J. L. Gonce
J. C. Klock
B. J. Lentz
J. R. Nelson
J. B. Overmeyer
A. J. Parker
E. O. Ponti
W. M. Street

ETHYL CORPORATION

INTER-OFFICE

November 22, 1977



TO: Mr. D. E. Park

FROM: R. H. Jones/M. J. Wilhelm

SUBJECT: Asbestos Removal from No. 1 Shop Cell Rebuilding Wash Down Water

Background

In the No. 1 Shop, asbestos is used as the diaphragm material in the caustic chlorine cells. When the diaphragm becomes blinded with solid impurities, the asbestos is washed off the cathode and replaced with a new layer of asbestos. The dirty asbestos is then washed down the sewer, enters the diversion canal, and ultimately flows into the North Lagoon and contributes to asbestos loading of the general plant effluent water.

Samples taken of effluent water leaving the plant showed 32,000,000 fibers/liter, or 28 lbs of asbestos per day passing through the system. This indicates that 172 lbs/day (by difference) are settling along the edges of the drainage canals and in the settling ponds.

Problem

At present there are no discharge limits on asbestos per se but limits are expected to be placed on this contaminant in the future. Also, some problems are being encountered with asbestos pluggage of the screens around the pH probes in the pH control system. Therefore, alternative methods for asbestos removal from washdown water from the cell rebuilding area have been investigated.

Elimination of asbestos from the effluent water involves dewatering the asbestos and disposal of the collected asbestos in a safe, environmentally acceptable manner which conforms to current regulations governing disposal of asbestos waste.

Possible Solutions Examined

A number of methods were looked at for dewatering the slurry. First the possibility of using cartridge filters was investigated. This was judged to be impractical because of the relatively large volume of asbestos involved. The asbestos is hydroblasted off the cathode forming a slurry which contains ≈ 1.7 lbs asbestos/80 gal water/min. This occurs on an average of twice a day for a duration of about 1 hour for each washing. Therefore, total volume of water is about 9600 gal/day.

Next we looked at cleaning the cathode on a sandbed. This was discarded because it was too costly and also regulations required that any asbestos deposited at a site and left open to the air must within 24 hours be covered with a resinous or petroleum based dust suppresion agent which will bind the dust and prevent wind erosion. We then looked at hydrocloning but found that the degree of dewatering achieved was not sufficient to justify this approach. Centrifuges, vacuum dryers, and other types of mechanical equipment were investigated but discarded because of the high investment costs and maintenance expense.

Collecting the asbestos in a large basket was then examined. Asbestos would be washed off the cathode, and into the basket. The bottom would then be dropped out of the basket emptying the contents. Requirements for disposal of asbestos, however, require that the asbestos be buried in a leak proof container under 6 inches of soil in a Class A landfill. Transferring of the asbestos from the basket to the leakproof container presented a significant handling problem and this method was discarded.

Proposed Solution

A two-stage filtration process involving filtration through a nylon netting with subsequent filtration through a bag should remove nearly 100% of the asbestos from the cell rebuilding area effluent water. The cell washdown water first would be filtered through a nylon net lined basket. The asbestos filled net is then lifted by crane, tied off, slipped into a plastic bag, and removed by forklift to a leakproof Browning Ferris Industries Transportable container. This container is then hauled to a Class A landfill such as the Southwest Environmental Co. landfill in Livingston Parish. From pilot runs a 41 ft^3 basket was designed to hold the combined washings from two cathodes. The netting will hold 2000-2600 lbs of asbestos mud. A special net, with grommets inserted in a seat belt type material around the edge, will hold this weight. The asbestos after dewatering for 5 hours contains about 85% moisture. This high moisture content is due to the gelatinizing of the asbestos which occurs in prolonged contact with caustic. The netting should collect 80-90% of the asbestos. The remainder passes through the netting.

If it is necessary to remove the remaining asbestos, a second stage of filtration (bag pressure filter system) would be necessary. In order to size such a system, baseline data on pressure drop and flow rates as asbestos cake builds in the bag were developed. A single bag pressure filter was rented for pilot tests. A 0.6 wt % slurry was filtered at 120 psi pressure. Eight pounds of wet asbestos was collected which filled the 200 in^3 bag. Filter area was 2.7 ft^2. Analysis showed the collected material to be 70% moisture, these tests indicate that for small quantities of asbestos, bag filters can be used.

Economics

The cost of the first phase filtration has been estimated and is tabulated below.

Investment

Basket	$2200	

Expenses:

Plastic Bags	$.585/bag	$150/yr
Nylon netting	$17.56/net	$4500/yr
Rental of Leakproof Dumpster	$94/mo	$1130/yr
Hauling charge	$130/load*	$2410/yr
Disposal charge	$14.00/yd^3*	$5060/yr
		$13320/yr

We have not yet made an investment estimate for the pressure bag filtration equipment. However, we would probably want to implement the first stage filtration initially and then follow up later with the pressure bag filtration if justified.

Recommendations

We are presently under no regulations on asbestos content of our general plant effluent water. However, asbestos is classified as a toxic substance so regulations are anticipated in the future. If asbestos pluggage of the pH probe screens is considered to be a significant problem, we could implement the first stage removal at the costs given in the foregoing table. We propose that we proceed with this first stage at least on a test basis to (1) determine the effect on the asbestos content of the general plant effluent water, and (2) determine the effect on asbestos pluggage of the pH probe screen. This would enable us to assess the need for the second stage filtration system to meet any future standards for asbestos in the effluent water.

M. J. Wilhelm

M. J. Wilhelm

MJW/jgl

---

* Based on written quotations to M. J. Wilhelm from Southwest Environmental Co., dated November 7, 1977.

DISTRIBUTION:

Mr. H. O. Bourque
Mr. R. M. Carlson
Mr. N. E. Garland
Mr. J. E. Gonce
Mr. J. L. Guillot
Mr. W. Q. Hall
Mr. J. H. Huguet
Mr. R. H. Jones
Mr. H. K. Kelley
Mr. M. A. Lea
Mr. J. A. LeBlanc, Jr.
Mr. B. J. Lentz (4)
Mr. H. L. Loflin
Mr. W. C. Lotz
Mr. S. D. Motsinger
Mr. E. V. Nahr
Mr. J. B. Overmeyer
Mr. D. E. Park
Mr. P. M. Randall
Mr. J. D. Russell
Mr. H. G. Smith
Mr. R. G. Stirling, Jr.
Mr. W. C. Strader
Mr. J. W. Street
Mr. W. M. Street
Mr. J. R. Thompson
Mr. D. R. Todd
Mr. F. J. Weimer
Mr. S. E. Williamson

E-00887

ETC 15393