

CO.09-1

# THE AEROSPACE CORPORATION

## INTEROFFICE CORRESPONDENCE

TO: File

CC: F. Hoch  
A. Wallo  
C. Young

7016.83.maj.03  
DATE: 29 July 1983

SUBJECT: MARION MILLSITE ACTIVITIES

FROM: Mary Alice Jennison  
BLDG: ROOM:  
EXT:

---

Enclosed is a summary of Marion Millsite activities and its connection with the AEC, together with a copy of information collected from Colorado Bureau of Mines Annual Report (1954-1959) and from the Minerals Yearbook (1956-1959).

MAJ:sej

SUMMARY OF MARION MILLSITE ACTIVITIES AND ITS  
CONNECTION WITH THE AEC

In 1954, Wah Chang Corporation, New York, began to mill tungsten ore at its Marion mill in Boulder County, Colorado. Due to the expiration of the government's tungsten ore buying program on November 1, 1956, Wah Chang Corporation began (in late 1957) to mill thorite ore. In 1958, Wah Chang Corporation processed thorite ore and other rare-earth ores and shipped the concentrates to the Davison Chemical Company, Curtis Bay, Maryland, plant for further refinement. By the end of 1958, Wah Chang Corporation discontinued operation of its mill due to high operating cost and transportation cost to the east coast markets. The Wah Chang Corporation mill in Boulder County was sold in 1959 to private interests.

The Davison Chemical Company had two contracts with the Atomic Energy Commission (AEC). Contract AT(30-1)-1037 stated that the AEC would buy from the Davison Chemical Company thorium hydroxide which they had processed. The other contract AT(49-6)-993 between Davison Chemical Company and AEC stated that AEC would supply to Davison, monazite sands which Davison would in turn supply the AEC the thorium hydroxide they processed from the monazite sands.

Under Contract AT(49-6)-993 the AEC bought monazite sands mainly from foreign sources and supplied Davison Chemical Company with this material. Under Contract AT(30-1)-1037 Davison Chemical Company sold to the AEC thorium hydroxide which they had processed from their own sources. From the information collected and summarized above, it appears that any Colorado concentrates containing thorium sold to Davison for refining and then sold to the AEC would have been purchased under Contract AT(30-1)-1037.

SOURCE- COLORADO BUREAU OF MINES ANNUAL REPORT

- 1954 During the year 1954, the Wah Chang Corporation of New York took over the mill and other properties of the Boulder Tungsten Mines, Inc. It is possible that Wah Chang may become an important factor in the production of tungsten in Boulder County and other areas of the state. (p. 20)
- 1957 The expiration of the government's tungsten ore buying program on November 1, 1956, resulted in an almost complete shutdown of all tungsten properties in Boulder County during 1957. ... Late in 1957 a shipment of thorium ore was treated at the Wah Chang Corporation's Marion mill and the results were encouraging. (p. 19)
- 1958 The Wah Chang Corporation operated the Marion mill on Sugar Loaf Road processing thorite ore from the Canon City area. (p. 20)
- 1959 The Wah Chang Corporation mill at Sugar Loaf was sold to private interests during the year. The new owners made some changes in the flowsheet and processed thorium ore as well as custom ores from Cedar Creek County. (p. 21)

## SOURCE - MINERALS YEARBOOK

### 1956 (Volume I)--Thorium

Thorium compounds were produced from monazite concentrate during 1956 at the following domestic plants:

Lindsay Chemical Company, West Chicago, Illinois  
Rare Earths Department, Davison Chemical Company,  
Pompton Plains, New Jersey  
Maywood Chemical Works, Maywood, New Jersey  
Heavy Minerals Company, Chattanooga, Tennessee

The Rare Earths Department of Davison Chemical Company, a division of W.R. Grace and Company, opened a new \$2 million monazite processing plant at Curtis Bay Baltimore, Maryland, in June 1956. The plant, with a 15- to 25-ton/day raw material capacity, was designed to produce high-quality thorium and rare earth salts from monazite concentrate. In 1956 and 1957, the plant was scheduled to treat monazite from the national stockpile, separate the two major constituents, supply the AEC with the thorium product, and return to the stockpile a purified, insoluble, rare earth double salt for outside storage (Minerals Yearbook, Volume I, p. 1157).

