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FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

ELIMINATION REPORT
FOR THE
FORMER ELECTRO METALLURGICAL COMPANY
NIAGARA FALLS, NEW YORK

U.S. DEPARTMENT OF ENERGY
OFFICE OF NUCLEAR ENERGY
OFFICE OF REMEDIAL ACTION AND WASTE TECHNOLOGY
DIVISION OF FACILITY AND SITE DECOMMISSIONING PROJECTS

CONTENTS

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INTRODUCTION

From 1942 through 1953, the Electro Metallurgical Company ("Electromet"), a subsidiary of Union Carbide and Carbon Corporation (now Umetco Minerals Corporation, a subsidiary of Union Carbide Corporation) performed work with radioactive materials under contract to the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC). Radiological contamination in excess of current Department of Energy (DOE) guidelines* is currently present at the site. However, based on a review of historical records pertaining to these activities and the results of radiological surveys conducted between 1976 and 1980, DOE has concluded that: (1) the 1953 agreement transferring the property to the contractor relieved AEC of all further responsibility for the site, including decontamination, and (2) the residual radioactive material is probably the result of licensed commercial activities conducted by the contractor rather than the operations performed by the contractor on behalf of the above-mentioned DOE predecessors. Therefore, DOE has no authority under the Atomic Energy Act of 1954, as amended, to perform remedial action at the site and is eliminating it from consideration for inclusion in the Formerly Utilized Sites Remedial Action Program (FUSRAP). The Environmental Protection Agency and the State of New York will be informed of this decision so that they make take whatever action they deem appropriate.

This report presents information supporting DOE's determination regarding authority for cleanup. It will be archived by DOE through the Assistant Secretary for Management and Administration. A copy of this package will be available for public review between 8:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), at the DOE Public Reading Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, SW., Washington, D.C.

BACKGROUND

Site Function

MED contract W-7405-Eng-14, initiated on November 14, 1942, called for design, engineering, construction, and operation of a plant to produce uranium metal from uranium tetrafluoride (UF_4), also known as green salt. Expansion of the facility occurred under construction contracts W-7405-Eng-227 and 255. Electromet received UF_4 from Union Carbide's Linde Air Products Division plant at Tonawanda, New York, reacted it with magnesium in induction furnaces to convert it to uranium

*U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites (Rev. 1, July 1985).

metal, and then recast the metal into 110- to 135-kilogram ingots. The products were generally shipped to either Hanford Engineer Works, Richland, Washington, Argonne National Laboratory, Argonne, Illinois, or Du Pont's Chambers Works, Deepwater, New Jersey, for testing, or to Simonds Saw and Steel Company, Lockport, New York, Vulcan Crucible Steel Company, Alliquippa, Pennsylvania, Revere Copper and Brass Company, Detroit, Michigan, or Joslyn Manufacturing and Supply Company, Fort Wayne, Indiana, for rolling. Process residues (dolomite slag, uranium chips, and crucible dross) were shipped to other sites for uranium recovery, storage, or disposal. These sites included Lake Ontario Ordnance Works (LOOW), Lewiston, New York, (now known as the DOE Niagara Falls Storage Site), Mallinckrodt Chemical Company, St. Louis, Missouri, Vitro Manufacturing Company, Canonsburg, Pennsylvania, the Du Pont Chambers Works, and Hooker Electrochemical Company, Niagara Falls, New York.

In addition to production of metal from green salt, Electromet recast scrap metal from Simonds, Chapman Valve Manufacturing Company, Indian Orchard, Massachusetts, and American Rolling Mill Company (location unknown). The contract also contained a provision for the conduct of research and development. Some work was done under this provision from April to October 1945. The exact nature of the work is not known, but it may have involved low- and/or high-grade uranium ores.

Production of uranium metal was suspended in August 1946 and resumed in October 1947. On November 30, 1948, Electromet was liquidated as a separate company and became the Electro Metallurgical Division of Union Carbide and Carbon Corporation. All rights, assets, liabilities, and contracts were transferred to Union Carbide. Production continued until September 28, 1949, when the last casting of uranium was conducted. The plant was placed in standby condition two days later.

