

FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM  
ELIMINATION REPORT  
FOR  
INTERNATIONAL MINERALS AND CHEMICAL CORPORATION  
MULBERRY, FLORIDA

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Department of Energy  
Office of Nuclear Energy  
Office of Remedial Action and Waste Technology  
Division of Facility and Site Decommissioning Projects

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INTRODUCTION

The Department of Energy (DOE), Office of Nuclear Energy, Office of Remedial Action and Waste Technology, Division of Facility and Site Decommissioning Projects (and/or predecessor agencies, offices, and divisions), has reviewed the past activities conducted on behalf of the Atomic Energy Commission (AEC) at the International Minerals and Chemical Corporation facility in Mulberry, Florida. A preliminary radiological survey revealed some residual radium contamination in the soil that exceeds current DOE radiological guidelines<sup>1</sup>. However, on the basis of a review of available historical and radiological information, DOE has determined that the contamination is not attributable to the AEC-sponsored operations. Therefore, DOE does not have legal authority to conduct remedial actions at this site and will not include it in the Formerly Utilized Sites Remedial Action Program (FUSRAP).

This report summarizes information on the radiological status of the site and summarizes the results of DOE's authority investigation. Although the contamination exceeds guidelines, it does not pose a significant radiological hazard to site occupants or the general public under current conditions of site usage.

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<sup>1</sup> 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, 1985).

This elimination report 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

International Minerals and Chemical Corporation conducted research and development on uranium recovery from leached zone material (Bartow clay) in the Florida Land Pebble Phosphate Field. The operation included the production of uranium from a pilot plant for developing engineering data for a full-size facility (later constructed at International's Bonnie Chemical Plant at Bartow, Florida). This work was performed under AEC contracts AT(49-1)-538 and AT(49-1)-545, effective April 26, 1951 through June 30, 1955. An earlier contract with International Minerals and Chemical Corporation (AT(30-1)-942) was destroyed according to standard records management schedules, but is believed to have involved geologic investigations of Florida phosphate-bearing lands.

### Site Description

The pilot plant research and development work was performed at the company plant in Mulberry, Florida (Figure 1). All that remains of the pilot facility is a 250-foot x 50-foot concrete slab. The disposition of the equipment, scrap, and rubble from the facility is not known.

