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Golder Associates

January 28, 2003

0237624

Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399

RECEIVED
JAN 28 2003
BUREAU OF AIR REGULATION

Attention: Mr. Syed Arif

Re: DEP FILE NO. 1070005-019-AC (PSD-FL-264A)
GEORGIA-PACIFIC PALATKA OPERATIONS
NO. 3 BLEACH PLANT
RESPONSES TO REQUESTS 15 THROUGH 20

Dear Mr. Arif:

On behalf of Georgia-Pacific Corporation (G-P), Golder Associates Inc. (Golder) is pleased to submit the following information as the second response to the Department's request for additional information, dated November 26, 2002, regarding the above referenced project. Please note that the items are listed in the same order as in the letter for convenience. The responses below address the requests numbered 15 through 20 of the letter. Responses for Questions 1 through 14 were provided in an earlier letter to the Department, dated January 3, 2003.

G-P has revised both the operating costs and emissions for the carbon monoxide (CO) cost effectiveness calculations, previously presented in Table B-1 of the 2002 application. As explained throughout several of the responses below, G-P contracted Jacobs Engineering to refine and document a site-specific estimate of direct costs. Jacobs investigated all possible incineration points to control the No. 3 Bleach Plant CO emissions. The conclusion regarding technically feasible incineration points is: 1) use the combination boiler and power boiler together, or 2) a stand-alone regenerative thermal oxidizer (RTO). Detailed costs are developed and presented for both of these alternatives.

Costs for other thermal oxidizers types (*e.g.*, catalytic oxidizers) are similar to an RTO and have similar destruction efficiencies. Because no oxidizers of any type have been demonstrated to control emissions from a bleach plant, a BACT analysis may consider these controls as equivalent choices. Thus, the Jacobs cost estimates address the RTO. The computed cost effectiveness described below for an RTO is economically infeasible, and changing the oxidizer type would not affect this determination.

In the November 2002 application, G-P used the maximum annual CO emissions from the No. 3 Bleach Plant in the cost effectiveness calculations. For the revised analysis presented herein, the emissions rate applied to the cost effectiveness calculations reflect guidance presented in Section B V.D.2.b of the New Source Review Workshop Manual - Draft (EPA 1990):

IV.

> *"In addition, historic upper bound operating data, typical for the source or industry, may be used in defining baseline emissions in evaluating the cost effectiveness of a control option for a specific source. For example, if for a source or industry, historical upper bound operations call for two shifts a day, it is not necessary to assume full time (8760 hours) operation on an annual basis in calculating baseline emissions."* (EPA, 1990)

Thus, G-P reviewed the recent years of operating data to define the baseline emissions (*i.e.*, uncontrolled emissions). The following table presents the most recent operating rates:

Table 1. BACT Baseline Operating Data for Bleaching Operations, G-P Palatka

Year	Net Throughput[a] (Bleached pulp, tons/yr)	Total Throughput (Bleached pulp, tons/yr)	Fraction Softwood	Fraction Hardwood
2001	285,801	317,557	0.578 0.633	0.422 0.367
2000	281,756	313,062	0.574	0.426
1999	273,803	304,226	0.578 0.633	0.422 0.367

[a] Net throughput reflects a 10% loss of pulp. The amount of pulp entering the bleach plant is equal to net value ÷ 90%

The calculated baseline CO emissions then becomes:

1999: (317,557 tons/yr x 0.633 softwood x 1.68 lb CO/ton softwood +
317,557 tons/yr x 0.367 hardwood x 0.64 lb CO/ton hardwood) / 2000 lbs/ton
= 206 TPY CO emissions

2000: (313,062 tons/yr x 0.574 softwood x 1.68 lb CO/ton softwood +
313,062 tons/yr x 0.426 hardwood x 0.64 lb CO/ton hardwood) / 2000 lbs/ton
= 194 TPY CO emissions

2001: (304,226 tons/yr x 0.578 softwood x 1.68 lb CO/ton softwood +
304,226 tons/yr x 0.422 hardwood x 0.64 lb CO/ton hardwood) / 2000 lbs/ton
=189 TPY CO emissions

Consistent with the BACT guidance cited above, using the highest historic rate among these three years yields a baseline emission rate of 206 TPY. The controlled emission rate for the cost effectiveness calculation is equal to:

Baseline emission rate x (1-control efficiency).

For oxidation in a boiler or a stand-alone oxidizer, the control efficiency is approximately 95%. Thus, the controlled emission rate is equal to: 206 TPY x (1-0.95) = 10.3 TPY
The net reduction in CO emissions from such a control device is then equal to:

206 TPY – 10.3 TPY = 195.7 TPY

Thus the cost effectiveness calculations divide the annualized costs by 195.7 TPY CO removed. Using this information, Questions 15 through 20 are addressed in turn in the following sections.

15. Request: *Please provide the information submitted by you to the vendors in getting the quote for CO removal using thermal oxidation, catalytic incineration or incineration in an existing boiler. Provide copies of the quotes received for the three options listed. Also, indicate if the thermal* *oxidizer and the catalytic incinerator are designed to be located upstream or downstream of the existing scrubber. What advantage does one location have over the other?*

Response:
The appendix attached to this letter contains the Jacobs Engineering summary of a site-specific cost estimate for thermal oxidation in the on-site boilers or an RTO. Also included are three RTO vendor quotes for other projects, which Jacobs used in developing the site-specific costs for the Palatka Mill.

G-P has applied this site-specific quote developed by Jacobs in recalculating the cost effectiveness. The revised cost effectiveness calculations are presented in Table B-2 attached. In the calculations, an equipment life of 10 years and 7% interest has been assumed, based on the OAQPS Cost Control Manual, Section 3.2, Chapter 2, Incinerators.

For both scenarios of controlling CO emissions with either the existing boilers or a new thermal oxidizer, G-P has determined the cost effectiveness to be greater than $5,000 per ton of CO removed. These costs are excessively high. Other recent BACT determinations for CO issued by the Department, with cost effectiveness values ranging between $2,500 and $4,400 per ton of CO removed, have been determined to be economically infeasible. Thus, G-P maintains that these add-on controls are not economically feasible, especially in light of the fact that no other bleach plant is known to have installed CO controls. Efficient bleaching operations remains as BACT for the No. 3 Bleach Plant.

The oxidizer location for any option must be downstream of an acid scrubber. The concentrations of chlorine compounds in the No. 3 Bleach Plant exhaust stream are much lower after the scrubber. Without scrubbing these compounds, conventional materials cannot withstand the corrosive attack of the acid gases. However, the existing scrubber on the No. 3 Bleach Plant has not been included in the cost estimates.

16. Request: *Please provide cost analysis in modifying (if required) the existing thermal oxidizer used for NCG's control to accommodate the bleach plant exhaust for CO control.*

Response:
The No. 3 Bleach Plant exhaust stream has a flow rate of approximately 15,000 cubic feet per minute (cfm). The volumetric flowrate of the existing thermal oxidizer used for non-condensible gas (NCG) control is approximately 12,000 cfm. The existing thermal oxidizer is completely loaded and cannot accept any additional gas streams. The thermal oxidizer uses a mist eliminator filter as a post-combustion control device to remove fine particles including sulfuric acid. This control system has a design flowrate of approximately 12,000 cfm. Thus, the mist eliminator filters would also be incapable of filtering the additional volumetric flow. As a result, the existing NCG thermal oxidizer is technically infeasible for oxidizing the No.3 Bleach Plant exhaust gases.

17. Request: *The BACT analysis refers to the removal of some VOC and HAPs with the control options selected for CO removal. Explain the reasons for not including the removal of VOC and HAPs in the cost effectiveness ($/ton) figure obtained for CO removal.*

Response:
Although considering the reduction of collateral pollutants, including toxic pollutants, is part of the BACT analysis, it is problematic to include such reductions in the cost effectiveness calculations. This is because the cost effectiveness for a particular project is compared to what has been determined to be unreasonable for other projects. As a result, the cost effectiveness for CO control

presented for G-P's project must be compared to other BACT determinations for CO. Including VOCs and toxic/hazardous pollutants in the cost effectiveness calculation makes it difficult to fairly compare projects. Furthermore, CO was the only pollutant that triggered PSD review for this project.

An updated estimate of HAP and VOC emissions from the No. 3 Bleach Plant is presented in Attachment GP-EU2-G8 attached. Two scenarios are presented: the first based on the maximum permitted production rate, and the second based on the expected actual production rate, as calculated above. As shown, expected VOC and HAP emissions are 9.8 and 49.9 TPY, respectively. The revised VOC emissions are based on a NCASI factor for total hydrocarbons using EPA Method 25A. This factor provides a more accurate estimate of VOC emissions based on the reference method for VOC. The previously used factor for VOC was based on summing the volatile organic HAP emissions for the No. 3 Bleach Plant.

The majority of HAP emissions are due to methanol. It is noted that the emission factor utilized for methanol is based on very limited NCASI data for bleaching with 100-percent chlorine dioxide (ClO_2) substitution, and therefore has a high degree of uncertainty. Actual emissions from the No. 3 Bleach Plant could be much lower.

18. Request: *EPA Air Pollution Control Cost Manual recommends using a flat 10 percent over the operations labor wage rate for maintenance labor costs. Table B-2 of the application indicates the maintenance labor cost to be twice the operating labor cost. Please explain the discrepancy.*

Response:
G-P has revised the referenced Table B-2 using a site-specific engineering estimate. The operating labor is estimated by assuming 1 hour per day for the Boiler option, and 3 hours per day for the RTO option.

The revised figures, presented in the attached Table B-2, apply two different methods to estimate the maintenance labor. For the Boiler option, the maintenance cost is estimated at twice the operating labor. The Boiler option maintenance includes inspecting the boiler interior nearest the No.3 Bleach Plant exhaust injection point. To conduct such a detailed inspection along with the external inspections of new fans and a demister, would require a significant amount of time. Thus, for the Boiler option, G-P assumed a total of 730 hours per year, which is equal to an average of 2 hours per day. In contrast, for the RTO option, G-P applied the conservative default recommendation of 10% of the operating labor.

19. Request: *Please explain the reasons for adding the cost of a new stack in Table B-2 using thermal oxidation or catalytic incineration when a stack already exists.*

Response:
Table B-2 included a new stack for exhaust from an oxidizer because it is the lowest cost option. The existing No.3 Bleach Plant scrubber stack sits adjacent to the bleaching equipment. For the hypothetical scenario of a stand-alone thermal/catalytic oxidizer, the new equipment requires more space than is available in the bleach plant area. A new oxidizer would be sited as close as possible, but no less than 700 feet away. The cost to return the post-control gas stream (i.e., an additional 700 feet back to the existing scrubber stack) is approximately $515,000. The cost for a new oxidizer stack

would be less than this amount. Thus, the lower cost option is to include the cost of a new stack, and not include additional piping to return the exhaust back to the existing stack.

20. Request: *In the original PSD permitting done in 1999, the purchased equipment cost for Regenerative Catalytic Oxidation providing 95% removal of CO emissions was given as $427,250. The same equipment cost for this modification is given to be $1,163,400. Please justify the increase of over $0.7M in a three-year period. Also, explain the reasons for not including the cost of gas conditioning equipment in the original project.*

Response:
The cost estimates cannot be directly compared for differences. The 1999 cost estimate only included oxidizer costs, and did not include piping from the bleach plant area, gas conditioning, and most other miscellaneous equipment. The 1999 estimate was very low in an attempt to predict a conservatively low cost effectiveness. Thus, the original cost estimate was sufficiently complete to demonstrate the economic infeasibility of controls without including all capital items. The enclosed cost estimate reflects all anticipated equipment, including a mist elimination system to protect against corrosive attack on the metallic components. The 1999 cost estimate was not detailed or site-specific enough to identify these protective requirements. However, the updated costs estimates attached demonstrate that CO oxidation is still economically infeasible.

The Department had also requested that G-P's previous response letter, addressing the first fifteen questions in the Department's letter, be sealed by a registered professional engineer. In order to comply with this request, the G-P response package is included in this submittal as an attachment.

Thank you for consideration of this information. Please call if you have any questions concerning this submittal.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P. E., Q. E. P.
Principal Engineer
Florida P. E. #19011
SEAL

cc: M. Carpenter
M. Aguilar
S. Matchett
W. Jernigan

DB/jkw

Enclosures: Appendix

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Table B-2. Cost Effectiveness for Control of CO Emissions From ECF No. 3 Bleach Plant, Georgia-Pacific, Palatka FL (01/27/2003)

Cost Items	Cost Factors	Cost ($) Duct to Boiler	Cost ($) Thermal Ox
DIRECT CAPITAL COSTS (DCC):			
(1) Purchased Equipment Cost			
(a) Oxidizer/Air Injection Equip/Services	Based on On-site Engineering Estimate	2,491,934	3,299,584
(b) New Stack	included	0	0
(c) Ductwork and Electronic controls	included	0	0
(d) Structural Support	included	0	0
(f) Exhaust Fan	included	0	0
(g) Freight	included	0	0
(h) Sales Tax (Florida)	6%	149,516	197,975
(i) Instrumentation	included	0	0
(j) Subtotal - Purchased Equipment	included	2,641,450	3,497,559
(2) Direct Installation	included	0	0
Total DCC:		2,641,450	3,497,559
INDIRECT CAPITAL COSTS (ICC):			
(3) Indirect Installation Costs			
(a) Engineering	(0 10) x (PEC) (EPA Factor)	264,145	349,756
(b) Construction & Field Expenses	(0.05) x (PEC) (EPA Factor)	132,073	174,878
(c) Construction Contractor Fee	(0.10) x (PEC) (EPA Factor)	264,145	349,756
(d) Contingencies for retrofit	(0.25) x (PEC) (EPA Factor)	660,363	874,390
(4) Other Indirect Costs			
(a) Startup	(0.02) x (PEC) (EPA Factor)	52,829	69,951
(a) Testing	(0.01) x (PEC) (EPA Factor)	26,415	34,976
(b) Working Capital	30-day DOC (EPA Factor)	19,230	20,210
Total ICC:	(3) + (4)	1,419,199	1,873,916
TOTAL CAPITAL INVESTMENT (TCI)	DCC + ICC	4,060,649	5,371,475
DIRECT OPERATING COSTS (DOC):			
(1) Operating Labor			
Operator	$22/hr, 1 hr/day for Boiler; 3 hr/day for RTO	8,030	24,090
Supervisor	15% of operator cost	1,205	3,614
(2) Maintenance			
Labor (includes inspection of boiler)	2xOperating Labor for Boiler, 10% of operating labor for RTO	18,469	2,770
Materials	Equivalent to Maintenance Labor	18,469	2,770
(3) Utilities			
(a) Electricity	$0.075/kWh; 8,760 hr/yr 112 kw Boiler; 201 kw RTO	73,584	132,057
(b) Natural Gas	1 56 MMBtu/hr; $4.736/MMBtu	--	64,720
(c) Fuel Oil for recoup steam losses	3.52 MMBtu/hr $3.6/MMBtu (2002 actual average)	111,007	--
(4) Chemicals and Materials			
Ceramic Bed Replacement	Once per 8 yrs @ $100,000	--	12,500
Total DOC:	(1) + (2) + (3) + (4)	230,763	242,521
INDIRECT OPERATING COSTS (IOC):			
(7) Overhead	60% of oper. labor & maintenance (EPA Factor)	27,704	19,947
(8) Property Taxes	1% of total capital investment (EPA Factor)	40,606	53,715
(9) Insurance	1% of total capital investment (EPA Factor)	40,606	53,715
(10) Administration	2% of total capital investment (EPA Factor)	81,213	107,430
Total IOC:	(7) + (8) + (9) + (10)	190,129	234,806
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.1424 times TCI (10 yrs @ 7%)	578,236	764,898
ANNUALIZED COSTS (AC):	DOC + IOC + CRF	999,129	1,242,225
UNCONTROLLED BASELINE CO EMISSIONS (TPY)		206	206
TOTAL CO REMOVED:	95% removal efficiency	195.7	195.7
COST EFFECTIVENESS:	$ per ton of CO Removed	5,105	6,348

Source: Georgia-Pacific Corp, 2003, Golder Associates Inc., 2003.

REVISIONS TO APPLICATION FORM

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram?
Bleach Plant Alkaline Scrubber Stack

2. Emission Point Type Code:
2

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code:
V

6. Stack Height:
118 feet

7. Exit Diameter:
3.5 feet

8. Exit Temperature:
130-145 °F

9. Actual Volumetric Flow Rate:
16,000 acfm

10. Water Vapor:
5-10 %

11. Maximum Dry Standard Flow Rate:
13,500 dscfm

12. Nonstack Emission Point Height:
feet

13. Emission Point UTM Coordinates:
Zone: East (km): North (km):

14. Emission Point Comment (limit to 200 characters):

Values representative of scrubber exhaust stack. Based on October 2002 testing. Exit temperature and actual volumetric flow rate values are constantly changing with ambient conditions.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **3.7** **lbs/hr** **15.28** tons/year
4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor: Reference: **NCASI**
7. Emissions Method Code: **5**
8. Calculation of Emissions (limit to 600 characters):

See Attachment GP-EU1-G8.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

VOCs are from bleach plant alkaline wet scrubber.

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lbs/hour tons/year
5. Method of Compliance (limit to 60 characters):
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Emissions Unit Information Section 1 **of** 1 **No. 3 Bleach Plant**

Pollutant Detail Information Page 2 **of** 6 **Total Hazardous Air Pollutants**

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **HAPS**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **18.9** **lbs/hr** **77.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **Manuf. Info & NCASI**	7. Emissions Method Code: **5**
8. Calculation of Emissions (limit to 600 characters): **See Attachment GP-EU1-G8.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lbs/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **H115-Methanol**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17.4** **lbs/hr** **71.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **NCASI**	7. Emissions Method Code: **5**
8. Calculation of Emissions (limit to 600 characters): **See Attachment GP-EU1-G8.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lbs/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 1 **of** 1 **No. 3 Bleach Plant**

Pollutant Detail Information Page 4 **of** 6 **Chloroform**

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **H043-Chloroform**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.49** **lbs/hr** **2.02** tons/year

4. Synthetically Limited? [**X**]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
Reference: **NCASI**

7. Emissions Method Code: **5**

8. Calculation of Emissions (limit to 600 characters):

See Attachment GP-EU1-G8.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Allowable Emissions

Allowable Emissions ______ of ______

1. Basis for Allowable Emissions Code:

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units:

4. Equivalent Allowable Emissions:
lbs/hour tons/year

5. Method of Compliance (limit to 60 characters):

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **100 lbs/hr** **324** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **1.68 lbs/ADTBP (100% softwood factor)** Reference: **See Attachment A**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **See Table 2-1 for presentation of emission rates. Detailed calculations provided in Appendix A to Attachment A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **324 TPY**	4. Equivalent Allowable Emissions: **100** lbs/hour **324** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **See Attachment A.**	

Emissions Unit Information Section 1 **of** 1 **No. 3 Bleach Plant**

Pollutant Detail Information Page 6 **of** 6 **Chlorine**

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **H038-Chlorine**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **0.8** **lbs/hr** **3.3** tons/year

4. Synthetically Limited? [**X**]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor: **10 ppmvd**
   Reference: **Permit No. 1070005-006-AC**

7. Emissions Method Code: **0**

8. Calculation of Emissions (limit to 600 characters):

   See Attachment GP-EU1-G8.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **RULE**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **10 ppmvd**

4. Equivalent Allowable Emissions: **0.8** lbs/hour **3.3** tons/year

5. Method of Compliance (limit to 60 characters):

   Initial compliance testing by EPA Method 26A.

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Permit No. 1070005-006-AC and 40 CFR 63, Subpart S.

0237624/4/4.1/012803/GP-EU2-G8 revised
1/28/2003

Attachment GP-EU2-G8. Estimated HAP and VOC Emissions From the No. 3 Bleach Plant, Georgia-Pacific, Palatka (revised 01/27/03)

Pollutant Name	HAP?	Avg Factor (lb/ADTBP) (a)	Maximum ADTBP/hr (b)	Maximum ADTBP/yr (b)	Actual ADTBP/yr (c)	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (TPY)	Actual Annual Emissions (TPY)
Acetaldehyde	YES	ND	--	--	--	--	--	--
Benzene	YES	1.80E-04	60.0	492,750	317,557	0.011	0.04	0.03
Carbon Tetrachloride	YES	ND	--	--	--	--	--	--
Chlorine (d)	YES	0.0133	60.0	492,750	317,557	0.800	3.29	2.12
Chlorine Dioxide (e)	NO	0.0380	60.0	492,750	317,557	2.283	9.37	6.04
Chlorobenzene	YES	2.10E-04	60.0	492,750	317,557	0.013	0.05	0.03
Chloroform (f)	YES	8.19E-03	60.0	492,750	317,557	0.491	2.02	1.30
1,2-Dichloroethane (Ethylene Dichloride)	YES	ND	--	--	--	--	--	--
Dimethyl Sulfide	NO	ND	--	--	--	--	--	--
Formaldehyde (g)	YES	ND	--	--	--	--	--	--
Methanol	YES	2.90E-01	60.0	492,750	317,557	17.40	71.45	46.05
Methyl Ethyl Ketone	YES	6.70E-04	60.0	492,750	317,557	0.040	0.17	0.11
Methyl Isobutyl Ketone	YES	4.50E-04	60.0	492,750	317,557	0.027	0.11	0.07
Methyl Mercaptan	NO	3.80E-02	60.0	492,750	317,557	2.280	9.36	6.03
Methylene Chloride	YES	ND	--	--	--	--	--	--
Alpha-Pinene	NO	4.70E-04	60.0	492,750	317,557	0.028	0.12	0.07
Beta-Pinene	NO	2.20E-04	60.0	492,750	317,557	0.013	0.05	0.03
Styrene	YES	3.50E-04	60.0	492,750	317,557	0.021	0.09	0.06
Tetrachloroethyene	YES	ND	--	--	--	--	--	--
Toluene	YES	1.70E-04	60.0	492,750	317,557	0.010	0.04	0.03
1,2,4-Trichlorobenzene	YES	5.00E-04	60.0	492,750	317,557	0.030	0.12	0.08
1,1,1-Trichloroethane (Methyl Chloroform)	YES	ND	--	--	--	--	--	--
1,1,2-Trichloroethane	YES	ND	--	--	--	--	--	--
Trichloroethylene	YES	ND	--	--	--	--	--	--
M&P-Xylene	YES	4.80E-04	60.0	492,750	317,557	0.029	0.12	0.08
O-Xylene	YES	2.70E-04	60.0	492,750	317,557	0.016	0.07	0.04
TOTAL HAPS					Total HAPs =	18.89	77.56	49.98
Total Hydrocarbons (Method 25A)		0.062	60.0	492,750	317,557	3.720	15.28	9.84

ND = Non Detectable
ADTBP = Air Dried Tons of Bleached Pulp
ODTBP = Oven Dried Tons of Bleached Pulp
lb/hr = pounds per hour
TPY = tons per year

Footnotes:

(a) All emission factors (except chlorine, chlorine dioxide, chloroform and formaldehdye) based on data in NCASI Technical Bulletin No. 701: Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Sources at Chemical Wood Pulp Mills. Mill codes BPF and BPME1 are most representative of the proposed ECF bleach plant at Georgia Pacific's Palatka mill. If values were given for both mill codes, then the values were averaged. Non-detectable limits not used.

(b) Maximum hourly based on 1,440 ADTBP/day. Maximum annual based on a production rate of 1,350 ADTBP times 365 days/yr.

(c) Based on actual annual production rate for 1999.

(d) Based on Permit No. 1070005-006-AC, Specific Condition 7.(a), 10 ppmvd limit for chlorinated HAPs (as chlorine) and flow rate of 13,500 dscfm, equal to 0.75 lb/hr. Then divide by 1,350 ADTBP per day (56.25 ADTBP/hr).

(e) Based on design information provided by scrubber manufacturer. Factor based on 1,350 ADTBP/day and 214.25 lb/hr uncontrolled chlorine dioxide and 99% scrubber removal efficiency.

(f) Based on data in NCASI Technical Bulletin No. 679: Volatile Organic Emissions From Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants. Mill Code E "c" Line is most representative of the proposed ECF bleach plant at Georgia Pacific's Palatka mill. Chloroform emission factor converted to lb/ADTBP using the following formula: 9.1 e-3 lb/ODTBP * (0.90 ODTBP/ADTBP) = 8.19 e-3 lb/ADTBP.

(g) Based on data in NCASI Technical Bulletin No. 701: Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Sources at Chemical Wood Pulp Mills. Formaldehyde data based on Mill Code BPMN.

JACOBS ENGINEERING QUOTE

JACOBS

1041 East Butler Road (29607)
Post Office Box 5456
Greenville, SC 29606-5456
864-676-6000 FAX 864-676-6368

January 27, 2003

Ms. Elizabeth Sellers
Georgia-Pacific
John Campbell Highway 216
Palatka, Florida 32177

Re: Georgia-Pacific
Palatka, Florida
Jacobs Job No. 16AZ1380
Study of Thermal Oxidation of
Bleach Plant Scrubber Vent CO

Dear Beth:

As requested by Georgia-Pacific, we have studied the potential options for controlling the carbon monoxide, CO, discharged from the No. 3 Bleach Plant Scrubber at Palatka, Florida and have prepared budgetary estimates (P-1) for two options. After analysis as described below, the selected two options were identified as follows:

Option 1: Incinerate the gases in the No. 5 Power Boiler and use the No. 4 Combination Boiler as a backup.

Option 2: Incinerate the gases in a new Regenerative Thermal Oxidizer (RTO).

Jacobs visited the mill to gather data and obtain information, which has been used as the basis for the option evaluations and cost estimates. The accuracy of the estimates is consistent with the P-1 requirement.

Option Analysis

Test results of Georgia-Pacific's Palatka, FL mill show that it's No. 3 Bleach Plant scrubber discharge is approximately 15,500 ACFM at 130^{0}F, saturated. This discharge has CO as one of its constituents. The recommended design flow rate is 16,000 ACFM at 150°F. The dry gas is primarily air.

The mill has seven existing units that are thermal oxidation devices. The following chart summarizes their potential utilization to control CO emissions:

Existing Thermal Oxidation Device	Comments	Uptime
No. 5 Power Boiler	Good average steam load to accommodate bleach plant gas stream. Furnace is positive pressure, allowing furnace gas leaks, which is less desirable with CO gas stream incineration. Good air heater exit gas temperature @ 400 Deg. F.	94.5%
No. 4 Combination Boiler	Good average steam load to accommodate bleach plant gas stream. Bark firing on grate can produce inconsistent furnace conditions and less than ideal CO gas stream oxidation. Good air heater exit gas temperature @ 400 Deg. F.	94.5%
No. 4 Recovery Boiler	Chlorides in bleach plant gas stream will lower chemical ash melting temperature, increasing plugging of superheater and boiler bank.	95%
New Thermal Oxidizer (Installed 2002)	Does not have adequate capacity for volume of gas from bleach plant scrubber	(Not Applicable)
No. 4 Package Boiler	A standby unit. Does not have necessary uptime.	<50%
No. 6 Package Boiler	A rental standby unit. Does not have necessary uptime.	<50%
Lime Kiln	Lime Kiln does not have capacity for additional air.	

From the above choices, there are several devices, which are not technically feasible. The recovery boiler has potential operational issues that need to be avoided (e.g., reaction and conversion of recovery products beyond design of recovery system). In addition, the last four units in the chart are not acceptable.

In contrast, the No. 5 Power Boiler is the best oxidation device option. The No. 4 Combination Boiler is a second choice or could serve as a backup as in Option 1. The power boiler should be able to provide very good oxidation of CO. However, in a furnace of the power boiler's size, there can be some CO at the furnace outlet, which may interfere with identifying oxidation of the bleach plant's CO. By combining the two boilers, the uptime is at least 98%, as either boiler is typically operating. The limiting factor for uptime is the operating condition of low steam demand, and thus low-fuel usage rates. These low-load conditions limit the amount of additional air, such as the bleach plant stream, that can be added. Destruction efficiency of CO from the Bleach Plant Scrubber Vent stream for both the Power Boiler and Combination Boiler would be approximately 95%.

Besides using existing thermal oxidation devices for the bleach plant gas stream, a new unit can be installed. For this application, an RTO is recommended. It will have approximately 98% uptime. If additional uptime is needed, a second RTO may be considered. Destruction efficiency of CO is guaranteed at 95%.

For the estimate, we will consider two alternates, the No. 5 Power Boiler backed up by the No. 4 Combination Boiler and an RTO without a backup device. Deciding the merits of a backup unit (either alternate) will be part of the BACT analysis.

Cost Summary

Our cost estimates for the two defined options are shown below. These costs are direct costs, which include labor, equipment and materials only without any contingency allowance. Indirect costs are also not included.

Option 1 Direct Cost	$2,491,934
Option 2 Direct Cost	$3,299,584

Utilities Requirements

	Option 1	**Option 2**
Fuel	3.52 MM Btu/hr of Fuel Oil	1.56 MM Btu of Natural Gas
Steam	300 pph of 50 psig steam	0
Electric Power	112 kW	201 kW

The scope, for the two options reflected in the Direct Costs above, is described as follows. Collection and transport is common to both options.

Collection and Transport of Gases

The No. 3 Bleach Plant scrubber exhaust gases will be ducted to the CO thermal oxidation device by tying a duct into the bleach plant scrubber stack. There will be a damper that isolates the stack and a damper that isolates the duct to the oxidizer. This arrangement allows startup of the scrubber through the existing stack initially, before transporting the gases through the new duct.

The new duct will be routed either to an area under the No. 4 Combination Boiler precipitator for oxidation in the No. 5 Power Boiler, or across the effluent channel to the area of the existing oxygen storage facility for oxidation in an RTO.

Power Boiler (Option 1)

The transport duct will feed a mist eliminator followed by a constant speed motor driven fan. A steam coil air heater follows the fan and will elevate the gas temperature enough to avoid condensation on existing metal surfaces at the No. 5 Power Boiler. A tee after the heater will allow the gases to either vent to atmosphere or continue to the boiler. The vent will only be used on startup for proving proper operation. The tee will have a damper on its vent leg and on its downstream leg. If both the power boiler and combination boiler will be used as thermal oxidation devices, with the combination boiler as a backup, the duct split to feed either boiler will be located after the vent tee.

Leaving the fan and steam heater location, the duct will be routed around the boiler building to the No. 5 Power Boiler where it will be fed into the combustion air duct between the air heater and the burner windbox. There will be a perforated distribution header added inside the existing combustion air duct.

The No. 4 Combination Boiler is used to back up the power boiler. For this, the line to the combination boiler will feed the gas into the undergrate air plenum. This must be done at the ground floor, which has minimal headroom, so the duct will transition to a shallow rectangular section. It will enter the undergrate plenum near the rear of the grate and have an internal perforated distribution header. Control of the fan, heater and injection will be by the boiler operators.

Regenerative Thermal Oxidizer (Option 2)

The transport duct will feed a mist eliminator followed by a constant speed motor driven fan. A tee after the fan will allow the gases to either vent to atmosphere or continue to the RTO. The vent will only be used on startup or during an upset condition. The tee will have a damper on its vent leg and on its downstream leg. The RTO system will include a valveless style unit equipped with a variable speed motor driven I.D. fan, combustion fan, and stack. A propane fuel system will be included as a back up to natural gas.

Structural

All new equipment will be supported at grade on either concrete slabs on grade or on concrete foundation mats supported on piling. Pipe support will be provided at 20 foot spacing on existing pipe bridges and within existing buildings along routes provided by the piping engineer. Existing pipe bridges will be modified as needed to support the vent gas piping. Steel has been included for fan and air heater access platforms. For the RTO option, mat foundations and piling have been included for all equipment at grade.

Piping

The estimator made piping material take-offs using the block flow diagrams and the overall site layout drawings developed for this project. The piping estimate was developed using overall lengths of pipe runs and applying a factor based on a cost per diameter inch of pipe per foot. For this phase of the estimate Fiberglass pipe was used for gas transmission lines from the scrubber to the incineration point. Schedule 40 Carbon Steel was used for all steam and steam condensate lines and natural gas lines. The estimate included all above ground process piping. Piping designed by other departments or other vendors was excluded.

A visit to the jobsite was made to establish the scope definition, and to meet with the client to establish approximate tie-in locations, locations of utility bridges, interface with other design groups and/or vendors for space availability, etc.

Instrumentation

Allowances for instrumentation and controls are based on an estimated loop count for the gas transport system and for any additional loops needed for the RTO options. Allowances for DCS additions or upgrades are added as a line item in the estimate as needed for the particular option.

Electrical

Power Boiler Option for Total Oxidation

The new 200 hp fan motor required for transport of the vent gas to incineration in the Power Boiler is a 4160 volt motor. A new starter is included for the new fan motor. Instrument wiring is included for the new loops. No electrical heat tracing is included.

RTO Option for Total Oxidation

The new 200 hp fan motor required for transport of the vent gas to incineration in the RTO is a 4160 volt motor. All other motors required for the RTO are 460 volt motors. New starters are included for the new motors. New electrical equipment will be located in existing facilities and in the RTO facility. Instrument wiring is included for the new loops from the RTO to the existing DCS. No electrical heat tracing is included.

We trust this evaluation and the cost estimates meet your requirements and thank you for this opportunity to assist Georgia-Pacific.

Sincerely.

James R. Uz

James R. Uz
Project Manager

Distribution

G-P	Jacobs	Golder Associates
Eric Allen	John Rickard	David A. Buff
Mark Aguilar	James Cantrell	
Mike Evans	Tod Flathmann	
Jeff Brown		

TOTAL COST SUMMARY - JE PRIME CODE

JOB: ESTIMATE 1 - BLEACH PLANT SCRUBBER DISCHARGE TO POWER BOILER
CLIENT: GEORGIA PACIFIC
LOCATION: PALATKA, FLORIDA
JOB NUMBER: 16AZ1380
CONSTRUCTION DURATION: TBD
ESTIMATE TYPE: +/- 25%
G:\ESTIMAT\GEORPAC\HVLC STUDIES\PALATKA, FLORIDA\16AZ1380\[EMAIL_Bleach Plant Scrubber Disch to Power Boiler_R1.xls]PRIME CODE TCS

ESTIMATE DATE: 01/17/03
REVISION: 1
ESTIMATED BY: MICHAEL WATSON
CHECKED BY:
EST. FILE #: 02052

PRIME CODE	DESCRIPTION	W-H	QTY	UNIT	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	TOTAL COST
	DIRECT COSTS								
50	MAJOR EQUIPMENT	300	0	0	$12,313	$133,282	$3,235	$0	$148,830
51	DEMOLITION	0	0	0	$0	$0	$0	$50,000	$50,000
52	SITE EARTHMOVING	0	0	0	$0	$0	$0	$0	$0
53	SITE IMPROVEMENTS	0	0	0	$0	$0	$0	$0	$0
54	PILING, CAISSONS	0	0	LF	$0	$0	$0	$0	$0
55	BUILDINGS	0	1	LOT	$0	$0	$0	$0	$0
56	CONCRETE	787	53	CY	$24,755	$0	$11,191	$0	$35,945
57	MASONRY, REFRACTORY	0	0	0	$0	$0	$0	$0	$0
58	STRUCTURAL STEEL	900	22	TN	$32,093	$0	$55,525	$2,700	$90,318
59	ROOFING AND SIDING	0	0	0	$0	$0	$0	$0	$0
60	FIRE PROOFING	0	0	0	$0	$0	$0	$0	$0
61	PROCESS DUCTWORK (NON-BUILDING)	0	0	0	$0	$0	$0	$0	$0
62	PIPING	13,687	1,560	LF	$561,190	$0	$582,879	$0	$1,144,069
63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	0	0	0	$0	$0	$0	$3,900	$3,900
64	INSTRUMENTATION	680	0	0	$27,879	$300,000	$0	$0	$327,879
65	ELECTRICAL	832	5,297	LF	$34,111	$134,150	$13,671	$0	$181,932
66	PAINTING, PROTECTIVE COATINGS	0	0	0	$0	$0	$0	$15,000	$15,000
67	FURNITURE, LAB & SHOP EQUIPMENT	0	0	0	$0	$0	$0	$0	$0
75	CONSTRUCTION SERVICE LABOR	3,437	0	0	$122,686	$0	$0	$0	$122,686
	TOTAL DIRECT COSTS	20,623			$815,026	$567,432	$666,501	$71,600	$2,120,559

TOTAL COST SUMMARY - JE PRIME CODE

JOB: ESTIMATE 1A - ADDER FOR BLEACH PLANT SCRUBBER DISCHARGE TO POWER & COMBINATION BOILER
CLIENT: GEORGIA PACIFIC
LOCATION: PALATKA, FLORIDA
JOB NUMBER: 16AZ1380
CONSTRUCTION DURATION: TBD
ESTIMATE TYPE: +/- 25%
G:\ESTIMATI\GEORPAC\HVLC STUDIES\PALATKA, FLORIDA\16AZ1380\[EMAIL_Bleach Plant Scrubber Disch to Power & Combination Boilers_R0.xls]PRIME CODE TCS

ESTIMATE DATE: 01/16/03
REVISION: 0
ESTIMATED BY: MICHAEL WATSON
CHECKED BY:
EST. FILE #: 02052

PRIME CODE	DESCRIPTION	W-H	QTY	UNIT	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	TOTAL COST
	DIRECT COSTS								
50	MAJOR EQUIPMENT	0	0	0	$0	$0	$0	$0	$0
51	DEMOLITION	0	0	0	$0	$0	$0	$50,000	$50,000
52	SITE EARTHMOVING	0	0	0	$0	$0	$0	$0	$0
53	SITE IMPROVEMENTS	0	0	0	$0	$0	$0	$0	$0
54	PILING, CAISSONS	0	0	LF	$0	$0	$0	$0	$0
55	BUILDINGS	0	1	LOT	$0	$0	$0	$0	$0
56	CONCRETE	0	0	CY	$0	$0	$0	$0	$0
57	MASONRY, REFRACTORY	0	0	0	$0	$0	$0	$0	$0
58	STRUCTURAL STEEL	47	1	TN	$1,684	$0	$2,913	$0	$4,598
59	ROOFING AND SIDING	0	0	0	$0	$0	$0	$0	$0
60	FIRE PROOFING	0	0	0	$0	$0	$0	$0	$0
61	PROCESS DUCTWORK (NON-BUILDING)	0	0	0	$0	$0	$0	$0	$0
62	PIPING	1,410	102	LF	$57,814	$0	$70,200	$0	$128,014
63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	0	0	0	$0	$0	$0	$1,000	$1,000
64	INSTRUMENTATION	480	0	0	$19,679	$150,000	$0	$0	$169,679
65	ELECTRICAL	40	216	LF	$1,640	$0	$329	$0	$1,969
66	PAINTING, PROTECTIVE COATINGS	0	0	0	$0	$0	$0	$2,000	$2,000
67	FURNITURE, LAB & SHOP EQUIPMENT	0	0	0	$0	$0	$0	$0	$0
75	CONSTRUCTION SERVICE LABOR	395	0	0	$14,115	$0	$0	$0	$14,115
	TOTAL DIRECT COSTS	2,373			$94,932	$150,000	$73,442	$53,000	$371,375

TOTAL COST SUMMARY - JE PRIME CODE

JOB: ESTIMATE 2 - BLEACH PLANT SCRUBBER DISCHARGE TO RTO
CLIENT: GEORGIA PACIFIC
LOCATION: PALATKA, FLORIDA
JOB NUMBER: 16AZ1380
CONSTRUCTION DURATION: TBD
ESTIMATE TYPE: +/- 25%
G:\ESTIMATI\GEORPAC\HVLC STUDIES\PALATKA, FLORIDA\16AZ1380\[EMAIL_Bleach Plant Scrubber Disch to RTO_R2.xls]PRIME CODE TCS

ESTIMATE DATE: 01/27/03
REVISION: 2
ESTIMATED BY: MICHAEL WATSON
CHECKED BY:
EST. FILE #: 02052

PRIME CODE	DESCRIPTION	W-H	QTY	UNIT	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	TOTAL COST
	DIRECT COSTS								
50	MAJOR EQUIPMENT	888	0	0	$36,423	$287,782	$6,985	$1,356,000	$1,687,190
51	DEMOLITION	0	0	0	$0	$0	$0	$50,000	$50,000
52	SITE EARTHMOVING	0	0	0	$0	$0	$0	$0	$0
53	SITE IMPROVEMENTS	0	0	0	$0	$0	$0	$5,000	$5,000
54	PILING, CAISSONS	0	0	LF	$0	$0	$0	$60,000	$60,000
55	BUILDINGS	0	1	LOT	$0	$0	$0	$0	$0
56	CONCRETE	1,357	200	CY	$42,661	$0	$29,995	$0	$72,656
57	MASONRY, REFRACTORY	0	0	0	$0	$0	$0	$0	$0
58	STRUCTURAL STEEL	755	18	TN	$26,950	$0	$46,616	$2,700	$76,265
59	ROOFING AND SIDING	0	0	0	$0	$0	$0	$0	$0
60	FIRE PROOFING	0	0	0	$0	$0	$0	$0	$0
61	PROCESS DUCTWORK (NON-BUILDING)	0	0	0	$0	$0	$0	$0	$0
62	PIPING	10,442	1,960	LF	$428,141	$0	$444,516	$0	$872,657
63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	0	0	0	$0	$0	$0	$500	$500
64	INSTRUMENTATION	680	0	0	$27,879	$200,000	$0	$0	$227,879
65	ELECTRICAL	1,307	7,358	LF	$53,585	$36,450	$32,256	$0	$122,291
66	PAINTING, PROTECTIVE COATINGS	0	0	0	$0	$0	$0	$15,000	$15,000
67	FURNITURE, LAB & SHOP EQUIPMENT	0	0	0	$0	$0	$0	$0	$0
75	CONSTRUCTION SERVICE LABOR	3,086	0	0	$110,146	$0	$0	$0	$110,146
	TOTAL DIRECT COSTS	18,515			$725,784	$524,232	$560,368	$1,489,200	$3,299,584

RTO VENDOR QUOTES

MEGTEC Systems
830 Prosper Road
P.O. Box 5030
De Pere, WI 54115-5030

920/336-5715

CLEANSWITCH™ -100-90 REGENERATIVE THERMAL OXIDIZER

Proposal Number 114973A

Prepared For:

Mr. Bruce Payne
Georgia Pacific Corporation
133 Peachtree Street NE
Atlanta, GA 30303

Mr. Pat Braud
Naheola Mill
7530 Highway 114
Pennington, AL 36916

By: Lisa Mencheski
Inside Sales Representative
Industrial and Emission Control Products

March 20, 2002

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Dear Gentlemen:

Thank you for considering MEGTEC Systems as your solution to your abatement requirements. I look forward to assisting you in your upcoming projects. I am forwarding you this package of information detailing MEGTEC's product offerings. Included in this package is a book *The Clean Air Compliance Handbook* that may be used for your reference.

MEGTEC Systems continually strives to build upon our reputation as a leading oxidizer manufacturer for VOC emission control. The statement "The Bottom Line is Process Knowledge" summarizes our core focus. We work to fully understand your process and how our equipment is to be integrated with your facility.

MEGTEC Systems differentiates itself from the competition through experience, innovation, product offerings, in-house fabrication and service.

Experience – Since 1971, MEGTEC Systems has been building oxidation systems, and has over 2,000 systems in operation worldwide. With installations in about every industry, our knowledge base is confidently applied to your specific application.

Innovation – MEGTEC Systems continually researches ways to offer abatement solutions. Our in-house Research & Development Department is dedicated to developing the latest technologies in oxidation with practical designs to meet challenging applications.

Product offerings – MEGTEC Systems offers the widest selection of abatement designs that can be tailored to meet your specific needs. Whether it's adsorption, thermal, recuperative, regenerative or catalytic, we have your solution.

In-house fabrication - MEGTEC Systems engineers and builds your equipment at our headquarters in DePere, WI. Our 250,000 ft^2 shop is equipped with the latest fabrication tools. Implementation of 6sigma quality program throughout engineering and fabrication assures your complete satisfaction.

Service - MEGTEC Systems has a manned 24/7/365 emergency parts and service assistance with 13 regional service centers located across the country and in Canada. Modem connection allows remote diagnostics of your equipment. Along with a $5 million revolving spare parts inventory, we have fifty (50) service representatives throughout North America.

I look forward to working with you and would like to offer my assistance in any way that I can. In the mean time, feel free to contact me with any comments or questions that you may have.

Respectfully yours,

Wade S. Klos
MEGTEC Systems
Account Executive
920-337-1505
wklos@megtec.com

cc: ROD, LMM Inside Sales Representative - MEGTEC Systems

PRICE, TERMS, DELIVERY AND WARRANTY

PRICE

	Pricing
One (1) 10,000 SCFM CLEANSWITCH™ Regenerative Thermal Oxidizer	$560,900
Level 1 Spare Parts	$1,900
Level 2 Spare Parts	$4,700
Freight	$9,100
Installation Supervision	$8,500
Start-up	$14,700
Training	$4,200
Total	**$604,000**

All prices are FOB Pennington, AL and are valid for 60 days.

TERMS

Purchase orders should be made out to MEGTEC Systems.

30% with purchase order
30% 60 days prior to shipment
30% upon notification of shipment
10% 30 days after shipment

CONDITIONS OF SALE

"The conditions of sale under date of July 15, 1999 shall constitute a part of this proposal and are incorporated herein by reference as if fully set forth herein."

DELIVERY

This equipment can be manufactured and ready for shipment 16-18 weeks from the receipt of your purchase order and down payment.

CONSTRUCTION TIME ON SITE

This equipment would require five (5) days for mechanical and electrical installation.

PRICE, TERMS, DELIVERY, AND WARRANTY

PRODUCT WARRANTY

Equipment sold and commissioned by a MEGTEC Systems representative will be warranted for a period of one (1) year from the date of commissioning; startup not to exceed one hundred eighty (180) days from the date of shipment. This warranty will provide service for one (1) year to repair or replace warranted parts at no charge for labor or material. Only incurred airfare, car rental, living expenses (food and lodging) and overtime premiums (the difference between the applicable overtime rate and the standard straight time rate) will be billed to the customer.

Warranty service means remedying any defects in workmanship and material found in the equipment.

Expendable parts will not be included under warranty.

For further data, see the MEGTEC Systems' Terms and Conditions sheet.

UPTIME

The MEGTEC Systems ENTERPRISE II® oxidizer system we are quoting for this project is the latest generation of regenerative oxidizers supplied by MEGTEC Systems. The design of this unit includes engineering and manufacturing practices we have developed over our 30-year history of building oxidation systems for outdoor industrial installations. Our goal is to have 24 hours, 7 days a week trouble free operation. To the extent that we do not meet this goal we have a commitment to our customer to react as fast as possible to get our equipment operational after any unanticipated fault or failure. In addition, we provide several options for preventative maintenance services to avoid any unforeseen problems.

PROCESS CONDITIONS

The CLEANSWITCH™ Regenerative Thermal Oxidation System is designed to operate with the following pulp and paper process.

Design Criteria

Process:	Naheola Mill
Process Lines:	Chemiwasher, Knotters, Screens and Filtrate Tanks
Process Volume:	9,000 SCFM
Process Temperature:	120° - 160° F
Process Solvent:	Primarily acetone; Exhaust also contains sulfide compounds
Solvent Concentration:	17.4 lbs/hr – total hydrocarbon and sulfide loading

EQUIPMENT RECOMMENDATION

MEGTEC Systems proposes a CLEANSWITCH™ Regenerative Thermal Oxidizer to meet your pollution control needs.

The CLEANSWITCH™ Regenerative Thermal Oxidizer System provides destruction of Volatile Organic Compounds (VOC's) and odor control. It combines high temperature thermal oxidation with a regenerative heat exchange to efficiently convert VOC's and other odor causing organic compounds to carbon dioxide and water vapor.

The CLEANSWITCH™ consists of two (2) energy recovery columns connected by a high temperature combustion chamber. The unit is internally lined with ceramic fiber insulation.

Flow is directed through the unit by a single valve such where one column is in a gas-heating (inlet) mode and the other column is in a gas-cooling (outlet) mode. The single switch valve incorporates a sealing system to ensure no bypass or leakage of process gas to clean exhaust gas.

VOC-laden air enters the oxidizer through the inlet manifold and is fed into the base of column A, where it passes vertically up through ceramic heat exchange media and is preheated almost to the combustion chamber temperature. The burner in the combustion chamber raises the air temperature to the operating set point where the oxidation process, which started in the ceramic media, is completed. Hot purified air then enters column B and passes vertically down through the ceramic media and is cooled before being exhausted to atmosphere.

EQUIPMENT SIZE

• Length	382 inches
• Width	104 inches
• Height	195 inches
• Weight (approx.)	63,000 lbs.
• Packing weight	18,200 lbs.

Also refer to General Arrangement Drawing #114973-0104

EXTERIOR APPEARANCE OF UNIT

Exterior will be painted #15 charcoal.

EQUIPMENT SPECIFICATIONS

• Maximum air flow:	10,000 scfm
• Maximum solvent capacity:	2,160,000 Btu/hr
	174 lbs/hr solvent[1]
• Maximum Process Inlet Temperature:	150° F
• Natural gas @ 5 psi with 1,000 Btu/ft^3 ± ¼ psig.	1,675 CFH
• Air required	@ 80-100 psig, -40°F dew point, 5 CFM
• Voltage:	460v/3Φ/60hz
• Electrical service required at:	211 KVA
• Oxidizer differential pressure drop at design conditions	14 inches

[1] Solvent heat value of 12,400 BTU/lb.

OPERATING COSTS

Process Exhaust Parameters				Energy Consumption		Flow to Stack	
Flow Rate [scfm]	Inlet Temp [°F]	Water Concentration [% by volume]	Solvent Load [lbs/hr]	Fuel [MMBtu/hr]	Electrical [kW]	Flow Rate [scfm]	Stack Temp. [°F]
8,941	140	20	17	2.2	48.0	9,237	372
8,941	140	0	17	2.1	48.0	--	--
3,750	140	0	0	0.58	8.0	--	--

Operating Costs are based on:

- 12,400 Btu/# for VOC's
- 950 BTU/Ft^3 for Natural Gas
- The above fuel consumption values include burner efficiency and thermal radiation.

BILL OF MATERIAL

ENCLOSURE

- The main housing consists of two (2) insulated energy recovery columns connected by a common insulated combustion chamber.
- The shell is constructed of 316L stainless steel
- The unit is shop assembled to the greatest extent possible to simplify field erection.
- Insulated with ceramic fiber
- Casing is coated with Therma-Cover thermal barrier
- All welded joints to eliminate any leakage of fumes or vapors.
- Normal operating temperature of 1650° F and maximum operating temperature of 1800° F
- Residence time of 0.75 seconds at 1600° F
- Time required to reach operating temperature from a cold start is one and one half (1½) hours.

HEAT EXCHANGE MEDIA

- High Al_2O_3 Acid Resistant ceramic heat exchange media to resist acid attack
- Media is chemically inert and thermally stable up to 2200° F.
- Sufficient quantity of ceramic media will be provided to obtain 90% nominal thermal efficiency.

BURNER

- Maxon Kinemax Burner or equivalent
- Fuel source is natural gas
- Electric modulating actuator
- 20:1 maximum turndown (on natural gas)
- Flame safeguard with Self-Checking Ultraviolet Scanner
- High temperature protection device
- Necessary interlocks to achieve safe starts and fail-safe operation (FM or IRI compatible)

BURNER ACCESS PLATFORM

- Allows for complete access to burner provided with an OSHA approved access platform. Safety rails, ladder and grating are included.

SYSTEM FAN

- Twin City Fan or equivalent
- 125 HP, High Efficiency TEFC Motor
- Complete with couplings or belts and OSHA approved guard
- Constructed of 316L stainless steel
- Insulated to prevent condensation and for personnel protection
- AC variable frequency fan speed control to maintain proper exhaust rates
- Teflon coated expansion joints
- Arrangement 1

VARIABLE FREQUENCY DRIVE (VFD)

- Yaskawa AC variable frequency speed drive is provided to vary fan motor speed, controlling the air volume to the oxidizer using negative pressure ductwork as the indication of flow.
- The drive is shipped mounted in the control house.

BILL OF MATERIAL

COMBUSTION BLOWER

- Twin City Blower or equivalent
- 10 HP, High Efficiency TEFC Motor
- Direct Drive, Arrangement 4 with inlet filter
- Across-the-line starters, circuit breakers and thermal overload relays for each motor

OXIDIZER FAN TO INLET DUCT

- Insulated to prevent condensation and for personnel protection
- Fabricated from 316L stainless steel and welded air tight

SWITCH VALVE

- Pneumatically Actuated
- Valve sealing included
- Constructed of 316L stainless steel

COMPRESSED AIR TANK

Provided to maintain sufficient volume of air for a switch valve change. Included are:

- 30 gallon ASME Code tank
- Mounted to CLEANSWITCH frame
- Prepiped
- Pressure gauge included

FRESH AIR DAMPER

- Enables the oxidizer exhaust fan to run without drawing air from the process during idle, standby and oxidizer purge periods. Damper is constructed of 316L stainless steel. Damper is actuated by a 120-volt motor with limit switches and NEMA 4 enclosure. Internal limit switches verify damper position. Damper is mounted in the ductwork prior to the oxidizer system fan. Damper is preset and pinned for positive action.

- The system automatically opens the fresh air damper to allow air into the fan inlet and maintain minimum flow if process air volumes are below the minimum turndown of the unit. In addition, this package is used for temperature control in high solvent situations.

CONTROL HOUSE

The CLEANSWITCH™ provides a unit mounted electrical control house that contains the following:

- Power distribution panel and programmable controller and oxidizer control panel
- AC drive
- Environmental control system (HVAC)
- Circuit breaker panel for lighting and outlets
- A single power feed is required for oxidizer power and all auxiliary power

BILL OF MATERIAL

VIDEO DISPLAY OPERATOR INTERFACE

- PanelMate grayscale touch screen display operator interface
- Video display operator interface
- One button start-up
- By-pass key switches wired to common terminal strip

PROGRAMMABLE LOGIC CONTROLLER (PLC)

- Allen Bradley SLC 5/04 Series PLC
- RS Logix software
- First-out indication for ease of trouble shooting
- Alarm history

CHART RECORDER

- Yokogawa one point chart recorder provides method to record operating temperature for proof of compliance as required by regulatory agencies.
- The chart recorder is mounted in the control house

MODEM

- Provided for remote access to PLC for trouble shooting, alarms, program modifications, and monitoring process variables.
- Auto-answer
- Shipped mounted in control cabinet
- Dedicated phone (voice and data) lines to be provided by customer

BAKE OUT CYCLE

- For applications where organic particulate, aerosols or condensables may exist in the process exhaust, the optional bake out cycle provides a method of cleaning the cold side of the oxidizer of these deposits. During this cycle, each of the energy recovery columns will be held in an extended gas-cooling (outlet) mode until the cold side of the oxidizer is raised to an appropriate temperature where any organic build up will burn off.

DOCUMENTATION

- Documentation – Five (5) sets of operator manuals and drawings are provided. Additional manuals are available at $200.00 each.

