

DOCKET NO. 40-17



THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN 48640

December 3, 1970

Mr. Donald E. Van Farowe  
Radiation Chief  
Michigan Department of Public Health  
Dewitt Road  
Lansing, Michigan 48904

RECEIVED  
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Dear Mr. Van Farowe:

From the 1950's to present, the Bay City Plant of The Dow Chemical Company has been accumulating sludge from its, and its contractor's, magnesium-thorium alloy process. Supervision of the Bay City Plant would like permission to dispose of this sludge by burial.

The total amount of the sludge is 4,640,000 pounds, of which approximately 66,000 pounds is thorium, about 1.4% thorium. The thorium is predominantly in the form of thorium oxide, which is insoluble in water. A small quantity (<1%) is in the form of magnesium-thorium, which is insoluble in water. However, due to the presence of chloride flux, HCl could be generated in the presence of water that would slowly decompose the magnesium-thorium alloy and release the thorium in a soluble form. Nonetheless, the vast majority of thorium is the insoluble thorium oxide.

The radioactive concentration of thorium in the sludge pile is an average  $1.7 \times 10^{-3}$   $\mu\text{Ci/g}$ , with a total of approximately 3.4 Ci, as determined by gamma spectral analysis.

✓ The burial site is on Dow Chemical property along the Saginaw River approximately 1 mile from the mouth. Drainage of the site is shown in the enclosed Figure 1. The topsoil of the site is foundry sand, cores, brick and slag to a depth of 2-4 feet. From a depth of 4-6 feet, medium compact wet, fine sand is found. From 6-7 feet, firm, moist swamp bottom material prevails. From a depth of 7 feet on, an extremely stiff, blue clay, sand and pebbles mixture is found. Figures 2-4 show the results of borings in the area.

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3500

Mr. Van Farowe

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December 3, 1970

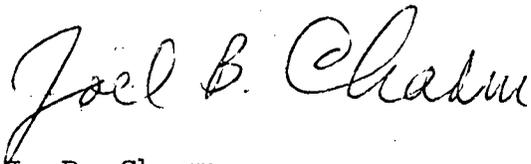
The nearest occupied buildings belong to the United States Coast Guard, about 1000 feet to the north of the site.

The nearest known water supply is the Bay City Municipal water intake in the Saginaw Bay, several miles to the north. Other water supplies to Dow and Consumers Power are used for cooling purposes, not for human consumption.

The proposal is to bury this material at its present site with a minimum of 4-6 feet of soil cover in a hole 10 feet deep. The clay base is relatively impervious to water flow and the leaching rate to the river should be many times lower than the current rate under open air conditions.

If this proposal meets with your approval, I would appreciate an answer as soon as possible (before inclement weather sets in). If you wish additional information, please feel free to contact me.