Electromet also supplied calcium metal to Los Alamos Scientific Laboratory, Iowa State College, and AEC's Santa Fe Yards under contracts W-26-021-Eng-13, AT (30-1)-Gen-137, 160, and 225, and AT-04-1-Gen-55, 56, 57, 78, 91, and 101 (1945 to 1948). In April 1950, the UF_4-to-metal plant was reactivated for casting zirconium metal sponge into ingots for the Naval Critical Requirement program. The work was conducted under W-7405-Eng-14 and funded under AEC contract AT(30-1)-861 with Titanium Alloy Manufacturing Division of National Lead Company (supplier of the zirconium). The plant was returned to standby condition at the completion of the work in September 1950. Portions of the facility were subsequently used under contract AT-(40-1)-1090 between Union Carbide and Carbon Research Laboratories, Inc. and AEC's Oak Ridge Operations Office. This contract directed Union Carbide to conduct research and development on methods of forming metal that would minimize unnecessary machining, finishing, and waste. This work was conducted from January to June, 1951. Although the contract is not specific, the metal involved was probably uranium. Later, just prior to demolition, the building was also apparently used for titanium processing (contract number unknown). AEC involvement at the site ended when contract W-7405-Eng-14 expired on June 30, 1953.

Following termination of the MED/AEC contracts, Electromet processed uranium and thorium for commercial use under New York State radioactive material license 950-0139. From August 1965 through April 1972, Union Carbide Corporation produced 505 tons of slag bearing 9212 pounds of thorium dioxide and 1293 pounds of uranium oxide. This slag was placed in 55-gallon drums and buried in a designated area on plant property in a hole 20 feet deep with 4 to 5 feet of soil cover.

Site Description

The Electromet site is located south of Pine Avenue, east of its intersection with Packard Road (Figure 1). The MED/AEC operations took place in one building, known as the Area Plant. The one-story cinder block and wood structure measured approximately 50 feet by 219 feet and was demolished in 1957. It was located approximately 400 feet east of 47th Street and 400 feet south of Royal Avenue, in an area now occupied by the south end of current Building 166.

Radiological History and Status

At the end of the contract, Electromet purchased the facility from AEC. The building and equipment were decontaminated through washing, vacuuming, and, in some locations, removing concrete floors and wooden platforms. The Health and Safety Division of AEC surveyed the site on August 11 and 14, 1953. Final certification of the radiological condition of the plant and a recommendation to release the facility were made on September 28, 1953. The building was later demolished with debris and uranium processing wastes transferred to the AEC portion of LOOW. In the late 1950s, the wastes from uranium processing were sent to Oak Ridge National Laboratory (ORNL) for permanent disposal. However, some of the rubble may have been deposited in the old Union Carbide dump (200 to 300 acres located north of Pine Avenue and owned by Newco, now CECOS International, Inc.).

On August 24, 1976, personnel from ORNL and the DOE (then the Energy Research and Development Administration) Oak Ridge Operations Office conducted a screening survey of the site and the old dump. Due to the near-background levels encountered over most of the two sites, comprehensive formal surveys were not recommended. However, beta-gamma readings in the area between Buildings 163 and 166 on the main site ranged up to 0.1 millirads per hour (within guidelines). Further measurements and soil sampling in this area were advised.

EG&G, Inc., conducted an aerial survey of the Niagara Falls area in November 1978, and again with more sensitive instruments in September 1979. No radiation anomalies were observed on the former Electromet site during either survey.

As a follow-up to the screening survey, ORNL personnel conducted another limited preliminary radiological survey on September 24, 1980.

