MEMORANDUM

TO: FILE
FROM: D. Levine

SUBJECT: Elimination Recommendation

SITE NAME: Wah Chang

CITY: Albany
STATE: OR
PO. Box 366
(company appears to have been located in New York)

OWNER(S):
Past: Unknown
Current: Unknown
Owner contacted ☐ yes ☐ no; if yes, date contacted

TYPE OF OPERATION
☑ Research & Development
☐ Facility Type
☐ Manufacturing
☐ University
☐ Research Organization
☐ Government Sponsored Facility
☐ Other operated Bureau of Mines zirconium plant in Albany, OR
☐ Production scale testing
☐ Pilot Scale
☐ Bench Scale Process
☐ Theoretical Studies
☐ Sample & Analysis
☐ "thorium metal development"
☐ Disposal/Storage

TYPE OF CONTRACT
☑ Prime AEC
☐ Subcontractor
☐ Purchase Order

Contract/Purchase Order #

CONTRACTING PERIOD: at least August 1956 to 1960

OWNERSHIP:

<table>
<thead>
<tr>
<th>LANDS</th>
<th>BUILDINGS</th>
<th>EQUIPMENT</th>
<th>ORE OR RAW MATL</th>
<th>FINAL PRODUCT</th>
<th>WASTE &amp; RESIDUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

AEC/MED OWNED | AEC/MED LEASED | GOVT OWNED | GOVT LEASED | CONTRACTOR OWNED | CONTRACTOR LEASED |

Bureau of Mines,
AEC/MED INVOLVEMENT AT SITE

Control
☐ AEC/MED managed operations
☐ AEC/MED responsible for accountability
☐ AEC/MED overviewed operations
☐ Contractor had total control
☒ unknown

Health Physics Protection
☐ Little or None
☐ AEC/MED responsibility
☐ Contractor responsibility
unknown

MATERIALS HANDLED:

Type (on basis of records reviewed)

☐ No Radioactive
☐ Natural Radioactive from Feed Materials Production
  ☐ Ore
  ☐ Refined Source Material
  ☐ Residue
☐ Natural Radioactive Material from Non-Nuclear Activities
☐ Man-Made
☒ Other ___ Zirconium
Comment ___________________________________________________________________

Quantities (on the basis of records reviewed)

☐ None
☐ Small Amounts
☒ Production Quantities
Comment about 300,000 lbs. of zirconium per year

OTHER PERTINENT FACTS:

☒ Facility was Licensed

☐ During AEC/MED-Related Operations
☐ For Similar Activities
☐ For Other Activities
Comment licensed to handle zirconium tailings

☐ Commercial Production Involving Radioactive Material during AEC/MED Operations

☐ Facility was Decontaminated and Released

☐ Availability of Close Out Records
  ☐ None  ☐ Some  ☐ Sufficient

☐ Radioactive Status: YES MAYBE PROBABLY NOT NOT
Contaminated Potential for Exposure (accessible) ___ X ___ ___ ___
QUANTITY OF RECORDS AVAILABLE:
☑ Very Little   ☐ Some   ☐ Sufficient

PROBABILITY OF FINDING ADDITIONAL RECORDS:
☑ Low   ☐ Possible   ☐ High

RECOMMENDATIONS:
☑ Eliminate
☐ Consider for Remedial Action
☐ Collect More Data

Comment

REFERENCES: (see attached list and references)

SUMMARY

Wah Chang operated the Bureau of Mines zirconium plant in Albany, Oregon. They later operated their own zirconium plant. Zirconium tailings, or the
Albany site, were covered by license. Because the
Albany site (U.S. Bureau of Mines Metallurgy Research
Center) is already included in EUREAP, it is
recommended that Wah Chang, which was only
an operator, be eliminated with respect to the "thorium
metal development" mentioned in letter, Travis to Biles, 9/4/74.

There are records which indicate that Wah
Chang was considered for an electron
beam melting project, but Wah Chang
was not selected to perform the work.
<table>
<thead>
<tr>
<th>Historical Listing</th>
<th>Wah Chang</th>
<th>6/15/87</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>Cutbert, F.</td>
<td></td>
</tr>
<tr>
<td>To</td>
<td>Davis, H.</td>
<td></td>
</tr>
<tr>
<td>Subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sites</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Other companies contacted to determine interest in project; Stauffer-Temescal was selected.