BILL OF MATERIAL

SPARE PARTS

Level 1 Spare Parts

Qty	Part No.	Description
3	198675	RELAY,3PDT,110VAC,10 A,IDEC RH 3B-ULAC110V
2	290290	THERMOCOUPLE,DUAL,TYPE K,12LG, MGO,PYRO KK43U-012-00-8HN31
1	179471	SWITCH-TEMP,DIGITAL,32-2502 DE G F,AIR,EUROTHERM 93
1	134031	IGNITER-SPARK,AUBURN #I-P17/MO DIFIED
1	289654	CYLINDER-AIR,6.00 BORE,18.875, PARKER,6.00CJ2MAUS14AC18.875
1	299489	CYLINDER-AIR,8.00 BORE,3.00 ST ROKE,COMPACT AIR,R8X3
1	299802	VALVE-SOLENOID,AAA,0.75 NPT,12 0V,50/60 HZ,391V-120V
1	213466	RELAY,120V AC,ALLEN BRADLEY #7 00-CF220-D
2	285177	SENSOR-PROXIMITY,SHIELDED,2 WI RE,PEPPER & FUCHS,NJ15+U4+W-T
1	121860	CIRCUIT BREAKER,5A,250V,SINGLE POLE, A-B 1492-GH050
1	267185	SCANNER-UV,SELF CHECKING,HONEY WELL C7061A1012
1	122030	TIMER,MULTI RANGE,FM,CE,24-240 V,50/60 HZ,10A,11 PIN,ATC 328D
1	121861	CIRCUIT BREAKER,10A,250V,SINGL E POLE,A-B 1492-G100
1	121862	CIRCUIT BREAKER,15A,250V,SINGL E POLE,A-B 1492-GH150

Level 2 Spare Parts

Qty	Dwg No.	Description
3	191998	SAFEGUARD-COMBUSTION,RELAY MOD ULE,HONEYWELL RM7890B1014B
1	267904	REMOTE RESET WITH DISPLAY,SAFE GUARD,HONEYWELL S7800A1001
1	278564	AMPLIFIER-UV,2 OR 3 SEC RESPON SE,CE,HONEYWELL,R7861A1026
1	256850	SWITCH-PRESS,GAS/AIR,100-500MB AR,40-200WC,SCHRODER,DG 500T.
1	168109	SWITCH-PRESS,GAS/AIR,1-10MBAR, 0.4-4"WC,KROMSCHRODER DG 10T
1	168110	SWITCH-PRESS,GAS/AIR,2.5-50MBA R,1-20WC,KROMSCHRODER,DG 50T
1	185672	SWITCH-PRESS,GAS/AIR,0.5-6MBAR ,0.2-2.4"WC,KROMSCHRODER DG 6T
1	169182	SWITCH-PRESSURE,0-100 PSI,ASHC ROFT,B4-24B100 PSI
1	126553	PAPER-CHART,Z-FOLD,F/STRIP CHA RT RECORDER,YOKOGAWA B9565AW
1	269130	TRANSMITTER,PRESS,0 TO 50 IN W C,ASHCROFT XL-5-F02-42-ST-50IW
1	121500	TRANSFORMER-IGNITION,120V PRI, 10,000V SEC,DONGAN A10-LA22
1	174526	FILTER,RFI,120/250VAC @ 3A,0.2 5 QUICK CONNECT,CORCOM 3VW1
1	289960	MODULE-THERMOCOUPLE/MV,8 CHANN ELS,24VDC,SLC 500,A-B 1746-NT8
1	251731	MODULE-INPUT,120 VAC,16 INPUTS ,SLC 500,A-B 1746-IA16
1	253172	MODULE-ANALOG INPUTS,4 CHAN,A/ V,24VDC,SLC 500,A-B 1746-NI4
1	122431	VALVE-SOLENOID,PILOT,2-WAY,0.5 O NPT,110/120V,NC,ASCO 8214G20
1	251732	MODULE-OUTPUT,120 VAC,16 OUTPU TS,SLC 500,A-B 1746-0A16
1	120944	REGULATOR-MINATURE,0.125NPT,AR ROW R161-P
1	284929	REGULATOR-PRESS,0.50 NPT,12.0- 28.0 WC,ORN,EQUIMETER 043-180
1	253173	MODULE-ANALOG OUT,4 CHAN,0-20M A,24VDC,SLC 500,A-B 1746-N04I
1	254526	MODULE-ANALOG,2 INPUT/2 OUTPUT ,A-B 1746-NI041
1	291346	PEN,PLOTTER,PURPLE,MICRO 1000C HART RECORDER,YOKOGAWA B9902A
1	255542	SWITCH-PRESS,GAS/AIR,30-150MBA R,12-60WC,KROMSCHRODER,DG 150T
1	290596	TRANSMITTER-PRESS,0-100PSI,4-2 0MA,ASH,K1-7-MO2-42-C1-100
1	253179	MOTOR-ACTIONATOR,10-150 DEG,60 SEC,HONEYWELL M740A1046 S&C
1	299175	REGULATOR,PRECISION,2-150 PSI, .250 NPT,PARKER FRL 3550 1040P
1	281102	REGULATOR/FILTER,COMPRESSED AI R,GRAINGER 6B312
1	294402	PEN,RED,MICRO 1000 CHART RECORDER,YOKOGAWA B9902AM
1	282265	RECORDER-CHART,STRIP,1 POINT,M ICRO-R1000,YOKOGAWA 436001
1	260554	TRANSMITTER,PRESSURE,0-5WC,4- 20MA,ASHCROFT,ASH-XL-DP-050
1	269131	TRANSMITTER-PRESS,0-15WC,4-20M A,ASHCROFT XL-5-F02-42-ST-15IW

PERFORMANCE WARRANTY

GUARANTEE

MEGTEC Systems makes the following Performance Warranty:

If all of the performance conditions, as defined in the performance tabulation, are satisfied, then the oxidation equipment:

Total Reduced Sulfur

...will reduce the concentration of sulfur measured at the oxidizer stack by 99% or to a lower limit of 10 ppmv.

Hydrocarbons

...will reduce the concentration of gaseous phase hydrocarbons measured at the inlet of the oxidizer as compared to the concentration of gaseous phase hydrocarbons measured at the outlet (i.e.: discharge stack) of the oxidizer by 99% or to a lower limit of 40 ppmv average as C_1 as verified by U.S. EPA test methods 25A. The Performance Conditions are defined in this specification under the heading of "Design Criteria". The equipment must be operated no lower than 1600° F oxidation temperature.

Oxides of Nitrogen (NOx)

...when operated on natural gas and according to equipment specifications, the equipment will perform such that the total concentration of NOx as measured (i.e. uncorrected to 3% oxygen) at the discharge stack will not exceed 25 ppmv, 95% thermal efficiency average NOx as NO_2.

This guarantee is predicated upon an inlet NOx concentration of 0 ppmv and no nitrogen containing hydrocarbons or ammonia type compounds are in the process exhaust.

Carbon Monoxide

...when operated on natural gas and according to equipment specifications, the equipment will perform such that it will reduce the concentration of carbon monoxide measured (uncorrected to 3% oxygen) at the oxidizer stack to a lower limit of 20 ppmv average.

PERFORMANCE WARRANTY

CRITERIA

- The length of term for this guarantee is twelve (12) months (one (1) year) from date of start-up, not to exceed eighteen (18) months from shipment date by MEGTEC Systems.
- MEGTEC Systems reserves the right to adjust the oxidation temperature within 100° F of design set point to achieve conformance.
- For the purposes of this warranty, U.S. EPA Method 25A (FID) or equivalent must be used unless another test method is mutually agreed upon. U.S. EPA Method 18 should be used to measure and subtract methane.
- Use of the oxidizer must be in accordance with MEGTEC Systems operating instructions. Guaranteed performance is based on the use of the solvent description listed in the proposal.
- Non-conformance with this warranty shall be demonstrated to the satisfaction of MEGTEC Systems by and at the expense of the buyer. MEGTEC Systems reserves the right to assist in the development of testing protocol in cooperation with the BUYER and their assigned consultants and/or testing contractor.

Note: *Compounds such as, but not limited to, heavy metals, halogens, sulfur, can degradate the ceramic fiber insulation and oxidizer internal components. These compounds will void the warranty if found in process stream. These can originate from chlorinated solvents, fluorides, et cetera.*

INSTALLATION AND FIELD SERVICE

INSTALLATION SUPERVISION, START-UP AND TRAINING

MEGTEC Systems proposes to furnish start-up as indicated below.

- One (1) installation engineer for five (5) consecutive ten (10) hour days will be provided for installation supervision. This quotation also includes one (1) round trip travel and incurred lodging expenses.
- One (1) field service representative for seven (7) consecutive ten (10) hour days will be provided for start-up and training. This quotation also includes one (1) round trip travel and incurred lodging expenses.
- To ensure that a field service representative is available, please contact us at least fourteen (14) days prior to your scheduled start-up.
- To prepare for start-up services the equipment should be fully installed according to specifications and all utilities should be complete, operable and in compliance with local codes.
- Our equipment will be checked mechanically and electrically and all operational data will be verified. A copy of the data form will be provided to the customer. Associated equipment by others should be functional to the point that it will enable us to completely test our equipment.
- Operational and basic maintenance training will be provided for user personnel by the field service representative upon completion of start-up. Twenty (20) hours of training includes four (4) 4-hour segments covering four (4) shifts.
- The service rates found on the following page will apply to any hours required beyond the normal eight hour day or for delays encountered that are not attributable to our equipment.

OTHER SERVICE OFFERINGS

- $5 million revolving spare parts inventory available
- 24 hour emergency parts and service assistance available 365 days a year
- Regional service centers located in California, Florida, Maryland, New Jersey, West Virginia, Wisconsin and Ontario, Canada. Overseas service is available through offices in England, France, Germany, Singapore, Australia, Sweden and Hong Kong

FIELD SERVICE RATES

EQUIPMENT SERVICE RATES

Start-up services, installation supervision, and service calls are provided at the following rates:

Straight Time	$ 95.00/hour	Up to 8 hours per day on weekdays
Time & One-Half	$140.00/hour	Over 8 hours up to 12 hours on weekdays; Up to 8 hours on Saturday
Premium Time	$186.00/hour	Over 12 hours on weekdays; over 8 hours Saturday; Sunday and Holidays
Travel Time	$ 75.00/hour	Travel will be based on actual hours
Weekend & Holiday Travel Time	$115.00/hour	Same as above
Weekend Layover	8 Hrs straight time/day	Plus actual expenses
Field Training	$105.00/hour (straight time)	Customer plant training

24/7 Technical & Modem (Effective June 1, 2001) MEGTEC Systems provides 24-hour, 365/day on-line real time modem & phone technical support for a charge of $150.00/per incident after warranty. An incident is defined as the time required to resolve one (1) problem.

- *MEGTEC Systems offers preventive maintenance programs, which can be tailored to meet your requirements. Please contact us at 920-336-5715 for details*
- *The above prices are subject to change without notice.*
- *All service calls are subject to a four (4) hour minimum billing plus travel.*

Expenses Expenses will be invoiced as incurred, plus a 6% service charge. These may include:

Actual: Airfare, lodging, car rental, and general expenses
Meal allowance billed at federal per diem
At Rate: Company Car - $40.00/day.

CUSTOMER RESPONSIBILITY

The following responsibilities are borne by the customer unless included in a MEGTEC Systems installation package offered with this document.

- If power capacitors are installed in your facility, please notify MEGTEC Systems at once as an isolation transformer may be necessary.
- Any special regulatory codes must be submitted to MEGTEC Systems before or with order placement.
- Fuel and vent piping to MEGTEC Systems connection points sized in accordance to MEGTEC Systems specifications.
- Electrical services to MEGTEC Systems connection points sized in accordance to MEGTEC Systems specifications.
- Natural gas @ 5 psi ± ¼ psig with 950 Btu/ft^3.
- Instrument quality compressed air @ 80 – 100 psig, -40° F dew point, and 5 CFM (per oxidizer) to MEGTEC Systems connection points sized in accordance to MEGTEC Systems specifications.
- Exhaust duct from process to inlet of oxidizer unit. If the run exceeds 75 feet (23 meters) with three (3) or more elbows, please notify MEGTEC Systems for fan sizing verification.
- Modifications to any existing equipment, building structures or other obstructions at the installation site.
- Wiring inside of non-MEGTEC Systems equipment and termination of wires related to the interface between non-MEGTEC Systems manufactured equipment and the proposed MEGTEC Systems equipment.
- Hand railing, ladder, service platform and heat insulation if required by OSHA.
- Roof or floor supports, as required.
- Flashing for through-roof ductwork
- Provide information / documentation identifying any special codes, permits or requirements specific to the installation site. Costs incurred to meet requirements not identified to MEGTEC Systems prior to this proposal will be the responsibility of the customer.
- Necessary engineering drawings and information related to non-MEGTEC Systems-manufactured equipment for interface between process and MEGTEC Systems equipment.
- EPA type air permit testing
- Clear and unobstructed access to the worksite for installation is required

CUSTOMER RESPONSIBILITY

- Area lighting unless specifically in the electrical installation scope
- Soils testing unless specifically referenced in the general installation scope
- **Noise – OSHA Compliance**
- Data on the noise levels of rotating equipment such as fans, motors, blowers, compressors, etc., as determined by the manufacturers, will be supplied upon request. The combined noise levels of the system, in conjunction with the surroundings, cannot be predetermined. If the noise levels from the system exceed OSHA or local code requirements, MEGTEC Systems can provide sound attenuation equipment, which will be the financial responsibility of the customer.

EXCEPTIONS

MEGTEC SYSTEMS TAKES EXCEPTION TO THE FOLLOWING ITEMS AS NOTED:

Instructions To Vendors/Destruction Criteria - #4

The MEGTEC Systems ENTERPRISE II® oxidizer system we are quoting for this project is the latest generation of regenerative oxidizers supplied by MEGTEC Systems. The design of this unit includes engineering and manufacturing practices we have developed over our 30-year history of building oxidation systems for outdoor industrial installations. Our goal is to have 24 hours, 7 days a week trouble free operation. To the extent that we do not meet this goal we have a commitment to our customer to react as fast as possible to get our equipment operational after any unanticipated fault or failure. In addition, we provide several options for preventative maintenance services to avoid any unforeseen problems.

Instructions To Vendors/Destruction Criteria - #5

Georgia Pacific requests Total Reduced Sulfur (TRS) emissions of less than 5 ppm averaged over a 12-hour period. MEGTEC Systems' destruction efficiency guarantee includes TRS emissions of 10 ppm maximum with a destruction efficiency of 98.5%.

Instructions To Vendors/Vendor's Design - #7

Georgia Pacific's specifies the use of controls and natural gas equipment for enrichment of the incoming gases to reduce NOx formation. The oxidizer will not be equipped with Natural Gas Injection since the application has the potential for particulate buildup and is designed for operation below 95% thermal efficiency.

Instructions To Vendors/Vendor's Design - #14

Although MEGTEC Systems has taken every precaution against acid attack, including construction materials of 316L stainless steel and the application of Therma-Cover insulation, there are still unknown variations in the tank vent loading. Therefore, MEGTEC Systems will not warranty the life of the shell for ten (10) years against any corrosion.

Instructions To Vendor/Vendor's Design - #24

MEGTEC Systems reserves the right to remedy any deficiencies of supplied equipment. Therefore, MEGTEC Systems takes exception to the buyer having the right to refund the entire purchase price.

Instructions To Vendors/Vendor's Design - #26

It has been requested that the structural steel be painted per Georgia Pacific specifications. Georgia Pacific paint specifications have not been supplied and therefore the cost is not adjusted for this.

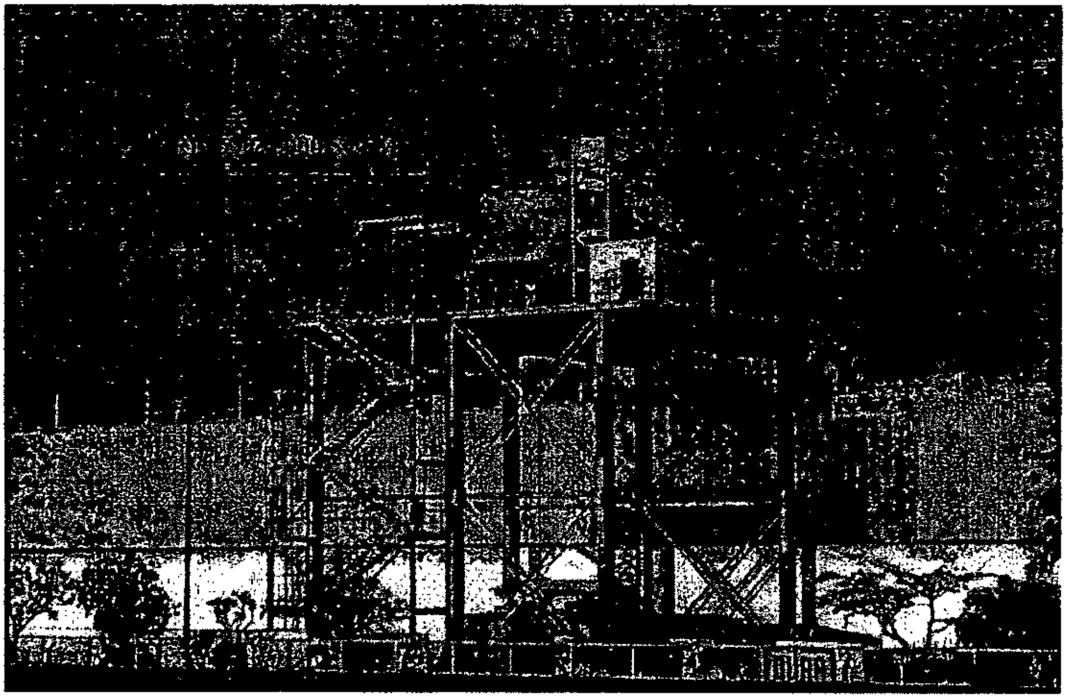
Georgia Pacific's Purchase Order Conditions

MEGTEC Systems takes exception to Georgia Pacific's Purchase Order Conditions. All conditions can be negotiated at time of order placement.

DÜRR

AN ENGINEERED SOLUTION
TO SUPPLY

A Durr Air Emission Control System



TO

Georgia Pacific Corporation

(1) Wa, (2) Or, (1) Me, (1) AL, (1) Ms, (1) Ga

August 16, 2001

DURR PROPOSAL NO. 01-RLP-0816

This proposal contains confidential and proprietary information of DURR and is not to be disclosed to any third parties without the express prior written consent of DURR.
This proposal is submitted solely for the purpose of enabling client to evaluate DURR's bid on the within project and shall be returned to DURR or destroyed if so requested by DURR

Durr Environmental, Inc.
31285 Durr Drive, PO box 930459, Wixom, MI 48393
Telephone: (248) 668-500 / Fax: (248) 926-6570

DÜRR

Georgia Pacific Corporation
133 Peachtree St., NE (30303)
PO Box 105605
Atlanta, Ga. 30348-5605

Attention: Mr. Jeffrey W. Brown
Phone: 404-652-4615

Subject: DURR Revised Budgetary Proposal # 01-RLP-0816

Dear Jeff,

I want thanks you and your associated again for taking the time to visit our installation at Guardian. Based on our discussions, I have attached a revised budgetary proposal for a modular RL10 RTO system for your brown stock washer applications. The system can handle the full range of process flows at all the various locations you indicated.

The enclosed system, which is proposed, includes an additional spool piece to provide a three quarter (3/4) second retention time at 1600'F. It also includes 304 and nitronic stainless steel for all of the wetted surfaces, including the fan, valve, and stack. The nitronic stainless steel is used for the piston rings and stator.

I have also included an optional VER (variable energy recovery) system, which will handle VOC/HAP concentration up to four times greater than your present indicated loading.

As I indicated in our discussions, NCG streams can be direct injected into the combustion chamber. We have install systems of this type into the pharmaceutical industry.

Again, I thank you for your continued interest in our products and services, and I will be happy to meet with you and your associates to discuss our equipment and system approach in detail for each process.

Regards,

Rodney L Pennington, PE
Director of Sales
Phone 407-822-9203
Cell 407-496-1911
rpennington@de.durr-usa.com

cc: Trent Moberg (GP)
Lawrence Otwell (GP)
Robert H. Orender (GP)
Steve Lowe (Air Techniques Inc.)
Mike Anderson (Caldwell Mckay Co., Inc)
Phil Audit (A&A Engineering)
Jeff Maser (ZWM Co.)

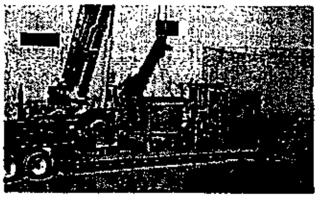
Budget Pricing

I) Core Dryer

Engineer, fabricate, supply and commission one (1) pre-piped/pre-wired Durr Modular Model RL10 RTO including:

- Added spool for ¾ second @ 1600'F
- Stainless Steel construction
- VER
- all the standard features and services described below:

Budget Price, including start up	$455,000
Budget Price, optional installation	$ 20,000



All prices are in U.S. dollars and subject to Durr's Standard Conditions of Sale, installation, ductwork and structural steel support or foundation by others, unless otherwise note,

By: ______________________

Rodney L Pennington, PE
Director of Sales
407-822-9203

Payment Terms

30%	of Price with Purchase Order.
65%	of Price based on monthly progress payments.
5%	of Price after successful performance testing.
-OR-	thirty days after equipment is ready for operation.
-OR-	ninety days after final material shipment, whichever comes first, if successful performance testing is delayed through no fault of DURR.

Delivery

Based on present workload, our delivery for this equipment is (24) after receipt and acceptance of your purchase order. Installation and start-up will take an additional 4 weeks.

NOTES: All prices exclude any taxes, duties, broker fees, value added taxes, income taxes, or any other allowance.

Standard RL Equipment

Mechanical Components

- Unitized base skid
- Pre-piped / pre-wired skid
- Rotary valve with pneumatic drive
- RTO housing
- Regenerative heat exchange 95% TER
- FM or IRI combustion system
- **Fresh air damper for purge or idle**
- Chamber flushing
- Valve sealing
- Delivered fully painted
- Expansion joints
- Nema 4 enclosure for Flex I/O

Miscellaneous

- Two maintenance manuals
- 8 hours training course
- Start up

Controls

- PLC controls
- Digital Flex I/O cards
- Analog Flex I/O cards
- T/C cards
- Control loops
- Self checking UV flame safeguard
- Labeled terminals and wires
- Power distribution
- Area lighting
- Pressure volume control
- Motor starters
- 120 V transformer

Optional RL Equipment

	Included	Not included	Optional Price
• Installation			X
• Foundations		X	
• 3O4 /nitronic SS wetted surfaces, valve, fan, and stack	X		
• Positive draft fan and motor	X		
• Induced draft fan and motor		X	
• Variable Frequency Drive (VFD)	X		
• Free-standing exhaust stack & manifolds	X		
• Stack platform		X	

DÜRR

~~• Re-circulation for maximum turn down~~		~~X~~	
• Wonderware with AB PLC	X		
• Natural Gas Injection	X		

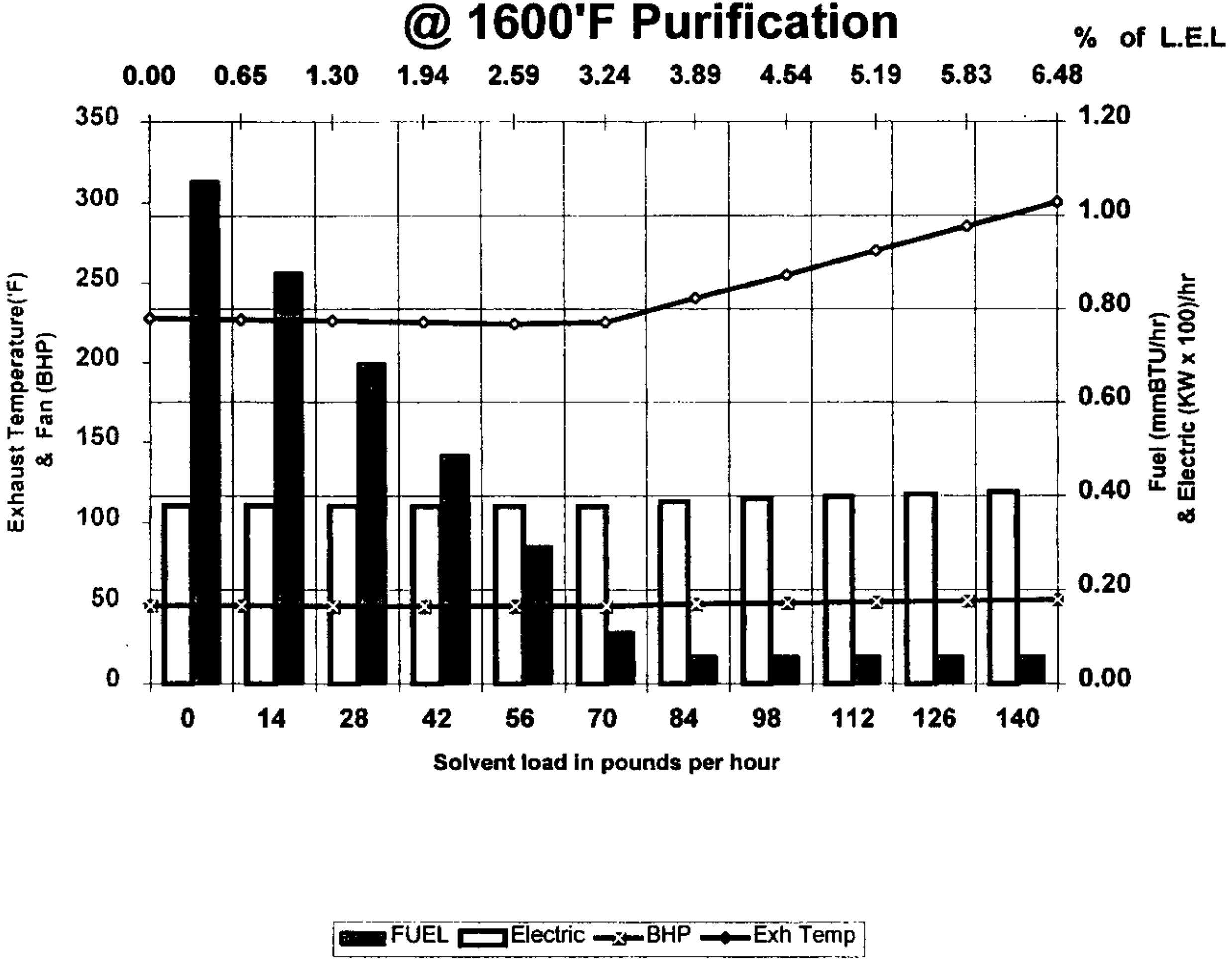
DURR RL Process Design Data

Date :	20-Jul-01	**N.G.I.**	yes
Data input by :	Durr Environmental Inc.	**Thermal Efficiency**	95
Company Name :	GP	**Number of Units**	1
Location:	Various	**Type**	RTO
Re-Therm Model RL	10	**Proposal #**	01-RLP-0720

Process Data Input

====================	**Maximum Design**	**Operating Case**	**Units**
Process Exhaust Volume	10,000	10,000	wSCFM
	11,500	11,500	ACFM
Process Exhaust Temp	150	150	deg F
Total Contaminants	140	35	lb/hr
TRS	100	100	PPMv
Methanol		200	PPMv
other		150	PPMv
Heat Value	12,500	12,500	BTU/lb
Average MW of VOC	44	44	as propane
Maximum BTU/HR Load	437,500	437,500	BTUs/HR
Solvent Auto-ignition Temp.	450	450	deg F
Inlet Concentration as VOC.	2,053	476	PPMv propane
Inlet Concentration as CH4.	5,644	1,411	PPMv CH4
Approx. % of LEL	16	16	% of LEL
Purification Temperature	1,800	1,600	deg F
Inlet Static Pressure	2.00	2.00	inches W.C.
Site Elevation A.S.L	100	100	feet

Durr RL RTO Operating Conditions @ 10,000 wSCFM @ 150 'F with NGI @ 1600'F Purification



Guarantees

VOCs

DURR guarantees that the RL will convert 99% or more of the total volatile organic in the inlet stream to carbon dioxide, water, and non-combustibles, down to a minimum of **20 PPMv measured as carbon** in the exhaust stream.

NO_x

DURR guarantees that the RL outlet emissions of NO_x will not exceed 10 PPMv measured as NO_2 (uncorrected), provided there are no NO_x or nitrogen bearing compounds contained in the inlet stream to the RL.

CO

DURR guarantees that the RL outlet emissions of CO will not exceed 50 $PPMv_v$ measured as CO (uncorrected).

General

The following provisions apply to all of the above guarantees:

- The process exhaust flow will not exceed specified value and the process conditions are as given in the process design data page of this proposal.
- The performance will be based on five test samples taken consecutively, of which the high and low value will be discarded. The test result will be arithmetic average of the three remaining tests.
- The performance guarantees apply only during normal operation, not during any maintenance procedures.
- If DURR fails to meet the Performance Guarantee, DURR will be given reasonable time to investigate and take corrective action within the scope of this contract.
- All performance tests will be arranged and paid for by Purchaser. DURR will be notified in writing 14 days prior to the tests.
- EPA Methods 7E, 10 and 25A are used to determine NO_x, CO and VOC performance, respectively.
- Methane is excluded from outlet emissions.
- The RL is installed and operated in accordance with DURR's Operating and Maintenance Instructions.

Field Service & Installation

Start-up and Training

Forty hours of start-up and training are included in the base equipment price. As part of the forty hours, DURR will conduct one 8-hour training course at Purchaser's site.

Installation (Optional)

- Installation is not included unless specified as an option on the price page.
- DURR can provide complete installation services at an additional cost. Call your sales representative for pricing.

Installation Supervision (Optional)

- No installation supervision is included unless specified as an option on the price page.
- DURR can provide a qualified representative at an additional cost. Call your sales representative for current pricing.

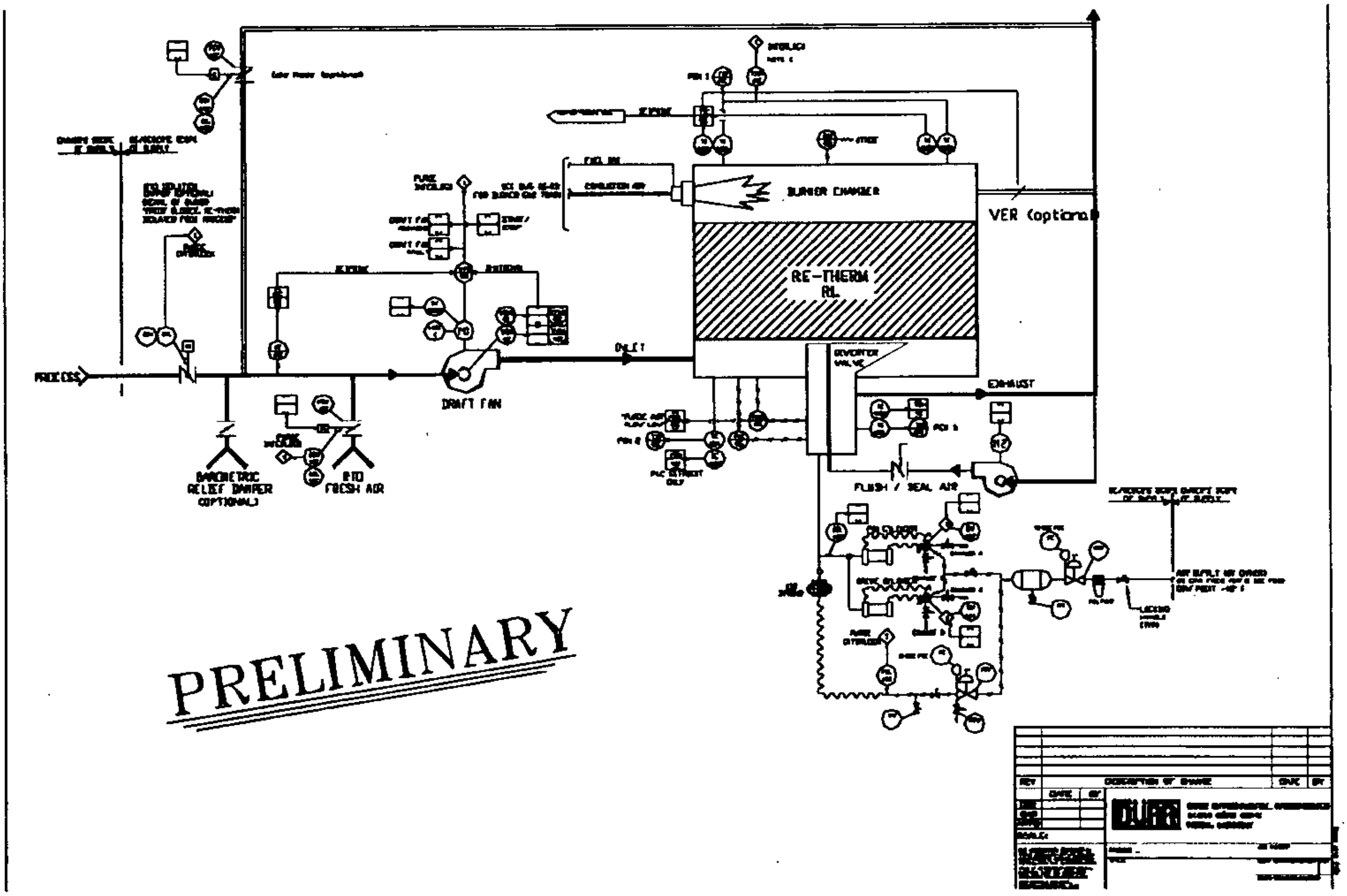
Supplied by Purchaser

- Locate, supply and install foundations including anchor bolts.
- Supply the following utilities to the connection point on the RE-THERM RL unit:
- Power voltage: 480V (or 4160V), 3 Ph, 60 Hz - 1 feed required.
- Fuel: adequate supply of natural gas at 1,000 BTU/ft^3 and regulated to 5.0 psig steady.
- Compressed air: 10 cfm supply of clean, dry compressed air at 80 psig and a -40'F dewpoint.
- Sub-station transformers and line isolators, if required.
- Sprinkler system or other fire or explosion protection systems as may be required by insurance company, governmental or local authorities.
- System ductwork including process isolation, spill dampers, inlet manifold, outlet manifold, and pressure relief dampers unless specifically quoted and purchased from DURR.
- Insulation (if necessary) of RE-THERM inlet and outlet duct manifolds, fans and other hot exposed ductwork.
- FM or IRI approval submittals.
- Necessary permits and approvals as may be required by any and all insurance, governmental agencies or local authorities.
- Applicable sales, use, excise or similar taxes.

Additional Field Services

- Additional field services are available, if necessary, at DURR's standard start-up/instructional service rates. Please contact your sales representative for current pricing.

Typical P&ID


PROCESS
BAROMETRIC RELIEF DAMPER (OPTIONAL)
RTO FRESH AIR
DRAFT FAN
INLET
BURNER CHAMBER
RE-THERM RL
VER (optional)
DIVERTER VALVE
EXHAUST
FLUSH / SEAL AIR
DÜRR

EISENMANN CORPORATION
BUDGETARY PROPOSAL NO. A82-068

COMPACT VALVELESS REGENERATIVE THERMAL OXIDIZER

FOR

GEORGIA PACIFIC
ATLANTA, GA

SEPTEMBER 6, 2001

TABLE OF CONTENTS

GENERAL TECHNICAL DATA

Operating Conditions

Exhaust Flow Rate	:	8,310 scfm (10,000 acfm)
Exhaust Inlet Temperature	:	160°F
Combustion Temperature	:	1,500°F
Burner Operating (No VOC)	:	1.4 MMBtu/hr
Burner Installed	:	4 MMBtu/hr
Fan Motor Operating (Incl. -2.0" W.C. Inlet & +1" W.C. for Stack)	:	42 bhp
Fan Motor Installed	:	50 hp
Fan Motor Turndown (Max. to Min.)	:	60 Hz to 15 Hz
System Pressure Drop	:	13.5 inches W.C.
System Destruction Efficiency	:	99%
System Thermal Efficiency	:	93%
Clean Air Outlet Temperature	:	94°F+ above inlet
System Weight	:	60 tons
Dimensions	:	12 feet x 38 feet

GENERAL SYSTEM DESCRIPTION

The process stream from the system exhaust vents is collected and sent to the VRTO-C system.

The process fan is operated by a VFD, which maintains a constant pressure in the duct. The fan directs the flow to the inlet of the VRTO-C.

Once within the VRTO-C unit, the exhaust will be directed by the rotating distributor to the appropriate sections of hot ceramic heat exchanger media. The heat exchanger bed is comprised of eight separate chambers. At any given moment, the exhaust moves upward through three and downward through three. The remaining chambers act as a sealed buffer between dirty and clean air. The exhaust will pass vertically upward through media taking on the heat and raising the air temperature close to the combustion temperature.

In the combustion area, the burner will provide additional energy to reach the temperature of approximately 1,500°F. This operating temperature oxidizes the VOCs and cleans the air. The clean heated air passes down through separate sections of the exchanger media returning its heat back to the system. A continuous purge cleanses the chambers before allowing cleaned air to exhaust through.

The patented EISENMANN rotating distributor continuously turns, shifting which section of the media is in the upward, downward or purge cycle. In this manner, a constant thermal efficiency and pressure drop is maintained.

The cleaned exhaust then passes from the VRTO-C to the EISENMANN provided 50 ft. clean air stack.

Vessel material of construction 316L.

UTILITY DATA

Electrical

Operating Conditions

VRTO-C Supply Fan
Quantity : 1
Operating : 1 x 42 bhp @ 460 vac
Connected : 1 x 50 hp @ 460 vac

Combustion Blower
Quantity : 1
Operating : 1 x 8.0 bhp @ 460 vac
Connected : 1 x 15.0 hp @ 460 vac

Air Distributor Drives
Quantity : 1
Operating : 1 x 0.75 bhp @ 460 vac
Connected : 1 x 1.0 hp @ 460 vac

Natural Gas

VRTO Burner
Quantity : 1
Operating (No VOC) : 1 x 1.4 MMBtu/hr
Connected : 1 x 4 MMBtu/hr

Compressed Air : None

Water : None

Ventilation : None

Steam : None

OPERATING COSTS

Natural Gas

Rate	: $5.00 per MMBtu
Total Btu (Including VOC)	: 1.4 MMBtu/hr
Hourly Cost	: $ 7.00 per hour

Electrical Power

Rate	: $0.05 per kW
Total Operating	: 51 bhp/38 kW
Hourly Cost	: $ 1.90

Yearly Maintenance Costs

Routine maintenance requirements, 50 man hours.
Yearly Eisenmann supervised inspection, 2 man days at rates shown on page 9. Parts, materials, labor and equipment not included.

GUARANTEES

100% Uptime Guarantee

EISENMANN guarantees that the VRTO will be able to treat exhaust 100% of the time when the system is operated in accordance to EISENMANN's operating and maintenance manual and within the design parameters of the system. In the event that the VRTO system is unable to treat exhaust during the base one (1) year warranty period, EISENMANN will extend the warranty an additional 3 months on the VRTO housing, ceramic and insulation for every occurrence during the base warranty period. The total warranty period with any extension(s) is limited to five (5) years after initial start-up. Supporting documentation will be required prior to the extension of the warranty.

24/7/365 Response Emergency Response

EISENMANN provides 24/7/365, 24 hours a day and 7 days a week, response to emergency calls. On calls outside of the normal business hours of 8 a.m. to 5 p.m. CST, Monday through Friday, the emergency pager will be activated. Upon receiving a page, an EISENMANN engineer will respond to the emergency call within 60 minutes. If your call is not responded to within 60 minutes, EISENMANN will dispatch a field technician to the plant to inspect the system free of charge.

ADVANTAGES OVER OTHER RTO SYSTEMS

- EISENMANN's patented design is the only damperless, single vessel unit proven in the market. A rotating distributor shifts the exhaust through the heat exchanger eliminating the pressure shocks associated with dampers. Standard EISENMANN design guarantees inlet pressure fluctuations of less than +/- 0.10 inches wc fluctuation. Typically, less than +/-0.05 inches wc is achieved. Multiple vessel RTOs with dampers and valves achieve no better than +/-0.50 inches wc.

- The high maintenance associated with damper type RTOs is eliminated. Valved or dampered systems require activation of valves every two minutes at the minimum. During vessel "switchover", untreated fumes may escape to the exhaust stack. The EISENMANN system replaces the pneumatics, actuators, dampers, linkage and lubricants with a simple rotating distributor that is driven by one exterior mounted 0.75 Bhp motor and gearbox. The inner shell and wedge walls (heat transfer area) of the vessel are constructed of 309 stainless steel for a long service life.

- A simpler design with fewer moving parts results in higher uptime reliability.

- The damperless design enables the fan to be located at the inlet to the oxidizer which reduces the cost of the fan and lowers the motor sizing by up to 15%.

- The EISENMANN VRTO-C offers consistent VOC removal efficiency. A damper RTOs removal efficiency deteriorates over time because of poor seating of the dampers. The VRTO-C will have the same DRE after 50,000 hours of operation.

SCOPE OF DELIVERY

By EISENMANN

- Skid Mounted Compact Valveless Regenerative Thermal Oxidizer - Complete with fuel gas burner, forced draft fan and VFD, structured ceramic media, rotary exhaust distributor and insulation
- Interconnecting ductwork between EISENMANN supplied components
- Flexible connectors to allow for thermal expansion as required
- Insulation and cladding to maintain OSHA standards
- Turnkey control panel with graphic interface
- Clean air stack
- Mechanical and electrical installation
- Installation supervision and start-up
- Freight to Alabama site

By Others

- Concrete pad
- Gas drops (5 psi) to the skid connection point
- Required power connection to tie-in points
- Exhaust duct from the process equipment to the fan inlet
- Emissions testing and certification
- DCS connection
- Fan inlet flexible connector and isolation damper

Per Diem Costs

Per diem (8 hour day) time:

- $ 1,000 per day Monday through Friday
- $ 1,500 Saturdays
- $ 2,000 Sundays

Plus travel and living expenses will be billed at cost.

Drawings

This is the typical drawing list from our VRTO-C operating and maintenance manual.

- VRTO-C flow schematic
- Block schematic
- General arrangement
- Lower section assembly
- Gas train

BUDGETARY PRICING

Base Price

Supply one (1) compact valveless regenerative thermal oxidizer (VRTO-C) as described in this proposal including site supervision and training. The system is designed for 8,310 scfm @ 160°F.

Total Lump Sum Equipment, Design, Freight and Installation	$	450,000.00

Option 1 – Budgetary Option Pricing

Three (3) year spare parts. Rotor drive motor and gear box, drive shaft, rotor support bearing, damper actuator, high temperature grease, door gasket, process fan bearings, flame rod, burner spark plug, combustion thermal couple.

Option 1	$	25,000.00

Delivery

Delivery to Site	:	14 weeks
Installation	:	1 week
Start-Up and Training	:	1 week
Total	:	16 weeks

EISENMANN CORPORATION

Wade S. Klos
Sales Group Leader
Clean Air Technology

Howard Hohl
Sales Manager
Clean Air Technology

Brown, Jeffrey W.

From: HHohl@aol.com

Sent: Friday, September 07, 2001 5:04 PM

To: Brown, Joe E.; jonbake@bellsouth.net; wade.klos@eisenmann.com; mark.west@eisenmann.com; egmcgee@hotmail.com

Subject: Georgia Pacific MACT I, Phase 2 Budgetary A82-068

Jeff:

Here is our budgetary proposal to abate vapors from a series of brownstock washers and storage tanks. The vent stream will be mostly methanol with small amounts of TRS compounds.

We look forward to speaking with you in the near future. Our local contact is Mr. Jon Baker with Crocker and Assoc. Jon can be reached at 770.246.6195. In the interim if you have any questions or comments please do not hesitate to contact Eisenmann direct at the numbers shown below.

Thank you.

Howard Hohl
DIRECT PH: 630.681.9604
CELL PH: 630.215.3979
CORP PH: 815.455.4100, x6066

GEORGIA-PACIFIC PREVIOUSLY SUBMITTED RESPONSES

Dave Buff

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P.O. Box 919
Palatka, FL 32178-0919
(386) 325-2001

January 3, 2003

Mr. Syed Arif
State of Florida
Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399

Re: DEP File No. 1070005-019-AC (PSD-FL-264A)
Georgia-Pacific Palatka Operations
No. 3 Bleach Plant

Dear Mr. Arif,

The following is in response to your request for additional information dated November 26, 2002. Please note that the items are listed in the same order as in the letter mentioned above for convenience.

1. **Request**: *Please provide the total pulp production at the facility for the years 1999, 2000 and 2001. Also, give a breakdown of where this pulp was utilized in the facility (bleached and unbleached areas). Additionally, provide a detailed accounting of this pulp when utilized in the tissue-making mill. If additional pulp was bought during those years, please include that in the accounting. The Department is expecting a complete material balance of the pulp produced in the facility and the pulp bought by the facility when compared to the material shipped from the facility.*

   Response: Please see Table 1 (see Attachment A). Note that pulp produced is back calculated from actual paper machine production. The mill also purchases both pulp and finished tissue in "parent" rolls. The purchased pulp, along with the virgin pulp, is utilized in manufacturing product at the Palatka Mill. The tissue "parent" rolls are converted into finished goods at the Mill – these rolls are only processed in the converting area of the Mill and do not add additional production to the pulp mill, bleach plant, or machine areas.

2. **Request**: *Please give a detailed accounting of how much of softwood and hardwood was utilized in the total pulp production at the facility for the years 1999, 2000 and 2001. How are the two types of woods segregated when feeding*

to the digesters? How is the pulp kept segregated and is there any blending of the pulp taking place prior to making final product.

Response: Please see Table 1. Hardwood and softwood chips are segregated into different chip silos prior to use, and are cooked separately in the digesters. The subsequent pulp is also segregated by species in different high-density pulp storage towers and is blended just prior to the paper machines as needed for the various paper grades.

3. **Request**: *During the plant trip on November 12, the No. 3 Bleach Plant was operating at 30 tph. Please indicate if the production rate was 30 ADTBP per hour.*

   Response: The production rate was 30 unbleached oven-dry standard tons per hour as measured going into the pre-bleach washer.

4. **Request**: *During the plant trip on November 12, the facility personnel talked about a chart at the No. 3 Bleach Plant presentation, which indicated reduced usage of ClO_2 and increased usage of oxygen and hydrogen peroxide to get the same bleach ability. If testing was done to authenticate this fact, please provide the necessary documents. Also, provide a detailed written description as well as the chart showed to the Department.*

   Response: No lab simulated testing was done to authenticate the results of the work done in reducing ClO_2 by using more hydrogen peroxide. No permanent changes to oxygen application rates were made during this time period based on trial and error results. The results presented were based on lb/ton application rates as measured by the inline instrumentation, and were obtained by trial and error experimentation.

   Charts 1 and 2 below illustrate the trial and error work that was completed, demonstrating a shift of work from ClO_2 in the first stage to hydrogen peroxide in the second stage. The last six weeks of data that were in the original presentation have been omitted due to an instrumentation failure that was identified subsequent to DEP's visit. (note, this paragraph needs to be indented to match the prior paragraph)

Chart 1

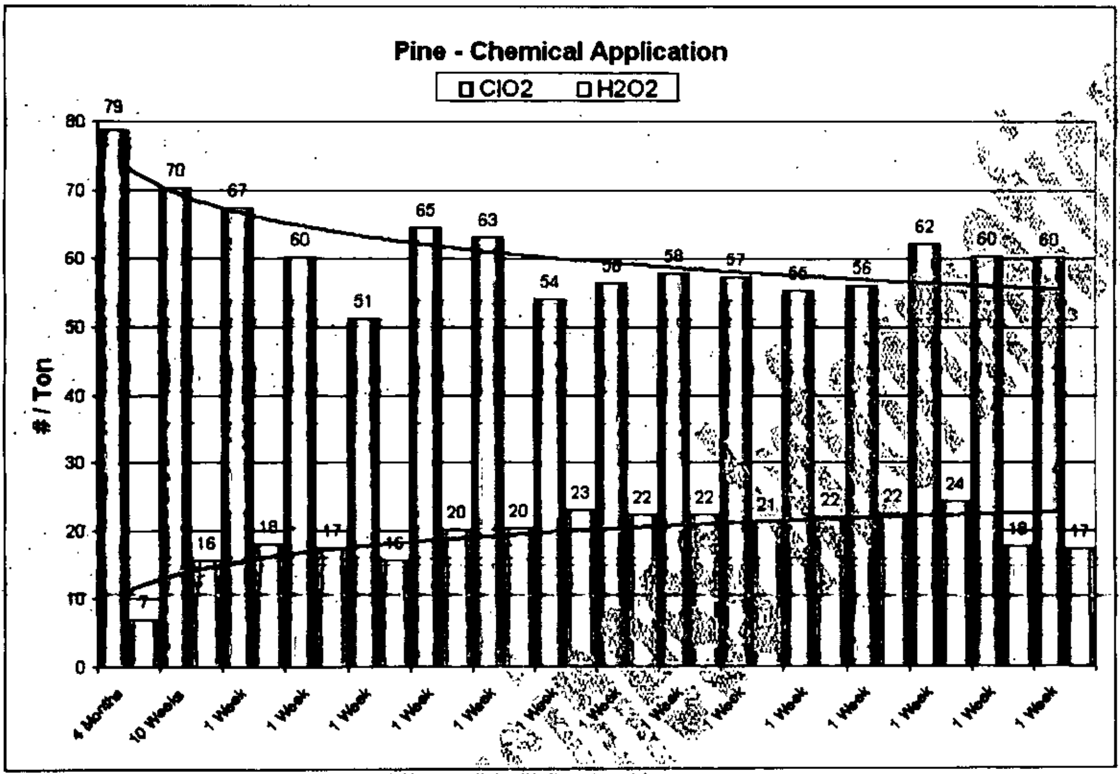
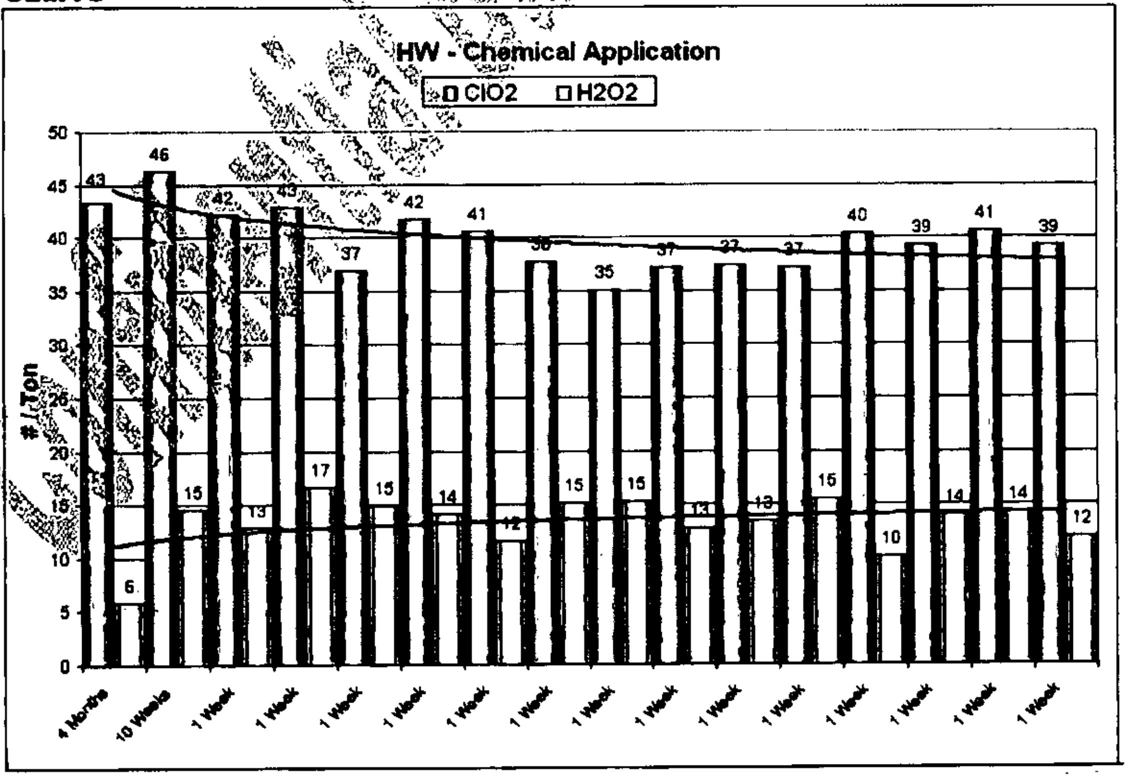


Chart 2



5. **Request**: *Please indicate if 100% of softwood pulp or 100% of hardwood pulp is processed through the bleach plant at any given time. Are there occasions when a mix of the two types of wood pulp is processed at the same time? What indicators are available in the control room to help the operators know what type and how much of either hardwood or softwood pulp is being processed.*

   Response: Softwood and hardwood are almost always processed in the bleach plant separately and are never intentionally mixed. However, the grade mix required by the machines requires the bleach plant to make frequent species changes. Therefore, it is not uncommon for more than one species to be in different stages of bleaching within the bleach plant at a given point in time. The bleach plant was designed to minimize mixing; however, there is a small amount of inadvertent mixing (typically 10~20 ADTBP) that occurs with each transition. The operators are able to approximately monitor the location of each species volumetrically in the bleach plant by tracking the origin of the pulp flow since the pulp is segregated in different pulp storage towers. This allows the distributed control system (DCS) to display the current species in each sequence of bleaching, allowing the operator to make adjustments as required.

6. **Request**: *Please explain how the ClO_2 application rate to the pulp is monitored. If data is kept on the application rate, how often is it recorded?*

   Response: Both the ClO_2 flow rate and strength are measured continuously by inline instrumentation. The pulp tonnage rate is measured by inline flow and consistency measurement instrumentation as well. This information is then converted into a lb/ton application rate. Operators record ClO_2 application information on their log sheets on an hourly basis during normal operation.

7. **Request**: *Please provide a copy of the initial and annual compliance tests done for this plant. The report should include information on the production rate of the bleach plant during the compliance tests.*

   Response: The reports are attached (Attachment B).

8. **Request**: *The Department is in receipt of daily pulp production data covering a period from January 2000 until October 2002 (34 months). The daily bleached pulp production data indicates a highest daily production rate of 1197.9 tons on June 30, 2002, and a highest monthly average of 884 tons per day in September 2002. Please explain the reasons for not achieving the permitted production rates of 1702 tons daily maximum and 1350 tons per day monthly average for the No. 3 Bleach Plant.*

   Response: The Bleach Plant, as built, is capable of producing 1440 bleached air-dry standard tons per day rather than the initial design rate of 1702 tons per day. As such, this update has been reflected in the more recent application.

Current grade mix on the paper machines does not require us to produce at the "as built", maximum rate. However, market conditions change frequently based on customer preferences and economic conditions. Therefore, the bleach plant was designed and built to meet these changing market conditions, and G-P wishes to be permitted for such operations.

9. **Request**: *Please provide detail test reports of the series of tests conducted in October 2002 to measure actual CO emissions from the plant.*

   Response: See Attachment C.

10. **Request**: *Please provide the ClO_2 application rate for the series of tests conducted in October 2002.*

    Response: See Attachment C. (See yellow page).

