

# MEMORANDUM

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

Date Dec 22/75

From C.Q. Olesen

Ref.

Subject Arsenic Suppression

Procedure: To take the 3 streams entering into #8 Ag. and combine them as a single stream. Working with 3 liters of this solution 3 grams of  $\text{CuSO}_4$  was added and agitated for complete mixing. Smaller samples were then taken and treated with various amounts of  $\text{Na}_2\text{CO}_3$  to attain defferent pH levels.

Data:

## Part I

	mls of sample	pH	Cu (ppm)	Fe (ppm)	As (ppm)
thickener 6	1700	7.7	.12	.30	31.5
thickener 11	875	3.0	.70	134	12.50
thickener 13	525	6.0	.15	13	145
6 + 11 + 13	3100	4.2	.40	33	93
6 + 11 + 13 + $\text{CuSO}_4$	3000	5.2	220	25	65

Part II The combined streams with  $\text{CuSO}_4$  plus  $\text{Na}_2\text{CO}_3$  as the alkaline reagent.

pH	Cu (ppm)	Fe (ppm)	As (ppm)
6.0	88	ND	39
7.1	3.92	ND	28
7.9	1.83	ND	26.5
9.1	.45	ND	18.8
9.9	.32	ND	15.8
10.4	1.62	ND	21.8

Calculations:

- the theoretical heavy metals in the combined streams were:  
As - 45.2 ppm Cu - .28 ppm Fe - 38 ppm
- amount of copper added to the combined streams was 246 ppm.

pH	Consumed As ppm	Consumed Cu ppm	Cu/As
6.0	26	132	5.08
7.1	37	216	5.84
7.9	38.5	218	5.66
9.1	46.2	220	4.76
9.9	49.2	220	4.47
10.4	43.2	218	5.05

Conclusions: - overall, a discrepancy was noted from the theoretical calculated arsenic to the actual arsenic of 48ppm. This discrepancy was also noted in a previous report (arsenic suppression Sept5/75) of an increase of 50 ppmAs, within the combined streams. The actual cause of this increase is still obscure. - Also an optimum working PH of 9 - 10 was also noted with the use of  $\text{Na}_2\text{CO}_3$ , but it only attains the arsenic levels produced by the addition of lime. - since the levels attained with the use of  $\text{NH}_4\text{OH}$  are lower than that of  $\text{Na}_2\text{CO}_3$ , tests will be run using  $\text{NH}_4\text{OH}$  at varying pH's and a constant amount of copper.