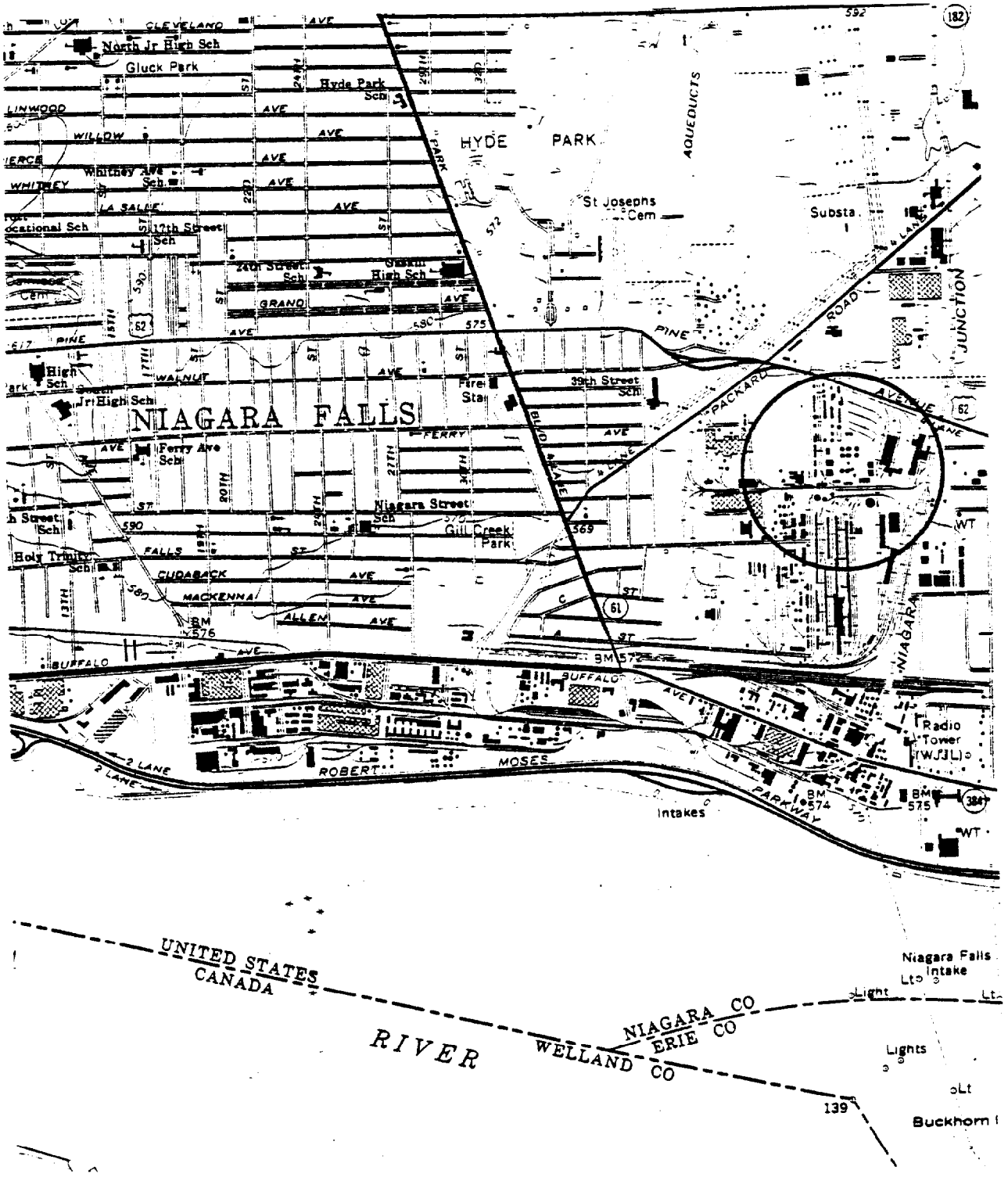

Figure 1. Location of the Former Electro Metallurgical Corporation in Niagara Falls, New York

They found relatively high concentrations of gamma-emitting radionuclides (above guidelines) in the thorium-232 and uranium-238 decay chains in the surface soil around Buildings 163 and 166 as well as elsewhere on the site. Contamination was also found in cracks and seams in the walls and floors of Building 163. Thorium-bearing ores were used during operations at this site; however, these activities were unrelated to the MED/AEC work. The uranium-238/radium-226 ratio measured in the soil samples indicates natural uranium, whereas the MED/AEC uranium work involved uranium metal, i.e., produced after the uranium was separated from its daughters. Thus, the observed uranium contamination was also apparently not the result of the MED/AEC conversion and metal-casting operations.

ELIMINATION ANALYSIS

The determination of authority for DOE to include a site in FUSRAP and perform any required remedial action is based upon an evaluation of the specific terms of the contract or contracts between MED/AEC and the site owner or operator; confirmation that the residual radioactive contamination at the site did occur during the performance of work sponsored by MED/AEC; and the nature of the working relationship between MED/AEC and the site owner or operator. The latter considerations specifically address ownership of facilities and equipment, control of contractor operations, and MED/AEC involvement in matters pertaining to health and safety at the facilities. Historical records and radiological data are analyzed to provide answers to five specific questions. These questions and the answers resulting from the Electromet authority review are as follows:

1. Was the site owned by a DOE predecessor or did a DOE predecessor have significant control over the operations or site?

The Federal Government owned the building where the MED/AEC contract work was conducted until contract termination in 1953. At that time, Union Carbide purchased the facility.

2. Was a DOE predecessor responsible for maintaining or ensuring the environmental integrity of the site (i.e., was it responsible for cleanup)?