11. **Request**: *Please list the pertinent information (% ClO_2 applied, kappa number, temperature etc.) that a compliance inspector should gather during an inspection of a bleach plant to ensure that the source is complying with the permitted CO emission limits. How will these parameters or others provide assurance that the limit is not exceeded?*

    Response: Emissions data for carbon monoxide emissions from bleach plant scrubbers first became available to the pulp and paper industry through the National Council for Air and Stream Improvement, Inc. (NCASI). NCASI Technical Bulletin 760 (TB 760) (July 1998) provides information on carbon monoxide emissions associated with oxygen delignification and chlorine dioxide bleaching of wood pulp. In numerous sections of the document, NCASI repeatedly states that the operating parameter correlations are not strong, and in many cases are non-existent (in the case of hardwood bleaching). For example, in the Introduction to TB 760, it is stated that, "Data from mill-conducted tests for CO emissions from 14 bleach plants at kraft pulp mills have already been reported in NCASI Technical Bulletin No. 701 (NCASI 1995). These data showed tremendous variability between mills, with CO emissions ranging from 0.003 to 1.73 lb per air dry ton of bleached pulp (lb/ADTBP). The causes for this variability were, however, unclear."

    Further, later in TB 760, when comparing CO emissions between two mills (Mills B and C),NCASI specifically states that, "The magnitude of CO emissions at Mill C appear comparable to those recorded at Mill B. This is in spite of ClO_2 application rates in this mill being less than half of those at Mill B." In the concluding paragraph of this same section, NCASI states that, "The available literature suggests that the lignin content of the brownstock entering the bleach plant and the ClO_2 charge would be the two main parameters controlling CO formation. However, since the ClO_2 charge for a desired pulp brightness is determined by the lignin content or kappa number of pulp entering the bleaching sequence, the ClO_2 charge by itself would be expected to be the controlling parameter in CO formation...A general trend of increasing CO emissions with increasing percent ClO_2 applied is seen, but the correlation is not strong".

In recent conversations, NCASI staff have strongly discouraged Georgia-Pacific from using the NCASI data from TB 760 in establishing emission factors. In TB 760, NCASI has attempted to simply present data for varying operating configurations (*e.g.*, bleach plant stages/configurations, percent chlorine dioxide applied, wood species, presence/absence of oxygen delignification, etc.). While some trends appear, as they state clearly and repeatedly in TB 760, the correlations are not strong.

Given this information, and general lack of data, Georgia-Pacific feels strongly that it is not appropriate to establish parametric values to be used in demonstrating compliance. This is not only supported by testing at the Palatka Mill, but by the full array of mills that was tested by NCASI. Georgia-Pacific feels that the annual stack-testing requirement should be sufficient to demonstrate compliance with the emission limit. If additional information becomes available in the industry in the future, indicating that the correlations are stronger, it might be possible to revisit this possibility. However, at this time, the correlations are simply not developed.

For the same reasons stated above (*e.g.*, lack of correlation with operating parameters), Georgia-Pacific felt that it was necessary to incorporate a safety margin into the emission factors that were utilized in the permit application. TB 760 indicates that, for given testing scenarios and runs, the emission values can vary considerably - the standard deviations that are presented in TB 760 are often very high.

12. **Request**: *Please explain if there is a nexus between ClO_2 application rate and HAP emissions from a bleach plant. If a nexus exists, how is it being applied to keep HAP emissions to a minimum from the plant?*

    Response: In attempting to answer this question, Georgia-Pacific has reviewed various literature that is readily available in the industry, primarily through NCASI. NCASI Technical Bulletin 701 (TB 701) states that, "Volatile organic and chlorinated compounds most prominent in bleach plant emissions included Cl_2, ClO_2, methanol (CH_3OH) and chloroform ($CHCl_3$)". Of these, only ClO_2 is not a regulated hazardous air pollutant (HAP) under Section 112(d) of the Clean Air Act.

    For the most prominent of these, methanol, TB 701 states that, "Emissions of methanol from bleach plant vents are affected by various factors including (a) the type of wood pulped (hardwood vs softwood), (b) O_2 delignification preceding the bleach plant, (c) percent substitution by ClO_2, (d) amount of methanol in ClO_2 solution used in bleaching, and (e) degree of removal of methanol from pulp in brownstock washing." NCASI does not identify ClO_2 application rate as a contributing factor to methanol formation. In Technical Bulletin 666 (TB 666), NCASI discusses some of these other factors in more detail. For example, with regard to ClO_2 substitution rate, TB 666 states that, "These data show, however, that when the impact of methanol entering with the pulp and the ClO_2 liquor was eliminated, the amount of methanol generated in the bleach plant decreased with increasing levels of ClO_2 substitution. This decrease in methanol formation was gradual up to 70 percent ClO_2 substitution but was very significant at 100 percent ClO_2 substitution". The Cluster Rule targets methanol emission reductions at the brownstock washers. Therefore, we expect that the quantity of methanol entering the bleach plant with the pulp will be reduced as the Cluster Rule is fully implemented at the Palatka Mill (by April 2006).

For chloroform, TB 701 states that, "The bleaching sequence (which influences the bleaching chemicals used) and level of bleaching (final brightness) are expected to affect emissions of Cl_2, ClO_2, and $CHCl_3$...The use of hypochlorite is perhaps the single largest factor influencing the formation and emission of $CHCl_3$ from bleach plant vents". The preamble to the Cluster Rule, which is targeted at reducing HAPs in the bleach plant and other mill areas, states that, "...the technology basis for MACT control of chloroform is complete chlorine dioxide substitution and elimination of hypochlorite as a bleaching agent. These process modifications were determined to reduce chloroform emissions significantly". Again, there is confirmation of the fact that the primary contributor to the formation of chloroform, a chlorinated HAP, is the use of hypochlorite in bleaching. In order to comply with the MACT/Cluster Rule requirements for reducing HAPs, the Palatka Mill practices 100 percent chlorine dioxide substitution. Hypochlorite bleaching is not utilized. Variation in ClO_2 application rate was not identified by NCASI or EPA (as part of the MACT development process) as a significant contributing factor to the formation or reduction of chloroform. It should also be noted that the Cluster Rule establishes a very tight control level for chlorinated HAPs of 0.002 pound per ton of oven-dried pulp (lb/ODTP). Based on recent testing, measured levels at the Palatka Mill were roughly an order of magnitude lower.

13. **Request**: *Please explain how the quantity of lignin in the pulp entering the bleach plant is being monitored and what role, if any, is that playing in the ClO_2 application rate.*

    Response: Kappa number has been proven to be a good relative indicator of lignin content in pulp. An inline kappa analyzer measures the kappa number of the pulp entering the bleach plant. The DCS uses this kappa measurement as one of the criteria for determining ClO_2 application rate, but final pulp brightness is the principal parameter used to control the operation of the Bleach Plant. (question – do we want to say something about the fact that final pulp brightness is something that is dictated by the customer and the specific product being manufactured.

14. **Request**: *The application pages under Section I, Page 20 proposes 3-hour average basis for monitoring pH of the gas scrubbing medium, fan amperage of the bleaching system vent gas fan and the scrubber recirculation flow. Please indicate if continuous monitoring of these parameters is required in 40 CFR 60, Subpart S. If so, EPA will have to approve this request.*

    Response: Continuous monitoring is required by 40 CFR 63.453 (c). Paragraph (n) of this same section requires that the Administrator approve the rationale for the selected operating parameter value, and monitoring frequency, and averaging time. Attachment C includes information provided to both the Department and the Administrator relative to this provision. The Northeast District worked with EPA on specific language in the draft Title V Permit Revision recently provided to us incorporating the parameter values, monitoring frequency, and averaging time (see Attachment D).

The responses to the remaining items (Nos. 15-20) in your letter dated November 26, 2002 will be provided under separate cover. We have contracted with an outside engineering firm to finalize our BACT analysis and expect to have the final response to the Department by February 1, 2003.

With the "completed responses" provided above, and those regarding the BACT analysis to be provided by February 1, we believe we will have fulfilled our obligation to submit a "complete application" no later than February 1, as required by paragraph 17 of the November 8, 2002 Consent Order and consistent with Rules 62-212.400 and 62-4.055. Please let me know promptly if the Department disagrees, so that we can consider whether we need to seek an extension to the Consent Order deadline.

If you have any further questions, please do not hesitate to call me at (386) 329-0918.

Sincerely,

Myra J. Carpenter

Myra J. Carpenter
Environmental Superintendent

Cc:
W.M. Jernigan
T. Wyles
M. Aguilar
S.Matchett

Attachment A

Georgia-Pacific Palatka Pulp & Paper Operations

Analysis of Material Shipments to Pulp Tons

Material Shipments out of Mill	1999	2000	2001
Kraft Shipments	317,527	302,430	284,872
Tissue Shipments	244,152	240,394	219,563
Total	561,679	542,824	504,435
Inventory Change	(7,436)	7,141	6,840
Net Shipments +/- Inventory Change	554,243	549,965	511,275
Purchased Paper Consumed	19,833	19,697	6,853
Net Tons Requiring Fiber	534,410	530,268	504,422
Pulp Tons Utilized			
Hard Pine Pulp	272,878	267,656	235,545
Soft Pine Pulp	192,533	179,778	183,869
Hardwood Pulp	111,674	133,276	134,049
Total Production	577,085	580,710	553,463
Average Moisture Loss of 5%	28,854	29,036	27,673
Bleaching Loss of 10%	27,380	28,176	28,580
Net Pulp Tons	520,850	523,499	497,210
Purchased Pulp	11,574	5,557	5,403
Total Pulp Consumed	532,424	529,056	502,613
Variance	1,986	1,212	1,809

Note:

Bleached Pulp Tons by Year	273,803	281,756	285,801

Variance reflects less than 0.5% of total shipments out of mill

Attachment B

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P.O. Box 919
Palatka, FL 32178-0919
(386) 325-2001

November 13, 2002

VIA FAX (904) 448-4363

Mr Christopher L. Kirts, P.E.
State of Florida
Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590

RE: Georgia-Pacific Corporation
Facility 1070005

Dear Mr. Kirts:

As you know, the Palatka mill conducted an initial performance test on the bleach plant scrubber stack in May 2001 and submitted the throughput rates and stack test results to the Department on June 11, 2001. The mill's submittal did not include other detailed information about chemical application rates, Kappa number, or the specific production mix (in terms of hardwood/softwood) being run at the time.

Enclosed is a table that contains additional information about the three test runs from that event. Also enclosed is a stack test report from the first three stack tests that were conducted during the week of October 28, 2002. Georgia-Pacific considers information about its chemical application rates, Kappa number, and other detailed production parameters to be confidential business information, pursuant to Section 403.111, F.S. This data relates to secret processes or secret methods of manufacture or production and is exempted from the public records act. G-P respectfully requests that you not copy or distribute it except to others in DEP who need to see it.

I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and data contained in this document are true, accurate, and complete.

Feel free to call Myra Carpenter if you have any questions about this information. She can be reached at (386) 329-0918.

Sincerely,

Theodore D. Kennedy

Theodore D. Kennedy
Vice President

tk

cc. W. M. Jernigan
S. Matchett

MAY 25, 2001 PRODUCTION DATA FOR TESTS

Times

5/25/01 21:50 Run 1
5/25/01 22:49

5/25/01 23:02 Run 2
5/26/01 0:01

5/26/01 0:12 Run 3
5/26/01 0:42

5/26/01 1:43
5/26/01 2:13

	Do Stage					Eop Stage		D1 Stage		
	ADTBPH	%SW	%HW	Kappa	%ClO2	%SW	%HW	%SW	%HW	%ClO2
Run 1	50.0	0	100	13.4	0.8	44.1	55.9	100	0	1.0
Run 2	52.6	0	100	13.2	0.8	0	100	67.9	32.1	1.0
Run 3	49.4	0	100	13.8	0.8	0	100	8.0	92.0	0.9

Notes: ADTBPH is air-dried tons of bleached pulp per hour
Kappa is the pre-washer kappa
%ClO2 is the %ClO2 applied in that stage

Please note that the Kappa and Chemical Application Rates are considered Confidential Business Information.

Attachment C

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P O Box 919
Palatka, FL 32178-0919
(386) 325-2001

November 13, 2002

VIA FAX (904) 448-4363

Mr Christopher L Kirts, P E
State of Florida
Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590

RE Georgia-Pacific Corporation
Facility 1070005

Dear Mr Kirts

As you know, the Palatka mill conducted an initial performance test on the bleach plant scrubber stack in May 2001 and submitted the throughput rates and stack test results to the Department on June 11, 2001 The mill's submittal did not include other detailed information about chemical application rates, Kappa number, or the specific production mix (in terms of hardwood/softwood) being run at the time.

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Sincerely

Theodore D. Kennedy

Theodore D Kennedy
Vice President

tk

cc A. M. Jernigan
S. Marchett

MAY 25, 2001 PRODUCTION DATA FOR TESTS

Times

5/25/01 21:50	Run 1
5/25/01 22:49	
5/25/01 23:02	Run 2
5/26/01 0:01	
5/26/01 0:12	Run 3
5/26/01 0:42	
5/26/01 1:43	Run 3 continued
5/26/01 2:13	

	Do Stage					Eop Stage		D1 Stage		
	ADTBPH	%SW	%HW	Kappa	%ClO2	%SW	%HW	%SW	%HW	%ClO2
Run 1	50.0	0	100	13.4	0.8	44.1	55.9	100	0	1.0
Run 2	52.6	0	100	13.2	0.8	0	100	67.9	32.1	1.0
Run 3	49.4	0	100	13.8	0.8	0	100	8.0	92.0	0.9

Notes
ADTBPH is air dried tons of bleached pulp per hour
Kappa is the pre-washer kappa
%ClO2 is the %ClO2 applied in that stage on weight basis

Please note that the Kappa and Chemical Application Rates are considered Confidential Business Information

TEST REPORT
On
STACK EMISSIONS

From the
BLEACH PLANT WET SCRUBBER OUTLET

In service at
GEORGIA-PACIFIC PALATKA OPERATIONS

Located in
PALATKA, PUTNAM COUNTY, FLORIDA

Prepared for
GEORGIA-PACIFIC CORPORATION

Test Completion Date: October 28th, 2002
Report Submittal Date: November 8th, 2002

Cubix Project No. 7382-FL1

Prepared by

Cubix Corporation

CORPORATE HEADQUARTERS
9225 US Hwy. 183 South, Austin, TX 78747

TABLE OF CONTENTS

INTRODUCTION

Emission testing was conducted on a Bleach Plant wet scrubber at the Georgia-Pacific Corporation (GaPac) Palatka Operations facility located on County Road 216 in Palatka, Putnam County, Florida. Carbon monoxide (CO) and other combustion products were measured in the outlet of the scrubber stack. Cubix Corporation, Southeast Regional Office conducted these tests on October 28th, 2002.

The purpose of this testing was to determine the CO emission rates of the scrubber while bleaching softwood in lieu of hardwood as an engineering study. Three one-hour test runs were conducted on the unit documenting process operating data, emission concentrations, and mass emission rates.

The tests followed the principles of the procedures set forth in the Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 4, and 10. Table 1 summarizes the background information pertinent to these tests.

This report has been reviewed and is approved for submittal by the following representative:

Leonard

Cubix Corporation

TABLE 1
Background Data

Source Owner:

Georgia-Pacific Corporation
County Road 216
Palatka, Florida 32177
Attention: Joe E. Taylor
(386) 329-0027 Phone
(386) 328-0014 Facsimile
Email: JETAYLOR@GAPAC.com

Test Contractor:

Cubix Corporation, SE Regional Office
3709 SW 42nd Avenue, Suite 2
Gainesville, Florida 32608
Attention: Roger Osier, Project Foreman
(352) 378-0332 Phone
(352) 378-0354 Facsimile
Email: rosier@cubixcorp.com

Process Description:

This pulp and paper mill produces both natural and bleached Kraft paper grades. Wood pulp is processed at the Bleach Plant in the manufacture of bleached paper products. The process utilizes chlorine dioxide (ClO_2) for the bleaching of pulp. Emissions from all stages of the bleaching process are sent to an alkaline wet scrubber.

Test Date(s):

October 28th, 2002.

Location:

Georgia-Pacific Palatka Operations is located on County Road 216 in Palatka, Putnam County, Florida.

Emission Sampling Point:

The Bleach Plant scrubber (outlet) stack has two 3" diameter flanged NPT sample ports located 90° to each other in the vertical stack before venting to atmosphere, see Appendix A for stack diagram.

Test Participants:

Georgia-Pacific Corporation
Joe Taylor, Test Coordinator

Test Participants (continued):

Cubix Corporation
Roger Paul Osier, Project Foreman
James Hastings, Field Technician

Test Methods:

Environmental Protection Agency (EPA) Method 1 was used for selection of velocity traverse point locations.

EPA Method 2 was used for conducting stack gas pitot tube measurements used in determination of stack gas velocity.

EPA Method 3a was used for determination of oxygen (O_2) and carbon dioxide (CO_2) concentrations.

EPA Method 4 was used for determination of stack gas moisture content.

EPA Method 10 was used for determination of carbon monoxide (CO) concentrations.

SUMMARY OF RESULTS

GaPac owns and operates Georgia-Pacific Palatka Operations facility in Palatka, Putnam County, Florida. At this facility a wet scrubber is used to collect and control emissions from the Bleach Plant in the bleaching process of wood pulp. The emissions from this scrubber are the subject of this report.

Table 2 is a summary of the testing results for the emissions from the wet scrubber. The summary table contains data recorded during the test from the process feed rate and scrubber operation as supplied by GaPac personnel, ambient conditions, and the measured emissions. The emission rates for CO are reported in terms of parts per million by volume (ppmv) on a dry basis and pounds per hour (lbs/hr).

TABLE 2: Summary of Results
Bleach Plant Scrubber - Softwood Testing

Test Run No.	Run 1	Run 2	Run 3	
Date	10/28/02	10/28/02	10/28/02	
Start Time	09:34	11:27	13:17	
Stop Time	10:34	12:27	14:17	
Unit Operation				**Averages**
Wood Type	Softwood	Softwood	Softwood	-
Production Rate (adtbph)	49.7	49.7	35.0	**44.8**
#ClO_2 (adtbp)	45.8	46.8	49.9	**47.5**
Ambient Conditions				
Atmospheric Pressure ("Hg)	29.98	29.96	29.91	**29.95**
Temperature (°F) : Dry bulb	80.5	84.2	87.6	**84.1**
(°F): Wet bulb	75.5	74.3	74.8	**74.8**
Humidity (lbs moisture/lb air)	0.0174	0.0155	0.0151	**0.0160**
Measured Emissions				
CO (ppmv, dry basis)	955.3	1083.6	951.3	**996.7**
O_2 (% volume, dry basis)	20.76	20.67	20.69	**20.71**
CO_2 (% volume, dry basis)	1.04	1.22	1.03	**1.10**
Stack Volumetric Flow Rates				
via Pitot Tube (SCFH, dry basis)	7.70E+05	8.06E+05	8.19E+05	**7.98E+05**
Mass Emission Rates				
CO (lbs/hr)	53.5	63.5	56.7	**57.9**

Please note that C102 Application Rate is considered Confidential Business Information

Three one-hour test runs were conducted for each required EPA test method on the wet scrubber outlet. CO, O_2, and CO_2 emissions were continuously monitored during each of these runs. Moisture content was determined gravimetrically during each test run using a chilled water impingement system. Stack velocity measurements were performed during each test run.

Pollutant mass emission rates were calculated using the volumetric flow rates determined by EPA Methods 1-4. Examples of mass emission rate calculations and other calculations necessary for the presentation of the results of this section are contained in Appendix B.

Appendix A contains all field data sheets used during these tests. Appendix B contains examples of all calculations necessary for the reduction of the data presented in this report. Operational data obtained during the testing is presented in Appendix C. Records of quality assurance activities are in Appendix D. Certifications of calibration gases and equipment used to conduct tests at this facility are in Appendix E. Appendix F contains a copy of the logged data records of the analyzer monitored emission concentrations.

PROCESS DESCRIPTION

Georgia-Pacific Corporation owns and operates the Georgia-Pacific Palatka Operations facility. In operation since 1947, this pulp and paper mill produces natural and bleached Kraft paper grades. The emissions from the outlet of the wet scrubber located at the Bleach Plant, a stage of the manufacture of bleached Kraft paper products, were measured as an engineering study to determine the effects of bleaching softwood pulp in lieu of hardwood pulp in the system. This section of the report provides a brief description of the process and the wet scrubber outlet.

The bleaching process is an elemental chlorine-free (ECF) process. The process utilizes ClO_2 for the pulp bleaching process. No elemental chlorine or hypochlorite salts are used in the process. The ClO_2 is produced on site.

The bleaching process consists of the staged introduction of ClO_2 to the pulp slurry followed by washing of the bleached pulp. G-P Palatka utilizes a 3-stage bleach plant for this process. The pulp comes across a pre-washer, followed by the D0 stage where ClO_2 is introduced, the E or extraction stage, and the D1 stage where additional ClO_2 is applied. The off gases from all stages of the process are collected and passed through a wet scrubber utilizing an alkaline scrubbing solution.

Sample ports meeting the criteria of EPA Method 1 were located in a straight vertical section of the scrubber stack outlet. The sample ports were greater than 2 stack diameters upstream from the nearest flow disturbance, the elbow just prior to the stack outlet, and greater than 8 diameters downstream from the nearest flow disturbance. Access to the stack was made available via a permanent steel frame platform equipped with a caged safety ladder. The diameter of the exhaust stack was 41.75 inches. Appendix A contains a field sketch of the stack configuration and sample port locations.

GaPac personnel provided operational data from the process instrumentation. Data sets were recorded during each test run; the average of this data was recorded in the summary table. Copies of the original data are contained in Appendix C of this report.

ANALYTICAL TECHNIQUE

The emissions from a bleach plant scrubber were measured to determine the quantity of emissions being emitted to the atmosphere under various operating conditions. The sampling and analysis procedures used during these tests conformed with those outlined in The Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 4, and 10. This section of the report describes the analytical techniques and procedures used during the testing.

The test matrix for the scrubber outlet consisted of three one-hour test runs following each test method specified by GaPac. The stack gas was analyzed for CO, O_2, and CO_2 by continuous instrumental monitors. All exhaust gas analyses were performed on a dry basis. Table 3 lists the instruments and detection principles used for these analyses.

Provisions were made to introduce the calibration gases to the instrumental monitors via two paths: 1) directly to the instruments via the sample manifold quick-connects and rotameters, and 2) through the complete sampling system including the sample probe, filter, heat trace, condenser, sample line, manifold, and rotameters. The former method was used for quick, convenient calibration checks. The latter method was used to demonstrate that the sample was not altered due to leakage, reactions, or adsorption within the sampling system (sample system bias check). An O_2 standard calibration gas was introduced into the O_2 analyzer directly. Then the response from the O_2 analyzer was noted as the calibration gas was introduced at the probe. Any difference between the two responses in the instrument was attributed to the bias of the sample system. Following the span gas bias check, a zero gas bias check was performed on the O_2 analyzer using nitrogen to check for any zero gas bias of the sample system. In accordance with EPA Method 3a, this span and zero bias check procedure was repeated for the CO_2 analyzer. This procedure was also used for the CO analyzer although not required by EPA Method 10.

As shown in Figure 1, a 1-inch diameter stainless steel probe was inserted into the sample port of the stack. The gas sample was continuously pulled through the probe and transported via a 100-foot long, $^3/_8$-inch diameter heat-traced Teflon® line into the mobile laboratory using a stainless steel/Teflon® diaphragm pump. At the pump exit the pressurized sample was pushed into a heated sample manifold. The bulk of the gas stream then passed into a stainless steel minimum contact condenser to dry the sample stream and into the (dry) sample manifold. From the manifold, the sample was partitioned to the analyzers through glass and stainless steel rotameters for flow control of the sample.

Instrumental monitors were housed in an air-conditioned trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e., NO_x calibration gases).

EPA Method 1 was used to determine the velocity traverse point locations. Prior to conducting the tests, a cyclonic flow check was conducted. No significant cyclonic flow was encountered. The stack met the minimum criteria set forth in the method. Pitot tube measurements were made at eight (8) separate traverse points in each stack cross section for a total of sixteen (16) traverse points. The location of the sample ports and the pitot tube traverse point distances for the scrubber stack are denoted in the "Circular Stack Sampling Traverse Point Layout" data sheet, see Appendix A.

EPA Method 2 was used for determination of stack gas velocity during each run. A pitot tube and inclined gauge oil manometer were used to measure the differential pressure at each traverse point. The stack temperature was determined with a K-type thermocouple and digital thermometer.

The stack gas analyses for CO_2 and O_2 concentrations were performed in accordance with procedures set forth in EPA Method 3a. Instrumental analyses were used in lieu of an Orsat or Fyrite procedure due to the greater accuracy and precision provided by the instruments. The CO_2 analyzer was based on the principle of infrared absorption. The O_2 analyzer operated using a paramagnetic detector.

EPA Method 4 was used to measure the moisture content of the stack gas. A chilled water impingement system was used in conjunction with a calibrated dry gas meter to pull a sample greater than 21 scf coincident with each test run. A K-type (chromel-alumel) thermocouple was used in conjunction with a digital thermometer to determine the exit temperatures in the chilled water impingement sampling train. This parameter is measured to ensure that the gas stream is cooled to a minimum of 68 degrees Fahrenheit as required by sampling methodology. Determination of the moisture content was necessary to determine stack gas molecular weights and volumetric flow rates.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous non-dispersive infrared (NDIR) analyzer was used for this purpose. This reference method analyzer was equipped with a gas correlation filter that removes most interference from moisture, CO_2, and other combustion products.

All data from the continuous monitoring instruments were logged into a computer file in 1-minute intervals and rolling 1-minute averages. A data logging system with a computer generated display screen monitored, recorded and averaged the emission concentrations. The program controlling the logging of data was also used to log QA data. See Appendix F of this report for copies of the raw data and Appendix D for the QA data.

Cubix personnel collected ambient absolute pressure, temperature and humidity data. A wet/dry bulb sling psychrometer was used to determine ambient temperature and humidity conditions. An aircraft-type aneroid barometer (altimeter) was used to measure absolute atmospheric pressure.

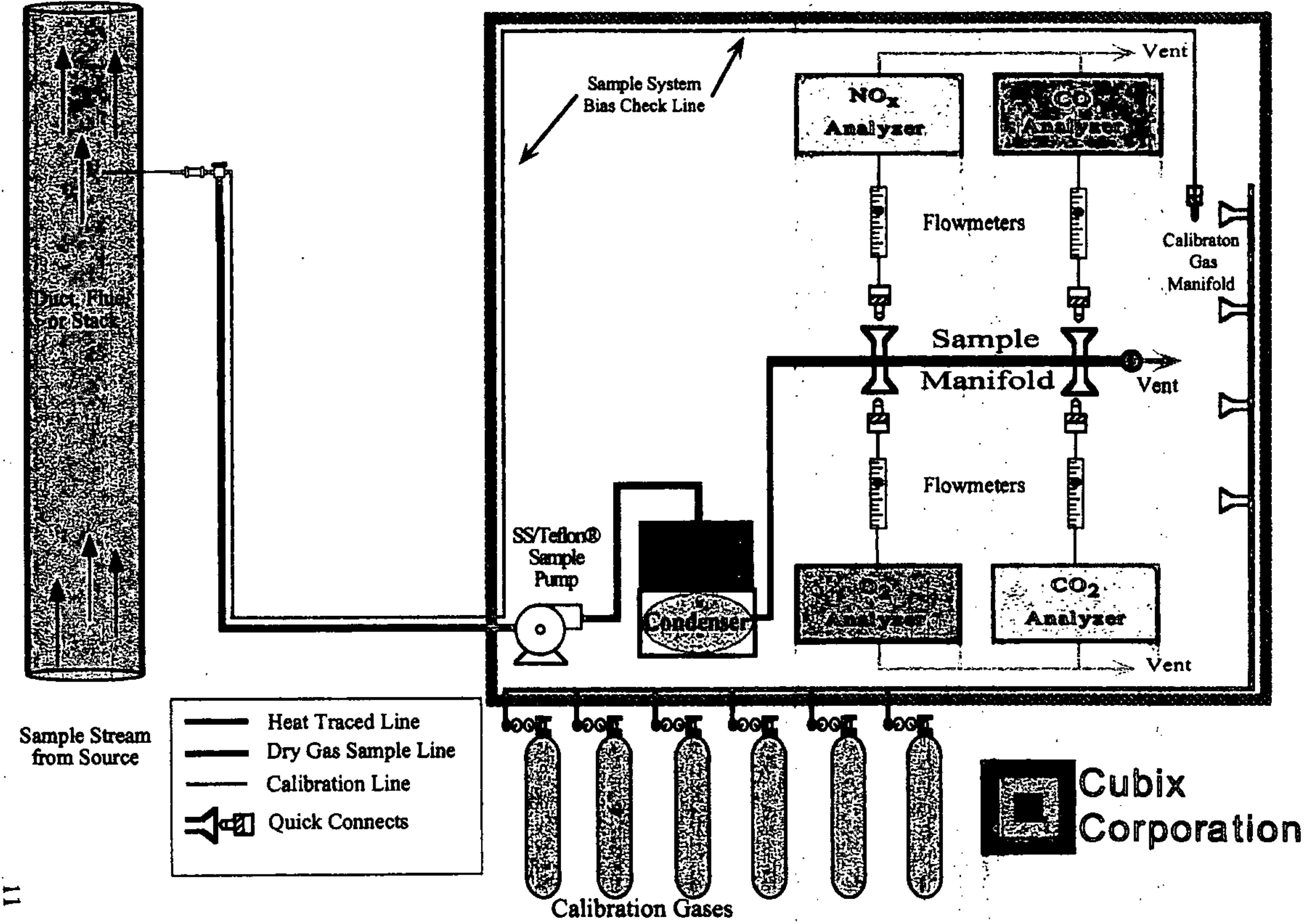
Emission calculations were conducted by a computer spreadsheet as shown in Table 2 of this report. Example calculations were performed manually using a hand-held calculator in order to verify the formulas used in the spreadsheet. Example calculations are in Appendix B of this report.

TABLE 3
ANALYTICAL INSTRUMENTATION

Parameter	Model and Manufacturer	Common Use Ranges	Sensitivity	Response Time (sec.)	Detection Principle
CO	TECO Model 48C	0-1 ppm 0-10 ppm 0-30 ppm 0-50, 0-100 ppm 0-200 ppm 0-500 ppm 0-1000 ppm	0.1 ppm	60	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
CO_2	Servomex 1400	0-5% 0-10% 0-15%	0.025% 0.05% 0.075%	< 10	Non-dispersive infrared absorption, electronic linearization of a logarithmic signal (Beer's Law)
O_2	Servomex 1400	0-5% 0-10% 0-25%	0.02% 0.02% 0.02%	< 10	Paramagnetic cell detector, inherently linear.

NOTE: Higher ranges available by sample dilution.
Other ranges available via signal attenuation.

FIGURE 1
INSTRUMENTAL SAMPLE SYSTEM DIAGRAM



QUALITY ASSURANCE ACTIVITIES

A number of quality assurance activities were undertaken before, during and after this testing project. This section of the report in conjunction with the documentation in Appendix D describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via a multi-point calibration. The instrument's linearity was checked by first adjusting the instrument's zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration. For CO, O_2, and CO_2, the instrument's response was accepted as being linear if the response of the other calibration gases agreed within ±2% span of the predicted values. The responses of the infrared absorption type CO and CO_2 analyzers are made linear through electronic suppression.

System bias checks were performed both before and after the sampling system was used for emissions testing. The sampling system's integrity was tested by comparing the responses of the O_2 analyzer to a calibration gas (and a zero gas) introduced via two paths as previously described in the *Analytical Techniques* section of this report. This system bias test was performed to assure that no alteration of the sample had occurred during the test due to leakage, reactions, or absorption. Similarly, system bias checks were performed with CO and CO_2 for added assurance of sample system integrity. Examination of the logged QA data records and Instrumental Analysis Quality Assurance Data worksheet in Appendix D shows that the analyzer response via both sample paths agreed within ±5%.

The residence time of the sampling and measurement system was estimated using the pump flow rate and the sampling system volume. The pump's rated flow rate is 0.8 scfm at 5 psig. The sampling system volume was approximately 0.175 scf. Therefore, the minimum sample residence time was approximately 13 seconds.

Cubix Corporation and instrument vendors conducted interference response tests on the CO, O_2, and CO_2 analyzers. The sum of the interference responses for H_2O, C_3H_8, CO, CO_2 and O_2 is less than 2 percent of the applicable full-scale span value. The instruments used for the tests meet the performance specifications for EPA Methods 3a and 10. The results of the interference tests are available in Appendix D of this report.

The sampling system was leak checked by demonstrating that it could hold a vacuum greater than 15 inches of mercury (Hg) for at least 1 minute with a decline of less than 1 inch Hg. A leak test was conducted after the sample system was set up and before testing began and after testing was completed before the system was dismantled. This test was conducted to insure that ambient air was not diluting the sampling system. The actual vacuum was greater than 24 inches Hg during the leak tests with no leakage detected.

As a minimum, before and after each test run, the analyzers were checked for zero and span drift. This allows test runs to be bracketed by calibrations and documents the precision of the data just collected. Calibration gases were introduced to the analyzers through the entire sampling system. Based on the applicable test method, the criterion for acceptable data is that each instrument drifts no more than ±3% of the full-scale response. Appendix D contains quality assurance tables and logged QA calibration records that summarize the zero and span checks that were performed for each test run. The worksheets also contain the data used to correct the data for drift per EPA Method 6c, Equation 6c-1. O_2 and CO_2 emissions data were corrected for drift as required by the test methods. CO emissions data was also corrected for drift to provide more accurate results and consistent quality assurance procedures.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to ±1% accuracy for each calibration gas. EPA Protocol No. 1 was used, where applicable (i.e., NO_X gases), to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix E.

The pitot tube tips used during the testing were visually inspected to insure that they met the criteria of EPA Method 2. The pitot tube lines were leak checked in the field in accordance with EPA Method 2 guidelines each time connection to the oil manometer was made.

The working dry gas meter used for the moisture train was calibrated prior to testing in accordance with EPA Method 4. A laboratory grade dry gas meter calibrated against a NIST reference instrument, a bell prover, was used for this calibration. Calibration certification documentation of the working meter can be found in Appendix E.

Appendix E also contains calibration data on ancillary measurement equipment used during this testing. The altimeter/barometer was used for determination of atmospheric pressure. Thermometers and thermocouples were used to determine stack gas temperatures and moisture train temperatures.

Cubix collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Cubix makes no warranty as to the suitability of the test methods. Cubix assumes no liability relating to the interpretation and use of the test data by others.

APPENDIX A:
FIELD DATA SHEETS

Sign In Sheet

Job Name: GEORGIA-PACIFIC - PALATKA PLANT
Date(s): OCTOBER 28, 2002

Job Number: CUBIX # 7382
Permit No. NA

Plant Name/Location: GEORGIA-PACIFIC Corp. PALATKA OPERATIONS / CR 216 / PALATKA, PUTNAM Co, F

Emission Source(s): BLEACH PLANT WET SCRUBBER

PARTICIPANTS:
Cubix Corporation Test Contractor
GEORGIA PACIFIC Corp. Owner/Operator
NA Regulatory Agency

Name	Affiliation	Position	Phone Number	Job Safety Review(Y/N)
Roger Paul Osier	CUBIX	PROJECT FOREMAN	(352) 378-0332	Y
Jim Hastings	CUBIX	FIELD TECH.	(352) 378-0332	Y
JOE TAYLOR	GEORGIA PACIFIC	TEST COORDINATOR	(386) 329-0027	Y

Cubix Corporation
Air Emission Testing Job Safety Analysis

Date: October 27th and 28th, 2002
Mobile Lab/Cubix Crew: T-13/LJB, RPO, DLD, and JTH
Client: Georgia-Pacific Corporation
Job #/Contact: 7382-FL1/Joe Taylor
Plant Name: Georgia-Pacific Palatka Operations
Unit Name(s): Bleach Pplant Scrubber
Location (city/state): Palatka, Florida

Description of Testing Activities:

Set-up on 10/27/02. Tested wet scrubber outlet stack at the Bleach Plant on 10/28/02.

Permits Required

Hot Work	☐ Check
Cold Work	☐ Check
Lock & Tag	☐ Check
Scaffolding	☐ Check
Crane/Lift	☐ Check
Line Break	☐ Check

Comments
No permits required in area where we were working.

Personal Protective Equipment Required

hard hat	☐ Check	acid suit	☐ Check
ear plugs/muffs	☐ Check	rubber boots	☐ Check
safety glasses	☐ Check	monogoggles	☐ Check
steel toed shoes	☐ Check	face shield	☐ Check
gloves	☐ Check	safety harness	☐ Check
hot gloves	☐ Check	respirator	☐ Check

Emergency Response

Safe Haven:	Upwind	*(Control room? Plant office?*
Wind Direction:	East	*N NE E SE S SW W NW*
Evacuation Route:	Upwind	*(front gate? Back gate? Crosswind?*
Assembly Points:	Down the road	*office? Down the road?*
Plant Map Reviewed:	Not Applicable	*Yes or No or Not Applicable*

Phone No's. & Alarm Knowledge (list type of sound)

Plant Contact Ph.: 386-329-0027
Control Room Ph.:
Emergency Ph.: 911
Other:
Evacuate:
Fire:
All Clear:
Poison Gas: yes
If facility has no alarms, verify communication with control room

Emergency Equipment Locations Identified

Emergency Shut Off	_ Located	_ Not Applicable	*manual emergency trip*
Fire Extinguisher	_ Located	_ Not Applicable	*Cubix Mobile Lab & Plant Ext.*
Safety Showers	_ Located	_ Not Applicable	*required for plant?*
Escape Air Pack	_ Located	_ Not Applicable	*required for plant?*

There was a plant alarm for chlorine gas but they didn't know what the alarm sounded like...They said we would know if we heard it.

JOB HAZARD IDENTIFIED

Hazardous Material (in plant area)
(flammability, reactivity, health hazards)
List Hazmat?? ClO2.

Environmental Hazards

airborne particulate	☐ Present	☐ No Hazard
burn hazard	☐ Present	☐ No Hazard
rain / fog	☐ Present	☐ No Hazard
electrical shock	☐ Present	☐ No Hazard
heat stress	☐ Present	☐ No Hazard
cold weather/frostbite	☐ Present	☐ No Hazard
inadequate lighting	☐ Present	☐ No Hazard
noise	☐ Present	☐ No Hazard
poor access/egress	☐ Present	☐ No Hazard

Comments: Difficult access to stack and sample ports.

Chemical Hazards (check hazards that are present at jobsite)

asfixiation	☐ Check	carcinogen	☐ Check
poison gas	☐ Check	chemical burns	☐ Check
chemical eye exposure	☐ Check	chemical skin exposure	☐ Check
flammable gas	☐ Check	flamable liquid	☐ Check
strong acid	☐ Check	strong base	☐ Check
OTHER	☐ Check		

Equipment Lifting & Fall Hazard

test equipment hoisting (pulley/boom)	_ Required	_ Not Applicable
portable ladder	_ Required	_ Not Applicable
man lift (cherry picker)	_ Required	_ Not Applicable
personnel basket (crane)	_ Required	_ Not Applicable
Plant Stairs & Ladders	_ Required	_ Not Applicable
rigging sample lines, umbilicle	_ Required	_ Not Applicable
scaffold	_ Required	_ Not Applicable

PRECAUTIONS TO BE IMPLEMENTED

Cubix MSDS in Mobile Lab	_ Yes	_ No
Plant MSDS reviewed???	_ Yes	_ Not Available

Protective Equipment		Protective Actions	
respirator	☐ Check	OTHER	☐ Check
work gloves	☐ Check	shade/cool breaks	☐ Check
rain protect elect. equip.	☐ Check	rain gear	☐ Check
inspect extension cords	☐ Check	secure/protect ext cords	☐ Check
hot gloves	☐ Check	warm up breaks	☐ Check
cold weather clothing	☐ Check	liquid intake	☐ Check
flash light/head lamp	☐ Check	night lighting	☐ Check
hearing protection	☐ Check	hard hat liner	☐ Check
housekeeping	☐ Check	alternate route	☐ Check

Respiratory Safety Equip		Protective Clothing	
supplied fresh air	☐ Check	fire suit	☐ Check
SCBA	☐ Check	acid suit	☐ Check
respirator (correct type?)	☐ Check	rubber boots	☐ Check
escape pack	☐ Check	monogoggles	☐ Check
exposure dosiometer	☐ Check	face shield	☐ Check
OTHER	☐ Check	OTHER	☐ Check

Inspections and Protective Actions

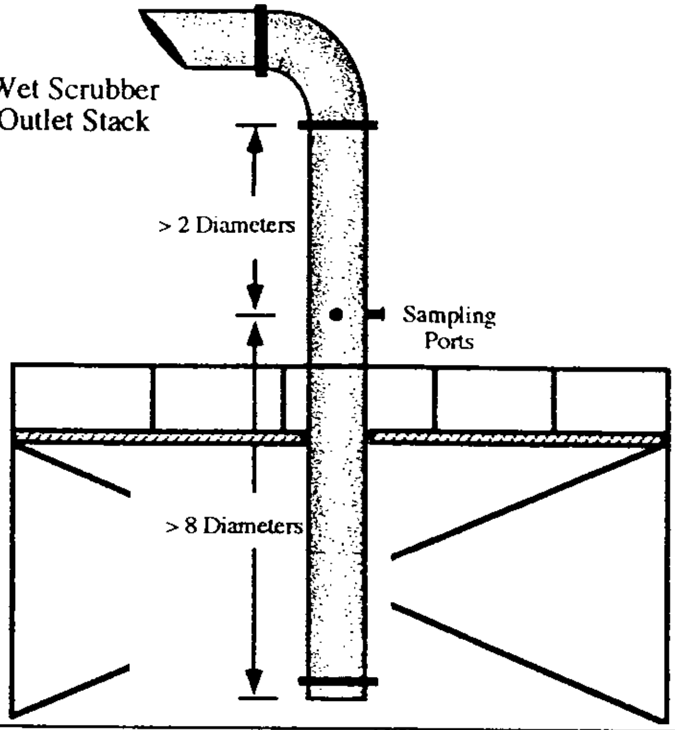
equipment secure	_ Check	clear lift zone	_ Check
operator certification	_ Check	rope inspection	_ Check
guy lines	_ Check	body harness	_ Check
radios/handsignals	_ Check	guard rails, toe plates	_ Check
housekeeping	_ Check	ladder tie-off	_ Check
lines secure	_ Check	monorails secure	_ Check
secure tools	_ Check	hard hats	_ Check

Circular Stack Sampling Traverse Point Layout
(EPA Method 1, Velocity Measurement Traverse Points)

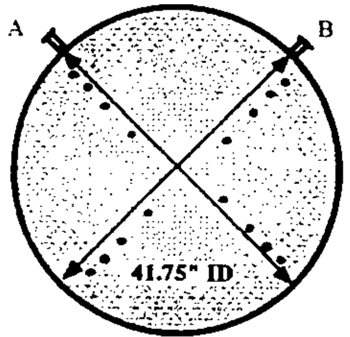
Date: October 27th, 2002
Client: Georgia-Pacific Corporation
Plant: G-P Palatka Operations
Source: Bleach Plant Scrubber
Technician(s): RPO, JTH

Port + Stack ID (in): 51.25
Port Extension (in): 9.50
Stack ID (in): 41.75
Stack Area (ft²): 9.507
Duct Diameters **upstream** from flow disturbance (A): > 2
Duct Diameters **downstream** from flow disturbance (B): >8
Total Required Traverse Points: 16
No. of Traverse Points per Diameter: 8

Stack Diagram
(Draw side view showing major components, dimensions, upstream downstream flow disturbances)



Cross Section

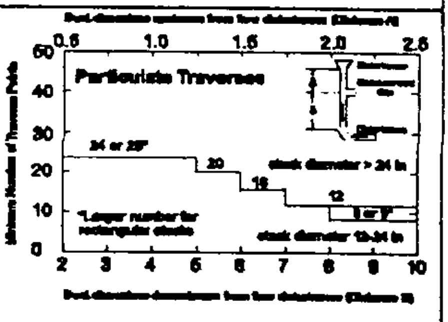


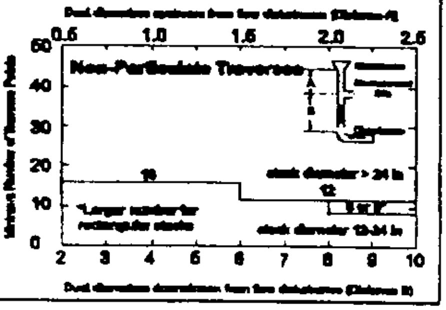
Unit Information

Bleach Plant Scrubber
Wet scrubber that uses an alkaline solution.

Traverse Point Number	Number of Traverse Points on a Diameter 4	6	8	12	*Calculated Traverse Point	*Traverse Point with Port Extension
1	6.7	4.4	3.2	2.1	1.34	10.84
2	25.0	14.6	10.5	6.7	4.38	13.88
3	75.0	29.6	19.4	11.8	8.10	17.60
4	93.3	70.4	32.3	17.7	13.49	22.99
5		85.4	67.7	25.0	28.26	37.76
6		95.6	80.6	35.6	33.65	43.15
7			89.5	64.4	37.37	46.87
8			96.8	75.0	40.41	49.91
9				82.3		
10				88.2		
11				93.3		
12				97.9		

**Stack diameters > 24 in shall have no traverse points located within 1-inch of the stack wall*
**Stack diameters ≤ 24 in shall have no traverse points located within 0.5-inch of the stack wall*





Testing by Cubix Corporation - Austin, Texas - Gainesville, Florida

EPA Methods 1 through 4: Velocity, Moisture Content, Molecular Weight, and Volumetric Flow Rates

Test Run No.	**Run 1**	**Run 2**	**Run 3**
Date	10/28/02	10/28/02	10/28/02
Start Time (Moisture Run Times)	09:42	11:33	13:24
Stop Time (Moisture Run Times)	10:27	12:14	14:05
Stack Moisture & Molecular Wt. via EPA Methods 3a & 4			
O_2 (% volume, dry basis)	20.76	20.67	20.69
CO_2 (% volume, dry basis)	1.04	1.22	1.03
Beginning Meter Reading (ft^3)	675.970	703.905	739.319
Ending Meter Reading (ft^3)	703.495	726.224	762.465
Beginning Impingers Weight (g)	2235.2	2262.1	2285.0
Ending Impingers Weight (g)	2262.1	2285.0	2316.9
Dry Gas Meter Factor (K_d)	0.9869	0.9869	0.9869
Dry Gas Meter Temperature (°F begin)	96	84	88
Dry Gas Meter Temperature (°F end)	90.6	90	95
Atmospheric Pressure ("Hg, absolute)	29.98	29.96	29.91
Volume of Water Vapor Collected (SCF)	1.268	1.080	1.504
Volume of Air Metered (SCF)	25.964	21.281	21.851
Stack Gas Moisture (% volume)	4.66	4.83	4.50
Dry Gas Fraction	0.9534	0.9517	0.9550
Stack Gas Molecular Wt. (lbs/lb-mole)	28.48	28.49	28.50
Stack Flow Rate via Pitot Tube			
ΔP #1	0.13	0.14	0.18
ΔP #2	0.18	0.19	0.19
ΔP #3	0.22	0.23	0.22
ΔP #4	0.20	0.25	0.22
ΔP #5	0.24	0.27	0.23
ΔP #6	0.24	0.24	0.23
ΔP #7	0.18	0.24	0.25
ΔP #8	0.18	0.22	0.25
ΔP #9	0.18	0.17	0.19
ΔP #10	0.20	0.19	0.22
ΔP #11	0.21	0.23	0.23
ΔP #12	0.22	0.22	0.25
ΔP #13	0.19	0.19	0.21
ΔP #14	0.20	0.23	0.22
ΔP #15	0.18	0.22	0.21
ΔP #16	0.16	0.22	0.23
Pitot Tube Factor	0.84	0.84	0.84
Sum of Square Root of ΔP's	7.0355	7.4085	7.5071
Number of Traverse Points	16	16	16
Average Square Root of ΔP's	0.439721	0.463030	0.469191
Average Temperature (°F)	126.8	130.9	130.8
Static Pressure ("H_2O)	-0.28	-0.14	-0.18
Stack Diameter (inches)	41.75	41.75	41.75
Stack Area (ft^2)	9.507	9.507	9.507
Stack Velocity (ft/min)	1571	1660	1683
Stack Flow, wet (ACFM)	14936	15783	16005
Average Stack Flow, dry (SCFH)	**7.70E+05**	**8.06E+05**	**8.19E+05**

MOISTURE & VELOCITY FIELD DATA SHEET

Date: 10-23-02
Plant: G-P Palatka Plant
Source: Chlorine Plant Scrubber
Technicians: RPO, JTH
Atm. Pressure: 29.98 "Hg (Pb)
Test Run No.: Run 1

Dry Gas Meter ID: T-10 EQUIMETER
Dry Gas Meter Factor: 0.9869 (Kd)
Pitot Tube No/Type: #2110 .7' 3/8" OD SS S-TYPE
Pitot Tube Factor: 0.84
Static Pressure: -.28 "H_2O (Pg)
Ave. Stack Temp. 126.8 °F (Ts)

Collection Data

Sample Box	7	
Leak Check ≤ 0.02 ft^3/min		
Pre-Test Leak Check	0.000 ft^3/min 24.2 "Hg Vac.	
Post-Test Leak Check	0.000 ft^3/min 25.0 "Hg Vac.	
	Initial	Final
Time	9:42	10.27
DGM Reading (ft^3 or L)	675.970	703.495
DGM Average Temp (°F)	96	90.6
Last Impinger Temp. (°F)	66	62.4
DGM Flow Rate	- 40	48
O_2 (% vol.)		
CO_2 (% vol.)		

Velocity System Leak Check

Leak Check ≤ 0.1 "H_2O/min at a pressure ≥ 3.0 "H_2O			
	+	−	
Pre-Test Leak Check	0.0	0.0	"H_2O/min
	3.6	4.6	"H_2O Pres.
	+	−	
Post-Test Leak Check	0.0	0.0	"H_2O/min
	4.2	4.1	"H_2O Pres.

Impingment System

Impinger	Contents	Initial Weight	Final Weight
1	Di H_2O	545.7	565.0
2	Di H_2O	557.5	559.8
3	Empty	485.9	486.5
4	Si Gel	646.1	650.8
5			
6			
Totals		2235.2	2262.1

Velocity Traverse Data
with Stack Temperature and Cyclonic Flow Check

Point	ΔP ("H_2O)	°F	α	Point	ΔP ("H_2O)	°F	α
1-1	.13	125	5	2-1	.18	122	10
1-2	.18	125	10	2-2	.20	123	10
1-3	.22	125	10	2-3	.21	127	7
1-4	.20	126	5	2-4	.22	128	5
1-5	.24	126	6	2-5	.19	130	6
1-6	.24	126	8	2-6	.20	130	6
1-7	.18	126	8	2-7	.18	132	8
1-8	.18	126	10	2-8	.16	132	10

MOISTURE & VELOCITY FIELD DATA SHEET

Date: 10-28-2002
Plant: G-P Palatka Plant
Source: Chlorine Plant Scrubber
Technicians: RPO, JTH
Atm. Pressure: 29.96 " Hg (Pb)
Test Run No.: Run 2

Dry Gas Meter ID: T-10 Equimeter
Dry Gas Meter Factor: 0.9869 (Kd)
Pitot Tube No/Type: #2110 7'-3/8"OD SS S-Type
Pitot Tube Factor: 0.84
Static Pressure: -.14 "H_2O (Pg)
Ave. Stack Temp. 130.9 °F (Ts)

Collection Data

Sample Box	1	
Leak Check ≤ 0.02 ft³/min		
Pre-Test Leak Check	0.000 ft³/min 22.5 "Hg Vac.	
Post-Test Leak Check	0.000 ft³/min 23.0 "Hg Vac.	
	Initial	Final
Time	1133	12:14
DGM Reading (ft³ or L)	703.905	726.224
DGM Average Temp (°F)	84	90
Last Impinger Temp. (°F)	67	58
DGM Flow Rate	40	40
O_2 (% vol.)		
CO_2 (% vol.)		

Velocity System Leak Check

Leak Check ≤ 0.1 "H_2O/min at a pressure ≥ 3.0 "H_2O	+	−
Pre-Test Leak Check	0.0	0.0 "H_2O/min
	3.6	4.6 "H_2O Pres.
Post-Test Leak Check	0.0	0.0 "H_2O/min
	4.2	4.1 "H_2O Pres.

Impingment System

Impinger	Contents	Initial Weight	Final Weight
1	Di H_2O	565.0	582.6
2	DH_2O	559.8	561.7
3	MT	486.5	486.8
4	Si Gel	650.8	653.9
5			
6			
Totals		2262.1	2285.0

Velocity Traverse Data
with Stack Temperature and Cyclonic Flow Check

Point	ΔP ("H_2O)	°F	α	Point	ΔP ("H_2O)	°F	α
1-1	.14	129	↓	2-1	.17	133	↓
1-2	.19	129		2-2	.19	133	
1-3	.23	131		2-3	.23	133	
1-4	.25	132		2-4	.22	133	
1-5	.27	133		2-5	.19	131	
1-6	.24	134		2-6	.23	130	
1-7	.24	134		2-7	.22	125	
1-8	.22	133		2-8	.22	121	

Cubix Corporation - Austin, Texas - Gainesville, Florida

MOISTURE & VELOCITY FIELD DATA SHEET

Date: 10-28-2002
Plant: G-P PALATKA PLANT
Source: Chlorine Plant Scrubber
Technicians: RPO, JTH
Atm. Pressure: 29.91 "Hg (Pb)
Test Run No.: RUN 3

Dry Gas Meter ID: T-10 EQUIMETER
Dry Gas Meter Factor: 0.9869 (Kd)
Pitot Tube No/Type: #2110 7'x3/8"OD SS S-TYPE
Pitot Tube Factor: 0.84
Static Pressure: .1 - .18 "H_2O (Pg)
Ave. Stack Temp. 130.8 °F (Ts)

Collection Data

Sample Box	1	
Leak Check ≤ 0.02 ft³/min		
Pre-Test Leak Check	0.000 ft³/min 25.0 "Hg Vac.	
Post-Test Leak Check	0.000 ft³/min 25.5 "Hg Vac.	
	Initial	Final
Time	13:24	14:05
DGM Reading (ft³ or L)	739.319	762.465
DGM Average Temp (°F)	88	95
Last Impinger Temp. (°F)	66	64
DGM Flow Rate	40	40
O_2 (% vol.)		
CO_2 (% vol.)		

Impingment System

Impinger	Contents	Initial Weight	Final Weight
1	DiH2O	582.6	605.0
2	DiH2O	561.7	565.6
3	MT	486.8	487.7
4	SiGEL	653.9	658.6
5			
6			
Totals		2285	2316.9

Velocity System Leak Check

Leak Check ≤ 0.1 "H_2O/min
at a pressure ≥ 3.0 "H_2O

	+	−	
Pre-Test Leak Check	0.0	0.0	"H_2O/min
	3.6	4.6	"H_2O Pres.
Post-Test Leak Check	0.0	0.0	"H_2O/min
	4.2	4.1	"H_2O Pres.