Sincerely,



J. B. Charm  
Biochemical Research Laboratory  
1701 Building  
MElrose 6-0641 (Area Code 517)

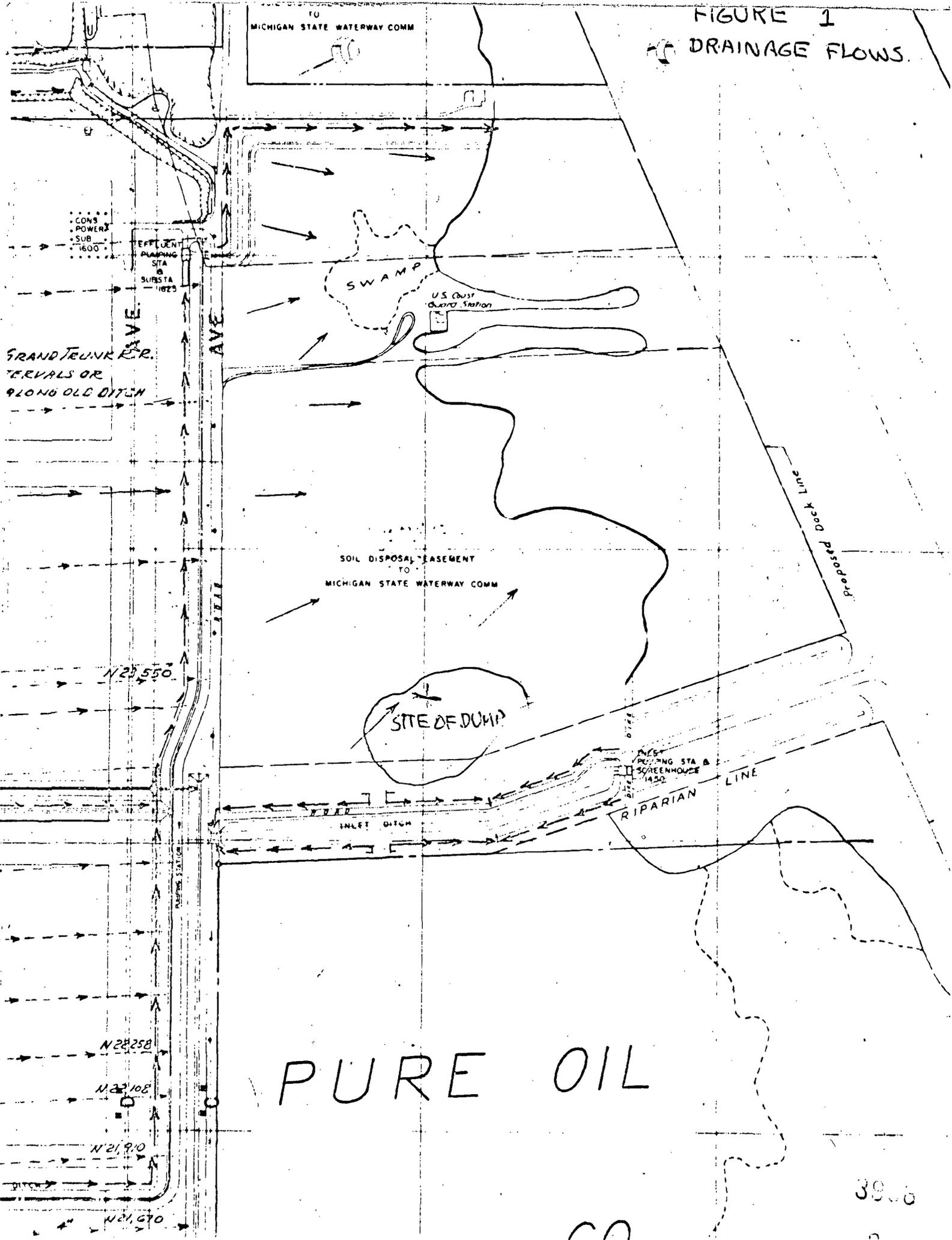
JBC:sjl

enclosures

cc: D. Smith, The Dow Chemical Company, Bay City Plants  
O. Heath, Business Statistics, The Dow Chemical Company  
L. G. Silverstein, Industrial Hygiene & Safety, The Dow  
Chemical Company  
H. R. Hoyle, Chairman, Radiation Safety Committee, The  
Dow Chemical Company

FIGURE 1  
DRAINAGE FLOWS.

TO  
MICHIGAN STATE WATERWAY COMM



CON'S  
POWER  
SUB  
1600

EFFLUENT  
PUMPING  
STA B  
SURSTA  
1073

GRAND TRUNK R.R.  
TRENCHES OR  
DITCHES ALONG OLD DITCH

SOIL DISPOSAL EASEMENT  
TO  
MICHIGAN STATE WATERWAY COMM

SITE OF DUMP

INLET  
PUMPING STA B  
SCREENHOUSE  
1450

INLET DITCH

RIPARIAN LINE

PURE OIL  
CO

3900