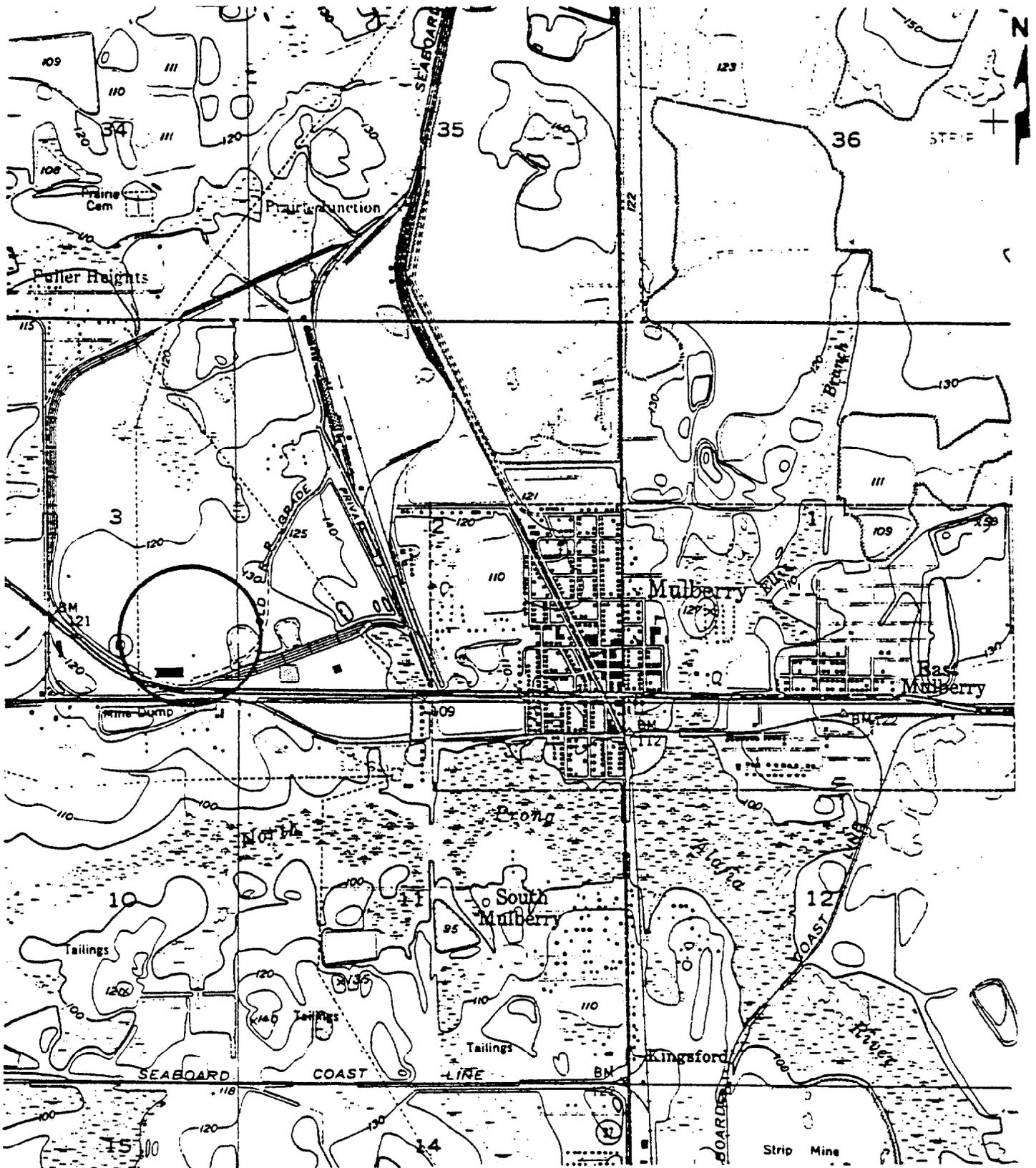


Figure 1. Location of the International Minerals and Chemical Corporation in Mulberry, Florida

## Radiological History and Status

Department of Energy (DOE) (then the Energy Research and Development Administration) Oak Ridge Operations Office and Oak Ridge National Laboratory personnel conducted a screening survey at this site on April 6, 1977, and found radiation levels above normal background levels. Soil and debris samples indicated radium concentrations of up to 28 picocuries/gram. Although these levels are above normal background for the United States, they are similar to those at other phosphate product plants currently operating without uranium recovery operations. As a result, any radioactive material remaining from the AEC-related operation would be insignificant in magnitude compared to and indistinguishable from material resulting from non-AEC 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 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 AEC; and the nature of the working relationship between AEC and the site owner or operator. The latter considerations specifically address ownership of facilities and equipment, control of contractor operations, and 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 authority review for the International Minerals and Chemical Corporation's 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?

Because only portions of the contracts survive, it is not possible to definitively answer this question. The complete contracts have apparently been destroyed in accordance with standard records management procedures. Cursory reviews of records of the AEC Feed Material Division stored in Oak Ridge, Tennessee, and in Suitland, Maryland, indicate that future discovery of duplicates of the contracts or any other supportive material is unlikely. Letter contract AT(49-1)-538 states that AEC will reimburse the contractor for costs applicable to the contract work (paragraph 4) and that, upon reimbursement, title to all materials, equipment, structures, etc., shall vest in the Government (paragraph 6). These provisions do not appear in the surviving portions of contract AT(49-1)-545. However, paragraph 2 of Amendment 7 to the contract indicates that the expected cost of the work was \$2,755,000. This would appear to include more than just operating costs. It is likely that AEC reimbursed the contractor for construction costs. Therefore, AEC may have owned the pilot plant. Judging from the available portions of the contracts, AEC control was limited to review of various operating records (AT (49-1)-545, Article VII).

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

Article XII of contract AT(49-1)-545, requires the contractor to conform to all minimum AEC health and safety regulations and requirements and to take "all reasonable steps and precautions to protect health and minimize danger from all hazards to life and property." AEC apparently had an overview role, because the contractor is required to "make all reports and permit all inspections as required by the Commission." Nothing in the contract requires AEC to perform or pay for cleanup of the plant upon contract termination.

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

There is no evidence that the observed contamination resulted from the uranium recovery operations. Two samples were analyzed. One had an elevated radium concentration while the uranium concentration was equivalent to background. Because radium is separated out of the phosphoric acid stream prior to the uranium recovery step, the radium contamination is probably due to the fertilizer production operations that International conducted independent of AEC involvement. The other sample contained elevated levels of both radium and uranium. However, because they are present in concentrations relatively close to secular equilibrium, it is unlikely that this contamination was the result of the AEC-contract work. Furthermore, the observed concentrations are typical concentrations found in unprocessed phosphate ore from Central Florida (Roessler, et al., 1979).

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?

Radium contamination in both samples taken at the site exceeded DOE remedial action guidelines; however, the material is apparently not the result of AEC-related activities.

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?

The site was and is owned by International Minerals and Chemical Corporation. The circumstances of the pilot plant's return to the contractor's control (if, in fact, title ever rested with the

government) are unknown. However, because residue contaminated with radium is inherent in phosphate ore processing operations (regardless of whether attempts are made to recover uranium), International must have been aware of the presence of contaminated material on the site.

### 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 AEC. The contamination appears to be the result of commercial phosphate fertilizer production operations conducted concurrently with the AEC-related uranium recovery activities. Therefore, based on available information, DOE has no authority under the Atomic Energy Act of 1954, as amended, to conduct remedial actions at this site and it is eliminated from further consideration under FUSRAP. Accordingly, the property owner, the U.S. Environmental Protection Agency, and the State of Florida will be informed of this decision, so that they may take whatever action they deem appropriate.

### REFERENCES

- o Atomic Energy Commission Letter Contract No. AT(49-1)-538, dated April 26, 1951 (excerpts).
- o Atomic Energy Commission Contract No. AT(49-1)-545, dated June 29, 1951, and modification 7 (excerpts).
- o Roessler, C.E., Z.A. Smith, W.E. Bolch, and R.J. Prince. 1979. "Uranium and Radium-226 in Florida Phosphate Materials." Health Physics 37:269-277.

- o Oak Ridge National Laboratory, March 1980. Preliminary Survey of International Minerals and Chemical Corporation, Mulberry, Florida.
  
- o Carroll, H.L., (International Minerals and Chemical Corporation) to William E. Mott (Department of Energy), letter of May 23, 1980.