Velocity Traverse Data
with Stack Temperature and Cyclonic Flow Check

Point	ΔP ("H_2O)	°F	α	Point	ΔP ("H_2O)	°F	α
1-1	.18	129	↓	2-1	.19	130	↓
1-2	.19	129		2-2	.22	130	
1-3	.22	131		2-3	.23	131	
1-4	.22	131		2-4	.25	132	
1-5	.23	131		2-5	.21	131	
1-6	.23	132		2-6	.22	131	
1-7	.25	131		2-7	.21	131	
1-8	~~.23~~ 25	131		2-8	.23	131	

APPENDIX B:
EXAMPLE CALCULATIONS

EXAMPLE CALCULATIONS

Moisture Content via EPA Method 4

refers to Test Run # 1

M_{WC} = net impinger weight gain = 2262.1 g – 2235.2 g = 26.9 g

Y = dry gas meter correction factor = 0.9869

V_m = volume metered = (703.495 – 675.970) = 27.525 ft^3

P_{atm} = atmospheric pressure = 29.98 "Hg

P_{met} = average meter pressure = P_{atm} = 29.98 "Hg

T_{met} = average meter temperature = 93.3° F + 460 °F = 553.3° R

K_2 = conversion factor, water weight to vapor = 0.04715 ft^3/g

K_3 = standard temp, pressure (STP) correction factor = 17.64° R/ "Hg

V_{WC} = total volume of water vapor collected at STP

$$= K_2 \times M_{WC}$$

$$= (0.04715 \times 26.9)$$

$$= 1.2683 \text{ ft}^3$$

$V_{m(std)}$ = total volume metered at STP

$$= K_3 \times Y \times V_m \times \frac{P_{met}}{T_{met}}$$

$$= 17.64 \times 0.9869 \times 27.525 \times \frac{29.98}{553.3}$$

$$= 25.964 \text{ ft}^3$$

B_{ws} = moisture content by EPA Method 4

$$= \frac{V_{WC}}{V_{WC} + V_{STP}}$$

$$= \frac{1.2683}{1.2683 + 25.964}$$

B_{ws} = **0.04657**

= **4.66 % moisture**

Stack Gas Molecular Weight

Refers to Test Run # 1

MW_{H_2O} = molecular wt of H_2O = 18 lb/lb-mole
MW_{CO_2} = molecular wt of CO_2 = 44 lb/lb-mole
MW_{O_2} = molecular wt of O_2 = 32 lb/lb-mole
MW_{N_2} = molecular wt of N_2 = 28 lb/lb-mole
C_{CO_2} = concentration of CO_2 = 0.0104 (from analyzer)
C_{O_2} = concentration of O_2 = 0.2076 (from analyzer)
C_{N_2} = concentration of N_2 = $1 - (C_{CO_2} + C_{O_2}) = 0.782$
F_d = dry gas fraction = $1 - B_{ws}$ = 0.95343

MW = molecular weight of stack gas (lb/lb-mole)

$$= \text{wt. of } H_2O + \text{wt. of } CO_2 + \text{wt. of } O_2 + \text{wt. of } N_2$$

$$= (MW_{H_2O} \times B_{ws}) + (F_d \times ((MW_{CO_2} \times C_{CO_2}) + (MW_{O_2} \times C_{O_2}) + (MW_{N_2} \times C_{N_2})))$$

$$= (18 \times 0.04657) + (0.95343 \times ((44 \times 0.0104) + (32 \times 0.2076) + (28 \times 0.782)))$$

MW = 28.48(4) lb/lb-mole

Stack Gas Flow Rate via Pitot Tube, Q_d

Refers to Test Run # 1

C_p = pitot tube coefficient = 0.84

ΔP = pressure difference in stack as measured (in. H_2O)

$\sqrt{\Delta P_{av}}$ = average of square root of ΔP's = 0.439721

T_s = ave. stack temperature = 126.8° F + 460 = 586.8° R

P_{atm} = site corrected atmospheric pressure = 29.98 "Hg

P_g = stack static pressure (in. H_2O) = -0.28 "H_2O

P_s = absolute stack pressure

= $P_{atm} + (P_g/13.6)$ = 29.959 "Hg

K_p = pitot tube constant = $85.49 \ \frac{ft}{sec}\left(\frac{(lb/lb-mole)(in.Hg)}{(^{\circ}R)(in.H_2O)}\right)^{\frac{1}{2}}$

T_{std} = absolute Temperature = 528° R

P_{std} = standard atmospheric pressure = 29.92 "Hg

V_s = stack velocity (ft/sec)

$$= K_p \times C_p \times \sqrt{\Delta P_{av}} \times \sqrt{\frac{T_s}{(P_s \times MW)}}$$

$$= 85.49 \times 0.84 \times 0.439721 \times \sqrt{\frac{586.8}{(29.959 \times 28.484)}}$$

= 26.185 ft/sec x 60 sec/min

V_s = 1571.1 ft/min

Q_a = stack flow rate (ft^3/min. actual)

= V x A , where A = area of stack = 9.507 ft^2

Q_a = 1571.1 x 9.507 = 14936.4 ft^3/min

Q_d = average stack flow rate on a dry basis at standard conditions (DSCFH)

$$= \frac{Q_a \times T_{std} \times P_s}{T_s \times P_{std}} \times F_d \times 60$$

$$= \frac{14936.4 \times 528 \times 29.959}{586.8 \times 29.92} \times 0.95343 \times 60$$

Q_d = 7.698×10^5 DSCFH, Average Flow

Correction of O_2 Gas Concentrations, C_{O_2}

Refers to Test Run # 1

Analytical instruments tend to drift in their calibrations over time and with changes in atmospheric conditions. Span and zero gas bias drift checks (calibrations) were conducted prior to and following each test. The results of these calibrations were used to bracket and thus correct the raw gas concentrations into corrected (more accurate) gas concentrations. The calculation used for these correction is 40 CFR 60, Appendix A, Method 6c, Equation 6c-1. This correction is required for CO_2 exhaust concentrations when using Method 3a. Cubix also conducts this correction for EPA Method 10 in order to present more accurate and consistent test results.

U_{O_2} = analyzer O_2 gas concentration, uncorrected for drift and bias

U_{O_2} = 20.52 ppmv, uncorrected

C_o = Average of initial/final zero gas concentrations
= -0.04 ppmv

C_m = Average of initial/final span gas concentrations
= 11.785 ppmv

C_{ma} = Actual upscale cylinder span gas concentrations
= 11.94 ppmv

C_{O_2} = Effluent O_2 gas concentration, ppmv corrected

$$= (U_{O_2} - C_o) \times \frac{C_{ma}}{C_m - C_o}$$

$$= (20.52 + 0.04) \times \frac{11.94}{11.785 + 0.04}$$

C_{O_2} = **20.76 ppmv O_2, dry basis corrected**

CO Mass Emission Rate (lbs/hr)

Refers to Test Run # 1

C_{CO} = observed concentration of CO = 955.3 ppmv
MW_{CO} = 28.01 lb/lb-mole for carbon monoxide
for ideal gas, 385.15 SCF = 1.0 lb/mole
Q_d = 7.698 x 10^5 SCFH (from ave. pitot tube volumetric flow)

E_{CO} = mass emission rate of CO in (lb/hr)

$$= C_{CO} \times 10^{-6} \times Q_d \times \frac{MW_{CO}}{385.15}$$

$$= 955.3 \times 10^{-6} \times 7.698 \times 10^5 \times \frac{28.01}{385.15}$$

E_{CO} = **53.5 lbs/hr**

APPENDIX C:
OPERATIONAL DATA

PRODUCTION RATE DATA

RUN	DATE	TIME	SPECIES	PRODUCTION RATE, adtbph	#ClO2/adtbp
1	10/28/02	0934-1034	softwood	49.7	45.8
2	10/28/02	1127-1227	softwood	49.7	46.8
3	10/28/02	1317-1417	softwood	35.0	49.9

Please note that the Chemical Application Rate is considered Confidential Business Information

APPENDIX D:
QUALITY ASSURANCE ACTIVITIES

Quality Assurance Activities
Calibration Error, Bias, and Drift Checks

Linearity Check	CO	O_2	CO_2
Analyzer Range (ppmv), O_2 & CO_2 in % vol	1250.0	25.00	15.00
Strip Chart Offset	0.0	10.0	2.0
Low Level Certified Value (ppm or % vol)	253.0	4.53	4.48
Mid Level Certified Value (ppm or % vol)	441.0	11.94	7.99
High Level Certified Value (ppm or % vol)	885.0	20.90	12.62
Zero Target (% Chart)	0.0	10.0	2.0
Low Level Target (% Chart)	20.2	28.1	31.9
Mid Level Target (% Chart)	35.3	57.8	55.3
High Level Target (% Chart)	70.8	93.6	86.1
Zero Observed (% Chart)	0.0	10.0	2.0
Low Level Observed (% Chart)	19.6	28.0	32.1
Mid Level Observed (% Chart)	34.5	57.8	55.5
High Level Observed (% Chart)	71.2	93.6	86.1
Zero Observed (ppm or % vol)	0.33	0.00	0.00
Low Level Observed (ppm or % vol)	244.64	4.50	4.52
Mid Level Observed (ppm or % vol)	430.65	11.95	8.02
High Level Observed (ppm or % vol)	889.46	20.90	12.62
% Difference From Zero to Target	0.0	0.0	0.0
% Difference From Low to Target	0.7	0.1	-0.3
% Difference From Mid to Target	0.8	0.0	-0.2
% Difference From High to Target	-0.4	0.0	0.0
EPA Allowable % Difference from Target	±2% Span	±2% Span	±2% Span

Test Run 1	CO	O_2	CO_2
Analyzer Range (ppm), O_2 & CO_2 in %	1250.0	25.00	15.00
Calibration Gas Certified Value (ppm or %)	885	11.94	7.99
Strip Chart Offset	0.0	10.0	2.0
Target Calibration Gas (Chart %)	70.8	57.8	55.3
Actual Zero Gas from Direct (Chart %)	0.0	10.0	2.0
Actual Calibration Gas from Direct (Chart %)	71.2	57.8	55.5
Initial Readings			
Zero Gas (chart %)	-0.2	9.9	2.4
Calibration Gas (chart %)	71.0	57.1	54.9
Zero Gas (ppmv)	-2.97	-0.03	0.06
Calibration Gas (ppmv)	887.15	11.77	7.94
Final Readings			
Zero Gas (chart %)	-0.2	9.8	2.3
Calibration Gas (chart %)	71.1	57.2	55.2
Zero Gas (ppmv)	-2.97	-0.05	0.04
Calibration Gas (ppmv)	888.80	11.80	7.98
Bias and Drift Calculations			
Zero Bias (% Chart) (Run-Direct Cal) ≤5%	-0.3	-0.2	0.3
Calibration Bias (% Chart) ≤5%	-0.1	-0.6	-0.3
Zero Drift (Chart %) (Run-Run) ≤3%	0.0	0.1	0.1
Calibration Drift (Chart %) ≤3%	-0.1	-0.1	-0.3
Run Results			
Raw Results (chart %)	76.7	92.1	9.2
Raw Results (ppmv or % vol)	958.7	20.52	1.08
Corrected Results (ppmv or % vol) from % chart	955.3	20.76	1.04

Quality Assurance Activities
Calibration Error, Bias, and Drift Checks

Test Run 2	CO	O_2	CO_2
Analyzer Range (ppm), O_2 & CO_2 in %	1250.0	25.00	15.00
Calibration Gas Certified Value (ppm or %)	885	20.90	4.48
Strip Chart Offset	0.0	10.0	2.0
Target Calibration Gas (Chart %)	70.8	93.6	31.9
Actual Zero Gas from Direct (Chart %)	0.0	10.0	2.0
Actual Calibration Gas from Direct (Chart %)	71.2	93.6	32.1
Initial Readings			
Zero Gas (chart %)	-0.2	9.8	2.3
Calibration Gas (chart %)	71.1	92.8	32.0
Zero Gas (ppmv)	-2.97	-0.05	0.04
Calibration Gas (ppmv)	888.80	20.70	4.50
Final Readings			
Zero Gas (chart %)	-0.1	9.9	2.4
Calibration Gas (chart %)	71.4	92.5	31.9
Zero Gas (ppmv)	-1.40	-0.03	0.06
Calibration Gas (ppmv)	893.00	20.62	4.48
Bias and Drift Calculations			
Zero Bias (% Chart) (Run-Direct Cal) ≤5%	-0.1	-0.1	0.4
Calibration Bias (% Chart) ≤5%	0.3	-1.1	-0.3
Zero Drift (Chart %) (Run-Run) ≤3%	-0.1	-0.1	-0.1
Calibration Drift (Chart %) ≤3%	-0.3	0.3	0.1
Run Results			
Raw Results (chart %)	87.3	91.7	10.4
Raw Results (ppmv or % vol)	1091.3	20.43	1.26
Corrected Results (ppmv or % vol) from % chart	1083.6	20.67	1.22

Test Run 3	CO	O_2	CO_2
Analyzer Range (ppm), O_2 & CO_2 in %	1250.0	25.00	15.00
Calibration Gas Certified Value (ppm or %)	885	20.90	4.48
Strip Chart Offset	0.0	10.0	2.0
Target Calibration Gas (Chart %)	70.8	93.6	31.9
Actual Zero Gas from Direct (Chart %)	0.0	10.0	2.0
Actual Calibration Gas from Direct (Chart %)	71.2	93.6	32.1
Initial Readings			
Zero Gas (chart %)	-0.1	9.9	2.4
Calibration Gas (chart %)	71.4	92.5	31.9
Zero Gas (ppmv)	-1.40	-0.03	0.06
Calibration Gas (ppmv)	893.00	20.62	4.48
Final Readings			
Zero Gas (chart %)	-0.1	9.9	2.3
Calibration Gas (chart %)	69.8	92.2	31.9
Zero Gas (ppmv)	-1.40	-0.03	0.04
Calibration Gas (ppmv)	873.00	20.55	4.48
Bias and Drift Calculations			
Zero Bias (% Chart) (Run-Direct Cal) ≤5%	-0.1	-0.1	0.3
Calibration Bias (% Chart) ≤5%	-1.3	-1.4	-0.3
Zero Drift (Chart %) (Run-Run) ≤3%	0.0	0.0	0.1
Calibration Drift (Chart %) ≤3%	1.6	0.3	0.0
Run Results			
Raw Results (chart %)	75.9	91.5	9.1
Raw Results (ppmv or % vol)	949.3	20.38	1.07
Corrected Results (ppmv or % vol) from % chart	951.3	20.69	1.03

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged QA Calibration Records

Run 1 10/28/02 9:34:18 10:34:18

Initial Linearity Test	Zero	Low	Mid	Span	L-Lin	M-Lin	S-Lin
CO (ppmv)	0.33	244.64	430.65	889.46	0.67	0.83	-0.36
O2 (% vol)	0.00	4.50	20.90	11.95	0.12	0.00	-0.04
CO2 (% vol)	0.00	4.52	12.62	8.02	-0.27	0.00	-0.20

Initial and Final Bias and Drift	I-Zero	I-Span	F-Zero	F-Span	Z-Bias	S-Bias	Z-Drift	S-Drift
CO (ppmv)	-2.97	887.15	-2.97	888.80	-0.26	-0.05	0.00	-0.13
O2 (% vol)	-0.03	11.77	-0.05	11.80	-0.20	-0.60	0.08	-0.12
CO2 (% vol)	0.06	7.94	0.04	7.98	0.27	-0.27	0.13	-0.27

Run Results and Cal Gases Used	Raw	Corrected	Ranges	Low Gas	Mid Gas	Span Gas
CO (ppmv)	958.7	955.3	1250.0	253.0	441.0	885.0
O2 (% vol)	20.52	20.76	25.00	4.53	20.90	11.94
CO2 (% vol)	1.08	1.04	15.00	4.48	12.62	7.99

Run 2 10/28/02 11:27:39 12:27:39

Initial Linearity Test	Zero	Low	Mid	Span	L-Lin	M-Lin	S-Lin
CO (ppmv)	0.33	244.64	430.65	889.46	0.67	0.83	-0.36
O2 (% vol)	0.00	4.50	11.95	20.90	0.12	-0.04	0.00
CO2 (% vol)	0.00	8.02	12.62	4.52	-0.20	0.00	-0.27

Initial and Final Bias and Drift	I-Zero	I-Span	F-Zero	F-Span	Z-Bias	S-Bias	Z-Drift	S-Drift
CO (ppmv)	-2.97	888.80	-1.40	893.00	-0.14	0.28	-0.13	-0.34
O2 (% vol)	-0.05	20.70	-0.03	20.62	-0.12	-1.12	-0.08	0.32
CO2 (% vol)	0.04	4.50	0.06	4.48	0.40	-0.27	-0.13	0.13

Run Results and Cal Gases Used	Raw	Corrected	Ranges	Low Gas	Mid Gas	Span Gas
CO (ppmv)	1091.3	1083.6	1250.0	253.0	441.0	885.0
O2 (% vol)	20.43	20.67	25.00	4.53	11.94	20.90
CO2 (% vol)	1.26	1.22	15.00	7.99	12.62	4.48

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged QA Calibration Records

Run 3 10/28/02 13:17:44 PM 14:17:44 PM

Initial Linearity Test	Zero	Low	Mid	Span	L-Lin	M-Lin	S-Lin
CO (ppmv)	0.33	244.64	430.65	889.46	0.67	0.83	-0.36
O2 (% vol)	0.00	4.50	11.95	20.90	0.12	-0.04	0.00
CO2 (% vol)	0.00	8.02	12.62	4.52	-0.20	0.00	-0.27

Initial and Final Bias and Drift	I-Zero	I-Span	F-Zero	F-Span	Z-Bias	S-Bias	Z-Drift	S-Drift
CO (ppmv)	-1.40	893.00	-1.40	873.00	-0.14	-1.32	0.00	1.60
O2 (% vol)	-0.03	20.62	-0.03	20.55	-0.12	-1.40	0.00	0.28
CO2 (% vol)	0.06	4.48	0.04	4.48	0.27	-0.27	0.13	0.00

Run Results and Cal Gases Used	Raw	Corrected	Ranges	Low Gas	Mid Gas	Span Gas
CO (ppmv)	949.3	951.3	1250.0	253.0	441.0	885.0
O2 (% vol)	20.38	20.69	25.00	4.53	11.94	20.90
CO2 (% vol)	1.07	1.03	15.00	7.99	12.62	4.48

Instrumental Analyses
Quality Assurance Data

Date: October 28, 2002
Company: Georgia-Pacific Corporation
Facility: Georgia-Pacific Palatka Operations
Source ID: Bleach Plany Wet Scrubber
Location: Patatka, Putnam County, Florida
Technicians: RPO, JTH

Instrumental Sample System Leak Checks

Date	Run Number	Vacuum (inches Hg)	Leak Rate (inches Hg/min)	Pass
10/27/02	Set-Up	24.8	0.0	yes
10/28/02	pre Run 1	24.0	0.0	yes
10/28/02	post Run 3	24.2	0.0	yes

Leak check criteria less than 1.0" Hg Vac. Decline at greater than 15.0" Hg Vac.

Analyzer Interference Response Checks

(Frequency: Prior to initial use of sampling system or after alteration or modification.)

Test Date: *September 27, 2002* *Technician:* *RPO*
Mobile Lab: *T-13* *Location:* *Gainesville, Florida*

Analyzer	**Manufacturer**	**Model**	**Serial Number**	**Detection Method/Comments**
NO_x Analyzer	TECO	42C	42CHL-69541-363	Chemiluminescence with Ozone
CO Analyzer	TECO	48C	48C-70472-365	Infrared Absorption/GFC Detector
O_2 Analyzer	Servomex	1440	1420C/2647	Paramagnetic Cell Detector
CO_2 Analyzer	Servomex	1440	01415/2537	Infrared Absorption/ Solid State Detector
THC	California Analytical	300-HFID CE	4J11003	Flame Ionization Detector

Interferrent Test Gases		**Analyzer Response (ppmv or % as applicable)**				
Type Gas	**Conc.**	**NO_x 0-25 ppmv**	**CO 0-50 ppmv**	**O_2 0-25% vol**	**CO_2 0-15% vol**	**THC 0-100 ppmv**
CO/Methane in air	885/919	0.1 ppmv			0.00 %	
Propane in air	2000	0.1 ppmv	0.4 ppmv		0.03 %	
SO_2 in N_2	4400	0.2 ppmv	-0.3 ppmv	0.00 %	0.00 %	no data
Air	dry instrument	< 0.1 ppmv	0.4 ppmv		0.03 %	no data
Nitrogen	pre-purified	0.0 ppmv	0.3 ppmv	0.00 %	0.00 %	no data
Air	UHC, CO free	0.0 ppmv	0.0 ppmv		0.01 %	no data
CO_2/O_2	4.54%/20.8%	< 0.1 ppmv	-0.2 ppmv			no data
CO_2/O_2	8.004%/11.91%	< 0.1 ppmv	-0.4 ppmv			no data
CO_2/O_2	12.62%/4.53%	< 0.1 ppmv	-0.6 ppmv			no data
NO_x in N_2	1209		0.4 ppmv	0.18 %	0.03 %	no data

APPENDIX E:
CALIBRATION CERTIFICATIONS

SPECTRA GASES INC.
3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: Cubix Corporation
SGI ORDER # : 0016436
ITEM# : 7
P.O.# : 2001032 T12 SID

CYLINDER # : CC-94787
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

CERTIFICATION DATE: 2/11/02
EXPIRATION DATE: 2/6/2005

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	1/30/02 2/6/02	252.8 ppm 252.5 ppm	253 ppm	+/- 1%
Methane	2/11/02	249 ppm	249 ppm	+/- 1%

BALANCE Air
PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	GMIS-1	CC94699	486 ppm
Methane	GMIS-1	CC52976	503.3 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	1/8/02
Methane	H. Packard 6890	US00001434	GC - FID	2/5/02

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Ted Neeme
TED NEEME

DATE: 2/11/02

SPECTRA GASES INC.

3434 Route 22 West • Branchburg, NJ 08876 USA Tel : (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: Cubix Corporation
SGI ORDER # : 0023960
ITEM# : 2
P.O.# : 2002420

CYLINDER # : CC-60135
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

CERTIFICATION DATE: 7/19/2002
EXPIRATION DATE: 7/11/2005

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	7/11/2002 7/19/2002	441 6 ppm 439 9 ppm	441 ppm	+/- 1%
Methane	7/11/2002	445 ppm	445 ppm	+/- 1%

BALANCE Air

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81681	CC-55779	994 ppm
Methane	GMIS-1	CC55777	993.6 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	7/19/2002
Methane	H Packard 6890	US00001434	GC - FID	6/24/2002

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: ______________
FRED PIKULA

DATE: 7/19/2002

SPECTRA GASES INC.

3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: Cubix Corporation
SGI ORDER # : 0000840
ITEM# : 4
P.O.# : G-1334

CYLINDER # : CC126532
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

CERTIFICATION DATE: 1/31/2001
EXPIRATION DATE: 1/30/2004

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	1/23/2001 1/31/2001	885.2 ppm 884.4 ppm	885 ppm	+/- 1%
Methane	1/30/2001	919 ppm	919 ppm	+/- 1%

BALANCE Air

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81681	CC55721	994 ppm
Methane	GMIS-1	CC55777	994.1 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	1/19/2001
Methane	H. Packard 6890	US00001434	GC - FID	1/30/2001

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: ____________________
FRED PIKULA

DATE: 1/31/2001

SPECTRA GASES INC.
3434 Route 22 West • Branchburg, NJ 08876 USA Tel. (908) 252-9300 • (800) 932-0624 • Fax (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: Cubix Corporation
SGI ORDER # : 0021285
ITEM# : 1
P.O.# : 2002275 T10LENO

CYLINDER # : CC-133482
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

Begin use 7/24/02

CERTIFICATION DATE: 5/24/2002
EXPIRATION DATE: 5/24/2005

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Dioxide	5/24/2002	4.48 %	4.48 %	+/- 1%
Oxygen	5/24/2002	20.9 %	20.9 %	+/- 1%

BALANCE Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Dioxide	GMIS-1	CC-90832	9.98 %
Oxygen	NTRM-1	CC-83909	22.8 %

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	5/24/2002
Oxygen	Horiba MPA-510	570694081	PM	5/20/2002

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: ____________________
FRED PIKULA

DATE: 5/24/2002

SPECTRA GASES INC.

3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

CUSTOMER: Cubix Corporation
SGI ORDER # : 0023960
ITEM# : 1
P.O.# : 2002420

CYLINDER # : CC-127463
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

CERTIFICATION DATE: 7/23/2002
EXPIRATION DATE: 7/23/2005

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Dioxide	7/23/2002	7.99 %	7.99 %	+/- 1%
Oxygen	7/23/2002	11.94 %	11.94 %	+/- 1%

BALANCE Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Dioxide	GMIS-1	CC-90832	9.98 %
Oxygen	NTRM-1	CC-83909	22.8 %

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	6/25/2002
Oxygen	Horiba MPA-510	570694081	PM	7/23/2002

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: ____________________
FRED PIKULA

DATE: 7/23/2002

Scott Specialty Gases

RATA CLASS

Dual-Analyzed Calibration Standard

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: G-1291
Project No.: 04-85228-002

Customer

CUBIX CORPORATION

4536 NW 20TH DRIVE
GAINESVILLE FL 32605

ORDER ON-LINE • www.SCOTTGAS.COM

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM009152 Certification Date: 4/03/00 Exp. Date: 4/03/2003

Cylinder Pressure***: 1883 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	12.62 %	+/- 1%	Direct NIST and NMi
OXYGEN	4.53 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.

* Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM [illegible]	1-01/03	ALM042032	13.96 %	CO2/N2
NTRM 2658	12/19/01	ALM031738	9.680 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220A/AAB9400260	03/28/00	Scott Enhanced FTIR
MTI-A/M200/171109	03/21/00	GAS CHROMATOGRAPHY

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis Second Triad Analysis Calibration Curve

CARBON DIOXIDE

Date:04/03/00	Response Unit:%	
Z1 = 0.0220	R1 = 13.956	T1 = 12.629
R2 = 13.966	Z2 = 0.0178	T2 = 12.617
Z3 = 0.0276	T3 = 12.620	R3 = 13.959
Avg. Concentration:	12.62	%

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999990
Constants: A = 0.000000
B = 1.000000 C = 0.000000
D = 0.000000 E = 0.000000

OXYGEN

Date:04/06/00	Response Unit AREA	
Z1 = 114.00	R1 = 35455.	T1 = 16619.
R2 = 35183.	Z2 = 141.00	T2 = 16552.
Z3 = 118.00	T3 = 16573.	R3 = 35179.
Avg. Concentration:	4.530	%

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999999418
Constants: A = -0.03442397
B = 0.000275952 C =
D = E =

APPROVED BY:

John Hunnicutt

Air Products and Chemicals, Inc.
5637 W. Fifth Street
Jacksonville, FL 32254
Telephone (904) 786-2663
FAX (904) 693-9128

AIR PRODUCTS

30 March, 1995

Cubix Corporation
2106 NW 67th Place
Suite 7
Gainesville, FL 32653

CERTIFICATE OF CONFORMANCE

This document certifies that the product listed below is supplied via Air Products and Chemicals, Inc. and complies with the current minimum purity specifications of Air Products and Chemicals, Inc., Specialty Gas Department.

Product	Hydrogen
Product Code	3602
Product	Oxygen
Product Code	1602
Shipper Number	854-C-78428
Product	Compressed Air
Product Code	9197
Product	Nitrogen
Product Code	2602
Shipper Number	854-C-78440

C Edward Henderson
Authorized Signature

Dry Gas Meter Calibration

WORKING METER

Date:	4/12/02
Prev. Calib. Date:	rebuilt
Location:	Cubix Austin Lab
Technician:	Bradley Rayhons
Meter Serial No:	2962152
Cubix DGM ID	T-10
Prev. Calib Factor (Y):	1 0000

REFERENCE METER

Calibration Date:	4/11/02
Location:	Cubix Austin Lab
Technician:	Steve Oleyar
Meter Serial No:	P164240
Cubix DGM ID	American
Calib. Factor (Y):	1 0022

REFERENCE METER

Calibration Run #	Time (min)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol. Total (cu ft)	Meter Rate (cu-ft /min)	Corr. Vol @ EPA STP (cu ft)
1	20	74	73.7	18.936	25.078	6.155	0 3078	5 998
2	18	74	74.5	26.261	33.362	7.117	0 3954	6 928
3	10	74	73 4	12.401	18.122	5.734	0 5734	5 589
4	11	74	74.6	35.001	42.645	7.661	0 6965	7.453
5	11	75	75.1	44 308	53.922	9.635	0 8759	9.367

WORKING METER

Calibration Run #	Time (min)	Start Temp (deg F)	Stop Temp (deg F)	Vol (initial) (cu ft)	Vol (final) (cu ft)	Vol Total (cu ft)	Meter Rate (cu-ft /min)	Corr. Vol @ EPA STP (cu ft)	Calculated DGM Factor (Y)
1	20	75	73.7	19.158	25.436	6.278	0.314	6.108	0 9819
2	18	75	73.9	26.635	33.854	7.219	0 401	7.023	0.9866
3	10	73	74.6	12.465	18.285	5.820	0.582	5 672	0.9854
4	11	74	75.8	35 525	43.266	7.741	0.704	7 529	0.9900
5	11	76	73.9	44.957	54 684	9.727	0 864	9 455	0.9906

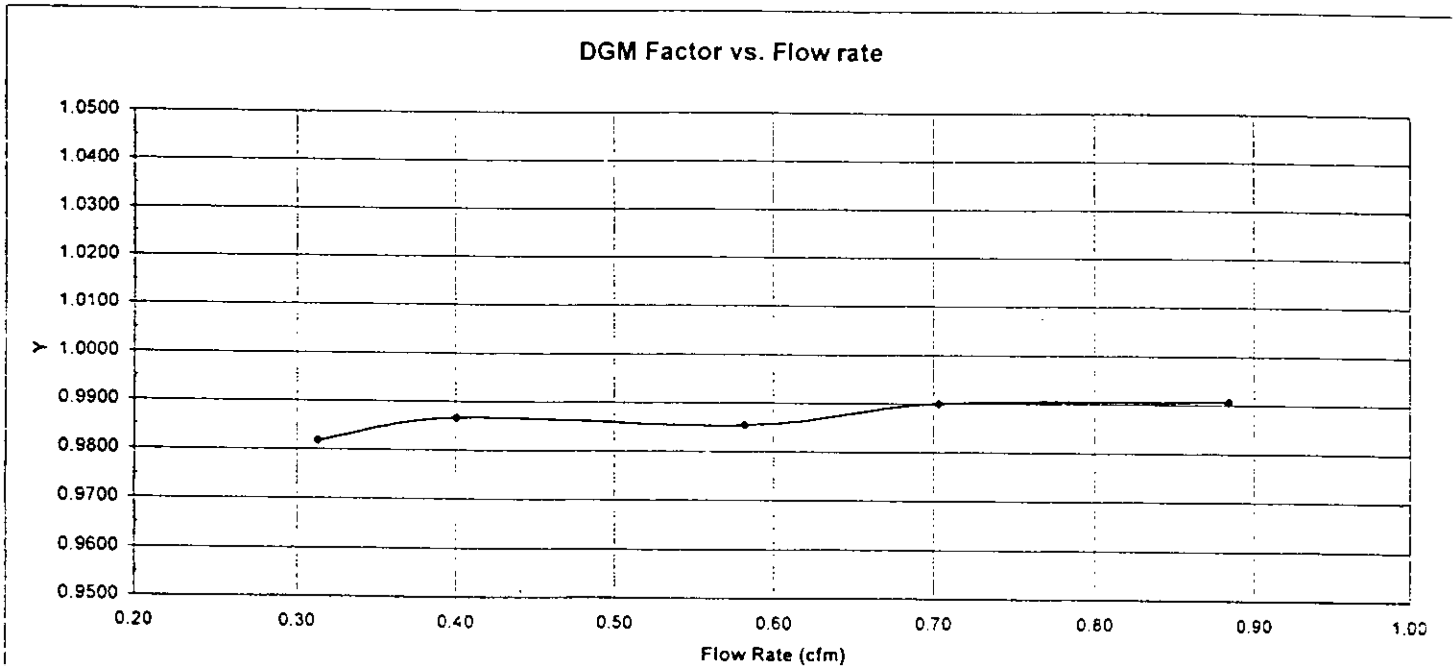
Dry Gas Meter (DGM Factor) Calibration Test Results

*** Average Y: 0.9869**

Ave. Y w/in 5% of previous value:	*YES*
Ave. Y between 0.95 and 1.05:	*PASS*
Ind. Y values +/- 0.02 from Ave.:	*PASS*

Criteria:

* Y- ratio of the reading of the reference meter to the working DGM. Acceptable tolerance of individual values from the average is +/- 0 02, with a value between 0.95 and 1 05.



signature

Cubix Corporation

Pitot Tube Calibration Sheet

S-Type Tip Inspection (Method 2, Section 4)

7 ft

Alignment Inspection

Transverse tube axis pitot-tip angle:

α_1 = 4 ° α_2 = 3 °

Each α must be less than 10° from perpendicular to the transverse tube axis

Longitudinal tube axis pitot-tip angle:

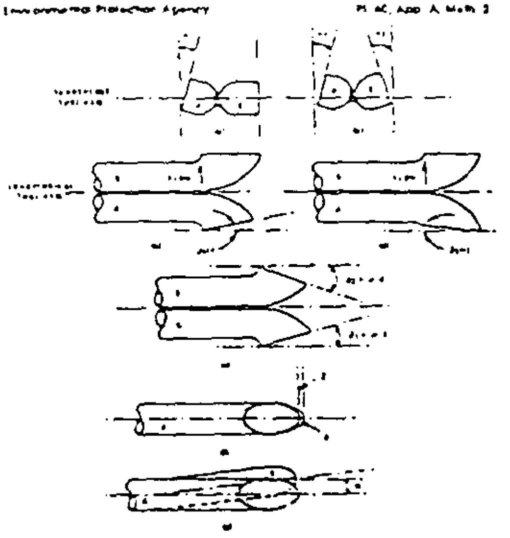
β_1 = 2 ° β_1 = 3 °

Each β must be less than 5° from parrallel to the longitudinal tube axis

Pitot-tip end length alignment:

z = 0 ([✓ in] or cm)

Z must be ≤ 0.32 cm (1/8 in)



Pitot-tip centriod alignment with respect to transverse axis:

w = 0 (in or [✓ cm])

W must be ≤ 0.08 cm (1/32 in)

Pitot Tip Dimension Check

External tubing diameter:

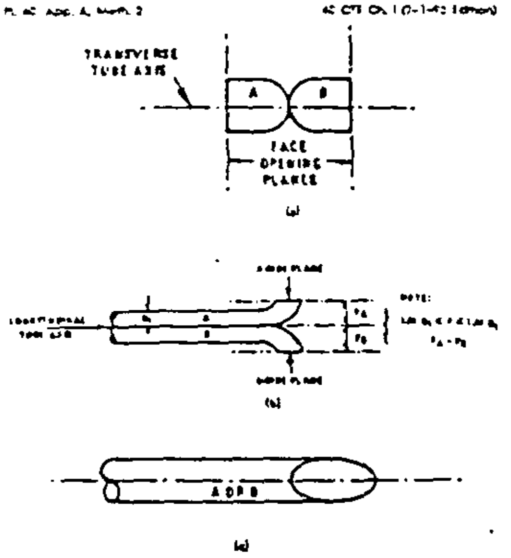
D_t = .375 ([✓ in] or cm)

D_t must be between 0.48 and 0.95 cm (3/16 and 3/8 in)

Base to opening plane distance:

$P_A = P_B$ = .475 ([✓ in] or cm)

P_A and P_B must be between 1.05 D_t and 1.50 D_t



Pitot Tube Coefficient

C_p = 0.84 Pitot Tube: 2110 Date and Initials: 8-7-02 JH

Calibration by Cubix Corporation - Austin, Texas - Gainesville, Florida

ALTIMETER TEST RECORD

This unit was tested and inspected IAW FAR Part 43, Appendix E, and is approved for return to service.

DATE: 3-8-02

WORK ORDER #: 3501

SCALE ERROR

-1000	-15
0	0
+ 500	0
+1000	+10
+1500	0
+2000	+10
+3000	+5
+4000	0
+6000	-5
+8000	+5
+10,000	+15
+12,000	+20
+14,000	+20
+16,000	+15
+18,000	0
+20,000	-10
+22,000	
+25,000	
+30,000	
+35,000	
+40,000	
+45,000	
+50,000	

START PRESSURE 30.06

FINAL PRESSURE 30.06

BAROMETRIC SCALE ERROR TEST

28.10	0	30.50	+5
28.50	-5	30.90	0
29.00	0	30.99	0
29.50	0		
29.92	0		

FRICTION TEST

1000	30	20,000	50
2000	30	25,000	
3000	30	30,000	
5000	30	35,000	
10,000	40	40,000	
15,000	45	50,000	

CASE LEAK TEST @ 18,000 0

CASE LEAK TEST @ 1,200 0

HYSTERESIS TEST @ 50% 20

HYSTERESIS TEST @ 40% 15

AFTER EFFECT 15

SERIAL NUMBER J5924

INSPECTOR

TRAILER 10
ALTIMETER/BAROMETER CALIBRATION SHEET

BFG/C 9001

BFGoodrich
Aerospace

Component Overhaul & Repair

817 Dessau Road
Austin, Texas 78753
512-251-3441
FAX 512-990-1271

FAA Repair Station No. UZ2R232L

CASTLEBERRY AERCOR

Serviceable Part Tag

COMPONENT Altimeter
PART NO. 5934P-1A.83
SERIAL NO. J5924
MFG United Instr WORK ORDER # V7071

☒ Overhaul ☐ Repair ☐ Bench Check & Test ☐ Other ______

The Aircraft Appliance identified above was overhauled, repaired, or bench tested (as per block marked) and inspected, in accordance with current Federal Aviation Administration Regulations, and is approved for return to service. Details of this component are on file at this repair station.

AUTHORIZED SIGNATURE

JAN 16 1995
DATE

ALTIMETER SCALE ERROR

PART NO. 5934P1A83 SERIAL NO. J5924

ALTIMETER PRESSURE

TEST PT (FT)	INDICATOR READINGS AT + 25 °C	TEST PT (FT)	INDICATOR READINGS AT + 25 °C	TEST PT (FT)	INDICATOR READINGS AT + 25 °C
-1000	+5	8,000	+5	30,000	
0 0	0	10,000	+10	35,000	
500	0	12,000	+15	40,000	
1000	0	14,000	+15	45,000	
1500	0	16,000	+5	50,000	
2000	0	18,000	0	55,000	
3000	-5	20,000	-5	60,000	
4000	-10	22,000		70,000	
6000	-10	25,000		80,000	

BFG/C91C2

NIST CALIBRATION CERTIFICATE

Page 2 of 2

Catalog Number : 17005-00 **Certificate Reference Number** 3924899

Instrument Tolerance

±3% full-scale

	Equipment "As Found"				Equipment "As Left"		
	Test Points	Reading	Deviation	O.O.T	Test Points	Reading	Deviation
Measured in: °F	[illegible]	[illegible]	[illegible]	☐	[illegible]	[illegible]	[illegible]
	32.00	32.0	0.0000	☐	32.00	32.0	0.0000
	[illegible]	[illegible]	[illegible]	☐	[illegible]	[illegible]	[illegible]
	110.00	110.0	0.0000	☐	110.00	110.0	0.0000
Measured in: °F	[illegible]	[illegible]	[illegible]	☐	[illegible]	[illegible]	[illegible]
	32.00	32.0	0.0000	☐	32.00	32.0	0.0000
	[illegible]	[illegible]	[illegible]	☐	[illegible]	[illegible]	[illegible]
	110.00	110.0	0.0000	☐	110.00	110.0	0.0000
Measured in:				☐ ☐			
				☐ ☐			
Measured in:				☐ ☐			
				☐ ☐			
Measured in:				☐ ☐			
				☐ ☐			

****** Note **** Check mark under the O.O.T column indicates the equipment is Out Of Tolerance.**

This certificate was performed under the climate controlled lab conditons of: 22 °C 50 %RH 29.5 "Hg

Additional Comments:

n/a

*This certificate shall not be reproduced except in full and requires written approval from InnoCal. * Results .data shown relates only to above listed item(s) **

INNOCAL™
INNOVATIVE CALIBRATION SOLUTIONS
625 East Bunker Court, Vernon Hills, Illinois, 60061
Domestic 866-InnoCal - Fax 847-247-2984

NIST CALIBRATION CERTIFICATE

Page 1 of 2

Catalog Number : 17005-00 **Certificate Reference Number** 3924899

Unit Under Test 1 : 03312-20 **Unit Under Test 2:** n/a
Serial Number 1 : 57778 **Serial Number 2:** n/a

Certificate Completed for: Cubix Corp
3709 SW 42nd Ave
Gainsville FL 32608

InnoCal certifies that the calibration of the listed units, used procedure number MWI-17005-00with equipment traceable to the National Institute of Standards and Technology (NIST), and the test was performed in accordance with ANSI/NCSL Z540-1,ISO Guide 25.

Best measurement uncertainty: k=2, ±0.08°C

Listed uncertainties represent the best measurement uncertainty expressed at 95% confidence level. Actual uncertainties available upon request.

Purchase Order Number: 2002615 **Secondary ID #:** n/a
Equipment Conditon : USED

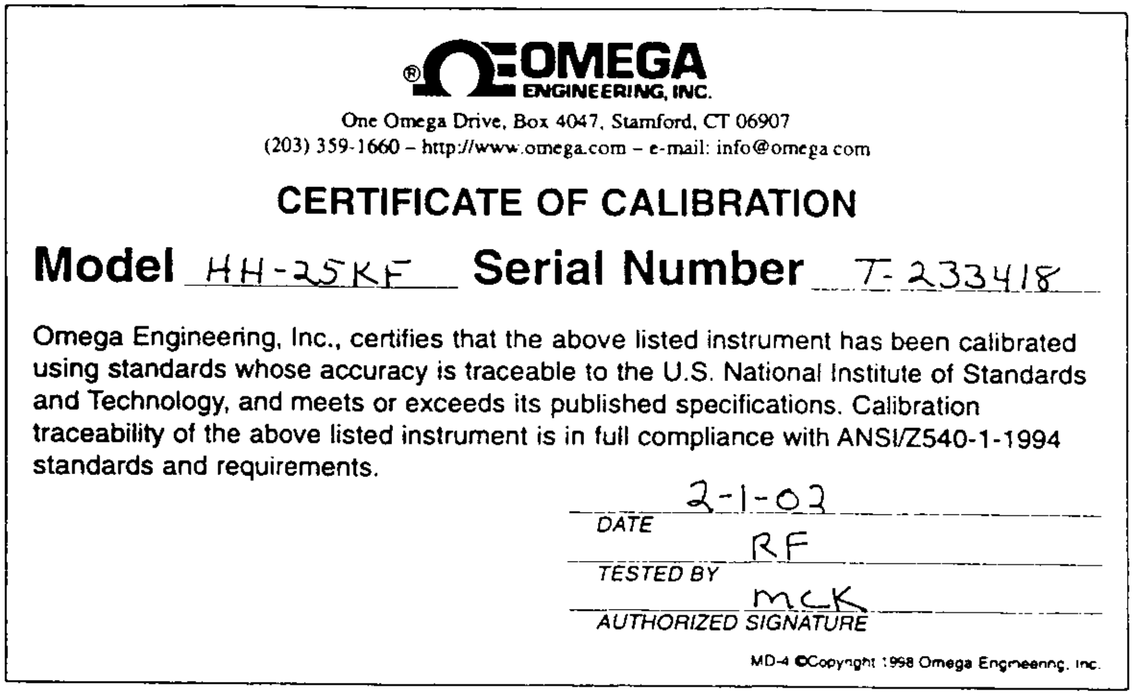
Calibration Standards Used

Manufacturer	Function Performed	Model Number	Serial Number	Due Date
Hart Scientific	Platinum Resistance Probe	5680	1074	04/14/03
Ertco/Hart	Temperature Indicator	850	85307	04/14/03

Lab Technician: 321

Date Completed: 10/17/02 **Issue Date:** 10/17/02 **Received Date** 9/18/02

This certificate shall not be reproduced except in full and requires written approval from InnoCal. • Results data shown relates only to above listed item(s) •



OMEGA
ENGINEERING, INC.

One Omega Drive, Box 4047, Stamford, CT 06907
(203) 359-1660 – http://www.omega.com – e-mail: info@omega.com

CERTIFICATE OF CALIBRATION

Model HH-25KF **Serial Number** T-233418

Omega Engineering, Inc., certifies that the above listed instrument has been calibrated using standards whose accuracy is traceable to the U.S. National Institute of Standards and Technology, and meets or exceeds its published specifications. Calibration traceability of the above listed instrument is in full compliance with ANSI/Z540-1-1994 standards and requirements.

2-1-02
DATE

RF
TESTED BY

mcK
AUTHORIZED SIGNATURE

Placed in service: August 14, 2002
Recalibration Date: February 1, 2003
Location: Trailer 10

OMEGA ENGINEERING, INC.
An OMEGA Technologies Company

Certificate Of Calibration

CUBIX

Cust. P.O. #:	G1342	Report #:	102915471
Test Item:	ASTM-1C-CC	Test Date:	22-FEB-01
Serial #:	99293	Recal Date:	Per System Application

Omega Engineering, Inc. certifies that the above instrumentation has been calibrated and tested **to meet or exceed** the published specifications. This calibration and testing was performed using instrumentation and standards that are traceable to the United States National Institute of Standards and Technology. Calibration on this product was performed by an approved Supplier/ Lab of Omega Engineering, Inc. and is in compliance with **MIL-STD-45662A**.

Test Conditions: Temperature 22 C Relative Humidity 35%

NIST Traceable Test Numbers: 213426,264615-01

Temperature	Thermometer Reading	Correction
	We certify that subject thermometer conforms to specifications and tolerances stated in A.S.T.M. Designate E-1, Table 1, No. 1C, Scale Error + or - 0.5 C Max.	

Metrology Inspector 27-FEB-01

OMEGA Engineering, Inc., One Omega Drive, Box 4047, Stamford, CT 06907 Telephone (203) 359-1660 • FAX: (203) 359-7811

APPENDIX F:
LOGGED DATA RECORDS
1-MINUTE AVERAGES

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
START Run 1	10/28/02	9:34:18	843.3	20.60	0.88	843.3	20.60	0.88
Run 1	10/28/02	9:35:18	850.0	20.58	0.94	846.6	20.60	0.91
Run 1	10/28/02	9:36:18	841.2	20.60	0.94	844.8	20.60	0.92
Run 1	10/28/02	9:37:18	910.5	20.60	0.96	861.2	20.60	0.93
Run 1	10/28/02	9:38:18	853.2	20.60	0.96	859.6	20.60	0.94
Run 1	10/28/02	9:39:18	895.1	20.60	0.94	865.5	20.60	0.95
Run 1	10/28/02	9:40:18	910.5	20.60	1.00	871.9	20.60	0.95
Run 1	10/28/02	9:41:18	856.6	20.58	0.96	870.0	20.60	0.95
Run 1	10/28/02	9:42:18	909.4	20.58	0.94	874.4	20.60	0.95
Run 1	10/28/02	9:43:18	851.1	20.58	0.94	872.0	20.59	0.94
Run 1	10/28/02	9:44:18	833.5	20.58	0.90	868.5	20.59	0.94
Run 1	10/28/02	9:45:18	908.3	20.58	0.92	871.9	20.59	0.94
Run 1	10/28/02	9:46:18	868.7	20.55	0.98	871.6	20.59	0.94
Run 1	10/28/02	9:47:18	930.3	20.53	1.00	875.8	20.59	0.94
Run 1	10/28/02	9:48:17	869.8	20.53	1.02	875.4	20.58	0.94
Run 1	10/28/02	9:49:16	919.3	20.55	1.04	878.1	20.58	0.95
Run 1	10/28/02	9:50:18	953.4	20.55	1.06	882.6	20.58	0.96
Run 1	10/28/02	9:51:17	892.9	20.55	1.04	883.1	20.58	0.96
Run 1	10/28/02	9:52:18	944.6	20.55	1.04	886.4	20.57	0.96
Run 1	10/28/02	9:53:17	928.1	20.58	1.06	888.4	20.57	0.97
Run 1	10/28/02	9:54:17	961.1	20.53	1.08	891.9	20.57	0.97
Run 1	10/28/02	9:55:17	963.3	20.53	1.12	895.2	20.57	0.98
Run 1	10/28/02	9:56:18	985.5	20.53	1.12	899.1	20.57	0.99
Run 1	10/28/02	9:57:18	961.1	20.55	1.14	901.7	20.57	0.99
Run 1	10/28/02	9:58:18	1000.7	20.58	1.12	905.6	20.57	1.00
Run 1	10/28/02	9:59:18	999.6	20.55	1.16	909.2	20.57	1.00
Run 1	10/28/02	10:00:18	1015.4	20.58	1.08	913.2	20.57	1.01
Run 1	10/28/02	10:01:18	997.4	20.55	1.08	916.2	20.57	1.01
Run 1	10/28/02	10:02:18	964.4	20.55	1.04	917.8	20.57	1.01
Run 1	10/28/02	10:03:18	1000.7	20.55	1.06	920.6	20.57	1.01
Run 1	10/28/02	10:04:18	975.4	20.53	1.10	922.4	20.56	1.02
Run 1	10/28/02	10:05:18	995.8	20.53	1.08	924.7	20.56	1.02
Run 1	10/28/02	10:06:18	954.5	20.53	1.06	925.6	20.56	1.02

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
Run 1	10/28/02	10:07:18	987.5	20.53	1.06	927.4	20.56	1.02
Run 1	10/28/02	10:08:18	930.3	20.50	1.06	927.5	20.56	1.02
Run 1	10/28/02	10:09:18	987.5	20.53	1.02	929.1	20.56	1.02
Run 1	10/28/02	10:10:18	949.0	20.50	1.08	929.7	20.56	1.02
Run 1	10/28/02	10:11:18	1000.7	20.50	1.08	931.5	20.56	1.02
Run 1	10/28/02	10:12:18	1015.0	20.48	1.10	933.7	20.55	1.03
Run 1	10/28/02	10:13:17	1021.3	20.45	1.10	935.9	20.55	1.03
Run 1	10/28/02	10:14:17	1003.2	20.45	1.16	937.5	20.55	1.03
Run 1	10/28/02	10:15:17	1000.7	20.45	1.16	939.0	20.55	1.03
Run 1	10/28/02	10:16:17	1003.0	20.45	1.18	940.5	20.55	1.04
Run 1	10/28/02	10:17:17	1005.7	20.45	1.22	942.0	20.54	1.04
Run 1	10/28/02	10:18:17	1015.7	20.45	1.18	943.6	20.54	1.04
Run 1	10/28/02	10:19:17	1008.7	20.45	1.18	945.0	20.54	1.05
Run 1	10/28/02	10:20:17	1002.7	20.48	1.18	946.3	20.54	1.05
Run 1	10/28/02	10:21:17	947.9	20.45	1.10	946.3	20.54	1.05
Run 1	10/28/02	10:22:17	990.7	20.40	1.16	947.2	20.53	1.05
Run 1	10/28/02	10:23:17	990.1	20.43	1.18	948.1	20.53	1.05
Run 1	10/28/02	10:24:17	1000.3	20.50	1.16	949.1	20.53	1.06
Run 1	10/28/02	10:25:17	1024.1	20.53	1.10	950.5	20.53	1.06
Run 1	10/28/02	10:26:17	1035.3	20.50	1.16	952.1	20.53	1.06
Run 1	10/28/02	10:27:17	1007.3	20.50	1.16	953.1	20.53	1.06
Run 1	10/28/02	10:28:17	1002.0	20.50	1.18	954.0	20.53	1.06
Run 1	10/28/02	10:29:17	1012.8	20.50	1.22	955.1	20.53	1.06
Run 1	10/28/02	10:30:17	998.6	20.50	1.24	955.8	20.53	1.07
Run 1	10/28/02	10:31:17	987.5	20.48	1.28	956.4	20.53	1.07
Run 1	10/28/02	10:32:17	999.6	20.45	1.26	957.1	20.53	1.07
Run 1	10/28/02	10:33:17	1000.7	20.43	1.28	957.8	20.52	1.08
END Run 1	10/28/02	10:34:17	1012.4	20.43	1.32	**958.7**	**20.52**	**1.08**

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
START Run 2	10/28/02	11:27:40	1012.8	20.43	1.32	1012.8	20.43	1.32
Run 2	10/28/02	11:28:40	1000.8	20.45	1.28	1034.6	20.44	1.31
Run 2	10/28/02	11:29:39	1043.0	20.45	1.32	1020.5	20.43	1.32
Run 2	10/28/02	11:30:39	1022.8	20.43	1.32	1020.2	20.44	1.31
Run 2	10/28/02	11:31:39	1047.0	20.43	1.34	1027.8	20.43	1.32
Run 2	10/28/02	11:32:39	1105.0	20.45	1.30	1034.8	20.43	1.32
Run 2	10/28/02	11:33:39	1049.0	20.48	1.30	1041.2	20.43	1.32
Run 2	10/28/02	11:34:39	788.8	20.30	1.22	1040.1	20.44	1.29
Run 2	10/28/02	11:35:39	1063.0	20.40	1.28	1030.5	20.43	1.29
Run 2	10/28/02	11:36:39	1022.8	20.43	1.26	1033.0	20.43	1.29
Run 2	10/28/02	11:37:39	1071.0	20.43	1.28	1034.2	20.43	1.29
Run 2	10/28/02	11:38:39	1089.0	20.45	1.32	1036.9	20.43	1.29
Run 2	10/28/02	11:39:39	1041.0	20.45	1.30	1042.5	20.43	1.29
Run 2	10/28/02	11:40:39	1107.0	20.48	1.30	1044.7	20.43	1.29
Run 2	10/28/02	11:41:39	1051.0	20.43	1.32	1045.3	20.43	1.29
Run 2	10/28/02	11:42:39	1057.0	20.45	1.30	1047.6	20.43	1.29
Run 2	10/28/02	11:43:39	1087.0	20.43	1.30	1048.9	20.43	1.29
Run 2	10/28/02	11:44:39	1092.8	20.45	1.30	1050.3	20.43	1.29
Run 2	10/28/02	11:45:39	1069.0	20.43	1.28	1053.1	20.43	1.29
Run 2	10/28/02	11:46:39	1083.0	20.40	1.32	1053.8	20.43	1.29
Run 2	10/28/02	11:47:39	1081.0	20.40	1.30	1055.6	20.43	1.29
Run 2	10/28/02	11:48:39	1083.0	20.43	1.28	1057.1	20.43	1.29
Run 2	10/28/02	11:49:39	1047.0	20.53	0.78	1057.6	20.43	1.29
Run 2	10/28/02	11:50:39	1061.0	20.40	1.26	1052.9	20.43	1.28
Run 2	10/28/02	11:51:39	1123.0	20.40	1.32	1054.3	20.43	1.28
Run 2	10/28/02	11:52:39	1081.0	20.43	1.24	1057.3	20.43	1.28
Run 2	10/28/02	11:53:39	1127.0	20.43	1.24	1058.8	20.43	1.28
Run 2	10/28/02	11:54:39	1061.0	20.43	1.26	1059.3	20.43	1.28
Run 2	10/28/02	11:55:39	1076.8	20.45	1.22	1060.3	20.43	1.28
Run 2	10/28/02	11:56:39	1127.0	20.40	1.30	1061.0	20.43	1.28
Run 2	10/28/02	11:57:39	1097.0	20.43	1.28	1063.2	20.43	1.28
Run 2	10/28/02	11:58:39	1127.0	20.43	1.28	1064.7	20.43	1.28
Run 2	10/28/02	11:59:39	1081.0	20.43	1.30	1065.7	20.43	1.28

