

# MEMORANDUM

To ..... H.E. Pawson

Date..... February 17, 1975

From ..... R.J. Tucker

Ref. .... Fe 2

Subject..... Waste Treatment - Precipitation of Arsenic from filtered Dust  
Treatment Barren Solution (CaO and FeSO<sub>4</sub>)

Two series of tests were run to assess the effectiveness of ferrous sulphate as an aid in the suppression of arsenic in the D.T.B.

A composite D.T.B. sample (1180 p.p.m.) was obtained for February 8, 9, and 10th, 1975. In the first series of tests various levels of CaO and FeSO<sub>4</sub> were combined with 200 ml portions of this D.T.B. composite. Each sample was shaken thoroughly and then left to sit for 2 hours. Solution samples were then drawn off by pipette.

Sample No.	Lime (lb/ton sol.)	FeSO <sub>4</sub> (lb/ton sol.)	pH	As. (p.p.m.)
1.	5	5	10.0	259
2.	20	2	11.2	3.9
3.	20	5	11.2	3.3
4.	1	1	8.5	880
5.	20	1	11.2	2.2

Arsenic analysis was by Atomic Absorption Spectrophotometry and no significance is placed on variations in arsenic content of 1 - 2 p.p.m. for samples containing less than 5 p.p.m. arsenic.

From the results of the 5 tests it is apparent that approximately 20 lbs. of lime are required per ton of D.T.B. solution to achieve acceptable arsenic suppression. The use of 1, 2 or 5 lbs of FeSO<sub>4</sub> per ton of solution does not vary the final arsenic assay significantly but the use of FeSO<sub>4</sub> effectively reduces the arsenic to lower levels than are presently achieved in #5 agitator.

The second series of tests were run to ascertain the stability of the precipitate produced and to further investigate the level of lime required.

200 ml samples were again used, the samples were shaken and allowed to settle for 2 hours. The clean solution was drawn off for analysis. The remaining solutions were then violently shaken with the precipitates for 30 seconds and filtered through Whatman #1 filter paper. Each solution was then analyzed for arsenic.

# MEMORANDUM

To H.E. Pawson  
From R.J. Tucker

Date February 17, 1975  
Ref. Fez con 4

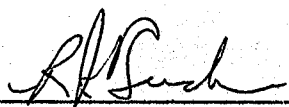
Subject Waste Treatment - Precipitation of Arsenic from filtered Dust  
Treatment Barren Solution (CaO and FeSO<sub>4</sub>)

- 2 -

Sample No.	CaO lb/ton sol.	FeSO <sub>4</sub> lb./ <sup>4</sup> ton sol.	pH		As. (p.p.m.)	
			Clean Soln.	Shaken & Filtered	Clean Soln.	Shaken & Filtered
1.	0	2	7.5	7	200	200
2.	10	2	10.8	11.3	150	13.8
3.	15	2	11.2	11.2	13.8	5.5
4.	20	2	11.3	11.3	5.0	2.2

10, 15, and 20 lbs. of lime per ton of solution produced progressively lower final arsenic levels for identical final pH's. Violent agitation and presumably the attendant improved contact and mixing resulted in better arsenic suppression.

Having discovered the physical stability of the precipitate formed by the addition of lime and ferrous sulphate to the D.T.B. it is proposed to investigate suppression of arsenic in the total Carbon Plant Waste Stream using lime and ferrous sulphate.

  
\_\_\_\_\_  
R.J. Tucker  
Mill Metallurgist