 Sample Identification and Labeling

- Section 9.0 Integrated Survey Procedures
 - 9.2 General Survey Approaches and Strategies

- Section 10.0 Health and Safety Control of Cross Contamination

- Section 11.0 Quality Assurance and Quality Control

Applicable procedures from the ORISE/ESSAP Quality Assurance Manual (Revision 7; January 31, 1995) include:

- Section 5 Training and Certification
- Section 6 Equipment and Instrumentation
- Section 7 Quality Control
- Section 8 Sample Chain-of-Custody
- Section 9 Data Management
- Section 10 Data Review and Validation
- Section 11 Records Handling and Storage

REFERENCES

Chemetron Corporation. Site Remediation Plan, Chemetron Remediation Project, Harvard Avenue and Bert Avenue Sites, Chemetron Corporation, Inc., Newburgh Heights, Ohio, Revision 1. Barry Koh & Associates, Inc., Owing Mills, Maryland; February 1995.

Oak Ridge Institute for Science and Education (ORISE). Radiological Survey of Portions of the Cleveland Works Facility, The Aluminum Company of America, Cleveland, Ohio. Revised Final Report. Oak Ridge, Tennessee; November 1992.

Oak Ridge Institute for Science and Education. Survey Procedures Manual for the Energy/Environment Systems Division, Environmental Survey and Site Assessment Program, Revision 9. Oak Ridge, Tennessee; April 30, 1995a.

Oak Ridge Institute for Science and Education. Quality Assurance Manual for the Energy/Environment Systems Division, Environmental Survey and Site Assessment Program, Revision 9. Oak Ridge, Tennessee; January 31, 1995b.

Oak Ridge Institute for Science and Education. Laboratory Procedures Manual for the Energy/Environment Systems Division, Environmental Survey and Site Assessment Program, Revision 9. Oak Ridge, Tennessee; January 31, 1995c.

U.S. Nuclear Regulatory Commission (NRC). Disposal or Onsite Storage of Thorium and Uranium Wastes from Past Operations. Washington, DC: Federal Register 46 (205): 52061-52063; October 1981.

U.S. Nuclear Regulatory Commission. Manual for Conducting Radiological Surveys in Support of License Termination (Draft). NUREG/CR-5849. Washington, DC; June 1992.

U.S. Nuclear Regulatory Commission. U.S. NRC Materials License-Chemetron Corporation, Inc. SUB-1357, Amendment No. 5; June 7, 1996.

ATTACHMENT A

FY 97 SPENDING PLAN		PERFORMANCE PERIOD	
		From	To
Name of Laboratory:		Jun-97	Aug-97
Oak Ridge Institute for Science and Education			
		RFTA	Est. Project Cost
Title of Project: #691		97-21	\$14,300.00
Chemetron Bert Avenue Containment Cell Survey 1, Newburgh Heights, OH			
Fee or Non-Fee Recoverable: FEE		NRC Fin Number	ORISE Number
TAC Number: L51242		A9093	1285.66

COST ELEMENTS	Oct-96	Nov-96	Dec-96	Jan-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%

COST ELEMENTS	Feb-97	Mar-97	Apr-97	May-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%

COST ELEMENTS	Jun-97	Jul-97	Aug-97	Sep-97
Direct Costs	\$615.00	\$8,154.00	\$2,231.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$185.00	\$2,446.00	\$669.00	\$0.00
Total Estimate Costs	\$800.00	\$10,600.00	\$2,900.00	\$0.00
Project Completion	5.59%	79.72%	100.00%	100.00%

ACTIVITY INFORMATION	Hours	Estimated Cost
Site Visit	0.0	\$0.00
Document Review	2.0	\$200.00
Presurvey	5.5	\$600.00
Travel- Labor	24.0	\$2,300.00
Travel- Other Expenses		\$3,900.00
Survey Activities	28.0	\$2,700.00
Report Preparation	22.0	\$2,900.00
Sample Analysis	17.0	\$1,700.00
Other	0.0	\$0.00
Total	98.5	\$14,300.00

ATTACHMENT B

FY 97 SPENDING PLAN		PERFORMANCE PERIOD		
		From	To	
Name of Laboratory:		Sep-97	Oct-97	
Oak Ridge Institute for Science and Education				
		RFTA	Est. Project Cost	
Title of Project: #691		97-21	\$15,500.00	
Chemetron Bert Avenue Containment Cell Survey 2, Newburgh Heights, OH				
Fee or Non-Fee Recoverable: FEE		NRC Fin Number	ORISE Number	
TAC Number: L51242		A9093	1285.66	
COST ELEMENTS	Oct-96	Nov-96	Dec-96	Jan-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%
COST ELEMENTS	Feb-97	Mar-97	Apr-97	May-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%
COST ELEMENTS	Jun-97	Jul-97	Aug-97	Sep-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$9,394.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$3,006.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$12,400.00
Project Completion	0.00%	0.00%	0.00%	80.00%
ACTIVITY INFORMATION	Hours	Estimated Cost	Oct-97	
Site Visit	0.0	\$0.00	Direct	\$2,348.00
Document Review	0.0	\$0.00	Indirect	\$752.00
Presurvey	5.0	\$500.00	Total	\$3,100.00
Travel- Labor	24.0	\$2,300.00		20.00%
Travel- Other Expenses		\$3,900.00		
Survey Activities	28.0	\$2,700.00		
Report Preparation	32.0	\$3,900.00		
Sample Analysis	22.5	\$2,200.00		
Other	0.0	\$0.00		
Total	111.5	\$15,500.00		

ATTACHMENT C

FY 97 SPENDING PLAN		PERFORMANCE PERIOD		
		From	To	
Name of Laboratory:		Sep-97	Oct-97	
Oak Ridge Institute for Science and Education				
		RFTA	Est. Project Cost	
Title of Project: #691		97-21	\$13,600.00	
Chemetron Bert Avenue Containment Cell Survey 3, Newburgh Heights, OH				
Fee or Non-Fee Recoverable: FEE		NRC Fin Number	ORISE Number	
TAC Number: L51242		A9093	1285.66	
COST ELEMENTS	Oct-96	Nov-96	Dec-96	Jan-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%
COST ELEMENTS	Feb-97	Mar-97	Apr-97	May-97
Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$0.00	\$0.00	\$0.00	\$0.00
Total Estimate Costs	\$0.00	\$0.00	\$0.00	\$0.00
Project Completion	0.00%	0.00%	0.00%	0.00%
COST ELEMENTS	Jun-97	Jul-97	Aug-97	Sep-97
Direct Costs	\$1,923.00	\$8,538.00	\$0.00	\$0.00
Indirect Costs- (G&A, DOE Factor)	\$577.00	\$2,562.00	\$0.00	\$0.00
Total Estimate Costs	\$2,500.00	\$11,100.00	\$0.00	\$0.00
Project Completion	18.38%	100.00%	100.00%	100.00%
ACTIVITY INFORMATION	Hours	Estimated Cost		
Site Visit	0.0	\$0.00		
Document Review	2.0	\$200.00		
Presurvey	22.0	\$2,300.00		
Travel- Labor	24.0	\$2,300.00		
Travel- Other Expenses		\$3,900.00		
Survey Activities	28.0	\$2,700.00		
Report Preparation	5.0	\$1,100.00		
Sample Analysis	11.3	\$1,100.00		
Other	0.0	\$0.00		
Total	92.3	\$13,600.00		