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
Run 2	10/28/02	12:00:39	1095.0	20.45	1.30	1066.8	20.43	1.28
Run 2	10/28/02	12:01:39	1079.0	20.43	1.26	1067.1	20.43	1.28
Run 2	10/28/02	12:02:39	1093.0	20.45	1.28	1067.8	20.43	1.28
Run 2	10/28/02	12:03:39	1087.0	20.45	1.30	1067.8	20.43	1.28
Run 2	10/28/02	12:04:39	1101.0	20.40	1.28	1069.0	20.43	1.28
Run 2	10/28/02	12:05:39	1149.0	20.43	1.30	1070.3	20.43	1.28
Run 2	10/28/02	12:06:39	1145.0	20.38	1.28	1072.7	20.43	1.28
Run 2	10/28/02	12:07:39	1209.0	20.38	1.32	1075.0	20.43	1.28
Run 2	10/28/02	12:08:39	1171.0	20.40	1.32	1077.7	20.43	1.28
Run 2	10/28/02	12:09:39	1187.0	20.40	1.32	1079.9	20.43	1.28
Run 2	10/28/02	12:10:39	1109.0	20.43	1.28	1081.8	20.43	1.28
Run 2	10/28/02	12:11:39	1131.0	20.43	1.22	1082.9	20.43	1.28
Run 2	10/28/02	12:12:39	1125.0	20.70	1.20	1083.4	20.43	1.28
Run 2	10/28/02	12:13:39	1099.0	20.48	1.16	1083.3	20.43	1.28
Run 2	10/28/02	12:14:39	1125.0	20.45	1.20	1083.4	20.43	1.28
Run 2	10/28/02	12:15:39	1091.0	20.48	1.18	1084.1	20.43	1.28
Run 2	10/28/02	12:16:39	1135.0	20.48	1.20	1084.5	20.43	1.27
Run 2	10/28/02	12:17:39	1083.0	20.48	1.18	1085.0	20.43	1.27
Run 2	10/28/02	12:18:39	1127.0	20.45	1.18	1085.8	20.43	1.27
Run 2	10/28/02	12:19:38	1113.0	20.45	1.20	1086.0	20.43	1.27
Run 2	10/28/02	12:20:38	1079.0	20.45	1.20	1086.5	20.43	1.27
Run 2	10/28/02	12:21:38	1145.0	20.45	1.20	1087.0	20.43	1.27
Run 2	10/28/02	12:22:38	1153.0	20.45	1.20	1087.6	20.43	1.27
Run 2	10/28/02	12:23:38	1091.0	20.43	1.22	1088.5	20.43	1.26
Run 2	10/28/02	12:24:38	1113.0	20.45	1.16	1089.4	20.43	1.26
Run 2	10/28/02	12:25:38	1173.0	20.45	1.20	1089.7	20.43	1.26
Run 2	10/28/02	12:26:38	1127.0	20.45	1.20	1090.3	20.43	1.26
END Run 2	10/28/02	12:27:38	1137.0	20.40	1.26	**1091.3**	**20.43**	**1.26**

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
START Run 3	10/28/02	13:17:45	1009.0	20.40	1.04	1009.0	20.40	1.04
Run 3	10/28/02	13:18:45	1023.0	20.45	1.06	1004.8	20.42	1.06
Run 3	10/28/02	13:19:45	969.0	20.45	1.04	999.4	20.44	1.04
Run 3	10/28/02	13:20:45	991.0	20.45	1.00	996.6	20.43	1.04
Run 3	10/28/02	13:21:45	983.0	20.45	0.98	992.1	20.44	1.03
Run 3	10/28/02	13:22:45	979.0	20.43	1.02	991.8	20.44	1.02
Run 3	10/28/02	13:23:45	991.0	20.43	1.02	988.9	20.44	1.02
Run 3	10/28/02	13:24:45	957.0	20.43	1.02	987.7	20.44	1.02
Run 3	10/28/02	13:25:45	1007.0	20.43	1.06	986.4	20.43	1.02
Run 3	10/28/02	13:26:45	923.0	20.28	1.04	985.4	20.42	1.02
Run 3	10/28/02	13:27:45	1015.0	20.33	1.04	985.1	20.41	1.03
Run 3	10/28/02	13:28:45	1025.0	20.33	1.14	986.6	20.40	1.03
Run 3	10/28/02	13:29:45	1039.0	20.38	1.12	992.9	20.40	1.04
Run 3	10/28/02	13:30:45	1089.0	20.38	1.12	997.1	20.40	1.05
Run 3	10/28/02	13:31:45	1055.0	20.38	1.14	1002.2	20.39	1.06
Run 3	10/28/02	13:32:45	1093.0	20.38	1.12	1007.8	20.39	1.06
Run 3	10/28/02	13:33:45	1065.0	20.35	1.14	1010.7	20.39	1.07
Run 3	10/28/02	13:34:44	1015.0	20.35	1.10	1014.0	20.39	1.07
Run 3	10/28/02	13:35:44	1083.0	20.35	1.14	1015.7	20.38	1.07
Run 3	10/28/02	13:36:44	1007.0	20.35	1.14	1017.6	20.38	1.07
Run 3	10/28/02	13:37:44	1013.0	20.38	1.08	1018.3	20.38	1.08
Run 3	10/28/02	13:38:44	1025.0	20.35	1.14	1017.1	20.38	1.08
Run 3	10/28/02	13:39:44	1005.0	20.35	1.12	1017.4	20.38	1.08
Run 3	10/28/02	13:40:44	1037.0	20.33	1.12	1016.7	20.38	1.08
Run 3	10/28/02	13:41:44	993.0	20.33	1.14	1016.6	20.38	1.09
Run 3	10/28/02	13:42:44	999.0	20.33	1.12	1016.1	20.37	1.09
Run 3	10/28/02	13:43:44	947.0	20.43	1.14	1013.9	20.37	1.09
Run 3	10/28/02	13:44:44	937.0	20.38	1.12	1011.8	20.38	1.09
Run 3	10/28/02	13:45:44	935.0	20.40	1.10	1008.9	20.38	1.09
Run 3	10/28/02	13:46:44	911.0	20.40	1.08	1006.3	20.38	1.09
Run 3	10/28/02	13:47:44	959.0	20.40	1.12	1003.6	20.38	1.09
Run 3	10/28/02	13:48:44	945.0	20.40	1.14	1001.9	20.38	1.09
Run 3	10/28/02	13:49:44	971.0	20.40	1.10	1000.9	20.38	1.09

Georgia-Pacific Palatka Operations, Bleach Plant Scrubber, Logged Data Records

Run Number	Date	Time	CO (ppmv)	O2 (% vol)	CO2 (% vol)	AVE CO (ppmv)	AVE O2 (% vol)	AVE CO2 (% vol)
Run 3	10/28/02	13:50:44	961.0	20.38	1.16	999.0	20.38	1.10
Run 3	10/28/02	13:51:44	929.0	20.35	1.08	998.1	20.38	1.10
Run 3	10/28/02	13:52:44	973.0	20.35	1.08	996.5	20.38	1.10
Run 3	10/28/02	13:53:44	909.0	20.38	1.12	994.6	20.38	1.10
Run 3	10/28/02	13:54:44	945.0	20.33	1.06	993.4	20.38	1.09
Run 3	10/28/02	13:55:44	933.0	20.33	1.08	991.5	20.38	1.09
Run 3	10/28/02	13:56:44	690.8	20.35	0.98	988.5	20.38	1.09
Run 3	10/28/02	13:57:44	927.0	20.33	1.04	984.3	20.37	1.09
Run 3	10/28/02	13:58:44	873.0	20.35	1.00	982.1	20.37	1.09
Run 3	10/28/02	13:59:44	891.0	20.38	1.02	980.0	20.37	1.08
Run 3	10/28/02	14:00:44	915.0	20.38	1.06	977.9	20.37	1.08
Run 3	10/28/02	14:01:44	861.0	20.38	1.04	976.3	20.37	1.08
Run 3	10/28/02	14:02:44	921.0	20.40	1.06	974.2	20.37	1.08
Run 3	10/28/02	14:03:44	855.0	20.38	1.06	972.2	20.37	1.08
Run 3	10/28/02	14:04:44	893.0	20.38	1.02	970.4	20.37	1.08
Run 3	10/28/02	14:05:44	849.0	20.38	1.04	967.8	20.37	1.08
Run 3	10/28/02	14:06:44	889.0	20.40	1.04	966.3	20.37	1.08
Run 3	10/28/02	14:07:44	917.0	20.40	1.04	964.7	20.37	1.08
Run 3	10/28/02	14:08:44	879.0	20.40	1.06	963.3	20.37	1.08
Run 3	10/28/02	14:09:44	903.0	20.38	1.04	962.1	20.37	1.08
Run 3	10/28/02	14:10:44	863.0	20.38	1.08	960.2	20.38	1.08
Run 3	10/28/02	14:11:44	855.0	20.38	1.02	958.7	20.38	1.08
Run 3	10/28/02	14:12:44	917.0	20.38	1.06	957.2	20.38	1.07
Run 3	10/28/02	14:13:44	879.0	20.38	1.06	956.0	20.38	1.07
Run 3	10/28/02	14:14:44	845.0	20.40	0.96	954.6	20.38	1.07
Run 3	10/28/02	14:15:44	883.0	20.38	0.98	952.6	20.38	1.07
Run 3	10/28/02	14:16:44	825.0	20.38	0.96	951.0	20.38	1.07
END Run 3	10/28/02	14:17:44	849.0	20.38	0.90	**949.3**	**20.38**	**1.07**

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P.O. Box 919
Palatka, FL 32178-0919
(386) 325-2001

December 13, 2002

Mr. Christopher L. Kirts
District Air Program Administrator
State of Florida
Department of Environmental Protection
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Re: Bleach Plant Compliance Test – October 2002
Georgia-Pacific Palatka Operations

Dear Mr. Kirts:

Continuous monitoring system (CMS) parameters, monitoring frequencies, averaging times and the rationale for selecting the CMS are required to be submitted for approval pursuant to 40 CFR 63.453 (n). This information has been updated from a previous submittal (letter dated October 25, 2002, Appendix A) reflecting recent compliance testing conducted in October 2002, which has been summarized and included in this correspondence for your review. (A copy of the test report is included as an attachment.)

The Bleach Plant scrubber collects and treats emissions from the No. 3 Bleach Plant as well as emissions from the R8/10 Chlorine Dioxide Generator. The pH of the gas scrubber effluent, the scrubber liquid influent flow rate, and the fan amps were continuously recorded during the testing. We have analyzed this information pursuant to 40 CFR 63.453 (n) as follows.

Although all runs demonstrated compliance with 40 CFR 63.445 (c) (2) by a considerable margin, four of the six runs were selected to develop operating parameter values providing the greatest operating flexibility while also demonstrating continuous compliance (see Table 1).

The average pH during these runs was 9.2 with a minimum during one run of 9.0 (see Figures 1 and 2 in Appendix B). We, therefore, propose for the Administrator's approval that we operate the scrubber effluent pH above a minimum of 9.0 as a rolling 3-hour average with a monitoring frequency of at least once every 15 minutes (see Table 2). We believe the monitoring frequency of once every 15 minutes to be appropriate because the standard deviation of the data was quite low. The average flow of the scrubber medium was 1257 gpm with a minimum of 1252 gpm. By the same rationale we propose for the Administrator's approval that we operate above a minimum flow of 1252 as a rolling 3-hour average with the same monitoring frequency described above.

Region 4 previously approved monitoring fan amperage of the bleaching system vent gas fan as an alternative monitoring parameter to 40 CFR 63.453 (c)(2) (letter dated December 22, 2000). The mill continuously monitors fan amperage and displays it as fan load on its Distributed Control System (DCS). Fan load during the time of the testing was calculated as follows (Equation 1).

$$\%Load = \frac{measured\ amps}{0.701 * full\ load\ amps} * 100 = \frac{measured\ amps}{0.701 * 25.7} * 100 = \frac{measured\ amps}{18.02} * 100$$

Please note 0.701 represents a conversion factor for ranging of the signal from the field instrumentation to the DCS.

Figure 3 reflects the fan load/amperage when the Bleach Plant goes down. Because the mill continues to run the fan the amperage goes up although the process is down. We have also taken all the belts off the fan motor to determine its "no load" amperage, 9.8 amps. Because of data variability we propose to operate the fan such that the amperage is below 19.3 and above 10.8 amps as a rolling 3-hour average. This will be converted to fan load for convenience of the operators. Note that this calculation has been simplified according to the following (Equation 2) and became effective on December 5, 2002 at 13:05.

$$\%Load = \frac{measured\ amps}{full\ load\ amps} * 100 = \frac{measured\ amps}{25.7} * 100$$

Again, we propose to monitor fan amperage/load at least once every 15 minutes. In all cases, pH, flow, and % Load data will be transferred to a plant wide information (PI) system for record keeping purposes.

We respectfully request written approval as required by 40 CFR 63.453 (n). If you have any questions about our rationale please do not hesitate to call me at (386) 329-0918.

Sincerely,

Theodore D. Kennedy
Vice President

tk

Enclosures

cc: Lee Page, EPA Region 4
William Jernigan, Atlanta
Scott Matchett, Atlanta
Cindy Barlow
Nickolai Selbach

Appendix A

Letter Dated October 25, 2002

Georgia-Pacific

Palatka Pulp and Paper Operations
Consumer Products Division

P.O. Box 919
Palatka, FL 32178-0919
(386) 325-2001

October 25, 2002

Mr. Mort Benjamin
Air Compliance Supervisor
Northeast District
Florida Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256-7577

Re: Cluster Rule CMS Parameters (40 CFR 63.453(n))
Georgia-Pacific Palatka Operations
1070005

Dear Mr. Benjamin:

During a recent review of recordkeeping and reporting procedures we discovered that continuous monitoring system (CMS) parameters, monitoring frequencies, averaging times and the rationale for choosing the CMS were not submitted in a readable, concise format and summary to the Department pursuant to 40 CFR 63.453 (n).

The CMS listed in the attached tables were chosen because they indicate when there is a breach of the Closed Vent Collection System, a bypass of the Condensate Collection System, or they otherwise indicate operation outside of tested operating ranges on the condensate, low-volume-high-concentration (LVHC) and bleach plant treatment systems specifically identified in 40 CFR Subpart S. The tables show the equipment, the parameters that are monitored, the CMS tag numbers, the limits that have been evaluated and the thresholds or minimum averaging times.

Limit switches, pressure measurements, stream flows, temperatures, pH, fan load, pH and indications of valve positions are forms of CMS that are generally accepted industry-wide for monitoring for compliance.

The parameters designated as "Valve Position" or "Vent Valve Position" in the attached Tables indicate that a system is either being collected (valve "Closed") or bypassed (valve "Open") to show compliance with the requirement to collect gases from the named LVHC systems.

The incinerator temperature values were selected because data collected during the IPT of the two incinerators indicated that compliance with the treatment requirements of 63.443(d) were met at all times when the temperatures were above the chosen values. The averaging time was selected based on run times of the reference test methods. Similarly, the parameter values shown for the stripper parameters mandated under 63.453(g) were based on data gathered during the stripper characterization study.

Finally, the scrubber parameters are either mandated by the rule (see 63.453(c)) or approved as acceptable alternative monitoring. Parameter values were chosen based on data gathered during the scrubber IPTand subsequent performance tests, and when the parameters are within the designated ranges, we meet the bleach plant treatment requirements found in 63.445(c). Averaging times were selected based on normal compliance test times.

If you have any more questions concerning this issue, please do not hesitate to contact either Joe Taylor at 386-329-0027 or via e-mail at jetaylor@gapac.com or me at 386-329-0918.

Sincerely,

Theodore D Kennedy

Theodore D. Kennedy
Vice-President
Palatka Operations

Bc: S. D. Matchett (GA030-43)
W. M. Jernigan (GA030-09)

MACT I CONTINUOUS MONITORING SYSTEMS

Area	Parameter/Equipment	Parameter Monitored	PI Tag Number	Range/Limit	Threshold/Averaging Time
Bleach Plant (scrubber)	Scrubbant Recirculation Flow	Flow	40fif31.pv	≥ 1229 gpm	3-hr average
	Scrubber Fan Load	Load	40iif33.pv	≥ 85%	Continuous
	Scrubbant Recirculation pH	PH	40aif32.pv	≥ 9.1	3-hr average
Thermal Oxidizer	Primary Incinerator Temperature	Temperature	13ncgincin:13ttm22a.pnt	≥ 1300° F	3-hr rolling average
	Backup Incinerator Temperature	Temperature	13ncgincin:13ttm22b.pnt	≥ 1300° F	
Steam Stripper	Steam Flow to Stripper	Steam Flow	13constrip:13fcc01.meas		3-hr rolling average
	Condensate Flow to Stripper	Condensate Flow	13constrip:13fcc19.meas	N/A	3-hr rolling average
	Condensate Temperature entering Column	Temperature	13constrip:13ttc30.pnt	≥ 160° F	3-hr rolling average
Condensate Collection	Pre-evaporator 1st and 2nd effect foul, Pre-evaporator hotwell condensate	Flow, gpm	13concollect:13ftk20.pnt	N/A	Daily average rolled into 15-day rolling average
	1st and 2nd effect contaminated condensate, as makeup	Flow, gpm	13concollect:13ftk03.pnt	N/A	Daily average rolled into 15-day rolling average
	Turpentine Decanter Underflow and Secondary Condenser condensate	Flow, gpm	13concollect:13ftk21.pnt	N/A	Daily average rolled into 15-day rolling average

MACT I CONTINUOUS MONITORING SYSTEMS

Area	Parameter/Equipment	Parameter Monitored	Loop Number	Range/Limit	Threshold/Averaging Time
Closed Vent System	#1 Blow Tank Safety Valve	Limit Switch	05VL1VNT	Open/Closed	minute
	#2 Blow Tank Safety Valve	Limit Switch	05VL2VNT	Open/Closed	minute
	#3 Blow Tank Safety Valve	Limit Switch	05VL3VNT	Open/Closed	minute
	Secondary Condenser Vent	Limit Switch	13D06	Open/Closed	minute
	Secondary Condenser Rupture Disc	Pressure Transmitter	13D07	14.5 psi	minute
	Secondary Condenser Rupture Disc	Pressure Transmitter	13D61	14.5 psi	minute
	Accumulator Safety Valve	Limit Switch	13A07	Open/Closed	minute
	Accumulator Safety Valve	Limit Switch	13A22	Open/Closed	minute
	Pre-evaporator Hotwell Loop Seal	Pressure Transmitter	13PTB23	14" water column	minute
	Pre-evaporator Hotwell Vent	Limit Switch	13D01	Open/Closed	minute
	Pre-evaporator Hotwell Rupture Disc	Pressure Switch	13D02	10 psi	minute
	Turpentine Condenser Vent	Limit Switch	13J01	Open/Closed	minute
	Turpentine Condenser Rupture Disc	Pressure Switch	13J02	10 psi	minute
	#1 Evaporator Hotwell Vent	Limit Switch	13J26	Open/Closed	minute

MACT I CONTINUOUS MONITORING SYSTEMS

Area	Parameter/Equipment	Parameter Monitored	Loop Number	Range/Limit	Threshold/Averaging Time
Closed Vent System	#1 Evaporator Hotwell Rupture Disc	Pressure Switch	13J27	10 psi	minute
	#2 Evaporator Hotwell Vent	Limit Switch	13J21	Open/Closed	minute
	#2 Evaporator Hotwell Rupture Disc	Pressure Switch	13J22	10 psi	minute
	#3 Evaporator Hotwell Vent	Limit Switch	13J16	Open/Closed	minute
	#3 Evaporator Hotwell Rupture Disc	Pressure Switch	13J17	10 psi	minute
	#3 Evaporator Hotwell Loop Seal	Pressure Transmitter	11PTJ12	14" water column	minute
	#4 Evaporator Hotwell Vent	Limit Switch	13J11	Open/Closed	minute
	#4 Evaporator Hotwell Rupture Disc	Pressure Switch	13J12	10 psi	minute
	#4 Evaporator Hotwell Rupture Disc	Pressure Switch	13J15	10 psi	minute
	#4 Evaporator Hotwell Loop Seal	Pressure Transmitter	68PTO46	14" water column	minute
	Stripper Feed Tank Water Seal	Water Seal	13K09	8 psi	minute
	Stripper Feed Tank Rupture Disc	Pressure Transmitter	13K15	14.5 psi	minute
	Stripper-off-gas to Oxidizer	Limit Switch	13L04	Open/Closed	minute
	Stripper-off-gas to Oxidizer Rupture Disc	Temperature Transmitter	13L14	160° F	minute

MACT I CONTINUOUS MONITORING SYSTEMS

Area	Parameter/Equipment	Parameter Monitored	Loop Number	Range/Limit	Threshold/Averaging Time
Closed Vent System	Stripper-off-gas to Boiler	Limit Switch	59D12	Open/Closed	
	Stripper-off-gas to Boiler Rupture Disc	Pressure Transmitter	59D35	14.5 psi	
	NCG Vent to Oxidizer	Limit Switch	13D70	Open/Closed	
	NCG to Oxidizer Rupture Disc	Pressure Transmitter	13D65	14.5 psi	
	NCG to Oxidizer Rupture Disc	Temperature Transmitter	13D68	160° F	
	Batch NCG to Boiler Rupture Disc	Pressure Transmitter	13D63	14.5 psi	
	NCG Vent to Boiler	Limit Switch	59D08	Open/Closed	
	NCG to Boiler Rupture Disc	Temperature Transmitter	59D06	160° F	

Appendix B

Miscellaneous Information

Table 1

	Run 1	Run 2	Run 3	Run 4
Start =	10/29/02 12.18	10/31/02 13 32	10/31/02 15:50	10/31/02 17:10
End =	10/29/02 13 23	10/31/02 14 43	10/31/02 16:56	10/31/02 18:16

	Do Stage					Eop Stage		D1 Stage		BP Scrubber									R-10 Run Status	Test
	BAST/h 43FYB04.PV	Maximum	STDEV	% Pine 43AYB04W.PV	% HW Calculation	% Pine 43AYD04W.PV	% HW Calculation	% Pine 43AYF04W.PV	% HW Calculation	Flow (gpm) 40FIF31.PV	Minimum	STDEV	pH 40AIF32.PV	Minimum	STDEV	Fan Load (%) 40IIF33.PV	Fan Load (amps) 40IIF33.PV	Fan Delta P (in H2O) 40PIF03.PV	ClO2 (STPD) 37FYF14.PV	Cl2 ppm
Run 1	50	52	0.6	100.0	0.0	100.0	0.0	100.0	0.0	1262	1261	0.6	9.1	9.0	0.06	83.9	15.1	20.9	0.00	0.233
Run 2	50	52	0.8	100.0	0.0	100.0	0.0	100.0	0.0	1253	1252	1 0	9.3	9.3	0 01	85.5	15.4	21.4	31.6	0.073
Run 3	50	52	0.6	100.0	0.0	100.0	0 0	100.0	0 0	1258	1257	0 8	9.3	9.3	0.00	85.4	15 4	21.4	37.3	0.020
Run 4	50	52	0.6	100.0	0 0	100.0	0 0	100.0	0 0	1262	1260	0 9	9 3	9.2	0.02	85.8	15 4	21 4	30.3	0.032
										Average =	1257			9.2		85.1	15.3			

Table 2

No. 3 Bleach Plant

Parameter		Test Condition	Proposed Operating Value	Monitoring Frequency	Averaging Time
pH, Minimum		9.0	9.0	5 min	3-hr., rolling
Scrubber flow, Minimum	(gpm)	1252	1252	5 min	3-hr., rolling
Fan load Minimum	(amps)	15.11[a]	10.8[c]	5 min	3-hr., rolling
Fan load Maximum	(amps)	15.45[b]	19.3[d]	5 min	3-hr., rolling
Fan "No Load"	(amps)	9.8			

[a] Equivalent to 83.9% Load, using Equation 1

[b] Equivalent to 85.8% Load, using Equation 1

[c] Equivalent to 41.9% Load using Equation 2

[d] Equivalent to75% Load using Equation 2

Figure 1

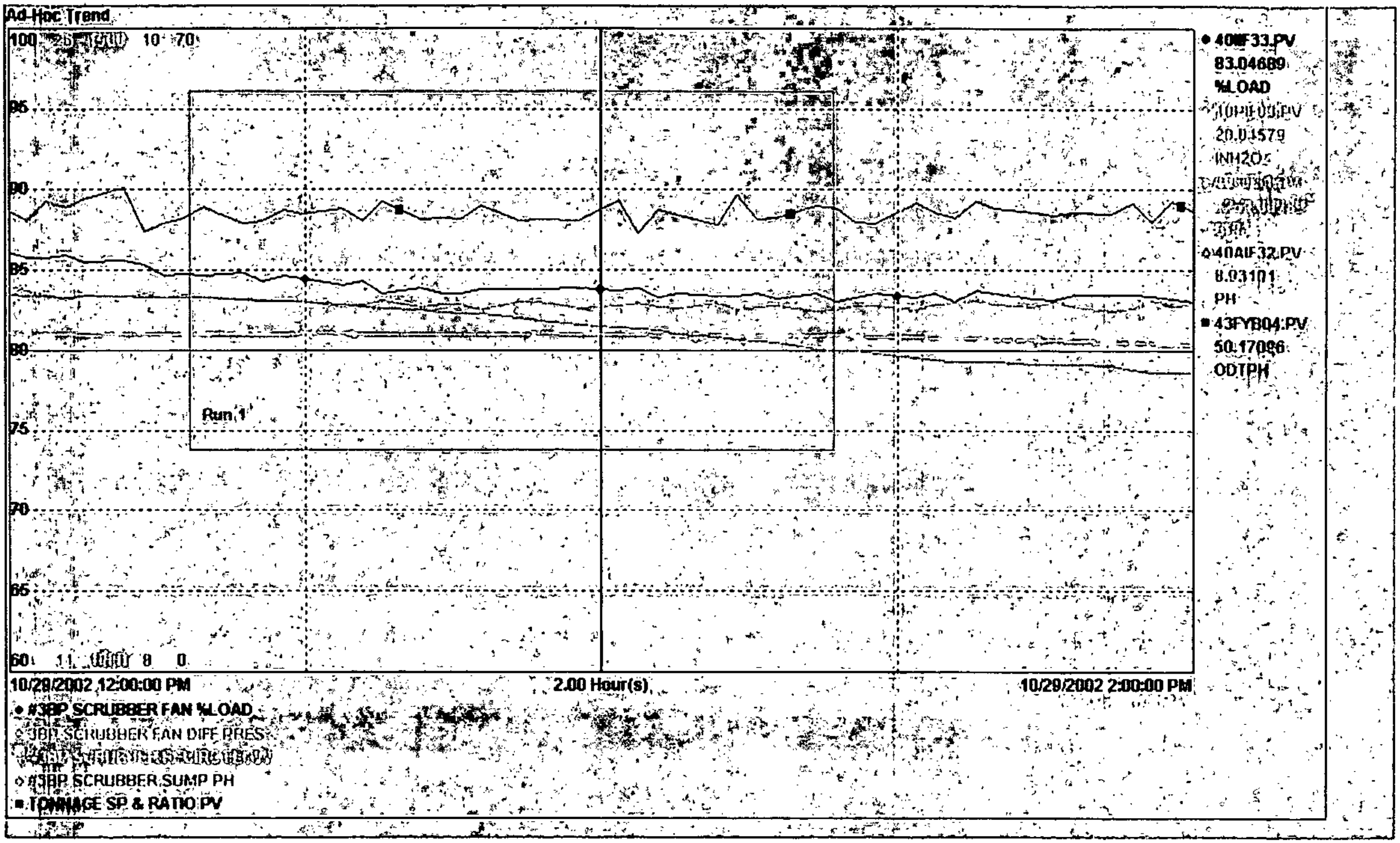

Ad-Hoc Trend
100
10
70
95
90
85
80
75
70
65
60
11
8
0
Run 1
10/29/2002 12:00:00 PM
2.00 Hour(s)
10/29/2002 2:00:00 PM
● #3BP SCRUBBER FAN %LOAD
◇ 3BP SCRUBBER FAN DIFF PRES
◇ #3BP SCRUBBER SUMP PH
■ TONNAGE SP & RATIO PV
● 40IIF33.PV
83.04689
%LOAD
20.01579
INH2O
◇ 40AIF32.PV
8.03101
PH
■ 43FYB04.PV
50.17096
ODTPH

Figure 2

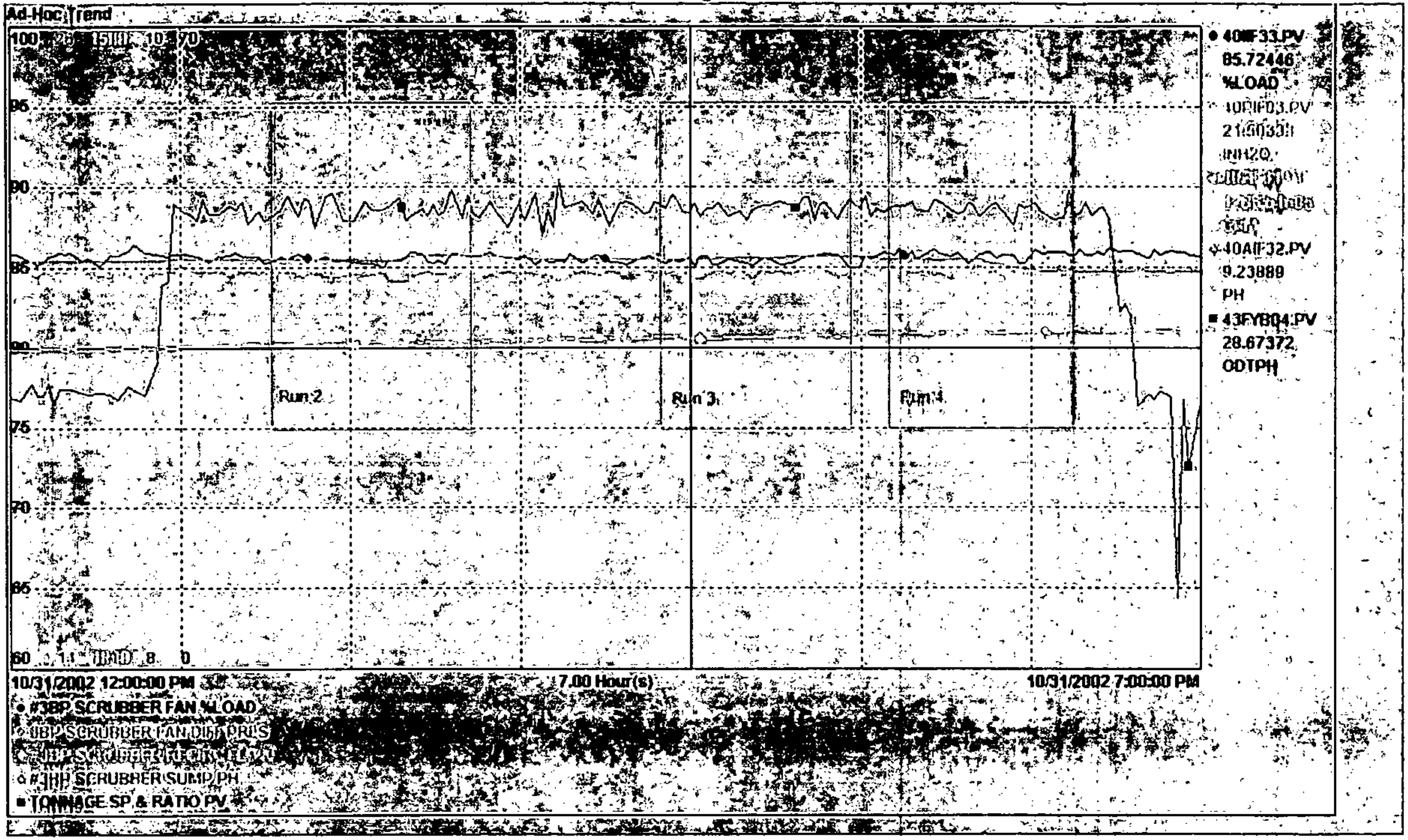
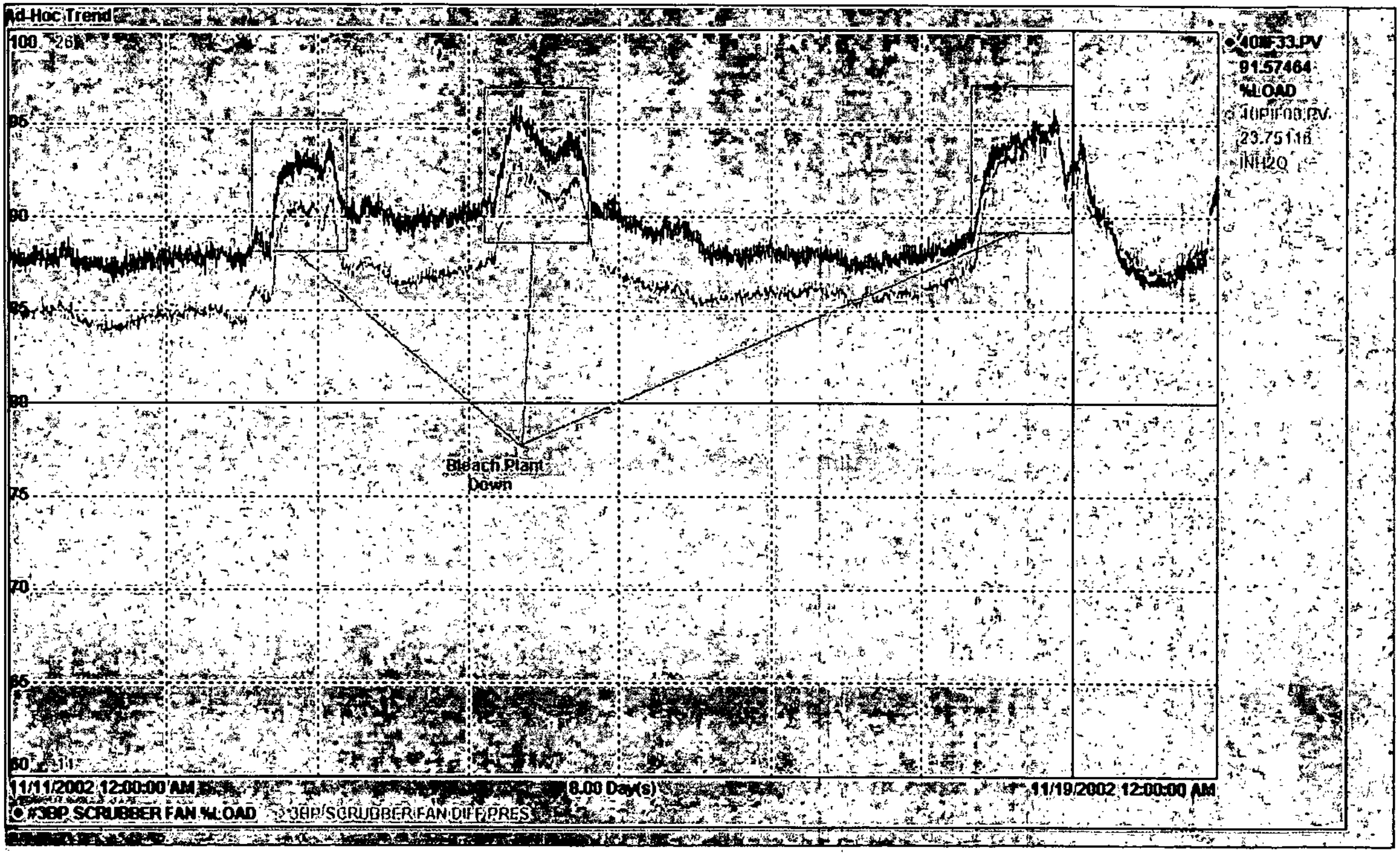

Ad-Hoc Trend
100
95
90
85
80
75
70
65
60
Run 2
Run 3
Run 4
10/31/2002 12:00:00 PM
7.00 Hour(s)
10/31/2002 7:00:00 PM
● 40IIF33.PV
85.72446
%LOAD
40RIF03.PV
INH2O
♦ 40AIF32.PV
9.23889
PH
■ 43FYB04.PV
28.67372
ODTPH
● #3BP SCRUBBER FAN %LOAD
◇ 3BP SCRUBBER FAN DIFF PRES
◇ #3BP SCRUBBER SUMP PH
■ TONNAGE SP & RATIO PV

Figure 3


Ad-Hoc Trend
100
26
95
90
85
80
75
70
65
60
Bleach Plant Down
11/11/2002 12:00:00 AM
8.00 Day(s)
11/19/2002 12:00:00 AM
#3BP SCRUBBER FAN %LOAD
3BP SCRUBBER FAN DIFF PRES
40IIF33.PV
91.57464
%LOAD
40PIF00.PV
23.75118
INH2O

Appendix C

Raw Data
(5-minute averages)

pH Run 1		pH Run 2		pH Run 3		pH Run 4	
29-Oct-02 12:18:00	9.2	31-Oct-02 13:32:00	9.3	31-Oct-02 15:50:00	9.3	31-Oct-02 17:10:00	9.3
29-Oct-02 12:23:00	9.2	31-Oct-02 13:37:00	9.3	31-Oct-02 15:55:00	9.3	31-Oct-02 17:15:00	9.3
29-Oct-02 12:28:00	9.1	31-Oct-02 13:42:00	9.3	31-Oct-02 16:00:00	9.3	31-Oct-02 17:20:00	9.3
29-Oct-02 12:33:00	9.1	31-Oct-02 13:47:00	9.3	31-Oct-02 16:05:00	9.3	31-Oct-02 17:25:00	9.3
29-Oct-02 12:38:00	9.1	31-Oct-02 13:52:00	9.3	31-Oct-02 16:10:00	9.3	31-Oct-02 17:30:00	9.3
29-Oct-02 12:43:00	9.1	31-Oct-02 13:57:00	9.3	31-Oct-02 16:15:00	9.3	31-Oct-02 17:35:00	9.3
29-Oct-02 12:48:00	9.1	31-Oct-02 14:02:00	9.3	31-Oct-02 16:20:00	9.3	31-Oct-02 17:40:00	9.3
29-Oct-02 12:53:00	9.1	31-Oct-02 14:07:00	9.3	31-Oct-02 16:25:00	9.3	31-Oct-02 17:45:00	9.3
29-Oct-02 12:58:00	9.1	31-Oct-02 14:12:00	9.3	31-Oct-02 16:30:00	9.3	31-Oct-02 17:50:00	9.3
29-Oct-02 13:03:00	9.1	31-Oct-02 14:17:00	9.3	31-Oct-02 16:35:00	9.3	31-Oct-02 17:55:00	9.2
29-Oct-02 13:08:00	9.0	31-Oct-02 14:22:00	9.3	31-Oct-02 16:40:00	9.3	31-Oct-02 18:00:00	9.2
29-Oct-02 13:13:00	9.0	31-Oct-02 14:27:00	9.3	31-Oct-02 16:45:00	9.3	31-Oct-02 18:05:00	9.2
29-Oct-02 13:18:00	9.0	31-Oct-02 14:32:00	9.3	31-Oct-02 16:50:00	9.3	31-Oct-02 18:10:00	9.2
		31-Oct-02 14:37:00	9.3				

Flow Run 1		Flow Run 2		Flow Run 3		Flow Run 4	
29-Oct-02 12:18:00	1263	31-Oct-02 13:32:00	1253	31-Oct-02 15:50:00	1258	31-Oct-02 17:10:00	1261
29-Oct-02 12:23:00	1262	31-Oct-02 13:37:00	1253	31-Oct-02 15:55:00	1258	31-Oct-02 17:15:00	1261
29-Oct-02 12:28:00	1263	31-Oct-02 13:42:00	1252	31-Oct-02 16:00:00	1257	31-Oct-02 17:20:00	1261
29-Oct-02 12:33:00	1263	31-Oct-02 13:47:00	1252	31-Oct-02 16:05:00	1257	31-Oct-02 17:25:00	1261
29-Oct-02 12:38:00	1263	31-Oct-02 13:52:00	1253	31-Oct-02 16:10:00	1258	31-Oct-02 17:30:00	1261
29-Oct-02 12:43:00	1262	31-Oct-02 13:57:00	1252	31-Oct-02 16:15:00	1258	31-Oct-02 17:35:00	1261
29-Oct-02 12:48:00	1263	31-Oct-02 14:02:00	1252	31-Oct-02 16:20:00	1258	31-Oct-02 17:40:00	1261
29-Oct-02 12:53:00	1263	31-Oct-02 14:07:00	1252	31-Oct-02 16:25:00	1259	31-Oct-02 17:45:00	1262
29-Oct-02 12:58:00	1262	31-Oct-02 14:12:00	1252	31-Oct-02 16:30:00	1259	31-Oct-02 17:50:00	1262
29-Oct-02 13:03:00	1262	31-Oct-02 14:17:00	1253	31-Oct-02 16:35:00	1260	31-Oct-02 17:55:00	1262
29-Oct-02 13:08:00	1261	31-Oct-02 14:22:00	1254	31-Oct-02 16:40:00	1259	31-Oct-02 18:00:00	1263
29-Oct-02 13:13:00	1262	31-Oct-02 14:27:00	1254	31-Oct-02 16:45:00	1259	31-Oct-02 18:05:00	1263
29-Oct-02 13:18:00	1261	31-Oct-02 14:32:00	1254	31-Oct-02 16:50:00	1259	31-Oct-02 18:10:00	1263
		31-Oct-02 14:37:00	1255				

Fan Load (Amps) Run 1		Fan Load (Amps) Run 2		Fan Load (Amps) Run 3		Fan Load (Amps) Run 4	
29-Oct-02 12:18:00	15.26	31-Oct-02 13:32:00	15.40	31-Oct-02 15:50:00	15.37	31-Oct-02 17:10:00	15.47
29-Oct-02 12:23:00	15.23	31-Oct-02 13:37:00	15.44	31-Oct-02 15:55:00	15.39	31-Oct-02 17:15:00	15.44
29-Oct-02 12:28:00	15.20	31-Oct-02 13:42:00	15.43	31-Oct-02 16:00:00	15.39	31-Oct-02 17:20:00	15.45
29-Oct-02 12:33:00	15.14	31-Oct-02 13:47:00	15.41	31-Oct-02 16:05:00	15.38	31-Oct-02 17:25:00	15.48
29-Oct-02 12:38:00	15.09	31-Oct-02 13:52:00	15.40	31-Oct-02 16:10:00	15.38	31-Oct-02 17:30:00	15.45
29-Oct-02 12:43:00	15.07	31-Oct-02 13:57:00	15.38	31-Oct-02 16:15:00	15.38	31-Oct-02 17:35:00	15.39
29-Oct-02 12:48:00	15.10	31-Oct-02 14:02:00	15.36	31-Oct-02 16:20:00	15.36	31-Oct-02 17:40:00	15.46
29-Oct-02 12:53:00	15.11	31-Oct-02 14:07:00	15.34	31-Oct-02 16:25:00	15.40	31-Oct-02 17:45:00	15.45
29-Oct-02 12:58:00	15.10	31-Oct-02 14:12:00	15.38	31-Oct-02 16:30:00	15.35	31-Oct-02 17:50:00	15.44
29-Oct-02 13:03:00	15.05	31-Oct-02 14:17:00	15.43	31-Oct-02 16:35:00	15.39	31-Oct-02 17:55:00	15.38
29-Oct-02 13:08:00	15.03	31-Oct-02 14:22:00	15.47	31-Oct-02 16:40:00	15.43	31-Oct-02 18:00:00	15.47
29-Oct-02 13:13:00	15.03	31-Oct-02 14:27:00	15.38	31-Oct-02 16:45:00	15.45	31-Oct-02 18:05:00	15.48
29-Oct-02 13:18:00	15.03	31-Oct-02 14:32:00	15.40	31-Oct-02 16:50:00	15.42	31-Oct-02 18:10:00	15.47
		31-Oct-02 14:37:00	15.45				

Fan Load (%) Run 1		Fan Load (%) Run 2		Fan Load (%) Run 3		Fan Load (%) Run 4	
29-Oct-02 12:18:00	84.7	31-Oct-02 13:32:00	85.5	31-Oct-02 15:50:00	85.3	31-Oct-02 17:10:00	85.9
29-Oct-02 12:23:00	84.6	31-Oct-02 13:37:00	85.7	31-Oct-02 15:55:00	85.4	31-Oct-02 17:15:00	85.7
29-Oct-02 12:28:00	84.4	31-Oct-02 13:42:00	85.6	31-Oct-02 16:00:00	85.4	31-Oct-02 17:20:00	85.8
29-Oct-02 12:33:00	84.0	31-Oct-02 13:47:00	85.5	31-Oct-02 16:05:00	85.4	31-Oct-02 17:25:00	85.9
29-Oct-02 12:38:00	83.8	31-Oct-02 13:52:00	85.5	31-Oct-02 16:10:00	85.4	31-Oct-02 17:30:00	85.8
29-Oct-02 12:43:00	83.6	31-Oct-02 13:57:00	85.4	31-Oct-02 16:15:00	85.4	31-Oct-02 17:35:00	85.4
29-Oct-02 12:48:00	83.8	31-Oct-02 14:02:00	85.3	31-Oct-02 16:20:00	85.2	31-Oct-02 17:40:00	85.8
29-Oct-02 12:53:00	83.9	31-Oct-02 14:07:00	85.1	31-Oct-02 16:25:00	85.5	31-Oct-02 17:45:00	85.8
29-Oct-02 12:58:00	83.8	31-Oct-02 14:12:00	85.4	31-Oct-02 16:30:00	85.2	31-Oct-02 17:50:00	85.7
29-Oct-02 13:03:00	83.6	31-Oct-02 14:17:00	85.6	31-Oct-02 16:35:00	85.4	31-Oct-02 17:55:00	85.4
29-Oct-02 13:08:00	83.4	31-Oct-02 14:22:00	85.9	31-Oct-02 16:40:00	85.6	31-Oct-02 18:00:00	85.9
29-Oct-02 13:13:00	83.4	31-Oct-02 14:27:00	85.4	31-Oct-02 16:45:00	85.8	31-Oct-02 18:05:00	85.9
29-Oct-02 13:18:00	83.4	31-Oct-02 14:32:00	85.5	31-Oct-02 16:50:00	85.6	31-Oct-02 18:10:00	85.9
		31-Oct-02 14:37:00	85.7				

Attachment

TECHNICAL SERVICES, INC.

(904) 353-5761
2901 Danese Street
Jacksonville, Florida 32206

Source Test Report

Georgia Pacific
Palatka, FL

Bleach Plant Outlet

5/25/01

Prepared By:

Technical Services, Inc.
2901 Danese Street
Post Office Box 52329
Jacksonville, Florida 32201
(904) 353 - 5761

David Salter
David Salter

USE OF THIS REPORT AND INFORMATION INCLUDED

This Report and the information contained is the property of the individual or organization named on the face hereof and may be freely distributed in its present form.

REPORT CERTIFICATION

Technical Services, Inc. (TSI) has used its professional experience and best professional efforts in performing this compliance test. I have reviewed the results of these tests and to the best of my knowledge and belief they are true and correct.

REPORT NO. 0104A07

Harvey C. Gray, Jr.

HARVEY C. GRAY, JR.
DATE:

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LIST OF FIGURES

LIST OF TABLES

I. Introduction

Compliance testing for Chlorinated Haps emissions and Carbon Monoxide emissions from the Bleach Plant Scrubber, located at the Georgia Pacific Paper facility in Palatka, FL., was performed on May 25th, 2001. Three (3) test runs, each lasting one (1) hour, were completed on this source for both tests.

Testing and analytical procedures were in accordance with EPA's Methods ten (10), twenty-six (26A), and Florida DEP requirements.

We wish to express our appreciation to Mr. Joe Taylor and the operating staff at Georgia Pacific for their valuable assistance in the successful completion of this project.

II. Summary and Discussion of Results

Results of the compliance tests are summarized in the following tables. Complete emissions data, along with supportive field and analytical data, are included in Appendices A, B, C, and G.

The Bleach Plant Scrubber was within compliance during the tests. The average emissions for Chlorinated Haps were 0.0089 lbs/hr, with an allowable emissions of 0.36 lbs/hr. The average emissions for Carbon Monoxide were 44.72 lbs/hr, with an allowable emissions of 46.0 lbs/hr.

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Volumetric Flow and Emission Output - Table I

FACILITY: Georgia Pacific
LOCATION: Palatka, FL

SOURCE: Bleach Plant Outlet

Date	Run Number	Chlorinated Haps Emissions GR/SCF	LB/HR	ppm, vol.	Vol. Flow Rate ACFM	SCFMD	Adjusted Volume SCFD	Percent H20	Percent Isokinetic
5/25/01	1	0.00008	0.0098	0.13	15440.0	14275.0	35.391	4.6	96.4
5/25/01	2	0.00007	0.0083	0.11	15256.0	14178.0	36.388	5.1	99.8
5/25/01	3	0.00007	0.0084	0.11	15409.0	14413.0	36.716	5.4	99.0
Mean		0.00007	0.0089	0.12	15368.3	14288.7	36.165	5.0	98.4

Mean determined as arithmetic average of the results for each of the three runs.

REMARKS: MACT requires <10 ppm chlorinated HAPs

GEORGIA PACIFIC - PALATKA, FLORIDA BLEACH PLANT - SUMMARY OF CARBON MONOXIDE RESULTS - MAY 25 - 26, 2001

	START TIME	END TIME	STACK FLOW scfmd	CARBON MONOXIDE, ppm	CARBON MONOXIDE, lbs/hr
RUN 1	21:50	22:49	14183	670.4	41.5
RUN 2	23:02	0:01	14406	766.3	48.2
RUN 3A	0:12	2:13	14331	712.0	44.5
TEST AVERAGE			**14307**	**716.2**	**44.7**

NOTE - DURING TEST RUN NUMBER THREE THE Eop MIXER TRIPPED. THE BLEACH PLANT PRODUCTION DECREASED AND THE TEST WAS SUSPENDED. ONCE NORMAL PRODUCTION RESUMED THE TEST RESTARTED.

III. Process Description And Operation

III. Process Description and Operation

The bleaching process is an elemental chlorine-free (ECF) process. The CLO2 is produced on site.

The bleaching process consists of the staged introduction of CLO2 to the pulp slurry followed by washing of the bleached pulp. The off gases from all stages of the process are collected and passed through a wet scrubber utilizing an alkaline scrubbing solution.

IV. Sampling Point Location

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Table III
Air Report - Sampling Point Locations

Facility	**Georgia Pacific**
Location	**Palatka, FL**
Source Name	**Bleach Plant Outlet**

Stack Interior Diameter = 42.00 inches

Sample Point Number	Inches Inside Stack Wall
1	1.85
2	6.13
3	12.43
4	29.57
5	35.87
6	40.15

Port Length 7 inches

Distances From Nearest Disturbance

Source	**Stack Distance**
Downstream - - - - - - - - - - - - - - - - - - -	> 8 diameters
Upstream -	> 2 Diameters

The above mentioned Downstream and Upstream distances are approximate distances.

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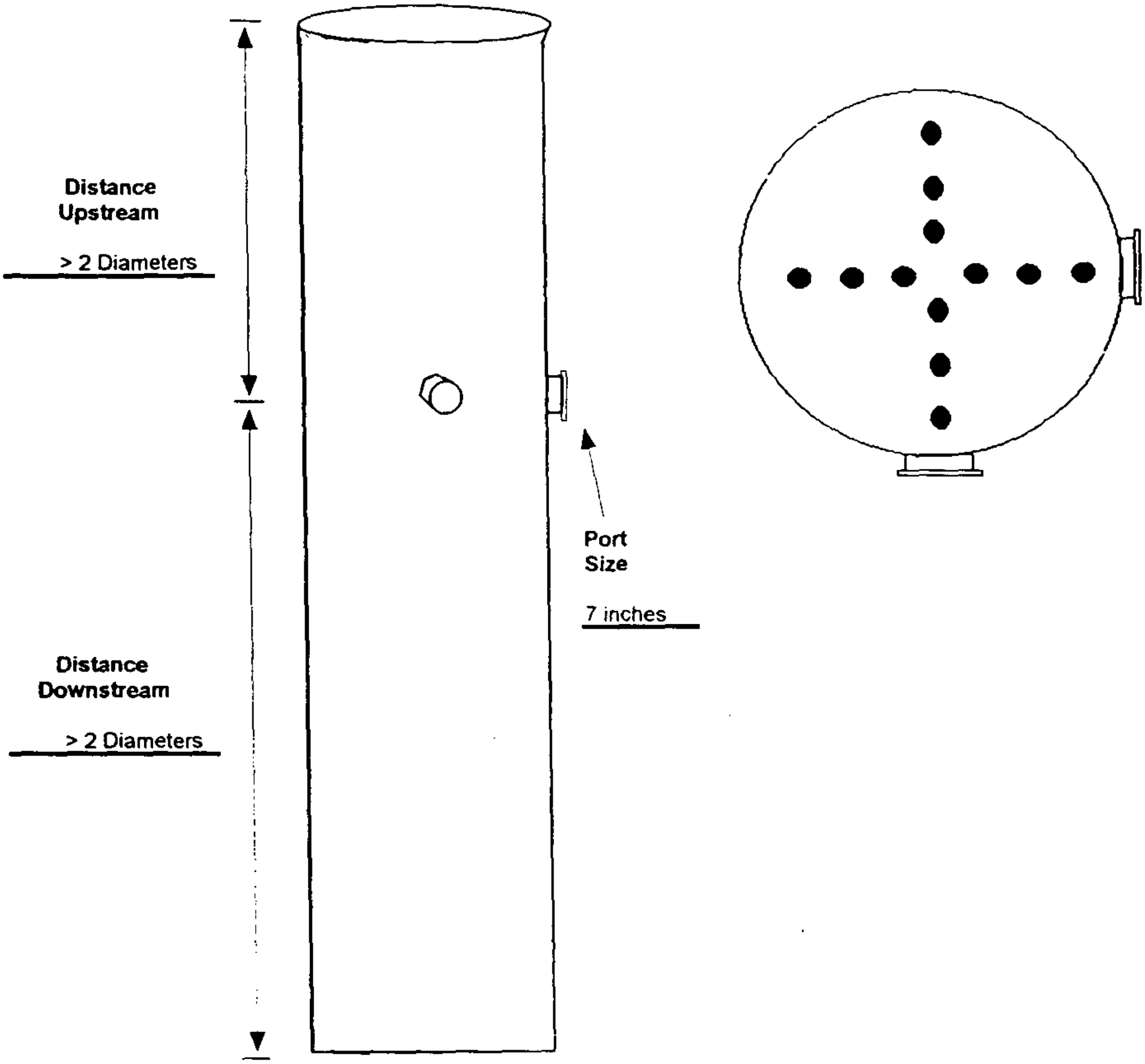
Air Report - Sampling Port Location Diagram

Facility Georgia Pacific **Date**
Location Palatka, FL
Source Bleach Plant Outlet



Distance Upstream

> 2 Diameters

Port Size

7 inches

Distance Downstream

> 2 Diameters

V. Field And Analytical Procedures

METHOD 10

DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES

1. Principle and Applicability

1.1 Principle. An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a Luft-type nondispersive infrared analyzer (NDIR) or equivalent.

1.2 Applicability. This method is applicable for the determination of carbon monoxide emissions from stationary sources only when specified by the test procedures contained in this text or otherwise specified by the Director. The test procedure will indicate whether a continuous or an integrated sample is to be used.

