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ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

September 12, 1996

Mr. Timothy Johnson
U.S. Nuclear Regulatory Commission
Division of Waste Management
Mail Stop: T-7F27
Washington, DC 20555

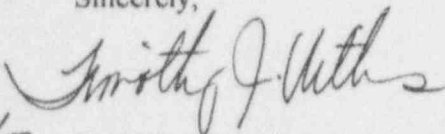
SUBJECT: PROPOSED CONFIRMATORY SURVEY PLAN FOR THE HARVARD AVENUE CONTAINMENT CELL AND SURROUNDING LAND AREA, CHEMETRON CORPORATION, CUYAHOGA HEIGHTS, OHIO (DOCKET NO. 040-08724; RFTA NO. 96-55)

Dear Mr. Johnson:

Enclosed is a copy of the proposed survey plan for the confirmatory survey of the Harvard Avenue containment cell and surrounding land area at the Chemetron Harvard Avenue site. The survey is tentatively scheduled for September 25 and 26, 1996; for this schedule to be met, approval is requested by September 17, 1996. Attachment A provides the spending plan for the proposed activities.

If you have any questions or comments please contact me at (423) 576-3740 or Tim J. Vitkus at (423) 576-5073.

Sincerely,

for 

Eric W. Abelquist
Assistant Program Director
Environmental Survey and
Site Assessment Program

EWA:dka

Enclosure

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**PROPOSED
CONFIRMATORY SURVEY PLAN
FOR THE
HARVARD AVENUE CONTAINMENT CELL
AND SURROUNDING LAND AREA
CHEMETRON CORPORATION
CUYAHOGA HEIGHTS, OHIO
(DOCKET NO. 040-08724)**

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 (CMC) 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. Production was primarily performed in the south end of Building 21 at the Harvard Avenue site from 1965 to 1972. By February 1972, the manufacture of the catalyst had been terminated, and in December 1973, the license was amended 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 CMC subsidiary in Louisville, Kentucky.

In 1975, the McGean Chemical Company, Inc., the predecessor to McGean-Rohco Incorporated (MCR), purchased the Harvard Avenue site. Chemetron, however, retained the license and responsibility for the depleted uranium at the facility. In 1979, a revised license (License No. SUB-1357) was issued to CMC by the NRC which allowed CMC to possess DU in the form of contaminants at the Harvard Avenue site.

Prepared by the Environmental Survey and Site Assessment Program, Environmental and Health Sciences Division, Oak Ridge Institute for Science and Education, under interagency agreement (NRC FIN No. A-9076) between the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy.

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 Avenue facility for wastes generated from the remediation of the Harvard Avenue site. 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.

As part of its characterization efforts, Chemetron collected 483 soil samples from the surface of the Harvard Avenue site. Concentrations of depleted uranium in these samples ranged from background levels to 107 pCi/g, with an average contamination level of 35 pCi/g total uranium (Chemetron 1995). Over 300 subsurface soil samples were collected from the Harvard Avenue site from boreholes with an average depth of 8 feet; the highest depleted uranium concentration was 81 pCi/g. Characterization of the excavated soil stockpiled on the north end of the site resulted in an average depleted uranium concentration of 33.7 pCi/g, with the highest concentration reported as 70.6 pCi/g.

Chemetron will perform final status surveys of the soil that is placed in the containment cell, as well as land areas adjacent to the cell. The licensee will perform surface scans of each one-foot lift of contaminated soil placed in the containment cell. One soil sample will be collected per 100 m² area of each one-foot lift, with the samples being composited over the three lifts. The final survey data will be used demonstrate that the average depleted uranium 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 Harvard Avenue disposal cell and land areas adjacent to the cell.

SITE DESCRIPTION

The property required to be remediated by Chemetron Corporation is owned by McGean-Rohco, Inc., and is located at 2910 Harvard Avenue in the suburb of Cuyahoga Heights, Ohio. The facility is located in a mixed industrial and residential area approximately six kilometers (4 miles) south of downtown Cleveland. The portion of the McGean-Rohco, Inc., facility on which licensed activities were performed is known as the Harvard Avenue site. The Harvard Avenue site is located on the west side of the property and borders the Aluminum Company of America (ALCOA) property. This portion of the property consists of approximately 1.2 hectares (3 acres) and has been cleared of buildings and debris as part of previous decontamination and remediation activities (RMC 1985). Currently, McGean-Rohco, Inc. operates a chemical manufacturing facility which is located to the east of the Harvard Avenue site and consists of thirteen main buildings and several auxiliary buildings—this portion of the site is referred to as the McGean-Rohco Complex. The McGean-Rohco Complex site boundaries are Harvard Avenue to the north, the Harvard Avenue site to the west, the Newburgh and Southshore Railroad to the south, and the Ohio Crankshaft Company to the east.

The Harvard Avenue containment cell will be constructed by excavating and stockpiling the contaminated soil, clearing the cell area for unrestricted release, filling the disposal cell with the contaminated material, and covering the cell with compacted clay. Due to space limitations at the site, the construction of the cell will proceed in two phases. The southern portion of the cell will be constructed first from the center to the south end, and then from the center to the north end of the site. The northern portion of the cell will be constructed after wastes have been placed in the southern portion, the contaminated stockpile materials have been moved from the northern portion of the site to the cell, and final surveys performed to demonstrate compliance with release criteria. The completed disposal cell will measure approximately 50 m by 130 m, with a contaminated soil depth of 1 m. The general Harvard Avenue site area is approximately 100 m by 200 m.

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 Tim Vitkus, Survey Projects Manager 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 McGean-Rohco 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

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 the containment cell area. Gamma scans of the adjacent land areas will be performed over approximately 50% of the area. 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 rate measurements were performed during a previous site survey (ORISE 1992).

Exposure rates will be measured at a minimum of ten locations within the containment cells and at six locations in the area adjacent to the containment cell. Exposure rates will be measured at 1 meter above the surface using a microrem meter.

SOIL SAMPLING

Background soil samples were collected from a previous site survey (ORISE 1992).

Surface and subsurface soil samples will be collected from ten randomly selected borehole locations. Boreholes will be drilled to a one-meter depth within the disposal cell using a manual hand auger at selected locations. Soil samples will be collected from each borehole location at intervals of

at selected locations. Soil samples will be collected from each borehole location at intervals of 0 to 15 cm, 30 to 45 cm, and 60 to 75 cm. Approximately 8 to 10 surface soil samples will be collected from the adjacent land area. Soil samples will also be collected from any locations of elevated direct radiation identified by surface scans. ESSAP will also request 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 (μ R/h). The data generated will be compared with the licensee's documentation and NRC guidelines established for release for unrestricted use. 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. Based on uranium solubility testing of the Harvard Avenue wastes, the maximum depleted uranium concentration that is acceptable for disposal in the containment cell is 200 pCi/g total uranium (NRC 1996). 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 μ R/h above background at one meter above soil, with a maximum of 20 μ R/h above background at one meter (NRC 1996).

TENTATIVE SCHEDULE

Measurement and Sampling	September 25 and 26, 1996
Sample Analysis	October 1996
Draft Report	November 1996

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 Procedure
 - 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. Quality Assurance Manual for the Energy/Environment Systems Division, Environmental Survey and Site Assessment Program, Revision 9. Oak Ridge, Tennessee; January 31, 1995a.

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, 1995b.

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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.