

SLUDGE DISPOSAL

The ultimate disposal of sludge has been given very serious consideration. Three (3) methods of disposal have been analyzed.

- I) Hauling of Wet Sludge to Disposal Sites
- II) Pumping to Disposal Sites
- III) Drying and Hauling to Disposal Sites

I. Hauling of wet Sludge to Disposal Sites--

(average quantity of thickened sludge is estimated to be 31,500 g.p.d.)

@ 8.33 lbs./gal. = 262,000 lbs./day

@ \$1.15/ton hauling charges = \$150 per day

Total = \$55,000 per year

II. Pumping to Disposal Sites--

Quantity = 133,000 g.p.d.

Distance = 12,000 feet

Total Maximum Head = 900 feet

Total Pumps Needed =

8 @ \$3,000 each = \$24,000

Pumping Stations \$62,000

Cost of Pipe

8" diameter, 12,000 feet

@ \$12.00 per _foot \$144,000

TOTAL \$230,000

Assuming 10 Years amortization at

a rate of 6% annual payment =	\$31,000
Annual pumping cost	\$16,000
Repairs & Maintenance	<u>\$ 3,000</u>
Total annual Expense	\$50,000

III. Drying and Hauling to Disposal Sites-

(average quantity of thickened sludge

is estimated to be 31,500 g.p.d.)

or 4,200 cu.ft./day

or 1,510,000 cu.ft./year

Assuming the depth of sludge applied to the

bed each application to be 8 inches

Number of applications per year = 8--

Total area of bed required =

$$\frac{1.51 \times 10^6 \times 12}{8 \times 8} = 238,000 \text{ sq. ft.}$$

$$8 \times 8$$

Providing 120 beds--(each 100' x 25')--
using a sand layer of 12-inch thickness
above underdrain pipes on 8-foot centers--
the construction cost of these beds would
be = \$500,000.

Assuming 40 year amortization at 6%	
interest, annual payment would be-	\$33,000
Repairs & Maintenance	25,000
Hauling of dry sludge	<u>18,000</u>
Total Annual Expense	\$76,000

The above economic analysis of the three (3) different methods of sludge disposal indicates that the Pumping Method to the Disposal Sites is the least expensive. Upon Drawing- No. 6805-P-7 can be found the various locations of underground pools which could be reached by pipelines. The theoretical volume of the pools indicates that it is sufficient for the life of the plant. The uncertainty of the movements of the sludge inside the mine workings makes the project less enticing. Any obstruction in the mine openings could prevent the movement of sludge and thereby conclude the backfilling operations prematurely. In spite of these possible drawbacks, the study revealed that the project is technically feasible. More research should be done on this phase of sludge disposal before the suggested method is discarded.

Comparatively, the hauling of wet sludge, via trucking, to various disposal sites is estimated to cost \$55,000 per year versus \$50,000 per year for the pumping

method, but is a more reliable method of disposal. The operation could be discontinued at any time without incurring any loss if a more economical and feasible method of removal were devised in the future. There is a possibility that the thickened sludge could be used as a soil conditioner. In view of the many advantages of the hauling of the wet sludge, it is considered to be the best method of sludge disposal for this project.

The third method, that of drying the sludge at the site and hauling the dried material to the disposal sites does not seem economically feasible at this time. Further research upon the dried material to determine whether or not it has any economic value could alter this conclusion.