2. Range and Sensitivity

2.1 Range. 0 to 1,000 ppm.

2.2 Sensitivity. Minimum detectable concentration is 20 ppm for a 0 to 1,000 ppm span.

3. Interferences

Any substance having a strong absorption of infrared energy will interfere to some extent. For example, discrimination ratios for water (H_2O) and carbon dioxide (CO_2) are 3.5 percent H_2O per 7 ppm CO and 10 percent CO_2 per 10 ppm CO, respectively, for devices measuring in the 1,500 to 3,000 ppm range. For devices measuring in the 0 to 100 ppm range, interference ratios can be as high as 3.5 percent H2O per 25 ppm CO and 10 percent CO2 per 50 ppm CO. The use of silica gel and ascarite traps will alleviate the major interference problems. The measured gas volume must be corrected if these traps are used.

4. Precision and Accuracy

4.1 Precision. The precision of most NDIR analyzers is approximately ± 2 percent of span.

4.2 Accuracy. The accuracy of most NDIR analyzers is approximately ± 5 percent of span after calibration.

5. Apparatus

5.1 Continuous sample (Figure 10-1).

5.1.1 Probe. Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

5.1.2 Air-cooler condenser or equivalent. To remove any excess moisture.

5.2 Integrated sample (Figure 10.2).

5.2.1 Probe. Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

5.2.2 Air-cooler condenser or equivalent. To remove any excess moisture.

5.2.3 Valve. Needle valve, or equivalent, to adjust flow rate.

5.2.4 Pump. Leak-free diaphragm type, or equivalent, to transport gas.

5.2.5 Rate meter. Rotameter, or equivalent, to measure a flow range from 0 to 1.0 liter per min. (0.035 cfm).

5.2.6 Flexible bag. Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 ft^3). Leak-test the bag in the laboratory before using by evacuating bag with a pump followed by a dry gas meter. When evacuation is complete, there should be no flow through the meter.

5.2.7 Pitot tube. Type S, or equivalent, attached to the probe so that the sampling rate can be requlated proportional to the stack gas velocity when velocity is varying with the time or a sample traverse is conducted.

5.3 Analysis (Fiqure 10-3).

5.3.1 Carbon monoxide analyzer. Nondispersive infrared spectrometer, or equivalent. This instrument should be demonstrated, preferably by the manufacturer, to meet or exceed manufacturer's specifications and those described in this method.

5.3.2 Drying tube. To contain approximately 200 g of silica gel.

5.3.3 Calibration gas. Refer to Section 6.1.

5.3.4 Filter. As recommended by NDIR manufacturer.

5.3.5 CO_2 removal tube. To contain approximately 500 g of ascarite.

5.3.6 Ice water bath. For ascarite and silica gel tubes.

5.3.7 Valve. Needle valve, or equivalent, to adust flow rate.

5.3.8 Rate meter. Rotameter or equivalent to measure gas flow rate of 0 to 1.0 liter per minute (0.035 cfm) through NDIR.

5.3.9 Recorder (optional). To provide permanent record of NDIR readings.

6. Reagents

6.1 Calibration gases. Known concentration of CO in nitrogen (N_2) for instrument span, prepurified grade of N_2 for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases shall be certified by the manufacturer to be within ± 2 percent of the specified concentration.

6.2 Silica gel. Indicating type, 6 to 16 mesh, dried at 175°C (347°F) for 2 hours.

6.3 Ascarite. Commercially available.

7. Procedure

7.1 Sampling

7.1.1 Continuous sampling. Set up the equipment as shown in Figure 10-1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. (See Sections 7.2 and 8). CO_2 content of the gas may be determined by using the Method 3 integrated sample procedure, or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.1.2 Integrated sampling. Evacuate the flexible bag. Set up the equipment as shown in Figure 10-2 with the bag disconnected. Place the probe in the stack and purge the sampling line. Connect the bag, making sure that all connections are leak free. Sample at a rate proportional to the stack velocity. CO_2 content of the gas may be determined by using the Method 3 integrated sample procedures, or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.2 CO Analysis. Assemble the apparatus as shown in Figure 10-3, calibrate the instrument, and perform other required operations as described in Section 8. Purge analyzer with N_2 prior to introduction of each sample. Direct the sample stream through the instrument for the test period, recording the readings. Check the zero and span again after the test to assure that any drift or malfunction is detected. Record the sample data on Table 10-1.

8. Calibration

Assemble the apparatus according to Figure 10-3. Generally an instrument requires a warm-up period before stability is obtained. Follow the manufacturer's instructions for specific procedure. Allow a minimum time of 1 hour for warm-up. During this time check the sample conditioning apparatus, i.e., filter, condenser, drying tube, and CO_2 removal tube, to ensure that each component is in good operating condition. Zero and calibrate the instrument according to the manufacturer's procedures using, respectively, nitrogen and the calibration gases.

TABLE 10-1. FIELD DATA

Location........................ Comments:

Test............................

Date............................

Operator........................

Clock Time	Rotameter setting, liters per minute (cubic feet per minute)

9. Calculation

Calculate the concentration of carbon monoxide in the stack using Equation 10-1.

$$C_{CO_{stack}} = C_{CO_{NDIR}} (1-F_{CO_2})$$

where:

$C_{CO_{stack}}$ = concentration of CO in stack, ppm by volume (dry basis).

$C_{CO_{DNIR}}$ = concentration of CO measured by NDIR analyzer, ppm by volume (dry basis).

F_{CO_2} = volume fraction of CO_2 in sample, i.e., percent CO_2 from Orsat analysis divided by 100.

10. Alternative Procedure

10.1 Interference Trap. The sample condition system described in Method 10A, Sections 2.1.2 and 4.2 may be used as an alternate to the silica gel and ascarite traps.

11. Bibliography

1. McElroy, Frank, The Intertech NDIR-CO Analyzer, Presented at 11th Methods Conference on Air Pollution, University of California, Berkeley, Calif., April 1, 1970.

2. Jacobs, M.B., et al., Continuous Determination of Carbon Monoxide and Hydrocarbons in Air by a Modified Infrared Analyzer, J. Air Pollution Control Association, 9(2):110-114, August 1959.

3. MSA LIRA Infrared Gas and Liquid Analyzer Instruction Book, Mine Safety Appliances Co., Technical Products Division, Pittsburgh, Pa.

4. Models 215A, 315A, and 415A Infrared Analyzers, Beckman Instruments Inc., Beckman Instructions 1635-B, Fullerton, Calif., October 1967.

5. Continuous CO Monitoring System, Model A5611, Intertech Corp., Princeton, N.J.

6. UNOR Infrared Gas Analayzers, Bendix Corp., Ronceverte, West Virginia.

ADDENDA

A. Performance Specifications for NDIR Carbon Monoxide Analyzers.

Range (minimum)	0-1000 ppm.
Output (minimum)	0-10mV.
Minimum detectable sensitivity	20 ppm.
Rise time, 90 percent (maximum)	30 seconds.
Fall time, 90 percent (maximum)	30 seconds.
Zero drift (maximum)	10% in 8 hours.
Span drift (maximum)	10% in 8 hours.
Precision (minimum)	±2% of full scale.
Noise (maximum)	±1% of full scale.
Linearity (maximum deviation)	2% of full scale.
Interference rejection ration	CO_2--1000 to 1,H_2O--500 to 1.

B. Definitions of Performance Specifications.

Range -- The minimum and maximum measurement limits.

Output -- Electrical signal which is proportional to the measurement; intended for connection to readout or data processing devices. Usually expressed as millivolts or milliamps full scale at a given impedance.

Full scale -- The maximum measuring limit for a given range.

Minimum detectable sensitivity -- The smallest amount of input concentration that can be detected as the concentration approaches zero.

Accuracy -- The degree of agreement between a measured value and the true value; usually expressed as ± percent of full scale.

Time to 90 percent response -- The time interval from a step change in the input concentration at the instrument inlet to a reading of 90 percent of the ultimate recorded concentration.

Rise Time (90 percent) -- The interval between initial response time and time to 90 percent response after a step increase in the inlet concentration.

Fall Time (90 percent) -- The interval between initial response time and time to 90 percent response after a step decrease in the inlet concentration.

Zero Drift -- The change in instrument output over a stated time period, usually 24 hours, of unadjusted continuous operation when the input concentration is zero; usually expressed as percent full scale.

Span Drift -- The change in instrument output over a stated time period, usually 24 hours of unadjusted continuous operation when the input concentration is a stated upscale value; usually expressed as percent full scale.

Precision -- The degree of agreement between repeated measurements of the same concentration, expressed as the average deviation of the single results from the mean.

Noise -- Spontaneous deviations from a mean output not caused by input concentration changes.

Linearity -- The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points.

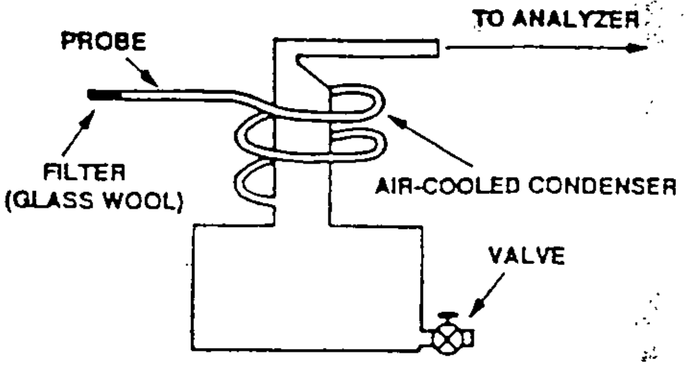


Figure 10-1. Continuous Sampling Train

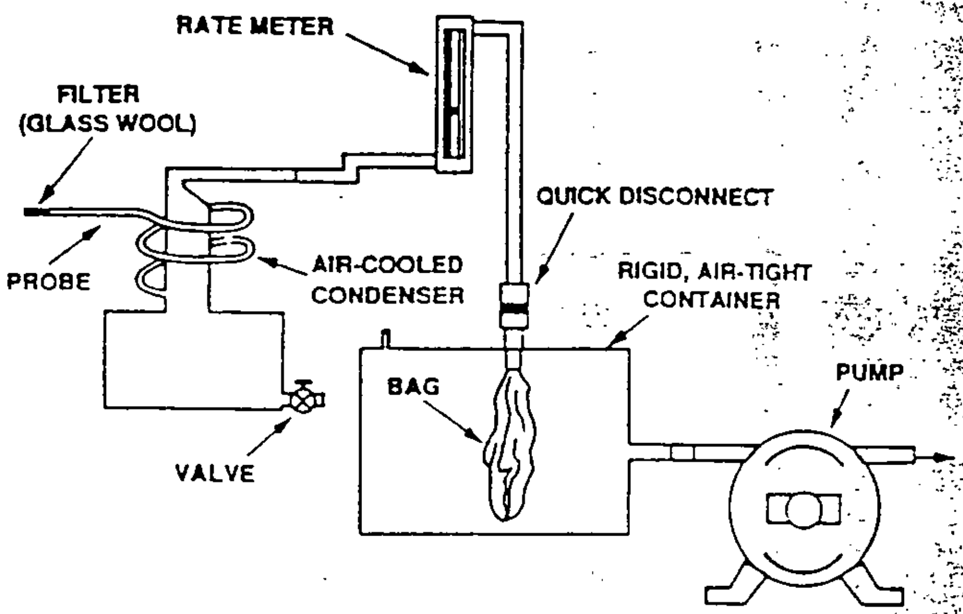


Figure 10-2. Integrated Gas–Sampling Train

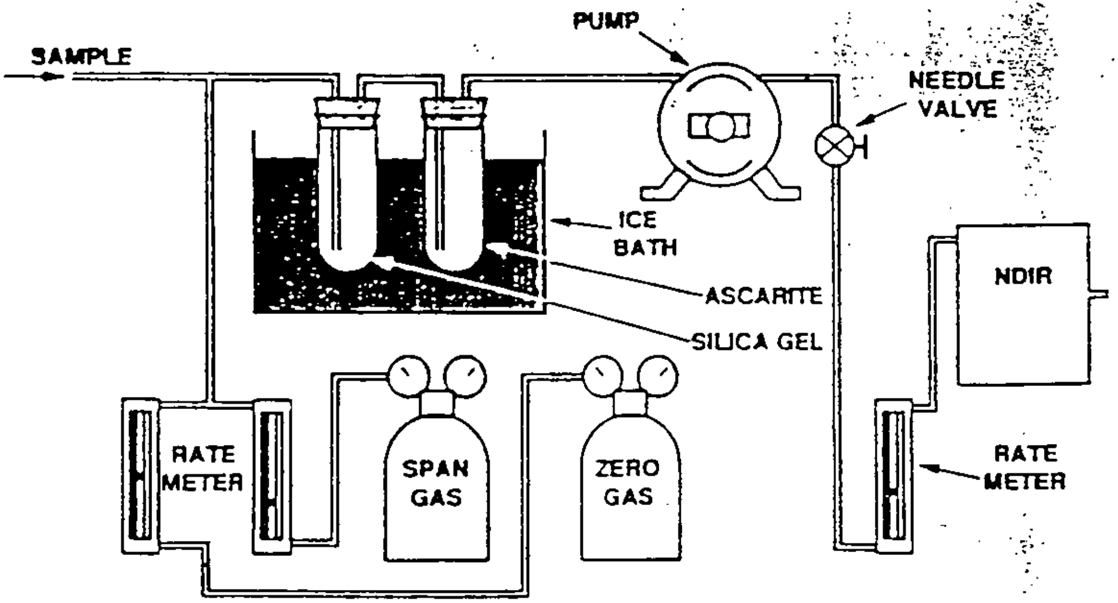


Figure 10-3. Analytical Equipment

METHOD 26A

DETERMINATION OF HYDROGEN HALIDE AND HALOGEN EMISSIONS FROM STATIONARY SOURCES - ISOKINETIC METHOD

1. Applicability, Principle, Interferences, Precision, Bias, and Stability

1.1 Applicability. This method is applicable for determining emissions of hydrogen halides (HX) [hydrogen chloride (HCL), hydrogen bromide (HBr), and hydrogen flouride (HF)] and halogens (X_2) [chlorine (Cl_2) and bromine (Br_2)] from stationary sources. This method collects the emission sample isokinetically and is therefore particulary suited for sampling at sources, such as those controlled by wet scrubbers, emitting acid particulate matter (e.g., hydrogen halides dissolved in water droplets). [**NOTE**: Mention of trade names or specific products does not constitute endorsement by the Enviromental Protection Agency.]

1.2 Principle. Gaseous and particulate pollutants are withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. The cyclone collects any liquid droplets and is not necessary if the source emissions do not contain them; however, it is preferable to include the cyclone in the sampling train to protect the filter from any moisture present. The filter collects other particulate matter including halide salts. Acidic and alkaline absorbing solutions collect the gaseous hydrogen halides and halogens, respectively. Following sampling of emissions containing liquid droplets, any halides/halogens dissolved in the liquid in the cyclone and on the filter are vaporized to gas and corrected in the impingers by pulling conditioned ambient air throught the sampling train. The hydrogen halides are solubilized in the acidic solution and form chloride (Cl^-), bromide (Br^-), and fluoride (F^-) ions. The halogens have a very low solubility in the acidic solution and pass through to the alkaline solution where they are hydrolyzed to form a proton (H^+), the halide ion, and the hypohalous acid (HClO or HBrO). Sodium thiosulfate is added to the alkaline solution to assure reaction with the hypohalous acid to form a second halide ion such that 2 halide ions are formed for each molecule of halogen gas. The halide ions in the separate solutions are measured by ion chromatography (IC). If desired, the particulate matter recovered from the filter and the probe is analyzed following the procedures in Method 5. [**NOTE**: If the tester intendes to use this sampling arrangement to sample concurrently for particulate matter, the alternative Teflon^R probe liner, cyclone, and filter holder should not be used. The Teflon^R filter support must be used. The tester must also meet the probe and filter temperature requriements of both sampling trains.]

1.3 Interferences. Volatile materials, such as chlorine dioxide (ClO_2) and ammonium chloride (NH_4Cl), which produce halide ions upon dissolution during sampling are potential interferents. Interferents for the halide measurements are the halogen gases which disproportionate to a hydrogen halide and an hypohalous acid upon dissolution in water. The use of acidic rather than neutral or basic solutions for collection of the hydrogen halides greatly reduces the dissolution of any halogens passing through this solution. The simultaneous presence of both HBr and Cl_2 may cause a positive bias in the HCl result with a corresponding negative bias in the Cl_2 result as well as affecting the HBr/Br_2 split. High concentrations of nitrogen oxides (NO_x) may produce sufficient nitrate (NO_3) to interfere with measurements of very low Br levels.

1.4 Precision and Bias. The method has a possible measurable negative bias below 20 ppm HCl perhaps due to reaction with small amounts of moisture in the probe and filter. Similiar bias for the other hydrogen halides is possible.

1.5 Sample Stability. The collected Cl^- samples can be stored for up to 4 weeks for analysis for HCl and Cl_2.

1.6 Detection Limit. The in-stack detection limit for HCl is approximately 0.02 ug per liter of stack gas; the analytical detection limit for HCl is 0.1 ug/ml. Detection limits for the other analyses should be similiar.

2. Apparatus

2.1 Sampling. The sampling train is shown in Figure 26A-1; the apparatus is similiar to the Method 5 train where noted as follows:

2.1.1 Probe Nozzle. Borosilicate or quartz glass; constructed and calibrated according to Method 5, Sections 2.1.1 and 5.1, and coupled to the probe liner using a Teflon^R union; a stainless steel nut is recommended for this union. When the stack temperature exceeds 210^oC (410^oF), a one-piece glass nozzle/liner assembly must be used.

2.1.2 Probe Liner. Same as Method 5, Section 2.1.2, except metal liners shall not used. Water-cooling of the stainless steel sheath is recommended at temperatures exceeding 500^oC. Teflon^R may be used in limited applications where the minimum stack temperature exceeds 120°C (250°F) but never exceeds the temperature where Teflon^R is estimated to become unstable (approximately 210°C).

2.1.3 Pitot Tube, Differential Pressure Gauge, Filter Heating System, Metering System, Barometer, Gas Density Determination Equipment. Same as Method 5, Sections 2.1.3, 2.1.4, 2.1.6, 2.1.8, 2.1.9, and 2.1.10.

2.1.4 Cyclone (Optional). Glass or Teflon^R. Use of the cyclone is required only when the sample gas stream is saturated with moisture; however, the cyclone is recommended to protect the filter from any moisture droplets present.

2.1.5 Filter Holder. Borosilicate or quartz glass, or Teflon^R filter holder, with a Teflon^R filter support and a sealing gasket. The sealing gasket shall be constructed of Teflon^R or equivalent materials. The holder design shall provide a positive seal against leakage at any point along the filter circumference. The holder shall be attached immediately to the outlet of the cyclone.

2.1.6 Impinger Train. The following system shall be used to determine the stack gas moisture content and to collect the hydrogen halides and halogens: five or six impingers connected in a series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. The first impinger shown in Figure 26A-1 (knockout or condensate impinger) is optional and is recommended as a water knockout trap for use under high moisture conditions. If used, this impinger should be constructed as described below for the alkaline impingers, but with a shortened stem, and should contain 50 ml of 0.1 N H_2SO_4. The following two impingers (acid impingers which each contain 100 ml of 0.1 H_2SO_4) shall be of the Greenburg-Smith design with the standard tip (Method 5, Section 2.1.7). The next two impingers (alkaline impingers which each contain 100 ml of 0.1 N NaOH) and the last impinger (containing silica gel) shall be of the modified Greenburg-Smith design (Method 5, Section 2.1.7). The condensate, acid, and alkaline impingers shall contain known quantities of the appropriate absorbing reagents. The last impinger shall contain a known weight of silica gel or equivalent desiccant. Teflon^R impingers are an acceptable alternative.

2.1.7 Ambient Air Conditioning Tube (Optional). Tube tightly packed with approximately 150 g of fresh 8 to 20 mesh sodium hydroxide-coated silica, or equivalent, (AscariteII^R has been found suitable) to dry and remove acid gases from the ambient air used to remove moisture from the filter and cyclone, when the cyclone is used. The inlet and outlet ends of the tube should be packed with at least 1-cm thickness of glass wool or filter material suitable to prevent escape of fines. Fit one end with flexible tubing, etc. to allow connection to probe nozzle following the test run.

2.2 Sample Recovery. The following items are needed:

2.2.1 Probe-Liner and Probe-Nozzle Brushes, Wash Bottles, Glass Sample Storage Containers, Petri Dishes, Graduated Cylinder or Balance, and Rubber Policeman. Same as Method 5, Sections 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, and 2.2.7.

2.2.2 Plastic Storage Containers. Screw-cap polypropylene containers to store silica gel. High-density polyethylene bottles with Teflon screw cap liners to store impinger reagents, 1-liter.

2.2.3 Funnels. Glass or high-density polyethylene, to aid in sample recovery.

2.3 Analysis. For analysis, the following equipment is needed:

2.3.1 Volumetric Flasks. Class A, various sizes.

2.3.2 Volumetric Pipettes. Class A, assortment, to dilute samples to calibration range of the ion chromatograph (IC).

2.3.3 Ion Chromatograph. Suppressed or nonsuppressed, with a conductivity detector and electronic integrator operating in the peak area mode. Other detectors, a strip chart recorder, and peak heights may be used.

3. Reagents

Unless otherwise indicated, all reagents must conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society (ACS reagent grade). When such specifications are not available, the best available grade shall be used.

3.1 Sampling.

3.1.1 Water. Deionized, distilled water that conforms to American Society of Testing and Materials (ASTM) Specification D 1193-77, Type 3.

3.1.2 Acidic Absorbing Solution, 0.1 N Sulfuric Acid (H_2SO_4). To prepare 1 L, slowly add 2.80 ml of concentrated H_2SO_4 to about 900 ml of water while stirring, and adjust the final volume to 1 L using additional water. Shake well to mix the solution.

3.1.3 Alkaline Absorbing Solution, 0.1 N Sodium Hydroxide (NaOH). To prepare 1 L, dissolve 4.00 g of solid NaOH in about 900 ml of water and adjust the final volume to 1 L using additional water. Shake well to mix the solution.

3.1.4 Filter. Teflon mat (e.g., Pallflex^R TX40H145) filter. When the stack gas temperature exceeds 210^{O}C (410^{O}F) a quartz fiber filter may be used.

3.1.5 Silica Gel, Crushed Ice, and Stopcock Grease. Same as Method 5, Sections 3.1.2, 3.1.4, and 3.1.5, respectively.

3.1.6 Sodium Thiosulfate, ($Na_2S_2O_33 \cdot 5\ H_2O$).

3.2 Sample Recovery.

3.2.1 Water. Same as Section 3.1.1.

3.2.2 Acetone. Same as Method 5, Section 3.2.

3.3 Sample Analysis.

3.3.1 Water. Same as Section 3.1.1.

3.3.2 Reagent Blanks. A separate blank solution of each absorbing reagent should be prepared for analysis with the field samples. Dilute 200 ml of each absorbing solution (250 ml of the acidic absorbing solution, if a condensate impinger is used) to the same final volume as the field samples using the blank sample of rinse water. If a particulate determination is conducted, collect a blank sample of acetone.

3.3.3 Halide Salt Stock Standard Solutions. Prepare concentrated stock solutions from reagent grade sodium chloride (NaCl), sodium bromide (NaBr), and sodium fluoride (NaF). Each must be dried at 110^{O}C for 2 or more hours and then cooled to room temperature in a desiccator immediately before weighing. Accurately weigh 1.6 to 1.7 g of the dried NaCl to within 0.1 mg, dissolve in water, and dilute to 1 liter. Calculate the exact Cl concentration using Equation 26A-1.

$$uCl^-/ml = g\ of\ NaCl \times 10^3 \times 35.453/58.44 \qquad \text{(Equation 26A-1)}$$

In a similar manner, accurately weigh and solubilize 1.2 to 1.3 g of dried NaBr and 2.2 to 2.3 g of NaF to make 1 liter solutions.

Use Equations 26A-2 and 26A-3 to calculate the Br^- and F^- concentrations.

$$ugBr^-/ml = g \text{ of } NaBr \times 10^3 \times 79.904/102.90 \quad \text{(Equation 26A-2)}$$

$$ugF^-/ml = g \text{ of } NaF \times 10^3 \times 18.998/41.99 \quad \text{(Equation 26A-3)}$$

Alternately, solutions containing a nominal certified concentration of 1000 mg/L NaCl are commercially available as convenient stock solutions from which standards can be made by appropriate volumetric dilution. Refrigerate the stock standard solutions and store no longer than 1 month.

3.3.4 Chromatographic Eluent. Same as Method 26, Section 3.2.4.

4. Procedure

Because of the complexity of this method, testers and analysts should be trained and experienced with the procedures to ensure reliable results.

4.1 Sampling.

4.1.1 Pretest Preparation. Follow the general procedure given in Method 5, Section 4.1.1, except the filter need only be desiccated and weighed if a particulate determination will be conducted.

4.1.2 Preliminary Determinations. Same as Method 5, Section 4.1.2.

4.1.3 Preparation of Sampling Train. Follow the general procedure given in Method 5, Section 4.1.3, except for the following variations:

And 50 ml of 0.1 N H_2SO_4 to the condensate impinger, if used. Place 100 ml of 0.1 N H_2SO_4 in each of the next two impingers. Finally, transfer approximately 200-300 g of preweighed silica gel from its container to the last impinger. Set up the train as in Figure 26A-1. When used, the optional cyclone is inserted between the probe liner and filter holder and located in the heated filter box.

4.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, Sections 4.4.1 (Pretest Leak-Check), 4.1.4.2 (Leak-Checks During the Sample Run), and 4.1.4.3 (Post-Test Leak-Check).

4.1.5 Train Operation. Follow the general procedure given in Method 5, Section 4.1.5. Maintain a temperature around the filter and (cyclone, if used) of greater than 120°C (248°F). For each run, record the data required on a data sheet such as the one shown in Method 5, Figure 5-2. If the condensate impinger becomes too full, it may be emptied, recharged with 50 ml of 0.1 N H_2SO_4, and replaced during the sample run. The condensate emptied must be saved and included in the measurement of the volume of moisture collected and included in the sample for analysis. The additional 50 ml of absorbing reagent must also be considered in calculating the moisture. After the impinger is reinstalled in the train, conduct a leak-check as described in Method 5, Section 4.1.4.2.

4.1.6 Post-Test Moisture Removal (Optional). When the optional cyclone is included in the sampling train or when moisture is visible on the filter at the end of a sample run even in the absence of a cyclone, perform the following procedure. Upon completion of the test run, connect the ambient air conditioning tube at the probe inlet and operate the train with the filter heating system at least 120°C (248°F) at a low flow rate (e.g., ΔH = 1 in. H_2O) to vaporize any liquid and hydrogen halides in the cyclone or on the filter and pull them through the train into the impingers. After 30 minutes, turn off the flow, remove the conditioning tube, and examine the cyclone and filter for any visible moisture. If moisture is visible, repeat this step for 15 minutes and observe again. Keep repeating until the cyclone is dry. [NOTE: It is critical that this is repeated until the cyclone is completely dry.]

4.2 Sample Recovery. Allow the probe to cool. When the probe can be handled safely, wipe off all the external surfaces of the tip of the probe nozzle and place a cap loosely over the tip. Do not cap the probe tip tightly while the sampling train is cooling down because this will create a vacuum in the filter holder, drawing water from the impingers into the holder. Before moving the sampling train to the cleanup site, remove the probe, wipe off any silicone grease, and cap the open outlet of the impinger train, being careful not to lose any condensate that might be present. Wipe off any silicone grease and cap the filter or cyclone inlet. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger and the filter holder, disconnect it at the filter holder and let any condensed water drain into the first impinger. Wipe off any silicone grease and cap the filter holder outlet and the impinger inlet. Ground glass stoppers, plastic caps, serum caps, Teflon tape, Parafilm, or aluminum foil may be used to close these openings. Transfer the probe and filter/impinger assembly to the cleanup area. This area should be clean and protectd from the weather to minimize sample contamination or loss. Inspect the train prior to and during disassembly and note any abnormal conditions. Treat samples as follows:

4.2.1 Container No. 1 (Optional; Filter Catch for Particulate Determination). Same as Method 5, Section 4.2, Container No. 1.

4.2.2 Container No. 2 (Optional; Front-Half Rinse for Particulate Determination). Same as Method 5, Section 4.2, Container No. 2.

4.2.3 Container No. 3 (Knockout and Acid Impinger Catch for Moisture and Hydrogen Halide Determination). Disconnect the impingers. Measure the liquid in the acid and knockout impingers to ± 1 ml by using a graduated cylinder or by weighing it to ± 0.5 g by using a balance. Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these impingers and connecting glassware including the back portion of the filter holder (and flexible tubing, if used) with water and add these rinses to the storage container. Seal the container, shake to mix, and label. The fluid level should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Retain rinse water and acidic absorbing solution blanks and analyze with the samples.

4.2.4 Container No. 4 (Alkaline Impinger Catch for Halogen and Moisture Determination). Measure and record the liquid in the alkaline impingers as described in Section 4.2.3. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these two impingers and connecting glassware with water and add these rinses to the container. Add 25 mg of sodium thiosulfate per ppm halogen-dscm of stack gas sample. [**NOTE**: This amount of sodium thiosulfate includes a safety factor of approximately 5 to assure complete reaction with the hypohalous acid to form a second Cl^- ion in the alkaline solution.] Seal the container, shake to mix, and label; mark the fluid level. Retain alkaline absorbing solution blank and analyze with the samples.

4.2.5 Container No. 5 (Silica Gel for Moisture Determination). Same as Method 5, Section 4.2, Container No. 3.

4.2.6 Container Nos. 6 through 9 (Reagent Blanks). Save portions of the absorbing reagents (0.1 N H_2SO_4 and 0.1 N NaOH) equivalent to the amount used in the sampling train; dilute to the approximate volume of the corresponding samples using rinse water directly from the wash bottle being used. Add the same ratio of sodium thiosulfate solution used in container No. 4 to the 0.1 N NaOH absorbing reagent blank. Also, save a portion of the rinse water alone and a portion of the acetone equivalent to the amount used to rinse the front half of the sampling train. Place each in a separate, prelableled sample container.

4.2.7 Prior to shipment, recheck all sample containers to ensure that the caps are well-secured. Seal the lids of all containers around the circumference with Teflon tape. Ship all liquid samples upright and all particulate filters with the particulate catch facing upward.

4.3 Sample Preparation and Analysis. Note the liquid levels in the sample containers and confirm on the analysis sheet whether or not leakage occurred during transport. If a noticeable leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results.

4.3.1 Container Nos. 1 and 2 and Acetone Blank (Optional; Particulate Determination). Same as Method 5, Section 4.3.

4.3.2. Container No. 5. Same as Method 5, Section 4.3 for Silica gel.

4.3.3 Container Nos. 3 and 4 and Absorbing Solution and Water Blanks. Quantitatively transfer each sample to a volumetric flask or graduated cyclinder and dilute with water to a final volume within 50 ml of the largest sample.

4.3.3.1 The IC conditions will depend upon analytical column type and whether suppressed or nonsuppressed IC is used. Prior to calibration and sample analysis, establish a stable baseline. Next, inject a sample of water, and determine if any Cl^-, Br^-, or F^- appears in the chromatogram. If any of these ions are present, repeat the load/injection procedure until they are no longer present. Analysis of the acid and alkaline absorbing solution samples requires separate standard calibration curves; prepare each according to Section 5.2. Ensure adequate baseline separation of the analyses.

4.3.3.2 Between injections of the appropriate series of calibration standards, inject in duplicate the reagent blanks and the field samples. Measure the areas or heights of the Cl^-, Br^-, and F^- peaks. Use the average response to determine the concentrations of the field samples and reagent blanks using the linear calibration curve. If the values from duplicate injections are not within 5 percent of their mean, the duplicate injection shall be repaeated and all four values used to determine the average response. Dilute any sample and the blank with equal volumes of water if the concentration exceeds that of the highest standard.

4.4 Audit Sample Analysis. Audit samples must be analyzed subject to availability.

5. Calibration

Maintain a laboratory log of all calibrations.

5.1 Probe Nozzle, Pitot Tube, Dry Gas Metering System, Probe Heater, Temperature Gauges, Leak-Check of Metering System, and Barometer. Same as Method 5, Sections 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, and 5.7, respectively.

5.2 Ion Chromatograph. To prepare the calibration standards, dilute given amounts (1.0 ml or greater) of the stock standard solutions to convenient volumes, using 0.1 N H_2SO_4 or 0.1 N NaOH, as appropriate. Prepare at least four calibration standards for each absorbing reagent containing the three stock solutions such that they are within the linear range of the field samples. Using one to the standards in each series, ensure adequate baseline separation for the peaks of interest. Inject the appropriate series of calibration standards, starting with the lowest concentration standard first both before and after injection of the quality control check sample, reagent blanks, and field samples. This allows compensation for any instrument drift occurring during sample analysis. Determine the peak areas, or height, of the standards and plot individual values versus halide ion concentrations in ug/ml. Draw a smooth curve through the points. Use linear regression to calculate a formula describing the resulting linear curve.

6. Quality Control

Same as Method 5, Section 4.4.

7. Quality Assurance

7.1 Applicability. When the method is used to demonstrate compliance with a regulation, a set of two audit samples shall be analyzed.

7.2 Audit Procedure. The currently available audit samples are chloride solutions. Concurrently analyze the two audit samples and a set of compliance samples in the same manner to evaluate the technique of the analyst and the standards preparation. The same analyst, analytical reagents, and analytical system shall be used both for compliance samples and the Environmental Protection Agency (EPA) audit samples.

7.3 Audit Sample Availability. Audit samples will be supplied only to enforcement agencies for compliance tests. Audit samples may be obtained by writing the Source Test Audit Coordinator (MD-77B), Quality Assurance Division, Atmospheric Research and Exposure Assessment Laboratory, U.S. Environmental Protection Laboratory, Research Triangle Park, NC 27711 or by calling the Source Test Audit Coordinator (STAC) at (919) 541-7834. The request for the audit samples should be made at least 30 days prior to the scheduled compliance sample analysis.

7.4 Audit Results. Calculate the concentrations in mg/dscm using the specified sample volume in the audit instructions. Include the results of both audit samples, their identification numbers, and the analyst's name with the results of the compliance determination samples in appropriate reports to the EPA regional office or the appropriate enforcement agency. **(NOTE:** Acceptability of results may be obtained immediately by reporting the audit results in mg/dscm and compliance results in total ug HCl/sample to the responsible enforcement agency.) The concentrations of the audit samples obtained by the analyst shall be agree within 10 percent of the actual concentrations. If the 10 percent specification is not met, reanalyze the compliance samples and audit samples, and include intitial and reanalysis values in the test report. Failure to meet the 10 percent specification may require retests until the audit problems are resolved.

8. Calculations

Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

8.1 Nomenclature. Same as Method 5, Section 6.1. In Addition:

B_X = Mass concentration of applicable absorbing solution blank, ug halide ion (Cl^-, Br^-, F^-)/ml, not exceed 1 ug/ml which is 10 times the published analytical detection limit of 0.1 ug/ml. (It is also approximately 5 percent of the mass concentration anticipated to result from a one hour sample at 10 ppmv HCl.)

C = Concentration of hydrogen halide (HX) or halogen (X_2), dry basis, mg/dscm.

m_{HX} = Mass of HCl, HBr, or HF in sample , ug.

m_{X2} = Mass of Cl_2 or Br_2 in sample, ug.

S_{X^-} = Analysis of sample, ug halide ion (Cl^-, Br^-, F^-)/ml.

V_s = Volume of filtered and diluted sample, ml.

8.2 Average Dry Gas Meter Temperature and Average Orifice Pressure Drop. See data sheet (Figure 5-2 of Method 5).

8.3 Dry Gas Volume. Calculate $V_{m(std)}$ and adjust for leakage, if necessary, using the equation in Section 6.3 of Method 5.

8.4 Volume of Water Vapor and Moisture Content. Calculate the volume of water vapor $V_{w(std)}$ and moisture content B_{ws} from the data obtained in this method (Figure 5-2 of Method 5); use Equations 5-2 and 5-3 of Method 5.

8.5 Isokinetic Variation and Acceptable Results. Use Method 5, Sections 6.11 and 6.12.

8.6 Actone Blank Concentration, Acetone Wash Blank Residue Weight, Particulate Weight, and Particulate Concentration. For particulate determination.

8.7 Total ug HCl, HBr, or HF Per Sample.

$$m_{HX} = K\ V_s\ (S_{X^-} - B_{X^-}) \qquad \text{(Equation 26A-4)}$$

where:

K_{HCl} = 1.028 (ug HCl/ug-mole)/(ug Cl^-/ug-mole).

K_{HBr} = 1.013 (ug HBr/ug-mole)/(ug Br^-/ug-mole).

K_{HF} = 1.053 (ug HF/ug-mole)/(ug F^-/ug-mole).

8.8 Total ug Cl_2 or Br_2 Per Sample.

$$m_{X2} = V_s\ (S_{X^-} - B_{X^-}) \qquad \text{(Equation 26A-5)}$$

8.9 Concentration of Hydrogen Halide or Halogen in Flue Gas.

$$C = K\ m_{HX,X2} / V_{m(std)} \qquad \text{(Equation 26A-6)}$$

where:

$K = 10^{-3}$ mg/ug

8.10 Stack Gas Velocity and Volumetric Flow Rate. Calculate the average stack gas velocity and volumetric flow rate, if needed, in using data obtained in this method and the equations in Sections 5.2 and 5.3 of Method 2.

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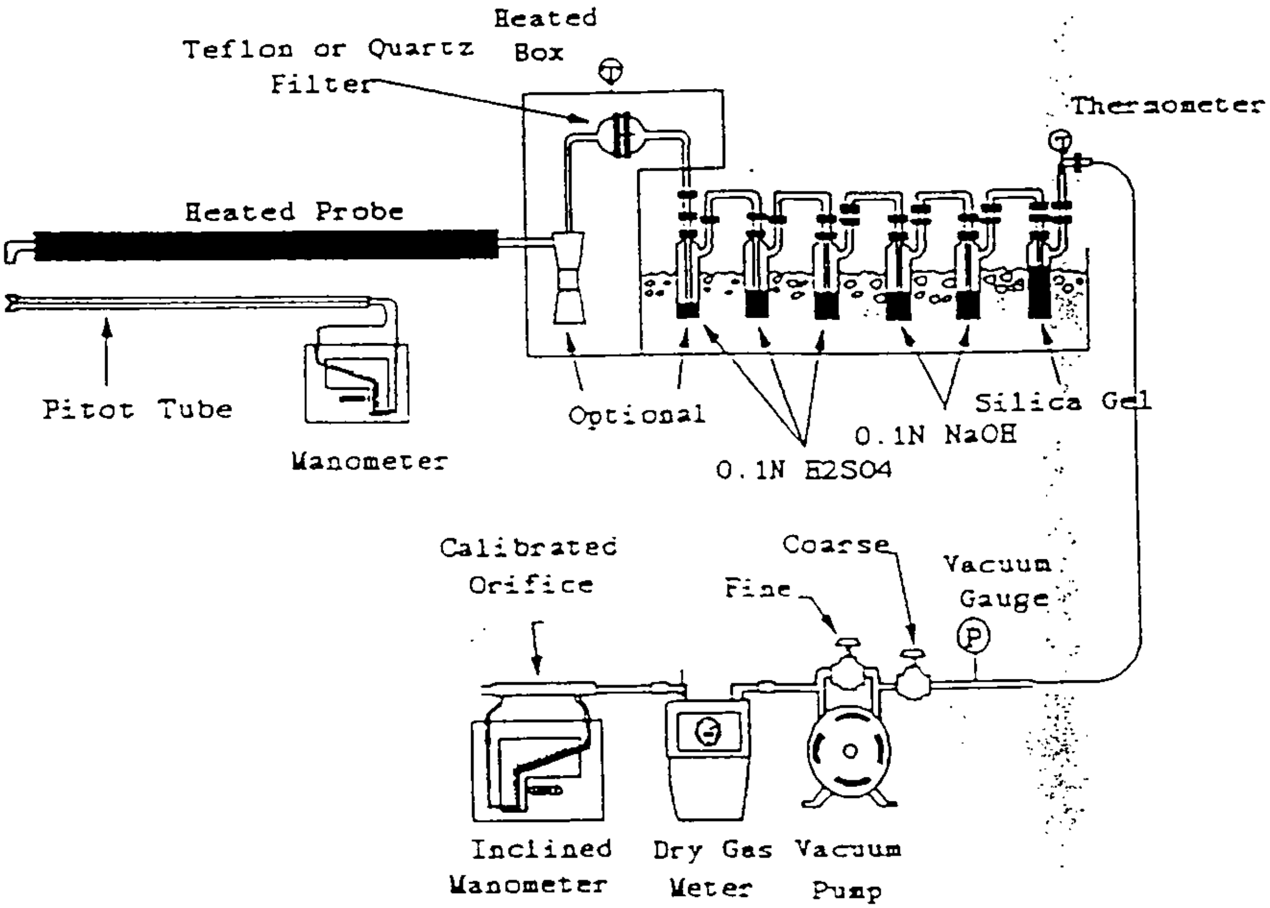

Figure 26A-1. Sampling train.

APPENDIX A

COMPLETE EMISSION DATA

Source Sampling Nomenclature Sheet

PB - Barometric pressure, inches Hg

PS - Stack pressure, inches Hg

AS - Effective area of positive stack gas flow, sq. ft.

As - stack area, sq. ft.

NPTS - Number of traverse point where the pitot velocity head was greater than zero

TS - Stack temperature, degrees fahrenheit

TM - Meter temperature, degrees fahrenheit

ASQH - Average square root of velocity head, inches H2O

DH - Average meter orifice pressure differential, inches H2O

AN - Sampling nozzle area, square feet

CP - S-type pitot tube correction factor

VM - Recorded meter volume sample, cubic feet (meter conditions)

VC - Condensate and silica gel increase in impingers, milliliters

PO - Pressure at the dry test meter orifice, $PB + \frac{H}{13.6}$

t - Test time in minutes

STP - Standard conditions, dry, 68 degrees fahrenheit (Tstd), 29.92 inches Hg (Pstd)

Y - Average ratio of accuracy of wet test meter to dry gas meter, with a tolerance of plus or minus 0.02

VWV - Conversion of condensate in milliliters to water vapor in cubic feet (STP)

VSTPD - Volume sampled, cubic feet (STP)

VT - Total water vapor and dry gas volume sampled, cubic feet (STP)

W - Moisture fraction of stack gas

FDA - Dry gas fraction

MD - Molecular weight of stack gas, lbs/lb-mole (dry conditions)

MS - Molecular weight of stack gas, lbs/lb-mole (stack conditions)

GS - Specific gravity of stack gas, referred to air

EA - Excess air

U - Stack gas velocity, feet per minute

QS - Stack gas flow rate, cubic feet per minute (stack conditions)

QD - Stack gas flow rate, cubic feet per minute (dry conditions)

QSTPD - Stack gas flow rate, cubic feet per minute (STP)

PISO - Percent isokinetic volume sampled (method described in Federal Register)

ESTP - Particulate concentration at standard and dry conditions, grains/scf

E12 - ESTP corrected to 12 % CO2, grains/scf

E50 - ESTP corrected to 50 % excess air, grains/scf

EM - Mass emissions rate, lbs/hr

Eh - Mass emissions rate, lbs mmBTUs

E - ESTP corrected to % Excess Air.

Equations For Calculating Particulate Emissions

$$\mathbf{VWV} = (0.04707) \times (\mathrm{VC})$$

$$\mathbf{VSTPD} = (17.65) \times (\mathrm{VM}) \times (\mathrm{PB} \frac{+ \ \mathrm{DH}}{13.6}) + (\mathrm{TM}) \times (\mathrm{Y})$$

$$\mathbf{VT} = (\mathrm{VWV}) \times (\mathrm{VSTPD})$$

$$\mathbf{W} = (\mathrm{VWV}) + (\mathrm{VT})$$

$$\mathbf{FDA} = (1.0) - (\mathrm{W})$$

$$\mathbf{MD} = (0.44 \times \%\,\mathrm{CO2}) + (0.32 \times \%\,\mathrm{O2}) + (0.28 \times \%\,\mathrm{N2}) + (0.28 \times \%\,\mathrm{CO})$$

$$\mathbf{MS} = (\mathrm{MD} \times \mathrm{FDA}) + (18 \times \mathrm{W})$$

$$\mathbf{CS} = (\mathrm{MS}) + (28.99)$$

$$\mathbf{EA} = \left[(100) \times (\%\,\mathrm{O2} - \frac{\%\,\mathrm{CO})}{2} \right] / \left[(0.266 \times \%\,\mathrm{N2}) - (\mathrm{O2} - \% \frac{\mathrm{CO})}{2} \right]$$

$$\mathbf{U} = (174) \times (\mathrm{CP}) \times (\mathrm{ASQH}) \times \sqrt{(\mathrm{TS} \times 29.92) + (\mathrm{CS} \times \mathrm{PS})}$$

$$\mathbf{QS} = (\mathrm{U}) \times (\mathrm{AS})$$

$$\mathbf{QD} = (\mathrm{QS}) \times (\mathrm{FDA})$$

$$\mathbf{QSTPD} = (528) \times (\mathrm{QD}) \times (\mathrm{PS}) + (\mathrm{TS} \times 29.9)$$

$$\mathbf{PISO} = \frac{(100) \times \mathrm{Ts} \times \mathrm{VSTPD} \times \mathrm{Pstd}}{\mathrm{Tstd} \times \mathrm{U} \times (t) \times \mathrm{An} \times \mathrm{Ps} \times (\mathrm{FDA})}$$

$$\mathbf{ESTP} = \frac{(\text{SAMPLE WT. in mg.}) \times (0.01543)}{\mathrm{VSTPD}}$$

$$\mathbf{E12} = \frac{(\mathrm{ESTP}) \times (12)}{(\mathrm{CO2}\ \%)}$$

$$\mathbf{E50} = \frac{(\mathrm{ESTP}) \times (100 + \mathrm{EA})}{150}$$

$$\mathbf{EM} = \frac{(\mathrm{ESTP}) \times (\mathrm{QSTPD})\ (60\ \mathrm{min})}{7000}$$

$$\mathbf{Eh} = \frac{(\mathrm{ESTP})}{7000} \times \text{FUEL FACTOR} \times \frac{20.9}{(20.9 - \%\,\mathrm{O2})}$$

$$\mathbf{E}_{\mathbf{EA}} = \frac{(\mathrm{ESTP}) \times (100 + \mathrm{EA})}{\text{Desired EA}}$$

Facility: Georgia Pacific **Test Date:** 5/25/01
Source: Bleach Plant Outlet **Run Number:** 1

Example Calculations:
Page 1

1. Stack Pressure, (PS)
   PS = PB + (PG/ 13.6)

Example. PB = 30.09 Therefore PS= 30.10 in. Hg.
PG = 0.07

2. Meter Pressure, (PM)
   PM = (PB) + (*H / 13.6)

Example. *H = 1.508 Therefore PM= 30.20 in. Hg.

3. Volume Water Vapor, (VWV).
   VWV = (0.04707) x (VC)

Example. VC = 37 Therefore VWV= 1.718 SCF

4. Meter Volume, corrected to Standard Conditions, (VSTD)

$$VSTPD = \frac{(17.65) \times (VM) \times (PM) \times (Y)}{TM}$$

Example. VM = 35.618 Therefore VSTPD = 35.391 SCF
PM = 30.20
TM = 553.1
Y = 1.031

5. Total Volume Of Sample, (VT).

VT = VWV + VSTPD

Example. VWV = 1.718 Therefore VT = 37.109 SCF
VSTPD = 35.391

PB = Barometric Pressure, inches of Hg.
PG = Static Pressure of stack, inches of H2O.
*H = Average meter orifice pressure differential inches of H2O.
VC = Volume condensate liquid volume + gain in silica gel wt., grams.
PM = See eq. 2.
TM = Temperature, meter, degrees Rankine.
Y = Meter Correction Factor
VWV = See eq. 3.
VSTPD = See eq. 4.

Facility: **Georgia Pacific** **Test Date:** **5/25/01**

Source: **Bleach Plant Outlet** **Run Number:** **1**

Example Calculations:
Page 2

6. Fraction Water Vapor in Gas Stream, (W)

$$W = (VWV / VT)$$

Example. VWV = 1.718 Therefore W = 0.046
VT = 37.109

7. Fraction Dry Air, (FDA).

$$FDA = 1.0 - W$$

Example. W = 0.046 Therefore FDA = 0.954

8. Molecular Weight of Stack Gas, Dry, (MD).

$$MD = (0.44 \times \%CO2) + (0.32 \times \%O2) + (0.28 \times \%N2) + (0.28 \times \%CO)$$

Example. CO2 = 0 Therefore MD = 28.84
O2 = 20.9
N2 = 79.1
CO = 0

9. Molecular Weight of Stack Gas, Stack Conditions, (MS).

$$MS = (MD \times FDA) + (18 \times W)$$

Example. MD = 28.84 Therefore MS = 28.34
FDA = 0.954
W = 0.046

10. Specific Gravity of Gas, Relative to Air, (GS)

$$GS = MS / 28.99$$

Example. MS = 28.34 Therefore GS = 0.978

VWV = See eq. 3
VT = See eq. 5
W = See eq. 6
MD = See eq. 8
MS = See eq. 9

Facility: **Georgia Pacific** **Test Date:** **5/25/01**

Source: **Bleach Plant Outlet** **Run Number:** **1**

Example Calculations:
Page 3

11. Velocity of Stack Gas, as feet per minute, (U).

U = 174 x CP x H. $\overline{\text{x / (TS x 29.92) / (GS x PS)}}$

Example. CP = 0.84 Therefore U = 1604.8 FPM
H = 0.4652
TS = 548
PS = 30.10
GS = 0.978

12. Stack Gas Flow Rate, Stack Conditions, cubic feet per minute, (QS).

QS = U x AS

Example. U = 1604.8 Therefore QS = 15440 ACFM
AS = 9.621

13. Stack Gas Flow Rate, Dry (QD)

QD = QS x FDA

Example. QS = 15440 Therefore QD = 14730 CFMD
FDA = 0.954

14. Stack Gas Flow Rate, Standard Temperature and Pressure, Dry, (QSTPD)

QSTPD = (528 x QD x PS) / (TS x 29.92)

Example QD = 14730 Therefore QSTPD = 14275 SCFMD
PS = 30.09
TS = 548

CP = Pitot Coefficient
H = Average of square roots of velocity heads, in H2O.
TS = Temperature of stack, deg. R.
PS = See eq. 1
GS = See eq. 10

Facility: **Georgia Pacific** **Test Date:** **5/25/01**

Source: **Bleach Plant Outlet** **Run Number:** **1**

Example Calculations
Page 4

15. Percent Isokinetic Volume Sampled, (PISO)

$$PISO = \frac{(100) \times Ts \times VSTPD \times Pstd}{Tstd \times U \times \Theta \times An \times Ps \times FDA}$$

Example. AN = 0.000413
Θ = 60
VSTPD = 35.391
Ts = 548
U = 1604.8

Therefore PISO = 96.4
Pstd = 29.92
Tstd = 528
Ps = 30.095147
FDA = 0.954

16. Particulate Concentration, grains per Standard Cubic Foot, (ESTP).

ESTP = (.01543 x Mg.) / VSTPD

Example. Mg. = 0
VSTPD = 35.391

Therefore ESTP = 0 Grs/ SCF.

17. Mass Emission Rate, Lbs / Hr, (EM).

$$EM = \frac{ESTP \times QSTPD \times 60\ Min/\ Hr}{7000}$$

Example.
QSTPD = 14275

Therefore EM = 0 Lbs/ Hr

VSTPD = See eq. 4
AN = Area Nozzle, Sq Ft
Mg. = Weight of particulate catch in milligrams.

