SOURCE EMISSIONS COMPLIANCE TEST REPORT
SULFURIC ACID STACK
DECEMBER 1991

Prepared for:

GENERAL CHEMICAL CORPORATION
Claymont, Delaware

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TABLE OF CONTENTS

APPENDICES

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LIST OF TABLES AND FIGURES

SECTION 1
SUMMARY

General Chemical Corporation retained Roy F. Weston, Inc. (WESTON) to perform a source compliance testing and analysis program at its sulfuric acid production facility in Claymont, Delaware.

The objective of the program was to determine the compliance status of the sulfuric acid stack relevant to sulfuric acid mist and sulfur dioxide emissions in accordance with the permit issued by the State of Delaware Department of Natural Resources and Environmental Control (DNREC). Also, additional SO_2 measurements were obtained to demonstrate the relative accuracy of the sulfuric acid stack SO_2 continuous emission monitor (CEM) and to verify the concentration of the SO_2 CEM calibration gas cylinder.

Testing and analytical procedures specified by the U.S. Environmental Protection Agency (EPA), as approved by the DNREC, were used throughout the test program. A total of three (3) EPA Method 8 and eight (8) EPA Method 6 tests were conducted on the sulfuric acid stack during the program.

An additional six (6) EPA Method 6 tests were performed on the SO_2 CEM calibration gas cylinder.

Representatives of DNREC were present during the test program.

A summary of the sulfuric acid mist and sulfur dioxide test results is presented in Table 1. A summary of the CEM relative accuracy for SO_2 is presented in Table 2. Table 3 presents a summary of the analysis of the standard gas cylinder and Table 4 presents a summary of EPA Method 6 and 8 SO_2 test results. Detailed test data and test results summaries are included in Tables 5 through 7 of the test results and discussion section.

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TABLE 1

SUMMARY OF EPA METHOD 8 SULFURIC ACID MIST
AND SULFUR DIOXIDE TEST RESULTS
SULFURIC ACID PLANT
DELAWARE VALLEY WORKS

Test #	Calculated H_2SO_4 Production ton/Hr[1] Plant Data	Emission Test Results				SO_2 Mass Emissions Rate from Recording Monitor lb/hr Plant Data
		Sulfuric Acid Mist			Sulfur Dioxide	
		H_2SO_4 Lb/hr	Lb/ton H_2SO_4 Produced Plant Data	Gm/Kg H_2SO_4 Produced Plant Data	SO_2 lb/hr	
1	48.17	5.72	0.12	0.06	55.65	69.09
2	48.17	4.65	0.10	0.05	50.23	61.75
3	45.46	10.77	0.24	0.12	46.52	52.09
Avg.	47.27	7.05	0.15	0.08	50.80	60.98

[1] A summary of production rates is provided in Appendix C.

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TABLE 2

RELATIVE ACCURACY OF THE SO_2 MONITOR

RUN #	Date	Time	RM[1] ppm	M[2]	Difference	
					(D)	$(D)^2$
1	11/19/91	0910 - 1042	119	140	21	441
2	11/19/91	1200 - 1322	105	124	19	361
3	11/19/91	1455 - 1618	95	108	13	169
4	11/20/91	0800 - 0820	112	116	4	16
5	11/20/91	0900 - 0920	111	119	8	64
6	11/20/91	1005 - 1025	106	113	7	49
7	11/20/91	1100 - 1120	117	120	3	9
8	11/20/91	1200 - 1220	112	130	18	324
9	11/20/91	1302 - 1322	121	131	10	100
10	11/20/91	1415 - 1435	107	128	21	441
11	11/20/91	1505 - 1525	124	120	-4	16
	Totals	-	1,229	1,349	120	1,990
	Average	-	112	123	11	181

Standard Deviation[3] = 8.3

Confidence Coefficient = 6

Monitor Relative Accuracy (percent) = 15

[1] RM = Measured sulfur dioxide concentration by Method 6 and 8 test train (ppm/v).

[2] M = Average concentration measured by SO_2 monitor during test period (ppm/v).

[3] See Appendix C for example calculation.

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TABLE 3

ANALYSIS OF STANDARD GAS CYLINDER

Method 6 Test Number	Measured SO_2 Concentration (ppm)	Certified Value (ppm)
1	599	---
2	640	---
3	662	---
4	637	---
5	612	---
6	622	---
Average	629	701.8

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TABLE 4
SUMMARY OF EPA METHOD 6 AND METHOD 8
SULFUR DIOXIDE TEST RESULTS

Test Run No.	Test Location	Test Date	Test Period	Measured Sulfur Dioxide Concentration[1] (ppm/v)
1	Stack	11/19/91	0910 - 1042	119
2	Stack	11/19/91	1200 - 1322	105
3	Stack	11/19/91	1455 - 1618	95
4	Stack	11/20/91	0800 - 0820	112
5	Stack	11/20/91	0900 - 0920	111
6	Stack	11/20/91	1005 - 1025	106
7	Stack	11/20/91	1100 - 1120	117
8	Stack	11/20/91	1200 - 1220	112
9	Stack	11/20/91	1302 - 1322	121
10	Stack	11/20/91	1415 - 1435	107
11	Stack	11/20/91	1505 - 1525	124
Series Avg.	---	---	---	112
1	Cylinder Gas	11/18/91	1230 - 1250	599
2	Cylinder Gas	11/18/91	1255 - 1315	640
3	Cylinder Gas	11/18/91	1320 - 1340	662
4	Cylinder Gas	11/18/91	1345 - 1405	637
5	Cylinder Gas	11/18/91	1410 - 1430	612
6	Cylinder Gas	11/18/91	1435 - 1455	622
Series Avg.	---	---	---	629

[1] ppm/v = parts per million by volume dry basis at standard conditions of 68°F and 29.92 inches Hg.

SECTION 2
INTRODUCTION

General Chemical Corporation retained WESTON to conduct a source testing and analysis program at its Claymont, Delaware sulfuric acid production facility.

The primary objective of the survey was to determine the sulfuric acid mist and sulfur dioxide compliance status of the sulfuric acid stack with DNREC limits. Additional SO_2 test runs were performed on the sulfuric acid stack and SO_2 calibration gas cylinder for the purpose of determining the relative accuracy of the SO_2 CEM. These results are summarized in Tables 1 through 4 of the summary section.

State of Delaware approved test methods were used throughout the program. All tests were performed during the period of November 18-20, 1991, by WESTON Air Quality Testing Services personnel.

Detailed test data and test result summaries are presented in Tables 5 through 7 of this report. Descriptions of the test location, test equipment, test procedures, sample recovery techniques and analytical methods used during the survey are also included herein. Raw test data, laboratory reports, process conditions and sample calculations, equipment calibration records and a list of WESTON project participants are provided in Appendices A through E, respectively.