Electron beam melting companies contacted with regard to electron beam melting project; Lah Chang indicated that they had not performed any U melting to date.
August 4, 1976

W. R. Travis, Director
Safety & Environmental Control Division
Oak Ridge Operations Office

UPDATED LIST OF SITES REQUIRING ADDITIONAL INFORMATION ON
RADIOLOGICAL DOCUMENTATION SURVEY

For our discussions and agreements on July 26, 1976, the following list identifies those sites where additional information is needed to determine whether a documentation survey is needed. This list does not agree with the listing Bill Thornton has. The order of listing does not indicate any priority.

1. Middlesex Sampling Plant, Middlesex, New Jersey (survey underway).

2. Tonawanda Storage Site, Tonawanda, New York (HAIST).
   a. Ashland Oil property (survey underway 7/26/76).
   b. Seaway Disposal Landfill (survey underway 8/2/76).

   a. Pupin Building.
   b. Frantis Building.
   c. Minerals Beneficial Lab.
   d. Heat Transfer Building.

4. Mallinckrodt, Destrahan Plant, St. Louis, Mo.

5. Mallinckrodt, Broadway Plant, St. Louis, Mo.

   NOTE: Reported that in 1957-58 period some 40 to 50 railroad carloads of refinery residues were taken to landfill near Hollidaysburg, Pa. Probably buried under 40 to 50 feet of dirt. Probably on Pennsylvania Railroad property.


8. E. I. duPont, Deepwater, New Jersey.

17. Horizons Inc., Cleveland, Ohio.
18. Wab Chang, Albany, Oregon. (There have been questions whether this is a "real" former site or not. Further efforts by OR should be made to verify this as a former site.)
20. Westinghouse, Bloomfield, New Jersey.
23. National Lead Co., Winchester, Mass. (This facility was previously used by American Cyanamide Co. for some contract work. The facility now houses the NTA Northeastern Radiological Lab.)
24. St. Louis Airport Site, St. Louis, Mo.
25. Staten Island Warehouse, New York. (This facility is reported to have been used to store Belgian Congo uranium ore. The exact location is not known at this time.)
26. Seneca Ordinance Depot, Poughkeepsie, New York. (This site used for storage of African ores.)
27. American Brass Company, Watertown, Mass. (uranium metal rolling activities.)
28. Dow Chemical Co., Pittsburgh, California. (Raw materials contract AT-(30-1)-CEN-236.)

29. E. I. duPont Co., Grosselli Chemical Division, Cleveland, Ohio. (Early work on Hanford slugs.)

30. Westinghouse, Pittsburgh, Pa. (Hanford slug production 1940's.)

Items 27 through 30 were not on the list Bill Thornton had on July 26, 1976. Also, item 27 on Bill's list should be deleted since the government-owned facilities in Winchester, Mass., were first operated under American Cyanamid contract which was terminated and a new contract with National Lead was initiated for operations in the same facilities.

Additionally, there are several other sites which have not yet been verified as sites where radiological activities were conducted. It is expected that such sites, when verified, will be added to this list.

J. R. H. Loop, Chief
Process Facilities Safety Branch
Division of Safety, Standards, and Compliance
Martin B. Biles, Director
Division of Operational Safety, HQ

RADIOLOGICAL CONDITION SURVEYS OF REAL PROPERTY

Reference is made to the General Manager's memorandum dated June 4, 1974, to Field Offices, requesting certain information on sites previously owned, leased or otherwise utilized by AEC or MED for operations involving radioactive materials.

Enclosure 1 is a list of these facilities derived from review of contract logs and historical information available in Oak Ridge. The list does not include facilities which were either operated under AEC or State License or which are now under license since disposition of these sites is subject to the requirements of that regulatory agency. The list of facilities which was supplied in the November 7, 1973, memorandum, R. J. Hart to F. K. Pittman, is further modified by deletion of those facilities which continue presently under OR jurisdiction since any future disposal will be subject to existing manual chapter requirements. Copies of available records describing the radiological condition of the listed sites are also enclosed.

As requested, we wish to make the following suggestions regarding further radiological surveys of the sites listed:

1. A radon survey should be made inside the Middlesex Sampling Plant. At the time of disposition there was no recognition of the radon potential in final survey records or criteria.

2. Periodic (annual) beta-gamma surface radiation surveys should be made at the St. Louis Airport Storage Site to confirm the continuing adequacy of covering fill to shield residual radiation.