Facility	Georgia Pacific
Location	Palatka, FL
Stack	Bleach Plant Outlet
Run Date	5/25/01
Run Number	1
Start Time	1850
Finish Time	1952
Weather	Clear
Total Time (min.)	60.00
Barometric Pressure	30.09
Stack Diameter (in.)	42.000
Stack Area sq. ft.	9.621
Nozzle Area sq. ft.	0.0004125
Number of Points	12
Avg of SQRT of V.H.	0.4652
Meter Correction (Y)	1.031
Nozzle Diameter	0.275
Pitot Correction Factor	0.84

Impinger Condensate , Ml	32
Silica Gel Condensate, Gm	4.5
Volume Metered	35.618
Meter Temp (Deg R)	553.1
Orsat CO2 %	0.0
Orsat O2 %	20.9
Orsat CO %	0.0
Orsat N %	79.1
Condensate Volume, Ml	36.5
Delta H (inches H2O)	1.5080
Stack Pressure	30.095
Stack Temp (Deg R)	548.0

==

Volume Water Vapor, SCF	**1.718**
Gas Volume Sampled, STPD	**35.391**
Total Volume, STP	**37.109**
Moisture in stack gas, volume fraction	**0.046**
Dry Stack Gas, volume fraction	**0.954**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.34**
Specific gravity of Stack Gas Relative to Air	**0.978**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1604.8**
Actual Stack Gas Flow Rate, ACFM	**15440**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14730**
Stack Gas Flow Rate, SCFMD	**14275**
Percent Isokinetic	**96.4**

Technical Services, Inc.
Environmental Consultants
Analytical Chemists

2901 Danese Street
Jacksonville, Fl. 32206
(904) 353 - 5761

Facility: Georgia Pacific
Stack: Bleach Plant Outlet
Run Date: 5/25/01
Run No: 1

Field Data Points				
Trav. Pt.	**Vel. Head**	**Meter Orif.**	**Stack °F**	**Meter °F**
1	0.23	1.60	92	91
2	0.23	1.60	91	92
3	0.22	1.53	89	93
4	0.22	1.53	90	93
5	0.22	1.53	90	93
6	0.2	1.39	90	93
7	0.22	1.53	86	93
8	0.23	1.60	85	93
9	0.22	1.53	85	93
10	0.22	1.53	85	94
11	0.21	1.46	88	95
12	0.18	1.25	85	94
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

Facility			
Location	Palatka, FL		
Stack	Bleach Plant Outlet		
Run Date	5/25/01	**Impinger Condensate, Ml**	36.0
Run Number	2	**Silica Gel Condensate, Gm**	5.2
Start Time	2130	**Volume Metered**	36.140
Finish Time	2234	**Meter Temp (Deg R)**	545.8
Weather	Scattered Clouds	**Orsat CO2 %**	0.0
Total Time (min.)	60.00	**Orsat O2 %**	20.9
Barometric Pressure	30.09	**Orsat CO %**	0.0
Stack Diameter (in.)	42.000	**Orsat N %**	79.1
Stack Area sq. ft.	9.621	**Condensate Volume, Ml**	41.2
Nozzle Area sq. ft.	0.0004125	**Delta H (inches H2O)**	1.4850
Number of Points	12	**Stack Pressure**	30.094
Avg of SQRT of V.H.	0.4616	**Stack Temp (Deg R)**	542.3
Meter Correction (Y)	1.031		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

==

Volume Water Vapor, SCF	**1.939**
Gas Volume Sampled, STPD	**36.388**
Total Volume, STP	**38.327**
Moisture in stack gas, volume fraction	**0.051**
Dry Stack Gas, volume fraction	**0.949**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.29**
Specific gravity of Stack Gas Relative to Air	**0.976**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1585.7**
Actual Stack Gas Flow Rate, ACFM	**15256**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14478**
Stack Gas Flow Rate, SCFMD	**14178**
Percent Isokinetic	**99.8**

Facility:	**Georgia Pacific**
Stack:	**Bleach Plant Outlet**
Run Date:	**5/25/01**
Run No:	**2**

Field Data Points				
Trav. Pt.	**Vel. Head**	**Meter Orif.**	**Stack ' F**	**Meter ' F**
1	0.23	1.60	81	85
2	0.23	1.60	82	85
3	0.22	1.53	82	85
4	0.22	1.53	82	84
5	0.21	1.46	83	88
6	0.2	1.39	82	87
7	0.23	1.60	82	85
8	0.22	1.53	83	86
9	0.21	1.46	82	86
10	0.21	1.46	83	86
11	0.2	1.39	83	86
12	0.18	1.25	83	86
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

Facility	Georgia Pacific
Location	Palatka, FL
Stack	Bleach Plant Outlet
Run Date	5/25/01
Run Number	3
Start Time	2300
Finish Time	2402
Weather	Partly Cloudy
Total Time (min.)	60
Barometric Pressure	30.09
Stack Diameter (in.)	42.000
Stack Area sq. ft.	9.621
Nozzle Area sq. ft.	0.0004125
Number of Points	12
Avg of SQRT of V.H.	0.4680
Meter Correction (Y)	1.031
Nozzle Diameter	0.275
Pitot Correction Factor	0.84

Impinger Condensate, Ml	40.0
Silica Gel Condensate, Gm	4.9
Volume Metered	36.222
Meter Temp (Deg R)	542.2
Orsat CO2 %	0.0
Orsat O2 %	20.9
Orsat CO %	0.0
Orsat N %	79.1
Condensate Volume, Ml	44.9
Delta H (inches H2O)	1.5250
Stack Pressure	30.094
Stack Temp (Deg R)	537.1

==

Volume Water Vapor, SCF	**2.113**
Gas Volume Sampled, STPD	**36.716**
Total Volume, STP	**38.829**
Moisture in stack gas, volume fraction	**0.054**
Dry Stack Gas, volume fraction	**0.946**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.25**
Specific gravity of Stack Gas Relative to Air	**0.974**
Excess Air (%)	**14864.9**
Average Stack Velocity, FPM	**1601.6**
Actual Stack Gas Flow Rate, ACFM	**15409**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14577**
Stack Gas Flow Rate, SCFMD	**14413**
Percent Isokinetic	**99.0**

Facility: Georgia Pacific
Stack: Bleach Plant Outlet
Run Date: 5/25/01
Run No: 3

		Field Data Points		
Trav. Pt.	**Vel. Head**	**Meter Orif.**	**Stack °F**	**Meter °F**
1	0.23	1.60	80	82
2	0.22	1.53	81	83
3	0.22	1.53	80	83
4	0.22	1.53	78	82
5	0.2	1.39	78	82
6	0.2	1.39	78	82
7	0.23	1.60	76	82
8	0.23	1.60	76	82
9	0.24	1.67	75	82
10	0.22	1.53	75	82
11	0.22	1.53	74	82
12	0.2	1.39	74	82
13	0		0	0
14	0		0	0
15	0		0	0
16	0		0	0
17	0		0	0
18	0		0	0
19	0		0	0
20	0		0	0
21	0		0	0
22	0		0	0
23	0		0	0
24	0		0	0
25	0		0	0
26	0		0	0
27	0		0	0
28	0		0	0
29	0		0	0
30	0		0	0

Ambient Air Services, Inc.
Environmental Consultants

106 Ambient Air Way
Starke, Florida 32091

(904) 964 - 8440
(904) 964 - 6675 fax

Volumetric Air-Flow Rates

Plant	GEORGIA PACIFIC		
Location	PALATKA, FL		
Stack	BLEACH PLANT		
Run Date	5/26/01		
Run Number	3	**Volume Metered**	0
Start Time	0	**Meter Temp (Deg R)**	ERR
Finish Time	0	**Orsat CO2 %**	0
Barometric Pressure	30.09	**Orsat O2 %**	21
Stack Diameter (in.)	42	**Orsat CO %**	0
Stack Area sq. ft.	9.621	**Orsat N %**	79
Number of Points	0	**Condensate Volume**	0
Avg of SQRT of V.H.	0.4641	**Delta H (inches H2O)**	ERR
Meter Correction (Y)	0	**Stack Pressure**	30.09
Pitot Correction Factor	0.84	**Stack Temp (Deg R)**	534.8

Moisture in stack gas, volume fraction	**0.053**
Dry Stack Gas, volume fraction	**0.947**
Molecular Weight of Stack Gas (Dry Basis)	**28.84**
Molecular Weight of Stack Gas (Stack conditions)	**28.270**
Specific gravity of Stack Gas Relative to Air	**0.975**
Excess Air (%)	
Average Stack Velocity, FPM	**1584.2**
Actual Stack Gas Flow Rate, ACFM	**15242**
Actual Stack Gas Flow Rate, (Dry) ACFMD	**14434**
Stack Gas Flow Rate (Standard conditions), SCFMD	**14331**
Stack Gas Flow Rate (Standard conditions), SCFMW	**15133**

APPENDIX B

FIELD DATA SHEETS

TECHNICAL SERVICES, INC.
JACKSONVILLE, FL
(904)353-5761

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: Georgia Pacific Palatka, GA
RUN No. 1
SOURCE: Bleach Plant outlet
DATE: ~~2~~ 5-25-01
WEATHER: Clear
TYPE TEST: M26A
TESTERS: DA / BAA
12 PTS. @ 5 MIN/PT 60 MIN
Y meter = 1.031
Filter No. =
COMMENTS:

PRE-TEST.
Ts = 558
Tm = 555
F.D.A. = 0.92

ORSAT
CO2 0
O2 20.9
CO 0

BAROMETRIC PRESS 30.09
METER BOX ID 11
METER DELTA Ha 2.32
PROBE ID 5c5
PITOT CORR. FACTOR 0.84
NOZZLE DIA 0.275 in.
PROBE TEMP ~250
STACK ID (IN): ~~46~~ 42
PORT LENGTH 7"

Dave/GP Pal Bch

TIME START	1850	START VOLUME	212.658
TIME END	1952	END VOLUME	248.276

Factors: 6.959

Eq = 0.36 lb/hr

Chlorinated hps

LEAK CHECK: PRE.TEST 0.016 CFM@15". POST: 0.006 @ 2 " Hg.
PITOT LEAK CHECK = OK AT 3"
VOL. WATER COLLECTED = 32 ML
WEIGHT MOIS. SILICA GEL = 4.5 GR
STAT.PRESS= +0.07

SCFMD = 17124

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg.
1-1	5	15.4	0.23	1.6	92	91	249	62	2
2	10	18.7	0.23	1.6	91	92	252	60	2
3	15	22.0	0.22	1.5	89	93	262	59	2
4	20	25.2	0.22	1.5	90	93	253	60	2
5	25	28.4	0.22	1.5	90	93	252	60	2
6	30	31.1	0.20	1.4	90	93	251	61	2
2-1	35	34.0	0.22	1.5	86	93	250	62	2
2	40	36.8	0.23	1.6	85	93	254	62	2
3	45	39.7	0.22	1.5	88	93	261	62	2
4	50	42.2	0.22	1.5	88	94	260	63	2
5	55	45.0	0.21	1.5	88	95	261	63	2
6	60		0.18	1.3	88	94	252	63	2

[redacted]TEC[redacted]AL [redacted]VICE[redacted]C. [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

JACKSONVILLE, FL
(904)353-5761

BAROMETRIC PRESS 30.05
METER BOX ID 11
METER DELTA Ha 2.32
PROBE ID 5C9
PITOT CORR. FACTOR 0.84
NOZZLE DIA 0.275 in
PROBE TEMP 250
STACK ID (IN) ~~46~~ 42
PORT LENGTH 7"

FACILITY: Georgia Pacific Palatka
SOURCE: Bleach Plant outlet
WEATHER: Scattered Clouds
TYPE TEST: M26A
TESTERS: KH/BM
12 PTS. @ 5 MIN/PT 60 MIN
Y meter = 1.031 Filter No. =

PRE-TEST.
Ts =
Tm =
F.D.A. =

RUN No 2
DATE 5-27-0X
ORSAT
CO2 0
O2 20.5
CO 0
Computer
Directory and file name

TIME START 2130 START VOLUME ~~[illegible]~~ 248.351
TIME END 2234 END VOLUME 284.491
Factors: 6.959

LEAK CHECK:
PRE TEST 0.010 CFM@15" POST 0.002 "Hg.
PITOT LEAK CHECK = OK AT 3"
VOL. WATER COLLECTED = 36 ML
WEIGHT MOIS. SILICA GEL = 5.2 GR
STAT PRESS= +0.05

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg	COMMENTS:
1-1	5	52.4	0.23	1.6	81	85	249	64	3	[illegible]
2	10	55.8	0.23	1.6	82	85	251	60	3	
3	15	58.2	0.22	1.5	82	85	254	60	3	
4	20	60.5	0.22	1.5	82	85	251	61	3	
5	25	63.4	0.21	1.5	83	85	252	61	3	
6	30	66.1	0.22	1.4	82	87	252	61	3	
2-1	35	68.9	0.23	1.4	82	85	242	61	3	
2	40	71.2	0.22	1.5	83	86	245	60	3	
3	45	74.2	0.21	1.5	82	86	251	61	3	
4	50	77.8	0.21	1.5	83	86	249	61	3	
5	55	79.9	0.20	1.4	83	86	242	61	3	
6	60		0.18	1.3	83	86	230	62	3	

TECHNICAL SERVICES, INC.
JACKSONVILLE, FL
(904)353-5761

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: Georgia Pacific Palatka, FL
RUN No 3
SOURCE: Bleach Plant Outlet
DATE: 5-25-01
WEATHER: Partly Cloudy
TYPE TEST: M26A
TESTERS: [illegible]/BM
12 PTS. @ 5 MIN/PT 60 MIN F.D.A. = ____
Y meter = 1.031 Filter No. = ____
Computer ____
Directory and file name ____

BAROMETRIC PRESS 30.09
METER BOX ID 11
METER DELTA Ha 2.32
PROBE ID 5cy
PITOT CORR FACTOR 0.84
NOZZLE DIA 0.225 in
PROBE TEMP ~250
STACK ID (IN) ~~46~~ 42
PORT LENGTH 7"

PRE-TEST.
Ts = ____
Tm = ____

ORSAT
CO2 0
O2 20.5
CO 0

TIME START 2300 START VOLUME 285.553
TIME END 2402 END VOLUME 3~~24~~2.15
Factors 6.959

LEAK CHECK:
PRE TEST 0.00 CFM@15" POST 0.001@3 "Hg.
PITOT LEAK CHECK = OK AT 3"
VOL. WATER COLLECTED = 40 ML
WEIGHT MOIS. SILICA GEL = 4.9 GR
STAT PRESS= +0.06

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP	METER TEMP (F)	FILTER TEMP (F)	LAST IMPINGER TEMP	VACUUM INCHES Hg	COMMENTS:
50 1-1	5	88.7	0.23	1.6	80	82	249	62	3	
2	10	90.8	0.22	1.5	81	83	255	60	3	
3	15	94.1	0.22	1.5	82	83	256	55	3	
4	20	98.2	0.22	1.4	78	82	252	66	3	
5	25	00.0	0.20	1.4	78	82	247	59	3	
6	30	03.1	0.20	1.4	78	82	25	59	3	
2-1	35	05.6	0.23	1.6	76	82	242	60	3	
2	40	7.9	0.23	1.6	76	82	240	60	3	
3	45	10.5	0.24	1.7	75	82	241	60	3	
4	50	13.1	0.22	1.4	75	82	242	61	3	
5	55	17.2	0.22	1.4	74	82	245	60	3	
6	60		0.20	1.4	74	82	236	61	3	

Velocity Traverse

Technical Services, Inc.
Jacksonville, FL (904)353-5761

Plant: Georgia Pacific
Date: 5-25-01
Source:
Barometric Pressure: 30.05
Stack Diameter: 46

Run No. (4)
Start: 0030 Stop: 0035
Static Press.(in.H2O): +0.05

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F
1-1	0.24	74.[illegible]
2	0.24	75
3	0.23	75
4	0.22	75
5	0.20	75
6	0.19	75
2-1	0.23	74
2	0.23	75
3	0.22	75
4	0.22	75
5	0.19	75
6	0.18	74

Run No.
Start: Stop:
Static Press.(in.H2O)

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F

Run No.
Start: Stop:
Static Press.(in.H2O)

Traverse Point No.	Velocity Head	Stack Temp. (Ts) Deg. F

APPENDIX C

LABORATORY ANALYSIS

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

For Georgia Pacific (Palatka)
P O Box 919
Palatka, FL 32178-0919
Contact: Joe Taylor

Report Date 30-May-01
Date Received 05/26/2001 @ 10.20
Purchase Order #:

CERTIFICATE OF ANALYSIS

LAB SAMPLE DESCRIPTION	MATRIX	SAMPLE DATE	SAMPLE TIME	SAMPLED BY
01050850	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 1/ COMPOSITE				
01050851	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 2/ COMPOSITE				
01050852	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 3/ COMPOSITE				
01050853	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 1/ COMPOSITE				
01050854	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H.
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 2/ COMPOSITE				
01050855	IMPINGER	05/25/2001	NA	TSI- D.S. , G.H
BLEACH PLANT INLET AND OUTLET, OUTLET RUN 3/ COMPOSITE				

Respectfully submitted,
Technical Services, Inc.

Walter Mock

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

Georgia Pacific (Palatka)

	Lab No	Parameter	Result		Code	Method	Detection Limit
	01050850	Default	Not analyzed				
	01050851	Default	Not analyzed				
	01050852	Default	Not analyzed				
R-1	01050853	Chloride	0.971	ug/ml Cl-		Method 26A	0.02
	01050853	Sample Volume	196	mls			1
			190.3 µg				
R-2	01050854	Chloride	0.808	ug/ml Cl-		Method 26A	0.02
	01050854	Sample Volume	200	mls			1
			161.6 µg				
R-3	01050855	Chloride	0.838	ug/ml Cl-		Method 26A	0.02
	01050855	Sample Volume	194	mls			1
			162.6 µg				

Georgia Pacific (Palatka)

Lab No	Parameter	Date of Analysis	Analysis Time	Analyst	Prep Date
01050850	Default			none	
01050851	Default			none	
01050852	Default			none	
01050853	Chloride	05/26/2001		WEM	
01050853	Sample Volume	05/26/2001		WEM	
01050854	Chloride	05/26/2001		WEM	
01050854	Sample Volume	05/26/2001		WEM	
01050855	Chloride	05/26/2001		WEM	
01050855	Sample Volume	05/26/2001		WEM	

APPENDIX D

SCRUBBER DATA AND PROCESS CERTIFICATION

BLEACH PLANT PRODUCTION DATA

DATE	TIME	ADTUP	FAN LOAD, %
05/25/01	1850-1952	55	85.1
	2133-2300	50	85.6
	2300-2330	55	85.9
	2330-0042	50	85.8
	0145-0230	50	85.2

ADTUP is air-dried tons of unbleached pulp across the bleach plant.
Fan load is the % of full load (amperage) of the fan used as the surrogate flow measure.
The scrubber recirculation flow ranged from 1500 gpm to 1740 gpm during the testing.
The scrubber pH was 9.5 during the testing.

DATA CERTIFICATION BY OWNER OR HIS AUTHORIZED AGENT

I, Myra Carpenter,
(print name)

certify that to my knowledge all data

submitted in this compliance test report

for the ECF Bleach Plant unit

on May 25, 2001
(date)

are true and correct.

Myra Carpenter
(signature and title)

APPENDIX E

CHAIN OF CUSTODY

01050850 -
01050875

Technical Services, Inc.
2901 Danese St., Jacksonville, FL 32206
(904) 353-5761 / fax (904) 358-2908

CHAIN of CUSTODY RECORD

CLIENT NAME & ADDRESS (REPORT TO BE SENT TO:) c/o Air Dept
Georgia Pacific
Palatka, FL

REMARKS
Bleach Plant inlet + Outlet
Method 26A

PROJ. NO.

PROJECT NAME/ ADDRESS:

SAMPLERS: (SIGNATURE) G Hawkins

BOTTLE MAKEUP 4" Polys

Sample Location ID	DATE	TIME	COMP	GRAB	TOTAL NO. of Containers	BOTTLE MAKEUP	PARAMETERS
Outlet R-1	5-25-01	N/A	✓		1	} 0.1N H_2SO_4	M 26A
2	↓	↓	↓		1		
3					1		
R-1					1	} 0.1N NaOH	
2					1		
3					1		

RELINQUISHED BY: DATE/TIME 5/30/01 1100 RECEIVED BY DATE/TIME

RELINQUISHED BY DATE/TIME RECEIVED BY DATE/TIME

RELINQUISHED BY DATE/TIME RECEIVED BY DATE/TIME

RECEIVED FOR LABORATORY BY DATE/TIME
[illegible] 5/30/01 1120

J

APPENDIX F

CALIBRATION DATA

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Annual Dry Gas Meter Calibration Data By TSI Reference Meter

REFERENCE METER **R-275** **TSI Reference Dry Meter Calibration Date:** **8/09/00**

Yi of reference meter: **1.012**

Date **1/4/01** **Calibrated by** **R Garza**

Barometric Pressure **30.12** **Meter Box** **11**

Orifice Manometer Setting (DH) In. H2O	Reference Dry Gas Meter Cu.ft.	Gas Volume		Temperature				Time (t), min	Delta H in. H2O	Yi
		Reference Meter (Vw) Std.Cu. Ft.	Dry Gas Meter (VD) Cu. Ft.	Reference Meter (Tw) Deg ^F	Dry Gas Meter	Temperature (Td) Deg ^F				
0.5	10.015	10.099	9.715	73.2		X	66.40	29.34	2.39	1.025
1	10.002	10.082	9.761	73.4		X	70.90	20.46	2.31	1.026
1.5	10.005	10.044	9.642	75.6		X	73.30	17.00	2.42	1.033
2	10.013	10.075	9.691	74.4		X	74.50	14.50	2.32	1.035
3	10.012	10.057	9.645	75.3		X	75.40	11.39	2.16	1.035
						Average Delta H and Y			2.32	1.031
						Yi Allowance =		1.011	To	1.051
						DH Allowance =		2.12	To	2.52

* If there is only one thermometer on the dry gas meter, record the temperature under Td

Vw = Gas volume passing through the Reference test meter, (cu. ft.)

Vd = Gas volume passing through the dry gas meter, (cu. ft.)

Tw = Temperature of the gas in the Reference test meter, Deg F

Td = Temperature of the gas in the dry gas meter, Deg F

DH = Pressure differential across orifice, in H2O = pretest DH + or - 0.20

Yi = Ratio of accuracy of the Reference test meter to dry gas meter for each run

Y = Average ratio of the Reference test meter to dry gas meter for all three test runs; tolerance = pretest Y + or - 0.02Y

Pb = Barometric pressure, in. Hg.

t = Time of calibration run, min.

Quality Assurance Handbook M5-2.4A

Quality Assurance Handbook M5-2.4A

T
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Post-Test Dry Gas Meter Calibration Data Form (English Units)

Test numbers All **Date** 5/31/01 **Meter Box No.** 11 **Facility** GP

Barometric Pressure, Pb 30.05 **Reference Meter** R-275 **Pretest Y Value** 1.024

Orifice Manometer Setting (DH) In. H2O	Gas Volume		Temperature				Time (), min	Vacuum Setting In. Hg.	Yi
	Reference Meter (Vw) Cu. Ft.	Dry Gas Meter (VD) Cu. Ft.	Reference Meter (Tw) Deg ^F	Dry Gas Meter					
						Average (Td) Deg ^F			
1.5	10.003	9.831	75	X	X	75	16.87	< 2	1.014
1.5	10.001	9.823	75	X	X	76	16.56	<2	1.016
1.5	10.000	9.820	80	X	X	81	16.92	<2	1.016
								Yi =	1.016

* If there is only one thermometer on the dry gas meter, record the temperature under Td

Yi

$$\frac{Vw * Pb * (Td + 460)}{Vd\ (Pb + (Delta\ H/13.6))\ x\ (Tw + 460)}$$

Vw = Gas volume passing through the reference test meter, (cu. ft.)
Vd = Gas volume passing through the dry gas meter, (cu. ft.)
Tw = Temperature of the gas in the reference test meter, Deg F
(Td)i = Temperature of the inlet gas of the dry gas meter, Deg F
(Td) = Temperature of the outlet gas of the dry gas meter, Deg F
Td = Average temperature of the gas in the dry gas meter, obtained by the average of (Td)i & (Td)o, Deg F
DH = Pressure differential across orifice, in H2O
Yi = Ratio of accuracy of the reference test meter to dry gas meter for each run
Y = Average ratio of the reference test meter to dry gas meter for all three test runs;
tolerance = pretest Y + or - 0.02Y
Pb = Barometric pressure, in. Hg
= Time of calibration run, min.

Quality Assurance Handbook M5-2.4A

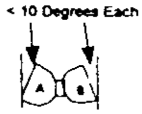
ANNUAL PITOT TUBE CALIBRATION WORKSHEET
MARCH 22, 2001

Pitot Tube I.D. #	Coefficient	Pa Inches	Pb Inches	Dt Inches	Zs Inches	Ws Inches	a1 Degrees	a2 Degrees	b1 Degrees	b2 Degrees	X Inches	Zp Inches	Y Inches
WC1	0.84	0.555	0.533	0.373	0.07	< 0.313	0	2	2	3	0.74	2.0	4.0
3A	0.84	0.554	0.556	0.374	0.061	< 0.313	1	3	2	2	1.4	2.0	4.0
3AG	0.84	0.550	0.551	0.375	0.003	< 0.313	2	3	3	2	1.5	2.0	4.0
4A	0.84	0.540	0.538	0.375	0.049	< 0.313	1	3	2	2	1.4	2.0	4.0
4AG	0.84	0.557	0.554	0.373	0.03	< 0.313	1	1	3	0	1.5	2.0	4.0
6A	0.84	0.512	0.539	0.375	0.063	< 0.313	0	2	2	1	1.5	2.0	4.0
6B	0.84	0.405	0.415	0.375	0.06	< 0.313	0	3	2	1	1.2	2.0	4.0
5CG	0.84	0.540	0.551	0.375	0.066	< 0.313	2	3	2	2	1.12	2.0	4.0
7A	0.84	0.550	0.542	0.374	0.056	< 0.313	1	2	1	2	1.31	2.0	4.0
7B	0.84	0.549	0.542	0.375	0.06	< 0.313	3	1	1	1	1.38	2.0	4.0
7C	0.84	0.555	0.550	0.375	0.051	< 0.313	1	2	2	2	1.41	2.0	4.0
7AG	0.84	0.540	0.535	0.371	0.037	< 0.313	3	3	1	1	1.3	2.0	4.0
7BG	0.84	0.550	0.551	0.375	0.034	< 0.313	2	2	3	3	1.1	2.0	4.0
7CG	0.84	0.556	0.554	0.375	0.032	< 0.313	1	3	1	1	1.35	2.0	4.0
8A	0.84	0.531	0.545	0.375	0.031	< 0.313	2	2	0	2	1.2	2.0	4.0
9A	0.84	0.520	0.512	0.374	0.056	< 0.313	2	2	1	1	1.51	2.0	4.0
10A	0.84	0.554	0.544	0.374	0.078	< 0.313	2	2	0	1	1.28	2.0	4.0
10B	0.84	0.550	0.552	0.375	0.05	< 0.313	1	1	3	2	1.25	2.0	4.0
12A	0.84	0.407	0.411	0.374	0.059	< 0.313	3	3	2	2	1.35	2.0	4.0

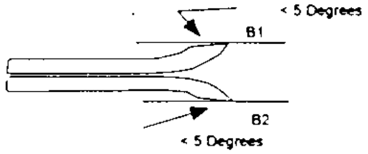
Calibrations performed by George Hawkins

Pa	Distance between where pitots adjoin to tip of pitot (Must be between 1.05 & 1.50 times O.D. of tubing)
Pb	Distance between where pitots adjoin to tip of pitot (Must be between 1.05 & 1.50 times O.D. of tubing)
Dt	Diameter of pitot tube (0.375 inches on all pitots)
Zs	Distance between the tip of the impact and static line along the length of the pitot (Must be < 1/8 inch (0.1250))
Ws	Spacing between Pitot tubes where welded together (Must be < 1/32 inch (0.0313))
a1	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be < 10 Deg)
a2	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be < 10 Deg)
b1	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be < 5 Deg)
b2	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be < 5 Deg)
X	Distance between side of nozzle and side of pitot tube (Must be > 3/4 inch)
Zp	Distance from center of pitot opening back to tip of thermal couple (Must be >= 3/4 inch (0.75))
Y	Distance from center of pitot opening back to probe (Must be >= 3 inches)

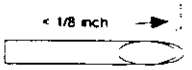
a1 & a2



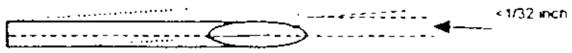
b1 & b2



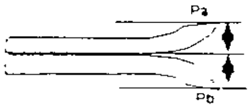
Z



W

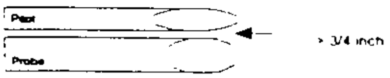


Pa & Pb

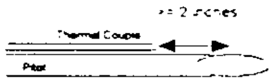


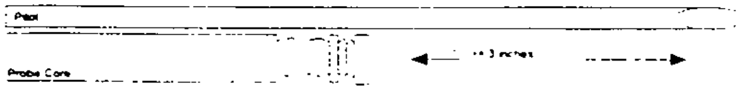
(>1.05 x O.D.) & (< 1.5 x O.D.)

X



ZP





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Air Report - Method Five Equipment Calibrations

NOZZLE CALIBRATION

Facility	**Georgia Pacific**	**Date**	**5/25/01**
Location	**Palatka, FL**		
Source Name	**Bleach Plant Outlet**	**Analyst**	

Calibration Data

All Technical Services, Inc. pitot tubes have been modified to comply with specifications as presented in the Thursday, August 18, 1977 Federal Register (Vol. 42, No. 160). A pitot tube correction factor of 0.84 has been assigned.

Our thermometers, pyrometers and thermocouples are calibrated against a standard mercury thermometer in a hot oven in our laboratory. (Data on following page.)

Our field barometer is checked before every test against that of our laboratory mercury barometer.

All probe nozzles are calibrated each test run to assure isokinetic sampling.

Nozzle Diameter in Inches: 0.275

				Mean
Run 1	0.275	0.275	0.275	0.275

S
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Air Report - Method Five Equipment Calibrations

THERMOCOUPLE CALIBRATIONS

Facility: Georgia Pacific
ocation: Palatka, FL
ource Name: Bleach Plant Outlet Inlet
Date: 5/31/01
Analyst:

Calibration Data

Ambient Temperature 75
Reference: Mercury in glass X
hermocouple Number 5cg
Other
arometric Pressure 29.97

Reference Point Number	Source(a) (specify)	Reference Thermometer Temperature	Thermocouple Temperature	Temperature Difference(b)
1	Ice Bath	34	33	0.20
2	Inter-mediate	75	73	0.37
3	Boiling Water	212	212	0.00
4	Hot Oil	347	345	0.25

≡ Type of calibration system used

= $\left[\frac{\text{(REF. TEMP. +460)-(THERMOCOUPLE TEMP. +460)}}{\text{ref. temp + 460}}\right] \text{X } 100 <= 1.5\%$

GEORGIA PACIFIC

PALATKA, FLORIDA

SUMMARY OF CO CALIBRATIONS - BLEACH PLANT

5/25/01 - 5/26/01

INSTRUMENT RANGE, PPM	1200

CALIBRATION GAS PPM	INITIAL CALIBRATION	END RUN 1	END RUN 2	END RUN 3
0.0	12.0	12.0	11.3	10.8
1015.0	1016.4	1020.0	1032.5	1031.6
594.7	575.1	N/A	N/A	N/A
301.9	293.5	N/A	N/A	N/A

CALIBRATION ERROR ((INSTRUMENT RESPONSE-CALIBRATION GAS VALUE)/INSTRUMENT RANGE)X100

0.0	1.0	1.0	0.9	0.9
1015.0	0.1	0.4	1.5	1.4
594.7	-1.6	N/A	N/A	N/A
301.9	-0.7	N/A	N/A	N/A

CALIBRATION DRIFT ((FINAL CALIBRATION - INITIAL CALIBRATION)/INSTRUMENT RANGE)X100

0.0	N/A	0.0	-0.1	-0.1
1015.0	N/A	0.3	1.3	1.3
594.7	N/A	N/A	N/A	N/A

ZERO BIAS CHECKS		(SAMPLE SYSTEM-DIRECT)/RANGEX100		
SAMPLE ZERO	DIRECT ZERO	BIAS		
N/A	N/A	#VALUE!	INITIAL	
N/A	N/A	#VALUE!	FINAL	ALL CAL GASES INJECTED TO PROBE TIP ONLY
CALIBRATION BIAS CHECKS				
CALIBRATION GAS, PPM	N/A			
SAMPLE	DIRECT	BIAS		
N/A	N/A	#VALUE!	INITIAL	
N/A	N/A	#VALUE!	FINAL	

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST **P.O NUMBER** 333045-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503.2PPM GMIS VS	1680B	CLM-009396	490.4 PPM

ANALYZER READINGS

R=REFERENCE STANDARD ***Z=ZERO GAS*** ***C=GAS CANDIDATE***

COMPONENT CARBON MONOXIDE 503.2PPM GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N 88-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED **LAST CALIBRATION DATE** 12/31/00

FIRST ANALYSIS DATE 12/27/00 **SECOND ANALYSIS DATE** 01/03/01

Z	0	**R**	503	**C**	301	**CONC.**	301.3	**Z**	0	**R**	504	**C**	302	**CONC.**	[illegible]
R	502	**Z**	0	**C**	302	**CONC.**	302.3	**R**	504	**Z**	0	**C**	302	**CONC.**	301.5
Z	0	**C**	302	**R**	503	**CONC.**	302.3	**Z**	0	**C**	303	**R**	504	**CONC.**	302.5

U/M ppm **MEAN TEST ASSAY** 302.0 **U/M** ppm **MEAN TEST ASSAY** 301.9

VALUES NOT VALID BELOW 150 PSIG
UNCERTAINTY OF CARBON MONOXIDE ±1.3PPM

THIS CYLINDER NO. CC114912
HAS BEEN CERTIFIED ACCORDING TO SECTION 2.2
OF TRACEABILITY PROTOCOL NO. EPA-600/R97/121
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 01/03/01
EXPIRATION DATE 01/03/04 **TERM**

CERTIFIED CONCENTRATION

CARBON MONOXIDE	301.9PPM
AIR	BALANCE

ANALYZED BY JOHN PRIBISH

CERTIFIED BY KEVIN BRADY

PRAXAIR

Praxair Distribution, Inc.
145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST

P.O NUMBER 333045-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503.2PPM GMIS VS	1680B	CLM-009396	490.4 PPM

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE 503.2PPM GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N B8-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED

LAST CALIBRATION DATE 12/31/00

FIRST ANALYSIS DATE 12/27/00

SECOND ANALYSIS DATE 01/03/01

Z 0	**R** 503	**C** 595	**CONC.** 595.6	**Z** 0	**R** 504	**C** 595	**CONC.** 594.1
R 502	**Z** 0	**C** 595	**CONC.** 595.6	**R** 504	**Z** 0	**C** 595	**CONC.** 594.1
Z 0	**C** 594	**R** 503	**CONC.** 595.6	**Z** 0	**C** 595	**R** 504	**CONC.** 594.1
U/M ppm			**MEAN TEST ASSAY** 595.3	**U/M** ppm			**MEAN TEST ASSAY** 594.1

VALUES NOT VALID BELOW 150 PSIG

UNCERTAINTIY OF CARBON MONOXIDE:±4 2PPM

THIS CYLINDER NO. SA12251
HAS BEEN CERTIFIED ACCORDING TO SECTION 2.2
OF TRACEABILITY PROTOCOL NO. EPA-600/R97/121
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 01/03/01
EXPIRATION DATE 01/03/04 **TERM**

CERTIFIED CONCENTRATION

CARBON MONOXIDE	594.7PPM
AIR	BALANCE

ANALYZED BY JOHN PARISH

CERTIFIED BY [illegible]

SPECTRA GASES
277 Coit St. • Irvington, NJ 07111 USA Tel.: (973) 372-2060 • (800) 932-0624 • Fax (973) 372-8551
Shipped From: 80 Industrial Drive • Alpha, N.J. 08865

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G2

CUSTOMER: Ambient Air Service
SGI ORDER # : 134478
ITEM# : 1
P.O.# : 07079802

CYLINDER # : CC88617
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 350

CERTIFICATION DATE: 7/8/98
EXPIRATION DATE: 7/8/2001

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	2/24/98 7/8/98	1014 ppm 1017 ppm	1015 ppm	+/- 1%

BALANCE Nitrogen

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81681	CC55775	994 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	6/29/98

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: ________________
FRED PIKULA

DATE: 7/8/98

APPENDIX G

CARBON MONOXIDE EMISSIONS

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/25/01 18 46	1030 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1026 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1022 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 46	1026 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1030 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1024 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1022 0	1015 ppm cal	10 98	1026 4			
5/25/01 18 47	1016 0	wait	10 98	1026 4			
5/25/01 18 48	923 8	wait	10 98	1026 4			
5/25/01 18 48	456 9	wait	10 98	1026 4			
5/25/01 18 48	144 2	wait	10 98	1026 4			
5/25/01 18 48	24 0	wait	10 98	1026 4			
5/25/01 18 49	14 0	wait	10 98	1026 4			
5/25/01 18 49	24 0	wait	10 98	1026 4			
5/25/01 18 49	56 1	wait	10 98	1026 4			
5/25/01 18 49	44 0	wait	10 98	1026 4			
5/25/01 18 50	18 0	wait	10 98	1026 4			
5/25/01 18 50	12 0	wait	10 98	1026 4			
5/25/01 18 50	12 0	wait	10 98	1026 4			
5/25/01 18 50	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	10 0	0 ppm cal	10 98	1026 4			
5/25/01 18 51	12 0	wait	10 98	1026 4			
5/25/01 18 51	16 0	wait	10 98	1026 4			
5/25/01 18 52	60 1	wait	10 98	1026 4			
5/25/01 18 52	154 3	wait	10 98	1026 4			
5/25/01 18 52	214 4	wait	10 98	1026 4			
5/25/01 18 52	270 5	wait	10 98	1026 4			
5/25/01 18 53	288 5	wait	10 98	1026 4			
5/25/01 18 53	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 53	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 53	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	292 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	294 5	301 9 ppm cal	10 98	1026 4			
5/25/01 18 54	294 5	301.9 ppm cal	10 98	1026 4			
5/25/01 18 55	292 5	301.9 ppm cal	10 98	1026 4			
5/25/01 18 55	286 5	wait	10 98	1026 4			
5/25/01 18 55	298 5	wait	10 98	1026 4			
5/25/01 18 55	440 8	wait	10 98	1026 4			
5/25/01 18 56	545 0	wait	10 98	1026 4			
5/25/01 18 56	575 1	wait	10 98	1026 4			
5/25/01 18 56	579.1	wait	10 98	1026 4			
5/25/01 18 56	581.1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	583 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 57	583 1	594 7 ppm cal	10 98	1025 4			
5/25/01 18 57	581 1	594 7 ppm cal	10 98	1025 4			
5/25/01 18 57	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 58	581 1	594 7 ppm cal	10 98	1026 4			
5/25/01 18 58	581 1	594 7 ppm cal	10 98	1025 4			
5/25/01 18 58	643 2	wait	10 98	1025 4			
5/25/01 18 58	939 8	wait	10 98	1025 4			
5/25/01 18 59	1070 1	wait	10 98	1025 4			
5/25/01 18 59	1118 2	wait	10 98	1025 4			
5/25/01 21 37	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 37	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 38	12 0	0 ppm cal	11 982	1021 8			
5/25/01 21 39	12 0	0 ppm cal	11 982	1021 8			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 21:39	12.0	0 ppm cal	11.982	1021.8			
5/25/01 21:39	14.0	wait	11.982	1021.8			
5/25/01 21:39	212.4	wait	11.982	1021.8			
5/25/01 21:40	849.2	wait	11.982	1021.8			
5/25/01 21:40	959.9	wait	11.982	1021.8			
5/25/01 21:40	1010.0	wait	11.982	1021.8			
5/25/01 21:40	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1016.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1012.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:41	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1020.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:42	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1020.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1016.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:43	1014.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:44	1018.0	1015 ppm cal	11.982	1021.8			
5/25/01 21:44	1008.0	wait	11.982	1021.8			
5/25/01 21:44	933.8	wait	11.982	1021.8			
5/25/01 21:44	729.4	wait	11.982	1021.8			
5/25/01 21:45	611.2	wait	11.982	1021.8			
5/25/01 21:45	581.1	wait	11.982	1021.8			
5/25/01 21:45	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:45	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	577.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	575.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	577.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:46	573.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:47	573.1	594.7 ppm cal	11.982	1018.2			
5/25/01 21:47	561.1	wait	11.982	1018.2			
5/25/01 21:47	601.1	wait	11.982	1018.2			
5/25/01 21:47	675.3	wait	11.982	1018.2			
5/25/01 21:48	701.3	wait	11.982	1018.2			
5/25/01 21:48	713.4	wait	11.982	1018.2			
5/25/01 21:48	721.4	wait	11.982	1018.2			
5/25/01 21:48	723.4	wait	11.982	1018.2			
5/25/01 21:49	717.4	wait	11.982	1018.2			
5/25/01 21:49	717.4	wait	11.982	1018.2			
5/25/01 21:49	719.4	wait	11.982	1018.2			
5/25/01 21:49	719.4	wait	11.982	1018.2			
5/25/01 21:50	715.4	run 1	11.982	1018.2	709.5	14183	43.9
5/25/01 21:50	713.4	run 1	11.982	1018.2	707.5	14183	43.8
5/25/01 21:50	711.4	run 1	11.982	1018.2	705.5	14183	43.7
5/25/01 21:50	709.4	run 1	11.982	1018.2	703.5	14183	43.5
5/25/01 21:51	705.4	run 1	11.982	1018.2	699.4	14183	43.3
5/25/01 21:51	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 21:51	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 21:51	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 21:52	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:52	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 21:52	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 21:52	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:53	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:53	691.3	run 1	11.982	1018.2	685.3	14183	42.4
5/25/01 21:53	691.3	run 1	11.982	1018.2	685.3	14183	42.4
5/25/01 21:53	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 21:54	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 21:54	683.3	run 1	11.982	1018.2	677.2	14183	41.9

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm, dry	POUNDS OF CO PER HOUR
5/25/01 21:54	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 21:54	669.3	run 1	11.982	1018.2	563.0	14183	41.0
5/25/01 21:55	669.3	run 1	11.982	1018.2	563.0	14183	41.0
5/25/01 21:55	675.3	run 1	11.982	1018.2	569.1	14183	41.4
5/25/01 21:55	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 21:55	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 21:56	669.3	run 1	11.982	1018.2	563.0	14183	41.0
5/25/01 21:56	679.3	run 1	11.982	1018.2	573.2	14183	41.7
5/25/01 21:56	675.3	run 1	11.982	1018.2	569.1	14183	41.4
5/25/01 21:56	675.3	run 1	11.982	1018.2	569.1	14183	41.4
5/25/01 21:57	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 21:57	673.3	run 1	11.982	1018.2	567.1	14183	41.3
5/25/01 21:57	667.3	run 1	11.982	1018.2	561.0	14183	40.9
5/25/01 21:57	663.3	run 1	11.982	1018.2	557.0	14183	40.5
5/25/01 21:58	667.3	run 1	11.982	1018.2	561.0	14183	40.9
5/25/01 21:58	663.3	run 1	11.982	1018.2	557.0	14183	40.6
5/25/01 21:58	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 21:58	655.3	run 1	11.982	1018.2	648.9	14183	40.1
5/25/01 21:59	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 21:59	649.2	run 1	11.982	1018.2	542.8	14183	39.8
5/25/01 21:59	633.2	run 1	11.982	1018.2	526.7	14183	38.8
5/25/01 21:59	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:00	647.2	run 1	11.982	1018.2	540.8	14183	39.6
5/25/01 22:00	641.2	run 1	11.982	1018.2	534.7	14183	39.3
5/25/01 22:00	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:00	651.2	run 1	11.982	1018.2	544.9	14183	39.9
5/25/01 22:01	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:01	657.3	run 1	11.982	1018.2	550.9	14183	40.3
5/25/01 22:01	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:01	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:02	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:02	693.3	run 1	11.982	1018.2	587.3	14183	42.5
5/25/01 22:02	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:02	691.3	run 1	11.982	1018.2	585.3	14183	42.4
5/25/01 22:03	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:03	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:03	697.3	run 1	11.982	1018.2	591.3	14183	42.8
5/25/01 22:03	705.4	run 1	11.982	1018.2	599.4	14183	43.3
5/25/01 22:04	705.4	run 1	11.982	1018.2	599.4	14183	43.3
5/25/01 22:04	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:04	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:04	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:05	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:05	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:05	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:05	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:06	659.3	run 1	11.982	1018.2	652.9	14183	40.4
5/25/01 22:06	657.3	run 1	11.982	1018.2	550.9	14183	40.3
5/25/01 22:06	651.2	run 1	11.982	1018.2	544.9	14183	39.9
5/25/01 22:06	643.2	run 1	11.982	1018.2	636.8	14183	39.4
5/25/01 22:07	647.2	run 1	11.982	1018.2	540.8	14183	39.6
5/25/01 22:07	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:07	553.2	run 1	11.982	1018.2	546.9	14183	40.0
5/25/01 22:07	651.2	run 1	11.982	1018.2	544.9	14183	39.9
5/25/01 22:08	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:08	657.3	run 1	11.982	1018.2	550.9	14183	40.3
5/25/01 22:08	653.2	run 1	11.982	1018.2	546.9	14183	40.0
5/25/01 22:08	555.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:09	563.3	run 1	11.982	1018.2	557.0	14183	40.6
5/25/01 22:09	569.3	run 1	11.982	1018.2	563.0	14183	41.0
5/25/01 22:09	565.3	run 1	11.982	1018.2	559.0	14183	40.8

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm, dry	POUNDS OF CO PER HOUR
5/25/01 22:09	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:10	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:10	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:10	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:10	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:11	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:11	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:11	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:11	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:12	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:12	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:12	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:12	665.3	run 1	11.982	1018.2	659.0	14183	40.8
5/25/01 22:13	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:13	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:13	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:13	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:14	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:14	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:14	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:14	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:15	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:15	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:15	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:15	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:16	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:16	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:16	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:16	667.3	run 1	11.982	1018.2	661.0	14183	40.9
5/25/01 22:17	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:17	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:17	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:17	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:18	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:18	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:18	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:18	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:19	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:19	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:19	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:19	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:20	685.3	run 1	11.982	1018.2	679.2	14183	42.0
5/25/01 22:20	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:20	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:20	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:21	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:21	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:22	671.3	run 1	11.982	1018.2	665.1	14183	41.2
5/25/01 22:22	675.3	run 1	11.982	1018.2	669.1	14183	41.4
5/25/01 22:22	677.3	run 1	11.982	1018.2	671.1	14183	41.5
5/25/01 22:22	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:23	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:23	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:24	689.3	run 1	11.982	1018.2	683.3	14183	42.3
5/25/01 22:24	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:24	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 22:24	689.3	run 1	11.982	1018.2	683.3	14183	42.3

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 22:25	687.3	run 1	11.982	1018.2	581.2	14183	42.2
5/25/01 22:25	681.3	run 1	11.982	1018.2	575.2	14183	41.8
5/25/01 22:25	685.3	run 1	11.982	1018.2	579.2	14183	42.0
5/25/01 22:25	683.3	run 1	11.982	1018.2	677.2	14183	41.9
5/25/01 22:26	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:26	679.3	run 1	11.982	1018.2	573.2	14183	41.7
5/25/01 22:26	679.3	run 1	11.982	1018.2	673.2	14183	41.7
5/25/01 22:26	687.3	run 1	11.982	1018.2	581.2	14183	42.2
5/25/01 22:27	693.3	run 1	11.982	1018.2	587.3	14183	42.5
5/25/01 22:27	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:27	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:27	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:28	699.3	run 1	11.982	1018.2	693.4	14183	42.9
5/25/01 22:28	697.3	run 1	11.982	1018.2	591.3	14183	42.8
5/25/01 22:28	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:28	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:29	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:29	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:29	699.3	run 1	11.982	1018.2	693.4	14183	42.9
5/25/01 22:29	709.4	run 1	11.982	1018.2	703.5	14183	43.5
5/25/01 22:30	717.4	run 1	11.982	1018.2	711.6	14183	44.0
5/25/01 22:30	711.4	run 1	11.982	1018.2	706.5	14183	43.7
5/25/01 22:30	703.3	run 1	11.982	1018.2	697.4	14183	43.2
5/25/01 22:30	701.3	run 1	11.982	1018.2	595.4	14183	43.0
5/25/01 22:31	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:31	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:31	695.3	run 1	11.982	1018.2	589.3	14183	42.7
5/25/01 22:31	697.3	run 1	11.982	1018.2	691.3	14183	42.8
5/25/01 22:32	695.3	run 1	11.982	1018.2	689.3	14183	42.7
5/25/01 22:32	693.3	run 1	11.982	1018.2	687.3	14183	42.5
5/25/01 22:32	687.3	run 1	11.982	1018.2	681.2	14183	42.2
5/25/01 22:32	681.3	run 1	11.982	1018.2	675.2	14183	41.8
5/25/01 22:33	673.3	run 1	11.982	1018.2	667.1	14183	41.3
5/25/01 22:33	671.3	run 1	11,982	1018.2	665.1	14183	41.2
5/25/01 22:33	669.3	run 1	11.982	1018.2	663.0	14183	41.0
5/25/01 22:33	655.3	run 1	11,982	1018.2	648.9	14183	40.1
5/25/01 22:34	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:34	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:34	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:34	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	639.2	run 1	11.982	1018.2	632.7	14183	39.1
5/25/01 22:35	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:35	641.2	run 1	11.982	1018.2	634.7	14183	39.3
5/25/01 22:36	647.2	run 1	11.982	1018.2	640.8	14183	39.6
5/25/01 22:36	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:36	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:36	665.3	run 1	11.982	1018.2	559.0	14183	40.8
5/25/01 22:37	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:37	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:37	563.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:37	659.3	run 1	11.982	1018.2	652.9	14183	40.4
5/25/01 22:38	655.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:38	663.3	run 1	11.982	1018.2	657.0	14183	40.6
5/25/01 22:38	667.3	run 1	11.982	1018.2	561.0	14183	40.9
5/25/01 22:38	667.3	run 1	11.982	1018.2	561.0	14183	40.9
5/25/01 22:39	661.3	run 1	11.982	1018.2	655.0	14183	40.5
5/25/01 22:39	555.3	run 1	11.982	1018.2	548.9	14183	40.1
5/25/01 22:39	657.3	run 1	11.982	1018.2	650.9	14183	40.3
5/25/01 22:39	561.3	run 1	11.982	1018.2	555.0	14183	40.5
5/25/01 22:40	657.3	run 1	11.982	1018.2	650.9	14183	40.3

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/25/01 22 40	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 40	657 3	run 1	11 982	1018 2	650 9	14183	40 3
5/25/01 22 40	661 3	run 1	11 982	1018 2	655 0	14183	40 5
5/25/01 22 41	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 22 41	673 3	run 1	11 982	1018 2	667 1	14183	41 3
5/25/01 22 41	673 3	run 1	11 982	1018 2	667 1	14183	41 3
5/25/01 22 41	675 3	run 1	11 982	1018 2	669 1	14183	41 4
5/25/01 22 42	679 3	run 1	11 982	1018 2	673 2	14183	41 7
5/25/01 22 42	677 3	run 1	11 982	1018 2	671 1	14183	41 5
5/25/01 22 42	669 3	run 1	11 982	1018 2	663 0	14183	41 0
5/25/01 22 42	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 22 43	659 3	run 1	11 982	1018 2	652 9	14183	40 4
5/25/01 22 43	659 3	run 1	11 982	1018 2	652 9	14183	40 4
5/25/01 22 43	663 3	run 1	11 982	1018 2	657 0	14183	40 6
5/25/01 22 43	667 3	run 1	11 982	1018 2	661 0	14183	40 9
5/25/01 22 44	677 3	run 1	11 982	1018 2	671 1	14183	41 5
5/25/01 22 44	683 3	run 1	11 982	1018 2	677 2	14183	41 9
5/25/01 22 44	683 3	run 1	11 982	1018 2	677 2	14183	41 9
5/25/01 22 44	681 3	run 1	11 982	1018 2	675 2	14183	41 8
5/25/01 22 45	685 3	run 1	11 982	1018 2	679 2	14183	42 0
5/25/01 22 45	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 45	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22 45	691 3	run 1	11 982	1018 2	685 3	14183	42 4
5/25/01 22 46	687 3	run 1	11 982	1018 2	681 2	14183	42 2
5/25/01 22 46	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 46	703 3	run 1	11 982	1018 2	697 4	14183	43 2
5/25/01 22 46	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 47	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22 47	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 47	703 3	run 1	11.982	1018 2	697 4	14183	43 2
5/25/01 22 47	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 48	705 4	run 1	11 982	1018 2	599 4	14183	43 3
5/25/01 22 48	701 3	run 1	11 982	1018 2	695 4	14183	43 0
5/25/01 22 48	695 3	run 1	11 982	1018 2	689 3	14183	42 7
5/25/01 22 48	697 3	run 1	11 982	1018 2	691 3	14183	42 8
5/25/01 22 49	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 49	703 3	run 1	11.982	1018.2	697 4	14183	43 2
5/25/01 22 49	699 3	run 1	11 982	1018 2	693 4	14183	42 9
5/25/01 22.49	705 4	run 1	11 982	1018 2	699 4	14183	43 3
5/25/01 22 50	711 4	wait	11 982	1018 2			
5/25/01 22 50	711 4	wait	11 982	1018 2			
5/25/01 22 50	711 4	wait	11 982	1018 2			
5/25/01 22 50	713 4	wait	11 982	1018 2			
5/25/01 22 51	701.3	wait	11 982	1018 2			
5/25/01 22 51	703 3	wait	11 982	1018 2			
5/25/01 22 51	701 3	wait	11 982	1018 2			
5/25/01 22 51	689 3	wait	11 982	1018 2			
5/25/01 22 52	757 5	wait	11 982	1018 2			
5/25/01 22 52	909 8	wait	11 982	1018 2			
5/25/01 22 52	993 9	wait	11 982	1018 2			
5/25/01 22 52	1014 0	wait	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 982	1018 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 53	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 54	1016 0	1015 ppm cal	11 65	1025 2			
5/25/01 22 54	1014 0	wait	11 65	1025 2			
5/25/01 22 54	1010 0	wait	11 65	1025 2			
5/25/01 22 54	1012 0	wait	11 65	1025 2			
5/25/01 22 55	995 9	wait	11 55	1025 2			
5/25/01 22 55	863 7	wait	11 65	1025 2			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 22 55	679 3	wait	11 65	1026 2			
5/25/01 22 55	593 1	wait	11 65	1026 2			
5/25/01 22 56	581 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	581 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	579 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 56	577 1	594 7 ppm cal	11 55	1026 2			
5/25/01 22 57	577 1	594 7 ppm cal	11 65	1026 2			
5/25/01 22 57	577 1	594 7 ppm cal	11 65	1025 2			
5/25/01 22 57	490 9	wait	11 65	1026 2			
5/25/01 22 57	232 4	wait	11 65	1026 2			
5/25/01 22 58	60 1	wait	11 65	1026 2			
5/25/01 22 58	16 0	wait	11 65	1026 2			
5/25/01 22 58	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22.58	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 22 59	12 0	0 ppm cal	11 65	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 66	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 66	1026 2			
5/25/01 23 00	12 0	0 ppm cal	11 66	1026 2			
5/25/01 23 00	82 1	wait	11 65	1026 2			
5/25/01 23 01	362 7	wait	11 65	1026 2			
5/25/01 23 01	613 2	wait	11 65	1026 2			
5/25/01 23 01	671.3	wait	11 66	1026 2			
5/25/01 23 01	671 3	wait	11 65	1026 2			
5/25/01 23 02	677 3	run 2	11 65	1026 2	665 9	14406	41 9
5/25/01 23 02	677 3	run 2	11 65	1026 2	665 9	14406	41 9
5/25/01 23 02	677 3	run 2	11 66	1026 2	665 9	14406	41 9
5/25/01 23 02	681 3	run 2	11 65	1026 2	669 9	14406	42 1
5/25/01 23 03	683 3	run 2	11 65	1026 2	671 9	14406	42 2
5/25/01 23 03	683 3	run 2	11 65	1026 2	671 9	14406	42 2
5/25/01 23 03	687 3	run 2	11 65	1026 2	675 9	14406	42 5
5/25/01 23 03	693 3	run 2	11 66	1026 2	682 0	14406	42 9
5/25/01 23 04	693 3	run 2	11 66	1026 2	682 0	14406	42 9
5/25/01 23 04	703 3	run 2	11 66	1026 2	692 0	14406	43 5
5/25/01 23 04	709 4	run 2	11 65	1026 2	698 0	14406	43 9
5/25/01 23 04	705 4	run 2	11 66	1026 2	694 0	14406	43 6
5/25/01 23 05	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 05	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 06	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 06	701.3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 06	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 06	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 07	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 07	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 07	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 07	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 08	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 08	711 4	run 2	11 65	1026 2	700 0	14406	44 0
5/25/01 23 08	715 4	run 2	11 65	1026 2	704 0	14406	44 2
5/25/01 23 08	711 4	run 2	11 65	1026 2	700 0	14406	44 0
5/25/01 23 09	713 4	run 2	11 65	1025 2	702 0	14406	44 1
5/25/01 23 09	719 4	run 2	11 65	1025 2	708 0	14406	44 5
5/25/01 23 09	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 09	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 10	711 4	run 2	11 65	1025 2	700 0	14406	44 0
5/25/01 23 10	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 10	709 4	run 2	11 65	1026 2	698 0	14406	43 9