There is no clear definition of responsibility for radiological health and safety in contract W-7405-Eng-14. No MED/AEC personnel were stationed at the site on a full-time basis, except during the construction phase. However, MED personnel assigned to the Medical Department at the University of Rochester did perform radiological surveys of Electromet every 3 or 4 weeks during the period of contract performance. Most liability and health and safety clauses in the contract deal with the construction and operating phases, i.e., the contractor is responsible for maintaining the plant in good working order and complying with state regulations regarding a safe working

environment. The contractor is generally released from liability for loss of or damages to government property, deaths, bodily injuries, etc., except for instances of gross negligence on the part of corporate officers (Articles I-J and VIII-A.1). The Federal Government is liable for expenses in connection with startup, maintenance and repair, and shutdown of the plant (Article VI-A.1.r). This could be interpreted as including decontamination.

At the end of the contract, Electromet purchased the plant from AEC. The sales agreement was designated as contract number AT(30-1)-S-23. The final, signed instrument has not been located and may have been destroyed in accordance with standard records management procedures. However, a "revised draft" of the agreement is available and contains several significant passages. In provision 2, Union Carbide agrees to release the Government from any and all liabilities for damage to Carbide land and property and releases the Government from any and all obligations to restore the land and property to its original condition. In provision 3, Carbide acknowledges receipt of the plant in a contaminated condition and agrees to decontaminate it to specified tolerances within one month after transfer of title. In provision 4, Carbide agrees to release the Government from liability for any deaths, injuries, or damage to property arising out of the transfer of the plant from AEC to Carbide or further use of the plant by Carbide after the transfer. Although the actual final sales agreement is not available, surviving memos written during the period July-November 1953 suggest that it did contain the above-cited provisions.

Following execution of the sales agreement, Electromet decontaminated the plant and equipment. AEC surveyed the site on August 11 and 14, 1953, and certified its acceptability for release with restrictions on the sale of three pieces of equipment that could not be adequately decontaminated.

3. Is the waste, residue, or radioactive material on the site the result of DOE predecessor-related operations?

Probably not. The contamination at the site consists of thorium and natural uranium (uranium in equilibrium with its daughter products). There is currently no evidence that any work with thorium was done for AEC/MED. The thorium contamination that exists at the site is apparently the result of unrelated licensed, commercial activities. Residual uranium contamination may also be the result of these licensed activities (i.e., unrelated to MED/AEC contract operations). The work done under contract to MED/AEC involved primarily (and possibly exclusively) uranium metal (i.e., uranium separated from its daughters). The observed Ra-226 concentrations are not consistent with residue that would result from these operations. Memos indicate intent to do some work with low-grade and possibly high-grade uranium ore under the research and development section (Title IV) of the contract. However, two former MED employees familiar with the Electromet operations of the period have no

recollection of work involving ore and, to date, no records documenting actual performance of the work have been found. Examination of Electromet records has been fairly exhaustive, and it is unlikely that additional information will be found. In any case, if these operations were conducted, their scale and the resulting potential for contamination would have been small. Any residual contamination would probably be insignificant compared to and indistinguishable from contamination remaining from commercial (non-MED/AEC), licensed operations with uranium. Research under AT-(40-1)-1090 entailed work with metal, so no radium contamination would be expected from these operations. Zirconium work under W-7405-Eng-14 also involved metal rather than ore, so no radiological contamination would be expected.

4. Is the site in need of further cleanup and was the site left in an unacceptable condition as a result of DOE predecessor-related activities?

Contamination at the site does exceed DOE remedial action guidelines; however, the material is apparently not the result of DOE predecessor-related activities. The property was contaminated at the time of its transfer to Union Carbide, but Carbide decontaminated it in accordance with the sales agreement and AEC certified the site as acceptable for release.

5. When accepting responsibility for the site, did the present owner know that it was contaminated and that additional remedial measures would be necessary before the site could be judged acceptable for unrestricted use?

Yes. The sales agreement obligated Union Carbide to decontaminate the plant and equipment to the satisfaction of AEC within one month after transfer of title.

SUMMARY OF FINDINGS

Although the site is contaminated above guidelines, there is currently no evidence that the residual radioactive materials resulted from operations conducted under contract to MED/AEC. The contamination appears to be the result of licensed, commercial operations conducted subsequent to the MED/AEC activities. Furthermore, the sales agreement transferring the property to Union Carbide released AEC from any obligation to restore the property to its original condition and required Carbide to clean up the contamination that existed at the close of the MED/AEC contract. Therefore, based on available information, DOE has determined that it has no authority under the Atomic Energy Act of 1954, as amended, to conduct remedial actions at this site. Accordingly, the property owner, the U.S. Environmental Protection Agency, and the State of New York will be informed of this decision, so that they may take appropriate action.