William H. Travis, Director
Safety and Environmental Control Division

Enclosures:
1. List of Facilities
2. Cys of Available Records
3. NYO Report

cc w/o encls:
J. H. Hill
T. H. Hardin
J. A. Lenhard
SUMMARY

SITES PREVIOUSLY OWNED, LEASED OR OTHERWISE UTILIZED BY AEC OR MED
(BASED ON RECOLLECTIONS AND RECORDS AVAILABLE IN OAK RIDGE)

Sites Meeting Current AEC Radiological Criteria

1. Lake Ontario Ordnance Works Site (LOOW)
   Location: Pletcher Road
     Model City, New York
   Radiological Condition: Reported formally to State of New York
     January 18, 1973. (Copies available at DOS)

2. St. Louis Airport Storage Site
   Location: Brown Road adjoining St. Louis Municipal Airport
     St. Louis, Missouri
   Radiological Condition: File enclosed

3. Oak Ridge Parcel 228
   Location: Oak Ridge, Tennessee
   Radiological Condition: File enclosed

4. Middlesex Landfill Site
   Location: Mountain Avenue
     Middlesex, New Jersey
   Radiological Condition: Previously reported to HQ by memo Hart to
     Biles, July 1, 1974. Reported to property owners by enclosed letters.

Sites Meeting AEC Radiological Disposal Criteria Existing at Time of Disposal

5. Middlesex Sampling Plant
   Location: Mountain Avenue
     Middlesex, New Jersey
   Radiological Condition: File enclosed

Enclosure 1
6. Mallinckrodt Destrahan Street Plant

Location: 65 Destrahan Street
St. Louis, Missouri

Radiological Condition: File enclosed

7. Mallinckrodt Broadway Plant (Plant 4)

Location: 3434 Broadway
St. Louis, Missouri

Radiological Condition: File enclosed

8. Harshaw Uranium Refinery

Location: 1000 Harvard Boulevard
Cleveland, Ohio

Radiological Condition: File enclosed

9. Bridgeport Brass - Metal Extrusion Plant

Location: Adrian, Michigan

Radiological Condition: Records not available in Oak Ridge

Following sites are assumed to meet appropriate disposal criteria at time of disposal; however, no records are available to confirm this assumption. The NYO report dated April 29, 1954 (NYO-4600) discusses the decontamination of several plants from early NYO operation; however, none of the plants are specifically identified. A copy of the report is enclosed to indicate the criteria and general attitudes which may well have existed when the above sites were released from AEC/MED control. Period of operation is listed when known.

10. Linde Air Products, Tonawanda, New York
Uranium ore and chemical operations

1943 - 50

11. Vitro - Canonsburg, Pennsylvania
Uranium ore and chemical operations

1943 - 57

12. Dupont - Deepwater, New Jersey
Uranium chemical and metal processing

1943 - 47

13. Simonds Saw & Steel - Lockport, New York
Uranium metal rolling

Late 40's until 1952

14. Joslyn Manufacturing - Fort Wayne, Indiana
Uranium metal rolling

40's

15. Bethlehem Steel - Buffalo, New York
Uranium metal rolling development

1950 - 51
Uranium metal rolling development  
1950 - 51

17. Columbia Steel - Pittsburgh, Pennsylvania  
Uranium metal rolling development  
?

18. American Brass - Watertown, Massachusetts  
Uranium metal rolling development  
?

19. Electromet - Niagara Falls, New York  
Uranium metal operations  
1943 - 50

20. Iowa State - Ames, Iowa  
Uranium and thorium metal and chemical processing  
1943 - 52

Uranium chemical operations  
1944 - 46

22. Horizons, Inc. - Cleveland, Ohio  
Thorium metal development  
Mid 50's

23. Wah Chang - Albany, Oregon  
Thorium metal development  
Mid 50's

24. Metal Hydrides - Beverly, Massachusetts  
Uranium metal development  
1943 - 45

25. Westinghouse - Bloomfield, New Jersey  
Uranium metal development  
1943 - 44

Uranium metal development  
1953 - 63

27. Kellex - Jersey City, New York  
Uranium metal development  
1949 - 52

28. Battelle - Columbus, Ohio  
Uranium metal and chemical development  
1943 - ?

29. Princeton University - Princeton, New Jersey  
Uranium ore process development  
1943 - 45

30. NBS - Washington, D. C.  
Uranium and thorium development + analysis  
1943 - 48

31. MIT - Cambridge, Massachusetts  
1946 - 47

32. MIT - Watertown, Massachusetts  
1947 - 49
33. American Cyanamid - Winchester, Massachusetts

34. National Lead - Winchester, Massachusetts
   (Uranium ore process development conducted by last four contractors for raw materials)

Sites probably not in compliance with AEC regulations at time of disposal:

35. Haist Property - file enclosed
In May the Commission announced an expanded program for procurement of high purity zirconium metal and hafnium oxide to meet increasing short- and long-range reactor development requirements. A major portion of the procurement is for scheduled projects of the Navy, the remainder for the Commission.