### 1957 (Volume II)--Rare Earths Metals

The Wah Chang Corporation mill at Sugar Loaf (Boulder County) processed thorite and other rare earth ores and shipped the concentrates to eastern consumers. (p. 269)

### 1957 (Volume I)--Colorado

Davison Chemical Company, a division of W.R. Grace and Company, Baltimore, Maryland, concluded its contract with the AEC after processing a portion of the government stockpile of monazite into crude rare earths and thorium. The installation was inadequate to handle the wide variation in monazite quality encountered in the stockpile. The plant was converted to the cracking of thorite ores to produce feed for Davison's refining and metal plants in Erwin, Tennessee, completed during the year. The Erwin operation includes the first commercial solvent-extraction facility in the U.S. for producing ultrapure nuclear-grade thorium oxide, as well as a plant for making thorium metal and thorium alloys. (p. 1147)

### 1957 (Volume I)--Colorado

Thorium deliveries to the AEC in the year ended June 30, 1957, totaled the equivalent of 223 tons of thorium metals in the forms of thorium salts; nearly 450 tons was expected to be acquired in the following year ending June 30, 1958. (p. 1146)

### 1957 (Volume I)--Domestic Production

Wah Chang Corporation, New York, New York, milled thorite ore at Boulder County, Colorado, to produce concentrates running from 20 to 40 percent  $\text{ThO}_2$ , at its research laboratory at Boulder. Wah Chang investigated the upgrading of thorium mineral concentrates beyond the milling state to chemical product. (p. 1147)

Thorium and thorium compounds were produced by four firms principally from monazite concentrate.

### Monazite Processors and Estimated Annual Capacity

	<u>Tons (Monazite)</u>
Lindsay Chemical Company*	12,000
Davison Chemical Company	1,000
Maywood Chemical Works	1,000
Heavy Minerals Company	<u>15,500</u>
	15,500

\*Main source of monazite concentrate from the  
Union of South Africa. (p. 1147)

### 1958 - (Volume I)--Colorado

Wah Chang Corporation, New York, New York, concentrated thorite ores at its Boulder, Colorado, mill for shipment to the Davison Chemical Division, Curtis Bay, Maryland, plant for further refining (Volume I, p. 1038).

### Volume III--Rare Earths Metals and Thorium

Shipments of rare earths and thorium minerals reached 650 tons valued at \$35,000 and consisted almost entirely of thorite mined and processed within the state. The stimulus to thorium production resulted from the purchase of thorium ores by Wah Chang Corporation for milling at its Marion mill near Boulder, Colorado. The concentrate was shipped to an eastern company for further processing. As a result of the outlet for thorite, the mine production of rare earth and thorium minerals reached 1,008 tons from approximately 16 properties in 5 counties. The Zabel-Beardsley lease in the Hardscrabble District of Custer County was operated by Calico Minerals, and 440 tons of thorite was produced, making it the largest single thorite-producing property. The Cotter Corporation of Canon City recovered low-grade thorite from the state claims in Custer

County making it the second largest producer. The Anna Lee mines, operated by George Austin and Richard Reese, Gendev Corporation, Leland Niles, and Peter Seerie Corporation, was also an important source of thorite.

Wah Chang Corporation by year end discontinued operation of its mill because of high operating cost and the transportation cost to east coast markets. As a result, practically all mining operations were discontinued. (Volume III, p. 213)

#### 1959 (Volume I)--Rare Earth Metals and Thorium

Activity in rare earths and thorium was limited. Shipments consisted of 9 tons of thorite mined from properties in Gunneson County. The thorite was sold to Rare Earth Uranium Mining and Development Corporation at Canon City.

#### 1959--Rare Earth Minerals and Metals

Mine shipments of domestic rare earth oxides in 1959 were virtually unchanged from 1958. The Union of South Africa remained the principle exporter of monazite, but imports from that nation ceased in March when sales contracts in the U.S. lapsed. Industrial stocks of rare earth products remained high.

The thorium procurement program of the AEC which was related to the build-up of coproduct rare earth metal stocks, expired at the end of 1959. The Commission had not indicated that the program would be renewed. (Volume I, p. 895)