

To K. Morton.....

Date May 10, 1978.....

Copies To A. Hall; W.A. Moore.....

Ref. ....

From L. Connell.....

Subject Isokinetic Roaster Stack Gas Sampling.....

Roaster stack gas emissions were sampled on five occasions in the period April 19th to May 5th, 1978. The total arsenic emission rates measured are summarized as follows;

<u>Date</u>	<u>Total As Concentration</u>	<u>Total As Emission Rate</u>
April 19	12.36 mg/scm	12.94 kg/day (x 2.205=1bs)
April 26	5.02 mg/scm	5.25 kg/day
April 28	5.76 mg/scm	6.75 kg/day
May 3	16.52 mg/scm	21.04 kg/day
May 5	5.95 mg/scm 9.122	6.33 kg/day 15.46

Detailed test results are presented in Table 1.

The results indicate that there should be no difficulty in meeting the proposed total arsenic stack emission rate of 17 mg/scm provided the present tempering air flow can be maintained during the warmer months.

Environment Canada's standard method for measuring particulate emissions from stationary sources suggests using deionized water in the sampling impingers which is the practise employed here at Giant. During the summer of 1977 E.P.S. sampled total arsenic emissions from the Giant stack using a 2 % NaOH solution in the impingers. The reasoning behind the use of the NaOH is to assist in full dissolution of gaseous arsenic. Test 78-6 (May 3) was conducted using a 2 % NaOH solution in the impingers in place of deionized water. The resulting arsenic reporting to the impingers was approximately 300 % higher. The higher arsenic level may be as a result of stack conditions, however, further investigation into the use of NaOH seems warranted.

Date:	April 19	April 26	April 28	May 3	May 5
Test #	78-3	78-4	78-5	78-6	78-7
Baghouse Inlet Temp. Status of Shaking Cycle during test	225 <sup>0</sup> F 48% Shaking Cycle	225 <sup>0</sup> F No Shaking Cycle	225 <sup>0</sup> F 46% Shaking Cycle	225 <sup>0</sup> F No Shaking Cycle	220 <sup>0</sup> F No Shaking Cycle
Ambient Temp Dry Gas Volume Sampled Moisture Content	34 <sup>0</sup> F 1.393 Std M <sup>3</sup> 5.98%	26 <sup>0</sup> F 1.678 Std M <sup>3</sup> 5.80%	30 <sup>0</sup> F 0.788 Std M <sup>3</sup> 6.97%	46 <sup>0</sup> F 1.933 Std M <sup>3</sup> 5.78%	44 <sup>0</sup> F 1.645 Std M <sup>3</sup> 6.16%
Stack Gas Temp. Stack Gas Velocity Stack Gas Volume	182 <sup>0</sup> F 2.73 M/Sec 726.5 Scm/min	178 <sup>0</sup> F 2.73 M/Sec 725.7 Scm/min	188 <sup>0</sup> F 3.08 M/Sec 814.2 Scm/min	191 <sup>0</sup> F 3.32 M/Sec 884.2 Scm/min	178 <sup>0</sup> F 2.68 M/Sec 740.0 Scm/min
Total Particulate Weight Total Arsenic Weight As to Filter and Probe As to Impingers	162.0 Mg/Scm 12.36 Mg/Scm 8.47 Mg/Scm 3.89 Mg/Scm	123.6 Mg/Scm 5.02 Mg/Scm 2.83 Mg/Scm 2.19 Mg/Scm	144.3 Mg/Scm 5.76 Mg/Scm 2.22 Mg/Scm 3.54 Mg/Scm	N/A* 16.52 Mg/Scm 5.66 Mg/Scm 10.86 Mg/Scm	146.3 Mg/Scm 5.95 Mg/Scm 2.48 Mg/Scm 3.47 Mg/Scm
As Particulate Emission Rate As Vapour Emission Rate	8.87 Kg/day 4.07 Kg/Day	2.96 Kg/day 2.29 Kg/Day	2.60 Kg/day 4.15 Kg/Day	7.21 Kg/Day 13.83 Kg/Day	2.64 Kg/Day 3.69 Kg/Day
Total As Emission Rate	12.94 Kg/Day (28.53 lbs/day)	5.25 Kg/Day (11.57 lbs/day)	6.75 Kg/Day (14.89 lbs/day)	21.04 Kg/Day 46.39 lbs/day	6.33 Kg/Day (13.96 lbs/day)
Particulate Emission Rate	169.62 Kg/Day (374.0 lbs/day)	129.25 Kg/Day (284.99 lbs/day)	169.18 Kg/Day (373.04 lbs/day)	N/A*	155.92 Kg/Day (343.80 lbs/day)
% Isokinetic	108.34%	103.70%	82.90%	92.67%	95.11%
Baghouse Total As Removal Efficiency Baghouse Particulate As Removal	99.78% 99.81%				
Baghouse Pressure during test (In. of H <sub>2</sub> O)	1.4-2.0-1.3	1.6 - 1.9	1.9-2.3-1.6	1.5 - 2.1	1.4 - 1.7
Comments	Std conditions with full shaking cycle.	Std conditions with no shaking cycle	Increased baghouse pressure with full shaking cycle	*Rubber O-Ring deteriorated con- taminating partic- ulate wt. Impinger H <sub>2</sub> O replaced by 2% NaOH	Low baghouse temperature with no shaking cycle