To provide an assured future supply of the materials, long-range contracts have been signed with three new commercial suppliers who were among 10 firms which submitted proposals. These three contracts, covering a 5-year period, call for annual delivery of 2,200,000 pounds of zirconium, subject to availability of funds, at an average cost of about $14 million a year.

The new long-range suppliers are: National Distillers Products Corp., which will supply 1 million pounds annually from new facilities to be constructed at Ashtabula, Ohio; NRC Metals Corp., a subsidiary of the National Research Corp., Cambridge, Mass., which will supply 700,000 pounds annually from a plant to be constructed near Pensacola, Fla.; and Carborundum Metals Co., which will supply 500,000 pounds annually from a plant to be constructed at Parkersburg, W. Va.

Contracts are for fixed unit prices subject to revision within established ceilings at specified periods during the contract terms. Production is expected to begin late in 1957 from new plants to be financed entirely by the suppliers.

Requirements for zirconium and hafnium which must be met before the new plants go into production are expected to exceed present stockpile and production. These requirements will be met (1) by Carborundum Metals Co., Inc., of Akron, N. Y., current Commission supplier, increasing its annual production from 200,000 pounds to 325,000 pounds; (2) by reactivating the plant at Albany, Oreg., of the Bureau of Mines, Department of the Interior, which was the pilot zirconium production plant in this country, to produce about 300,000 pounds annually beginning in August 1956 (The plant will be operated under a contract which will expire June 30, 1958, by the Wah Chang Corp., of New York which was among seven firms responding to a Commission invitation for proposals to operate the plant); and (3) by importing from Japan 200,000 pounds of zirconium, meeting the Commission's specifications, under an arrangement made on behalf of the Commission by this Government's Commodity Credit Corp. Deliveries are expected to begin this year and will be completed in 1957.

Each new arrangement includes procurement of all byproduct hafnium oxide which is obtained from the zirconium-bearing ores processed by the suppliers.
entirely supplying boral, zirconium, beryllium, and reactor-grade graphite.

Zirconium, hafnium. Of these two metals, produced from the same ore, zirconium with low neutron absorption is used primarily as a cladding material for fuel elements; hafnium with high neutron absorption is used in reactor control rods.

In 1955, all the zirconium used by the Commission was produced in Government-owned facilities. Because of the expanding requirements for the material, the Commission decided that, instead of building additional Government-owned plants, it would offer industry an opportunity to supply the metal under a fixed-price contract.

Formal awards for a total supply of 2 million pounds of zirconium metal a year were made to three companies. The National Distillers Products Corp. will furnish 1 million pounds a year from its new plant being built at Ashtabula, Ohio. NRC Metals Corp., a subsidiary of National Research Corp., will furnish 700,000 pounds a year from a new plant being built near Pensacola, Fla. Carborundum Metals Co. will furnish 500,000 pounds a year from a new plant being built at Parkersburg, W. Va.

In addition, the Commission contracted with the Wah Chang Corp. of New York, for continued operation of the Government-owned plant at Albany, Ore. Zirconium also is being provided from a source in Japan.

Boral. Originally produced only by the Government, boral, a lightweight shielding material developed by Oak Ridge National Laboratory, now is supplied on a commercial basis by Brooks & Perkins and Aluminum Co. of America.

Graphite. Graphite, used extensively as a moderating material for nuclear reactors, is made available in reactor-grade purity on a commercial basis from a number of manufacturers including National Carbon Co., Speer Carbon Co., United Carbon Products Co., and Great Lakes Carbon Corp.

Beryllium. Reactor-grade beryllium for the Government, as well as the private atomic energy industry, now is supplied by private firms. Commission needs for beryllium, a highly important moderator, have been supplied previously by a Government-owned plant. To meet the growing Commission demand for this metal, private industry was invited to submit proposals to supply 500,000 pounds over a 5-year period. Contracts were signed with Beryllium Corp., which is building a new plant near Reading, Pa., and with Brush Beryllium Co., which is constructing a new plant at Elmore, Ohio. The resulting increased production is needed.

Boron. Boron 10 isotope since it has the proper radioactive mechanisms and can be used. On February 1957, isotope was atomic energy program in metal form in the United States. Commission's plant is of producing enriched percent boron 10.

Development of Instruments. The design and manufacture of measuring instruments for research, for example, the branch of the private industry. The instrument has reached $20 million in 1957, manufacturing some of the special components. The Manhattan Project developed about the procurement of instruments and bids invited for more instruments. Manufacturers met the equipment with undetermined quantities of evaluation.