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/25/01 23 10	707 4	run 2	11 65	1026 2	696 0	14406	43 7
5/25/01 23 11	705 4	run 2	11 65	1026 2	594 0	14406	43 6
5/25/01 23 11	707 4	run 2	11 65	1026 2	596 0	14406	43 7
5/25/01 23 11	707 4	run 2	11 65	1026 2	696 0	14406	43 7
5/25/01 23 11	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 12	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 12	705 4	run 2	11 65	1026 2	694 0	14406	43 5
5/25/01 23 12	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 12	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 13	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 13	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 13	697 3	run 2	11 65	1026 2	586 0	14406	43 1
5/25/01 23 13	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 14	699 3	run 2	11 65	1026 2	588 0	14406	43 2
5/25/01 23 14	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 14	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 14	701 3	run 2	11 65	1026 2	690 0	14406	43 4
5/25/01 23 15	703 3	run 2	11 65	1026 2	692 0	14406	43 5
5/25/01 23 15	699 3	run 2	11 65	1026 2	688 0	14406	43 2
5/25/01 23 15	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 15	695 3	run 2	11 65	1026 2	684 0	14406	43 0
5/25/01 23 16	703 3	run 2	11 65	1026 2	592 0	14406	43 5
5/25/01 23 16	705 4	run 2	11 65	1026 2	694 0	14406	43 6
5/25/01 23 16	713 4	run 2	11 65	1026 2	702 0	14406	44 1
5/25/01 23 16	723 4	run 2	11 65	1026 2	712 0	14406	44 7
5/25/01 23 17	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 17	729 4	run 2	11 65	1026 2	718 0	14406	45 1
5/25/01 23 17	731 4	run 2	11 65	1026 2	720 1	14406	45 3
5/25/01 23 17	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23 18	733 4	run 2	11 85	1026 2	722 1	14406	45 4
5/25/01 23 18	737 4	run 2	11 65	1026 2	726 1	14406	45 6
5/25/01 23:19	733 4	run 2	11 65	1026 2	722 1	14406	45 4
5/25/01 23 19	727 4	run 2	11 65	1026 2	716 0	14406	45 0
5/25/01 23 19	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 19	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 20	731.4	run 2	11 65	1026 2	720 1	14406	45 3
5/25/01 23 20	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 20	719 4	run 2	11 65	1026 2	708 0	14406	44 5
5/25/01 23 20	721 4	run 2	11 65	1026 2	710 0	14406	44 6
5/25/01 23 21	723 4	run 2	11 65	1026 2	712 0	14406	44 7
5/25/01 23 21	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 21	727 4	run 2	11 65	1026 2	716 0	14406	45 0
5/25/01 23 21	723 4	run 2	11 65	1026 2	712 0	14406	44 7
5/25/01 23 22	721 4	run 2	11 65	1026 2	710 0	14406	44 6
5/25/01 23 22	725 4	run 2	11 65	1026 2	714 0	14406	44 9
5/25/01 23 22	721 4	run 2	11 65	1026 2	710 0	14406	44 6
5/25/01 23 22	717 4	run 2	11 65	1026 2	706 0	14406	44 4
5/25/01 23 23	719 4	run 2	11 65	1026 2	708 0	14406	44 5
5/25/01 23 23	723 4	run 2	11 55	1026 2	712 0	14406	44 7
5/25/01 23 23	725 4	run 2	11 55	1026 2	714 0	14436	44 9
5/25/01 23 23	731 4	run 2	11 65	1025 2	720 1	14436	45 3
5/25/01 23 24	727 4	run 2	11 65	1026 2	716 0	14436	45 0
5/25/01 23 24	735 4	run 2	11 65	1026 2	724 1	14406	45 5
5/25/01 23 24	759 5	run 2	11 65	1026 2	748 1	14436	47 0
5/25/01 23 24	757 5	run 2	11 55	1025 2	756 1	14406	47 5
5/25/01 23 25	767 5	run 2	11 55	1026 2	756 1	14406	47 5
5/25/01 23 25	761 5	run 2	11 55	1025 2	750 1	14406	47 1
5/25/01 23 25	759 5	run 2	11 55	1026 2	748 1	14436	47 0
5/25/01 23 25	761 5	run 2	11 65	1026 2	750 1	14436	47 1

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/25/01 23:26	763.5	run 2	11.65	1026.2	752.1	14406	47.3
5/25/01 23:26	763.5	run 2	11.65	1026.2	752.1	14406	47.3
5/25/01 23:26	759.5	run 2	11.65	1025.2	748.1	14406	47.0
5/25/01 23:26	753.4	run 2	11.65	1026.2	742.1	14406	46.5
5/25/01 23:27	753.4	run 2	11.65	1026.2	742.1	14406	46.5
5/25/01 23:27	759.5	run 2	11.65	1025.2	748.1	14406	47.0
5/25/01 23:27	763.5	run 2	11.55	1025.2	752.1	14406	47.3
5/25/01 23:27	759.5	run 2	11.65	1025.2	748.1	14406	47.0
5/25/01 23:28	759.5	run 2	11.65	1025.2	748.1	14406	47.0
5/25/01 23:28	761.5	run 2	11.65	1025.2	750.1	14406	47.1
5/25/01 23:28	761.5	run 2	11.65	1026.2	750.1	14406	47.1
5/25/01 23:28	763.5	run 2	11.65	1025.2	752.1	14406	47.3
5/25/01 23:29	767.5	run 2	11.65	1026.2	756.1	14406	47.5
5/25/01 23:29	777.5	run 2	11.65	1026.2	766.2	14406	48.2
5/25/01 23:29	783.5	run 2	11.65	1025.2	772.2	14406	48.5
5/25/01 23:29	775.5	run 2	11.65	1026.2	764.2	14406	48.0
5/25/01 23:30	767.5	run 2	11.65	1026.2	756.1	14406	47.5
5/25/01 23:30	767.5	run 2	11.65	1026.2	756.1	14406	47.5
5/25/01 23:30	769.5	run 2	11.65	1026.2	758.1	14406	47.6
5/25/01 23:30	775.5	run 2	11.65	1026.2	764.2	14406	48.0
5/25/01 23:31	793.5	run 2	11.65	1026.2	782.2	14406	49.2
5/25/01 23:31	801.5	run 2	11.65	1025.2	790.2	14406	49.7
5/25/01 23:31	797.5	run 2	11.65	1025.2	786.2	14406	49.4
5/25/01 23:31	793.5	run 2	11.65	1025.2	782.2	14406	49.2
5/25/01 23:32	787.5	run 2	11.65	1026.2	776.2	14406	48.8
5/25/01 23:32	785.5	run 2	11.65	1025.2	774.2	14406	48.7
5/25/01 23:32	783.5	run 2	11.65	1026.2	772.2	14406	48.5
5/25/01 23:32	779.5	run 2	11.65	1026.2	768.2	14406	48.3
5/25/01 23:33	781.5	run 2	11.65	1026.2	770.2	14406	48.4
5/25/01 23:33	785.5	run 2	11.65	1026.2	774.2	14406	48.7
5/25/01 23:33	781.5	run 2	11.65	1026.2	770.2	14406	48.4
5/25/01 23:33	781.5	run 2	11.65	1026.2	770.2	14406	48.4
5/25/01 23:34	787.5	run 2	11.65	1026.2	776.2	14406	48.8
5/25/01 23:34	791.5	run 2	11.65	1026.2	780.2	14406	49.0
5/25/01 23:34	796.5	run 2	11.65	1026.2	784.2	14406	49.3
5/25/01 23:34	799.5	run 2	11.65	1026.2	788.2	14406	49.5
5/25/01 23:35	803.5	run 2	11.65	1026.2	792.2	14406	49.8
5/25/01 23:35	803.5	run 2	11.65	1026.2	792.2	14406	49.8
5/25/01 23:35	809.6	run 2	11.65	1025.2	798.2	14406	50.2
5/25/01 23:35	811.6	run 2	11.65	1026.2	800.2	14406	50.3
5/25/01 23:36	795.5	run 2	11.65	1026.2	784.2	14406	49.3
5/25/01 23:36	789.5	run 2	11.65	1025.2	778.2	14406	48.9
5/25/01 23:36	811.6	run 2	11.65	1025.2	800.2	14406	50.3
5/25/01 23:36	831.6	run 2	11.65	1026.2	820.3	14406	51.6
5/25/01 23:37	847.6	run 2	11.65	1026.2	836.3	14406	52.6
5/25/01 23:37	851.6	run 2	11.65	1025.2	840.3	14406	52.8
5/25/01 23:37	847.6	run 2	11.65	1025.2	836.3	14406	52.6
5/25/01 23:37	847.6	run 2	11.65	1025.2	836.3	14406	52.6
5/25/01 23:38	853.6	run 2	11.65	1026.2	842.3	14406	52.9
5/25/01 23:38	871.7	run 2	11.65	1026.2	860.4	14406	54.1
5/25/01 23:38	883.7	run 2	11.65	1025.2	872.4	14406	54.8
5/25/01 23:38	879.7	run 2	11.65	1025.2	868.4	14406	54.5
5/25/01 23:39	869.7	run 2	11.65	1025.2	858.4	14406	53.9
5/25/01 23:39	869.7	run 2	11.65	1025.2	858.4	14406	53.9
5/25/01 23:39	875.7	run 2	11.65	1025.2	864.4	14406	54.3
5/25/01 23:39	869.7	run 2	11.65	1025.2	858.4	14406	53.9
5/25/01 23:40	859.7	run 2	11.65	1025.2	848.4	14406	53.3
5/25/01 23:40	859.7	run 2	11.65	1025.2	848.4	14406	53.3
5/25/01 23:40	855.5	run 2	11.65	1025.2	844.3	14406	53.1
5/25/01 23:40	855.5	run 2	11.65	1025.2	844.3	14406	53.1
5/25/01 23:41	851.5	run 2	11.65	1025.2	840.3	14406	52.8

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/25/01 23:41	847.6	run 2	11.65	1026.2	836.3	14406	52.5
5/25/01 23:41	851.6	run 2	11.65	1026.2	840.3	14406	52.8
5/25/01 23:41	851.6	run 2	11.65	1026.2	840.3	14406	52.8
5/25/01 23:42	849.6	run 2	11.65	1026.2	838.3	14406	52.7
5/25/01 23:42	853.6	run 2	11.65	1026.2	842.3	14406	52.9
5/25/01 23:42	859.7	run 2	11.65	1026.2	848.4	14406	53.3
5/25/01 23:42	857.7	run 2	11.65	1026.2	846.4	14406	53.2
5/25/01 23:43	851.6	run 2	11.65	1026.2	840.3	14406	52.8
5/25/01 23:43	853.6	run 2	11.55	1026.2	842.3	14406	52.9
5/25/01 23:43	853.6	run 2	11.65	1026.2	842.3	14408	52.9
5/25/01 23:43	849.6	run 2	11.65	1026.2	838.3	14406	52.7
5/25/01 23:44	851.6	run 2	11.65	1026.2	840.3	14406	52.8
5/25/01 23:44	857.7	run 2	11.65	1026.2	846.4	14406	53.2
5/25/01 23:44	869.7	run 2	11.65	1026.2	858.4	14406	53.9
5/25/01 23:44	885.7	run 2	11.55	1026.2	874.4	14406	55.0
5/25/01 23:45	895.7	run 2	11.65	1026.2	884.4	14406	55.6
5/25/01 23:45	889.7	run 2	11.65	1026.2	878.4	14406	55.2
5/25/01 23:45	885.7	run 2	11.65	1026.2	874.4	14406	55.0
5/25/01 23:45	889.7	run 2	11.65	1026.2	878.4	14406	55.2
5/25/01 23:46	879.7	run 2	11.65	1026.2	868.4	14406	54.6
5/25/01 23:46	857.7	run 2	11.65	1026.2	846.4	14406	53.2
5/25/01 23:46	839.6	run 2	11.65	1026.2	828.3	14406	52.1
5/25/01 23:46	837.6	run 2	11.65	1026.2	826.3	14406	51.9
5/25/01 23:47	835.6	run 2	11.65	1026.2	824.3	14406	51.8
5/25/01 23:47	835.6	run 2	11.65	1026.2	824.3	14406	51.8
5/25/01 23:47	831.6	run 2	11.65	1026.2	820.3	14406	51.6
5/25/01 23:47	825.6	run 2	11.65	1026.2	814.3	14406	51.2
5/25/01 23:48	825.6	run 2	11.66	1026.2	814.3	14406	51.2
5/25/01 23:48	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:48	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:48	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:49	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:49	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:49	833.6	run 2	11.65	1026.2	822.3	14406	51.7
5/25/01 23:49	839.6	run 2	11.65	1026.2	828.3	14406	52.1
5/25/01 23:50	833.6	run 2	11.65	1026.2	822.3	14406	51.7
5/25/01 23:50	823.6	run 2	11.66	1026.2	812.3	14406	51.0
5/25/01 23:50	823.6	run 2	11.66	1026.2	812.3	14406	51.0
5/25/01 23:50	827.6	run 2	11.65	1026.2	816.3	14406	51.3
5/25/01 23:51	825.6	run 2	11.65	1026.2	814.3	14406	51.2
5/25/01 23:51	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:51	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:51	827.6	run 2	11.66	1026.2	816.3	14406	51.3
5/25/01 23:52	829.6	run 2	11.66	1026.2	818.3	14406	51.4
5/25/01 23:52	831.6	run 2	11.65	1026.2	820.3	14406	51.6
5/25/01 23:52	829.6	run 2	11.65	1026.2	818.3	14406	51.4
5/25/01 23:52	823.6	run 2	11.65	1026.2	812.3	14406	51.0
5/25/01 23:53	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/25/01 23:53	813.6	run 2	11.65	1026.2	802.2	14406	50.4
5/25/01 23:53	813.6	run 2	11.66	1026.2	802.2	14406	50.4
5/25/01 23:53	811.6	run 2	11.66	1026.2	800.2	14406	50.3
5/25/01 23:54	809.5	run 2	11.55	1026.2	798.2	14406	50.2
5/25/01 23:54	811.6	run 2	11.65	1026.2	800.2	14406	50.3
5/25/01 23:54	815.6	run 2	11.65	1026.2	804.3	14406	50.5
5/25/01 23:54	817.6	run 2	11.65	1026.2	806.3	14406	50.7
5/25/01 23:55	813.5	run 2	11.55	1026.2	802.2	14406	50.4
5/25/01 23:55	809.6	run 2	11.65	1026.2	798.2	14406	50.2
5/25/01 23:55	805.5	run 2	11.65	1026.2	794.2	14406	49.9
5/25/01 23:55	803.5	run 2	11.55	1026.2	792.2	14406	49.8
5/25/01 23:56	809.5	run 2	11.65	1026.2	798.2	14406	50.2
5/25/01 23:56	815.5	run 2	11.65	1026.2	804.3	14406	50.5

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, acfm. dry	POUNDS OF CO PER HOUR
5/25/01 23 56	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/25/01 23 56	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/25/01 23 57	821 6	run 2	11 65	1026 2	810 3	14406	50 9
5/25/01 23 57	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 57	835 6	run 2	11 65	1026 2	824 3	14406	51 8
5/25/01 23 57	837 6	run 2	11 65	1026 2	826 3	14406	51 9
5/25/01 23 58	833 6	run 2	11 65	1026 2	822 3	14406	51 7
5/25/01 23 58	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 58	827 6	run 2	11 65	1026 2	816 3	14406	51 3
5/25/01 23 58	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/25/01 23 59	825 6	run 2	11 65	1026 2	814 3	14406	51 2
5/25/01 23 59	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/25/01 23 59	805 6	run 2	11 65	1026 2	794 2	14406	49 9
5/25/01 23 59	801 5	run 2	11 65	1026 2	790 2	14406	49 7
5/26/01 0 00	799 5	run 2	11 65	1026 2	788 2	14406	49 5
5/26/01 0 00	803 5	run 2	11 65	1026 2	792 2	14406	49 8
5/26/01 0 00	803 5	run 2	11 65	1026 2	792 2	14406	49 8
5/26/01 0 00	805 6	run 2	11 65	1026 2	794 2	14406	49 9
5/26/01 0 01	805 6	run 2	11 65	1026 2	794 2	14406	49 9
5/26/01 0 01	805 6	run 2	11 65	1026 2	794 2	14406	49 9
5/26/01 0 01	815 6	run 2	11 65	1026 2	804 3	14406	50 5
5/26/01 0 01	829 6	run 2	11 65	1026 2	818 3	14406	51 4
5/26/01 0 02	823 6	wait	11 65	1026 2			
5/26/01 0 02	815 6	wait	11 65	1026 2			
5/26/01 0 02	789 5	wait	11 65	1026 2			
5/26/01 0 02	739 4	wait	11 65	1026 2			
5/26/01 0 03	887 7	wait	11 65	1026 2			
5/26/01 0 03	1597 1	wait	11 65	1026 2			
5/26/01 0 03	1959 8	wait	11 65	1026 2			
5/26/01 0 03	1959 8	wait	11 65	1026 2			
5/26/01 0 04	1362.7	wait	11 65	1026 2			
5/26/01 0 04	478 9	wait	11 65	1026 2			
5/26/01 0 04	66 1	wait	11 65	1026 2			
5/26/01 0 04	18 0	wait	11 65	1026 2			
5/26/01 0 05	12 0	0 ppm cal	11 65	1026 2			
5/26/01 0 05	12.0	0 ppm cal	11 65	1026 2			
5/26/01 0 05	12.0	0 ppm cal	11 65	1026 2			
5/26/01 0 05	10 0	0 ppm cal	11 65	1026 2			
5/26/01 0 06	10 0	0 ppm cal	11 65	1026 2			
5/26/01 0 06	12 0	0 ppm cal	11 65	1026 2			
5/26/01 0 06	16 0	wait	11 65	1026 2			
5/26/01 0 06	128 2	wait	11 65	1026 2			
5/26/01 0 07	595 1	wait	11 65	1026 2			
5/26/01 0 07	909 8	wait	11 65	1026 2			
5/26/01 0 07	1030 0	1015 ppm cal	11 65	1026 2			
5/26/01 0 07	1038 0	1015 ppm cal	11 65	1026 2			
5/26/01 0 08	1036 0	1015 ppm cal	11 65	1026 2			
5/26/01 0 08	1026 0	1015 ppm cal	11 65	1026 2			
5/26/01 0 08	936 8	wait	11 047	1032 0			
5/26/01 0 08	765 5	wait	11 047	1032 0			
5/26/01 0 09	635 2	wait	11 047	1032 0			
5/26/01 0 09	607 2	wait	11 047	1032 0			
5/26/01 0 09	603 2	wait	11 047	1032 0			
5/26/01 0 09	601 1	wait	11 047	1032 0			
5/26/01 0 10	601 1	wait	11 047	1032 0			
5/26/01 0 10	595 1	wait	11 047	1032 0			
5/26/01 0 10	657 3	wait	11 047	1032 0			
5/26/01 0 10	725 4	wait	11 047	1032 0			
5/26/01 0 11	805 6	wait	11 047	1032 0			
5/26/01 0 11	835 6	wait	11 047	1032 0			
5/26/01 0 11	845 6	wait	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/26/01 0:11	847.6	wait	11.047	1032.0			
5/26/01 0:12	845.6	run 3a	11.047	1032.0	829.7	14331	51.9
5/26/01 0:12	841.6	run 3a	11.047	1032.0	825.7	14331	51.6
5/26/01 0:12	845.6	run 3a	11.047	1032.0	829.7	14331	51.9
5/26/01 0:12	851.6	run 3a	11.047	1032.0	835.7	14331	52.2
5/25/01 0:13	857.7	run 3a	11.047	1032.0	841.5	14331	52.6
5/26/01 0:13	853.6	run 3a	11.047	1032.0	837.5	14331	52.4
5/26/01 0:13	847.6	run 3a	11.047	1032.0	831.7	14331	52.0
5/26/01 0:13	845.6	run 3a	11.047	1032.0	829.7	14331	51.9
5/26/01 0:14	843.6	run 3a	11.047	1032.0	827.7	14331	51.7
5/26/01 0:14	843.6	run 3a	11.047	1032.0	827.7	14331	51.7
5/26/01 0:14	845.6	run 3a	11.047	1032.0	829.7	14331	51.9
5/26/01 0:14	849.6	run 3a	11.047	1032.0	833.7	14331	52.1
5/26/01 0:15	851.6	run 3a	11.047	1032.0	835.7	14331	52.2
5/25/01 0:15	849.6	run 3a	11.047	1032.0	833.7	14331	52.1
5/26/01 0:15	845.6	run 3a	11.047	1032.0	829.7	14331	51.9
5/26/01 0:15	847.6	run 3a	11.047	1032.0	831.7	14331	52.0
5/26/01 0:16	853.6	run 3a	11.047	1032.0	837.5	14331	52.4
5/26/01 0:16	855.6	run 3a	11.047	1032.0	839.5	14331	52.5
5/26/01 0:16	849.6	run 3a	11.047	1032.0	833.7	14331	52.1
5/26/01 0:16	853.6	run 3a	11.047	1032.0	837.5	14331	52.4
5/26/01 0:17	871.7	run 3a	11.047	1032.0	855.5	14331	53.5
5/25/01 0:17	871.7	run 3a	11.047	1032.0	855.5	14331	53.5
5/25/01 0:17	869.7	run 3a	11.047	1032.0	853.5	14331	53.4
5/26/01 0:17	869.7	run 3a	11.047	1032.0	853.5	14331	53.4
5/26/01 0:18	865.7	run 3a	11.047	1032.0	849.5	14331	53.1
5/26/01 0:18	867.7	run 3a	11.047	1032.0	851.5	14331	53.2
5/26/01 0:18	875.7	run 3a	11.047	1032.0	859.5	14331	53.7
5/26/01 0:18	873.7	run 3a	11.047	1032.0	857.5	14331	53.6
5/26/01 0:19	861.7	run 3a	11.047	1032.0	845.5	14331	52.9
5/26/01 0:19	857.7	run 3a	11.047	1032.0	841.5	14331	52.6
5/26/01 0:19	861.7	run 3a	11.047	1032.0	845.5	14331	52.9
5/26/01 0:19	861.7	run 3a	11.047	1032.0	845.5	14331	52.9
5/26/01 0:20	863.7	run 3a	11.047	1032.0	847.5	14331	53.0
5/26/01 0:20	869.7	run 3a	11.047	1032.0	853.5	14331	53.4
5/26/01 0:20	869.7	run 3a	11.047	1032.0	853.5	14331	53.4
5/26/01 0:20	869.7	run 3a	11.047	1032.0	853.5	14331	53.4
5/26/01 0:21	865.7	run 3a	11.047	1032.0	849.5	14331	53.1
5/26/01 0:21	863.7	run 3a	11.047	1032.0	847.5	14331	53.0
5/26/01 0:21	871.7	run 3a	11.047	1032.0	855.5	14331	53.5
5/26/01 0:21	877.7	run 3a	11.047	1032.0	861.5	14331	53.9
5/26/01 0:22	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:22	877.7	run 3a	11.047	1032.0	861.5	14331	53.9
5/26/01 0:22	883.7	run 3a	11.047	1032.0	867.5	14331	54.2
5/26/01 0:22	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:23	881.7	run 3a	11.047	1032.0	865.5	14331	54.1
5/26/01 0:23	877.7	run 3a	11.047	1032.0	861.5	14331	53.9
5/26/01 0:23	879.7	run 3a	11.047	1032.0	863.5	14331	54.0
5/26/01 0:23	881.7	run 3a	11.047	1032.0	865.5	14331	54.1
5/26/01 0:24	887.7	run 3a	11.047	1032.0	871.5	14331	54.5
5/26/01 0:24	891.7	run 3a	11.047	1032.0	875.5	14331	54.7
5/26/01 0:24	891.7	run 3a	11.047	1032.0	875.5	14331	54.7
5/26/01 0:24	895.7	run 3a	11.047	1032.0	879.5	14331	55.0
5/26/01 0:25	917.8	run 3a	11.047	1032.0	901.4	14331	56.4
5/26/01 0:25	913.8	run 3a	11.047	1032.0	897.4	14331	56.1
5/26/01 0:25	901.7	run 3a	11.047	1032.0	885.5	14331	55.4
5/26/01 0:25	893.7	run 3a	11.047	1032.0	877.5	14331	54.9
5/26/01 0:26	899.7	run 3a	11.047	1032.0	883.5	14331	55.2
5/25/01 0:26	905.7	run 3a	11.047	1032.0	889.4	14331	55.6
5/26/01 0:26	899.7	run 3a	11.047	1032.0	883.5	14331	55.2
5/25/01 0:26	899.7	run 3a	11.047	1032.0	883.5	14331	55.2

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm-dry	POUNDS OF CO PER HOUR
5/26/01 0 27	893 7	run 3a	11 047	1032 0	877 5	14331	54 9
5/26/01 0 27	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 27	891 7	run 3a	11 047	1032 0	875 5	14331	54 7
5/26/01 0 27	895 7	run 3a	11 047	1032 0	879 5	14331	55 0
5/26/01 0 28	893 7	run 3a	11 047	1032 0	877 5	14331	54 9
5/26/01 0 28	889 7	run 3a	11 047	1032 0	873 5	14331	54 6
5/26/01 0 28	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 28	889 7	run 3a	11 047	1032 0	873 5	14331	54 6
5/26/01 0 29	889 7	run 3a	11 047	1032 0	873 5	14331	54 6
5/26/01 0 29	891 7	run 3a	11 047	1032 0	875 5	14331	54 7
5/26/01 0 29	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 29	881 7	run 3a	11 047	1032 0	865 5	14331	54 1
5/26/01 0 30	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 30	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 30	885 7	run 3a	11 047	1032 0	869 5	14331	54 4
5/26/01 0 30	891 7	run 3a	11 047	1032 0	875 5	14331	54 7
5/26/01 0 31	885 7	run 3a	11 047	1032 0	869 5	14331	54 4
5/26/01 0 31	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 31	887 7	run 3a	11 047	1032 0	871 5	14331	54 5
5/26/01 0 31	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 32	883 7	run 3a	11 047	1032 0	867 5	14331	54 2
5/26/01 0 32	889 7	run 3a	11 047	1032 0	873 5	14331	54 6
5/26/01 0 32	883 7	run 3a	11 047	1032 0	867 5	14331	54 2
5/26/01 0 32	875 7	run 3a	11 047	1032 0	859 6	14331	53 7
5/26/01 0 33	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 33	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 33	867 7	run 3a	11 047	1032 0	851 6	14331	53 2
5/26/01 0 33	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 34	873 7	run 3a	11 047	1032 0	857 6	14331	53 6
5/26/01 0 34	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 34	883 7	run 3a	11 047	1032 0	867 5	14331	54 2
5/26/01 0 34	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 35	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 35	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 35	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 35	873 7	run 3a	11 047	1032 0	857 6	14331	53 6
5/26/01 0 36	867 7	run 3a	11 047	1032 0	851 6	14331	53 2
5/26/01 0 36	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 36	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 36	865 7	run 3a	11 047	1032 0	849 6	14331	53 1
5/26/01 0 37	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 37	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 37	885 7	run 3a	11 047	1032 0	869 5	14331	54 4
5/26/01 0 37	885 7	run 3a	11 047	1032 0	869 5	14331	54 4
5/26/01 0 38	881 7	run 3a	11 047	1032 0	865 5	14331	54 1
5/26/01 0 38	877 7	run 3a	11 047	1032 0	861 6	14331	53 9
5/26/01 0 38	879 7	run 3a	11 047	1032 0	863 5	14331	54 0
5/26/01 0 38	875 7	run 3a	11 047	1032 0	859 6	14331	53 7
5/26/01 0 39	867 7	run 3a	11 047	1032 0	851 6	14331	53 2
5/26/01 0 39	865 7	run 3a	11 047	1032 0	849 6	14331	53 1
5/26/01 0 39	867 7	run 3a	11 047	1032 0	851 6	14331	53 2
5/26/01 0 39	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 40	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 40	865 7	run 3a	11 047	1032 0	849 6	14331	53 1
5/26/01 0 40	871 7	run 3a	11 047	1032 0	855 6	14331	53 5
5/26/01 0 40	869 7	run 3a	11 047	1032 0	853 6	14331	53 4
5/26/01 0 41	861 7	run 3a	11 047	1032 0	845 6	14331	52 9
5/26/01 0 41	855 6	run 3a	11 047	1032 0	839 5	14331	52 5
5/26/01 0 41	855 6	run 3a	11 047	1032 0	839 5	14331	52 5
5/26/01 0 41	851 6	run 3a	11 047	1032 0	835 7	14331	52 2
5/26/01 0 42	857 7	run 3a	11 047	1032 0	841 5	14331	52 6

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/26/01 0 42	865 7	run 3a	11 047	1032 0	849 5	14331	53 1
5/26/01 0 42	845 6	run 3a	11 047	1032 0	829 7	14331	51 9
5/26/01 0 42	823 6	run 3a	11 047	1032 0	807 8	14331	50 5
		run 3a Average			856 9		53 5
5/26/01 0 43	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	831 6	plant upset/delay	11 047	1032 0			
5/26/01 0 43	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	817 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	815 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 44	807 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	811 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	825 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	833 6	plant upset/delay	11 047	1032 0			
5/26/01 0 45	829 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	825 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	823 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 46	799 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	793 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	791 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	789 5	plant upset/delay	11 047	1032 0			
5/26/01 0 47	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	783 5	plant upset/delay	11 047	1032 0			
5/26/01 0 48	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	787 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	783 5	plant upset/delay	11 047	1032 0			
5/26/01 0 49	777 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	781 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 50	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	785 5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	791.5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	803 5	plant upset/delay	11 047	1032 0			
5/26/01 0 51	813 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	817 6	plant upset/delay	11 047	1032 0			
5/26/01 0.52	819 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	827 6	plant upset/delay	11 047	1032 0			
5/26/01 0 52	833 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	829 6	plant upset/delay	11,047	1032 0			
5/26/01 0 53	819 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	807 6	plant upset/delay	11 047	1032 0			
5/26/01 0 53	791 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	773 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	759 5	plant upset/delay	11 047	1032 0			
5/26/01 0 54	741 4	plant upset/delay	11 047	1032 0			
5/26/01 0 54	723 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	711 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	709 4	plant upset/delay	11 047	1032 0			
5/26/01 0 55	701 3	plant upset/delay	11 047	1032 0			
5/26/01 0 55	685 3	plant upset/delay	11 047	1032 0			
5/25/01 0 56	683 3	plant upset/delay	11 047	1032 0			
5/25/01 0 56	689 3	plant upset/delay	11 047	1032 0			
5/25/01 0 56	693 3	plant upset/delay	11 047	1032 0			
5/26/01 0 56	693 3	plant upset/delay	11 047	1032 0			
5/25/01 0 57	689 3	plant upset/delay	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm, dry	POUNDS OF CO PER HOUR
5/26/01 0:57	677.3	plant upset/delay	11.047	1032.0			
5/26/01 0:57	563.3	plant upset/delay	11.047	1032.0			
5/26/01 0:57	655.3	plant upset/delay	11.047	1032.0			
5/26/01 0:58	657.3	plant upset/delay	11.047	1032.0			
5/26/01 0:58	663.3	plant upset/delay	11.047	1032.0			
5/26/01 0:58	659.3	plant upset/delay	11.047	1032.0			
5/26/01 0:58	561.3	plant upset/delay	11.047	1032.0			
5/26/01 0:59	669.3	plant upset/delay	11.047	1032.0			
5/26/01 0:59	661.3	plant upset/delay	11.047	1032.0			
5/26/01 0:59	655.3	plant upset/delay	11.047	1032.0			
5/26/01 0:59	649.2	plant upset/delay	11.047	1032.0			
5/26/01 1:00	635.2	plant upset/delay	11.047	1032.0			
5/26/01 1:00	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:00	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:00	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:01	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:01	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:01	603.2	plant upset/delay	11.047	1032.0			
5/26/01 1:01	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:02	597.1	plant upset/delay	11.047	1032.0			
5/26/01 1:02	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:02	593.1	plant upset/delay	11.047	1032.0			
5/26/01 1:02	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:03	593.1	plant upset/delay	11.047	1032.0			
5/26/01 1:03	589.1	plant upset/delay	11.047	1032.0			
5/26/01 1:03	583.1	plant upset/delay	11.047	1032.0			
5/26/01 1:03	579.1	plant upset/delay	11.047	1032.0			
5/26/01 1:04	581.1	plant upset/delay	11.047	1032.0			
5/26/01 1:04	585.1	plant upset/delay	11.047	1032.0			
5/26/01 1:04	591.1	plant upset/delay	11.047	1032.0			
5/26/01 1:04	589.1	plant upset/delay	11.047	1032.0			
5/26/01 1:05	587.1	plant upset/delay	11.047	1032.0			
5/26/01 1:05	593.1	plant upset/delay	11.047	1032.0			
5/26/01 1:05	603.2	plant upset/delay	11.047	1032.0			
5/26/01 1:05	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:06	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:06	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:06	607.2	plant upset/delay	11.047	1032.0			
5/26/01 1:06	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:07	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:07	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:07	621.2	plant upset/delay	11.047	1032.0			
5/26/01 1:07	623.2	plant upset/delay	11.047	1032.0			
5/26/01 1:08	627.2	plant upset/delay	11.047	1032.0			
5/26/01 1:08	631.2	plant upset/delay	11.047	1032.0			
5/26/01 1:08	627.2	plant upset/delay	11.047	1032.0			
5/26/01 1:08	619.2	plant upset/delay	11.047	1032.0			
5/26/01 1:09	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:09	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:09	615.2	plant upset/delay	11.047	1032.0			
5/26/01 1:09	617.2	plant upset/delay	11.047	1032.0			
5/26/01 1:10	613.2	plant upset/delay	11.047	1032.0			
5/26/01 1:10	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:10	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:10	617.2	plant upset/delay	11.047	1032.0			
5/25/01 1:11	621.2	plant upset/delay	11.047	1032.0			
5/25/01 1:11	633.2	plant upset/delay	11.047	1032.0			
5/26/01 1:11	559.3	plant upset/delay	11.047	1032.0			
5/26/01 1:11	679.3	plant upset/delay	11.047	1032.0			
5/25/01 1:12	677.3	plant upset/delay	11.047	1032.0			
5/26/01 1:12	677.3	plant upset/delay	11.047	1032.0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/26/01 1 12	685 3	plant upset/delay	11 047	1032 0			
5/26/01 1 12	697 3	plant upset/delay	11 047	1032 0			
5/26/01 1 13	697 3	plant upset/delay	11 047	1032 0			
5/26/01 1 13	693 3	plant upset/delay	11 047	1032 0			
5/26/01 1 13	687 3	plant upset/delay	11 047	1032 0			
5/26/01 1 13	683 3	plant upset/delay	11 047	1032 0			
5/26/01 1 14	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 14	681 3	plant upset/delay	11 047	1032 0			
5/26/01 1 14	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 14	675 3	plant upset/delay	11 047	1032 0			
5/26/01 1 15	683 3	plant upset/delay	11 047	1032 0			
5/26/01 1 15	685 3	plant upset/delay	11 047	1032 0			
5/26/01 1 15	685 3	plant upset/delay	11 047	1032 0			
5/26/01 1 15	685 3	plant upset/delay	11 047	1032 0			
5/26/01 1 16	681 3	plant upset/delay	11 047	1032 0			
5/26/01 1 16	677 3	plant upset/delay	11 047	1032 0			
5/26/01 1 16	673 3	plant upset/delay	11 047	1032 0			
5/26/01 1 16	675 3	plant upset/delay	11 047	1032 0			
5/26/01 1 17	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 17	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 17	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 17	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1 18	669 3	plant upset/delay	11 047	1032 0			
5/26/01 1 18	669 3	plant upset/delay	11 047	1032 0			
5/26/01 1 18	669 3	plant upset/delay	11 047	1032 0			
5/26/01 1 18	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1 19	667 3	plant upset/delay	11 047	1032 0			
5/26/01 1 19	665 3	plant upset/delay	11 047	1032 0			
5/26/01 1 19	665 3	plant upset/delay	11 047	1032 0			
5/26/01 1 19	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1:20	673 3	plant upset/delay	11 047	1032 0			
5/26/01 1 20	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1 20	673 3	plant upset/delay	11 047	1032 0			
5/26/01 1:20	679 3	plant upset/delay	11.047	1032 0			
5/26/01 1 21	679 3	plant upset/delay	11 047	1032 0			
5/26/01 1 21	675 3	plant upset/delay	11 047	1032 0			
5/26/01 1:21	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1 21	673 3	plant upset/delay	11 047	1032 0			
5/26/01 1 22	677 3	plant upset/delay	11 047	1032 0			
5/26/01 1 22	681 3	plant upset/delay	11 047	1032 0			
5/26/01 1 22	683 3	plant upset/delay	11 047	1032 0			
5/26/01 1 22	697 3	plant upset/delay	11 047	1032 0			
5/26/01 1 23	707 4	plant upset/delay	11.047	1032 0			
5/26/01 1:23	711.4	plant upset/delay	11 047	1032 0			
5/26/01 1 23	705 4	plant upset/delay	11 047	1032 0			
5/26/01 1 23	705 4	plant upset/delay	11 047	1032 0			
5/26/01 1 24	709 4	plant upset/delay	11 047	1032 0			
5/26/01 1 24	711 4	plant upset/delay	11 047	1032 0			
5/26/01 1 24	709 4	plant upset/delay	11 047	1032 0			
5/26/01 1 24	707 4	plant upset/delay	11 047	1032 0			
5/26/01 1 25	705 4	plant upset/delay	11 047	1032 0			
5/26/01 1 25	701 3	plant upset/delay	11 047	1032 0			
5/26/01 1 25	597 3	plant upset/delay	11 047	1032 0			
5/26/01 1 25	583 3	plant upset/delay	11 047	1032 0			
5/26/01 1 26	671 3	plant upset/delay	11 047	1032 0			
5/26/01 1 26	675 3	plant upset/delay	11 047	1032 0			
5/26/01 1 26	679.3	plant upset/delay	11 047	1032 0			
5/26/01 1 26	569 3	plant upset/delay	11 047	1032 0			
5/26/01 1 27	565 3	plant upset/delay	11 047	1032 0			
5/26/01 1 27	563 3	plant upset/delay	11 047	1032 0			
5/26/01 1 27	561 3	plant upset/delay	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm dry	POUNDS OF CO PER HOUR
5/26/01 1 27	667 3	plant upset/delay	11 047	1032 0			
5/26/01 1 28	667 3	plant upset/delay	11 047	1032 0			
5/26/01 1 28	661 3	plant upset/delay	11 047	1032 0			
5/26/01 1 28	661 3	plant upset/delay	11 047	1032 0			
5/26/01 1 28	665 3	plant upset/delay	11 047	1032 0			
5/26/01 1 29	661 3	plant upset/delay	11 047	1032 0			
5/26/01 1 29	653 2	plant upset/delay	11 047	1032 0			
5/26/01 1 29	655 3	plant upset/delay	11 047	1032 0			
5/26/01 1 29	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1 30	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1 30	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1 30	665 3	plant upset/delay	11 047	1032 0			
5/26/01 1 30	669 3	plant upset/delay	11 047	1032 0			
5/26/01 1 31	665 3	plant upset/delay	11 047	1032 0			
5/26/01 1 31	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1 31	653 2	plant upset/delay	11 047	1032 0			
5/26/01 1 31	653 2	plant upset/delay	11 047	1032 0			
5/26/01 1 32	659 3	plant upset/delay	11 047	1032 0			
5/26/01 1.32	667 3	plant upset/delay	11 047	1032 0			
5/26/01 1 32	669 3	plant upset/delay	11 047	1032 0			
5/26/01 1 32	661 3	plant upset/delay	11 047	1032 0			
5/26/01 1 33	657 3	plant upset/delay	11 047	1032 0			
5/26/01 1 33	657 3	plant upset/delay	11 047	1032 0			
5/26/01 1 33	655 3	plant upset/delay	11 047	1032 0			
5/26/01 1.33	653 2	plant upset/delay	11 047	1032 0			
5/26/01 1 34	645 2	plant upset/delay	11 047	1032 0			
5/26/01 1:34	639 2	plant upset/delay	11 047	1032 0			
5/26/01 1 34	643 2	plant upset/delay	11 047	1032 0			
5/26/01 1:34	635 2	plant upset/delay	11 047	1032 0			
5/26/01 1:35	627 2	plant upset/delay	11 047	1032 0			
5/26/01 1:35	629 2	plant upset/delay	11 047	1032 0			
5/26/01 1.35	633 2	plant upset/delay	11 047	1032 0			
5/26/01 1 35	629 2	plant upset/delay	11 047	1032 0			
5/26/01 1 36	627 2	plant upset/delay	11 047	1032 0			
5/26/01 1:36	623 2	plant upset/delay	11.047	1032 0			
5/26/01 1:36	623 2	plant upset/delay	11 047	1032 0			
5/26/01 1:36	627 2	plant upset/delay	11 047	1032 0			
5/26/01 1:37	623 2	plant upset/delay	11.047	1032 0			
5/26/01 1:37	613 2	plant upset/delay	11 047	1032 0			
5/26/01 1:37	615 2	plant upset/delay	11 047	1032 0			
5/26/01 1:37	617 2	plant upset/delay	11.047	1032 0			
5/26/01 1:38	615 2	plant upset/delay	11 047	1032 0			
5/26/01 1.38	609 2	plant upset/delay	11 047	1032 0			
5/26/01 1:38	611 2	plant upset/delay	11 047	1032 0			
5/26/01 1.38	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1.39	625 2	plant upset/delay	11 047	1032 0			
5/26/01 1:39	625 2	plant upset/delay	11 047	1032 0			
5/26/01 1.39	621 2	plant upset/delay	11 047	1032 0			
5/26/01 1.39	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 40	617 2	plant upset/delay	11 047	1032 0			
5/26/01 1 40	615 2	plant upset/delay	11 047	1032 0			
5/25/01 1:40	613 2	plant upset/delay	11 047	1032 0			
5/26/01 1 40	605 2	plant upset/delay	11 047	1032 0			
5/26/01 1 41	601 1	plant upset/delay	11 047	1032 0			
5/26/01 1 41	605 2	plant upset/delay	11 047	1032 0			
5/26/01 1 41	603 2	plant upset/delay	11 047	1032 0			
5/26/01 1 41	599 1	plant upset/delay	11 047	1032 0			
5/26/01 1 42	607 2	plant upset/delay	11 047	1032 0			
5/25/01 1 42	611 2	plant upset/delay	11 047	1032 0			
5/26/01 1 42	607 2	plant upset/delay	11 047	1032 0			
5/25/01 1 42	505 2	plant upset/delay	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, scfm-dry	POUNDS OF CO PER HOUR
5/26/01 1:43	609.2	plant upset/delay	11.047	1032.0			
5/26/01 1:43	605.2	plant upset/delay	11.047	1032.0			
5/26/01 1:43	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:43	601.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	597.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:44	595.1	plant upset/delay	11.047	1032.0			
5/26/01 1:45	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 1:45	599.1	run 3b	11.047	1032.0	584.6	14331	36.6
5/26/01 1:45	603.2	run 3b	11.047	1032.0	588.6	14331	36.8
5/26/01 1:45	605.2	run 3b	11.047	1032.0	590.6	14331	36.9
5/26/01 1:46	611.2	run 3b	11.047	1032.0	596.6	14331	37.3
5/26/01 1:46	609.2	run 3b	11.047	1032.0	594.6	14331	37.2
5/26/01 1:46	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 1:46	579.1	run 3b	11.047	1032.0	564.7	14331	35.3
5/26/01 1:47	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:47	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:47	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:47	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:48	557.1	run 3b	11.047	1032.0	542.8	14331	33.9
5/26/01 1:48	551.0	run 3b	11.047	1032.0	536.8	14331	33.6
5/26/01 1:48	557.1	run 3b	11.047	1032.0	542.8	14331	33.9
5/26/01 1:48	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:49	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:49	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:49	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:49	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 1:50	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:50	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:50	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:50	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:51	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:51	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:52	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:52	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:52	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 1:52	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 1:53	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:53	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:53	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 1:53	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:54	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 1:54	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:54	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:54	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:55	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:55	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:55	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 1:55	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:56	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 1:56	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:57	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 1:57	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:57	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 1:57	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 1:58	569.1	run 3b	11.047	1032.0	554.8	14331	34.7

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1016 ppm cal	CORRECTED PPM	FLOW, acfm, dry	POUNDS OF CO PER HOUR
5/26/01 1:58	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:58	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 1:58	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 1:59	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:59	579.1	run 3b	11.047	1032.0	564.7	14331	35.3
5/26/01 1:59	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 1:59	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:00	587.1	run 3b	11.047	1032.0	572.7	14331	35.8
5/26/01 2:00	591.1	run 3b	11.047	1032.0	576.7	14331	36.1
5/26/01 2:00	593.1	run 3b	11.047	1032.0	578.7	14331	36.2
5/26/01 2:00	595.1	run 3b	11.047	1032.0	580.7	14331	36.3
5/26/01 2:01	591.1	run 3b	11.047	1032.0	576.7	14331	36.1
5/26/01 2:01	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:01	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:01	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:02	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:02	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:02	577.1	run 3b	11.047	1032.0	562.7	14331	35.2
5/26/01 2:02	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:03	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:03	573.1	run 3b	11.047	1032.0	558.7	14331	34.9
5/26/01 2:04	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:04	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:04	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:04	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:05	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:05	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:05	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:05	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:06	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:06	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:07	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:07	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:07	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 2:07	559.1	run 3b	11.047	1032.0	544.8	14331	34.1
5/26/01 2:08	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:08	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:08	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:08	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:09	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:09	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:10	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:10	571.1	run 3b	11.047	1032.0	556.7	14331	34.8
5/26/01 2:10	567.1	run 3b	11.047	1032.0	552.8	14331	34.6
5/26/01 2:10	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	561.1	run 3b	11.047	1032.0	546.8	14331	34.2
5/26/01 2:11	563.1	run 3b	11.047	1032.0	548.8	14331	34.3
5/26/01 2:11	565.1	run 3b	11.047	1032.0	550.8	14331	34.4
5/26/01 2:12	569.1	run 3b	11.047	1032.0	554.8	14331	34.7
5/26/01 2:12	575.1	run 3b	11.047	1032.0	560.7	14331	35.1
5/26/01 2:12	583.1	run 3b	11.047	1032.0	568.7	14331	35.6
5/26/01 2:12	585.1	run 3b	11.047	1032.0	570.7	14331	35.7
5/26/01 2:13	581.1	run 3b	11.047	1032.0	566.7	14331	35.4
5/26/01 2:13	583.1	run 3b	11.047	1032.0	568.7	14331	35.6

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE / TIME	PPM	COMMENTS	ZERO CAL	1015 ppm cal	CORRECTED PPM	FLOW, scfm dry	POUNDS OF CO PER HOUR
5/26/01 2 13	583 1	run 3b	11 047	1032 0	568 7	14331	35 6
5/26/01 2 13	577 1	run 3b	11 047	1032 0	562 7	14331	35 2
		run 3b Average			557 1		34 8
5/26/01 2 14	573 1	wait	11 047	1032 0			
5/26/01 2 14	571 1	wait	11 047	1032 0			
5/26/01 2 14	577 1	wait	11 047	1032 0			
5/26/01 2 14	579 1	wait	11 047	1032 0			
5/26/01 2 15	579 1	wait	11 047	1032 0			
5/26/01 2 15	575 1	wait	11 047	1032 0			
5/26/01 2 15	577 1	wait	11 047	1032 0			
5/26/01 2 15	587 1	wait	11 047	1032 0			
5/26/01 2 16	589 1	wait	11 047	1032 0			
5/26/01 2 16	585 1	wait	11 047	1032 0			
5/26/01 2 16	593 1	wait	11 047	1032 0			
5/26/01 2 16	603 2	wait	11 047	1032 0			
5/26/01 2 17	607 2	wait	11 047	1032 0			
5/26/01 2 17	607 2	wait	11 047	1032 0			
5/26/01 2 17	613 2	wait	11 047	1032 0			
5/26/01 2.17	613 2	wait	11 047	1032 0			
5/26/01 2.18	509 2	wait	11 047	1032 0			
5/26/01 2 18	613 2	wait	11 047	1032 0			
5/26/01 2 18	615 2	wait	11 047	1032 0			
5/26/01 2 18	611 2	wait	11 047	1032 0			
5/26/01 2.19	611 2	wait	11 047	1032 0			
5/26/01 2 19	615 2	wait	11 047	1032 0			
5/26/01 2 19	611 2	wait	11 047	1032 0			
5/26/01 2 19	611 2	wait	11 047	1032 0			
5/26/01 2 20	615 2	wait	11 047	1032 0			
5/26/01 2 20	611 2	wait	11 047	1032 0			
5/26/01 2 20	605 2	wait	11 047	1032 0			
5/26/01 2 20	605 2	wait	11 047	1032 0			
5/26/01 2 21	605 2	wait	11 047	1032 0			
5/26/01 2 21	599 1	wait	11 047	1032 0			
5/26/01 2 21	589 1	wait	11 047	1032 0			
5/26/01 2 21	587 1	wait	11 047	1032 0			
5/26/01 2 22	585 1	wait	11 047	1032 0			
5/26/01 2 22	573 1	wait	11 047	1032 0			
5/26/01 2 22	567 1	wait	11 047	1032 0			
5/26/01 2 22	569 1	wait	11 047	1032 0			
5/26/01 2 23	561 1	wait	11 047	1032 0			
5/26/01 2 23	557 1	wait	11 047	1032 0			
5/26/01 2 23	561 1	wait	11 047	1032 0			
5/26/01 2 23	559 1	wait	11 047	1032 0			
5/26/01 2 24	549 0	wait	11 047	1032 0			
5/26/01 2 24	450 8	wait	11 047	1032 0			
5/26/01 2 24	204 4	wait	11 047	1032 0			
5/26/01 2 24	48 1	wait	11 047	1032 0			
5/26/01 2 25	16 0	wait	11 047	1032 0			
5/26/01 2 25	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 25	12 0	0 ppm cal	11 047	1032 0			
5/26/01 2 25	12 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 26	128 2	wait	11 047	1032 0			
5/26/01 2 26	567 1	wait	11 047	1032 0			
5/26/01 2 27	917 8	wait	11 047	1032 0			
5/26/01 2 27	1026 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 27	1032 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 27	1032 0	1015 ppm cal	11 047	1032 0			
5/26/01 2 28	1036 0	1015 ppm cal	11 047	1032 0			
5/25/01 2 28	1032 0	1015 ppm cal	11 047	1032 0			

Georgia Pacific Bleach Plant - Carbon Monoxide Test

DATE - TIME	PPM	COMMENTS	ZERO CAL	1018 ppm cal	CORRECTED PPM	FLOW, acfm-dry	POUNDS OF CO PER HOUR
5/26/01 2 28	989 9	wait	11 047	1032 0			
5/26/01 2 28	813 6	wait	11 047	1032 0			
5/26/01 2 29	663 3	wait	11 047	1032 0			
5/26/01 2 29	607 2	wait	11 047	1032 0			
5/26/01 2 29	599 1	594 7 ppm car	11 047	1032 0			
5/26/01 2 29	599 1	594 7 ppm cal	11 047	1032 0			
5/26/01 2 30	601 1	594 7 ppm ca	11 047	1032 0			
5/26/01 2 30	591 1	594 7 ppm ca	11 047	1032 0			
5/26/01 2 30	436 8	wait	11 047	1032 0			
5/26/01 2 30	176 3	wait	11 047	1032 0			
5/26/01 2 31	50 1	wait	11 047	1032 0			
5/26/01 2 31	18 0	wait	11 047	1032 0			
5/26/01 2 31	12 0	wait	11 047	1032 0			
5/26/01 2 31	12 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 32	10 0	wait	11 047	1032 0			
5/26/01 2 32	12 0	wait	11 047	1032 0			
5/26/01 2 33	12 0	wait	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm cal	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm car	11 047	1032 0			
5/26/01 2 33	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 34	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 35	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 36	10 0	0 ppm ca	11 047	1032 0			
5/26/01 2 37	-4 1	end test	11 047	1032 0			
		Grand Average			716 2		44 71764667
		TEST AVERAGE			716 24	14307	44 72

APPENDIX H

PROJECT PARTICIPANTS

Project Participants

DAVID SALTER	FIELD TESTING CALIBRATIONS CALCULATIONS REPORT PREPARATION
WALTER MOCK	LAB ANALYSIS
BEN MOORE	FIELD TESTING
JOE COOKSEY	CO TESTING
CRAIG COHEN	CO TESTING
GEORGE HAWKINS	FIELD TESTING
HARVEY C. GRAY	REPORT REVIEW

SOURCE TEST REPORT

Georgia-Pacific Corporation
Palatka, Florida

Bleach Plant

October 29-31, 2002

Prepared By:

AAS Inc.

Ambient Air Services, Inc.

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Ambient Air Services, Inc. of Starke, Florida, has completed the testing as described in this report for Georgia-Pacific Corporation's Palatka, Florida Bleach Plant. To the best of our knowledge and abilities, we certify that all information, facts, and test data are true and correct. Information supplied to AASI for use in this report from Georgia-Pacific Corporation is perceived to be accurate and is used as such where necessary This report was prepared and certified by:

Report Number: 504-02-09

Prepared By:

Randy L Weston
19 November 2002

Reviewed By:

David Sholtes

David Sholtes
19 November 2002

EXECUTIVE SUMMARY:

On 29 and 31 October, 2002 Ambient Air Services, Inc. performed the FDEP required permit stack test at Georgia-Pacific Corporation's Palatka, Florida Bleach Plant. During this test all required stack testing parameters were met. Table I summarizes the results of the test.

TABLE I

Georgia-Pacific Corporation
Palatka, Florida
29 & 31 October, 2002

PARAMETER	**TEST RESULTS**				
29 October					
	Permit Limits	R 1	R 2	R 3	Avg
Carbon Monoxide (CO)	N/A	979.0 ppm	788.7 ppm	N/A	883.9 ppm
	46 lb/hr	58.0 lb/hr	44.5 lb/hr	N/A	51.2 lb/hr
Chlorinated HAP (Cl2)	10 ppm	0.233 ppm	0.160 ppm	0.164 ppm	0.186 ppm
	N/A	0.016 lb/hr	0.011 lb/hr	0.012 lb/hr	0.013 lb/hr
31 October					
	Permit Limits	R 1	R 2	R 3	Avg
Carbon Monoxide (CO)	N/A	1155.1 ppm	1212.2 ppm	583.1 ppm	983.5 ppm
	46 lb/hr	72.4 lb/hr	74.6 lb/hr	36.5 lb/hr	61.1 lb/hr
Chlorinated HAP (Cl2)	10 ppm	0.073 ppm	0.020 ppm	0.032 ppm	0.042 ppm
	N/A	0.005 lb/hr	0.001 lb/hr	0.002 lb/hr	0.003 lb/hr

TABLE OF CONTENTS

1.0 Introduction

Georgia-Pacific Corporation contracted with Ambient Air Services Inc. of Starke, Florida to perform the Chlorine and Carbon Monoxide compliance testing on the Bleach Plant located in Palatka, Florida

This testing was conducted in order to satisfy testing requirements of Permit Number 1070005-010-AC for emission sources associated with the Palatka, Florida Bleach Plant. For the testing perspective the requirements of the permit associated with this facility was tested under one mobilization effort.

A summary of the testing performed is summarized in Table 2.

The testing was conducted on October 29 & 31, 2002 Florida DEP was notified of the test dates.

Table 2

Georgia-Pacific Corporation
Palatka, Florida
29 & 31 October, 2002
Summary of Permit Requirements
Performance Emission Testing

Source Description	Approx. Stack Flow	Tests	EPA Method	No. of Runs	Min. hrs
Bleach Plant	13,135 scfmd	Cl	40CFR60 AppA. Meth 26a	6	1 hour
		CO	40CFR60 AppA. Meth 10	5	1 hour

2.0 Summary and Discussion of Results

2.1 Summary of Results

The following is the summary table for the test conducted with all results in Parts per Million and lbs/hr:

Table 3

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

Carbon Monoxide Emission Summary

RUN NUMBER	START TIME	END TIME	Total Minutes Tested	Flow, SCFM-D	Carbon Monoxide, parts per million	Carbon Monoxide, pounds per hour
1	12:25	13:24	60	12676	979.0	58.0
2	14:33	15:32	60	12068	788.7	44.5
Averages			120	12372	883.9	51.2

Table 4

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test

October 31, 2002

Carbon Monoxide Emission Summary

RUN NUMBER	START TIME	END TIME	Total Minutes Tested	Flow, SCFM-D	Carbon Monoxide, parts per million	Carbon Monoxide, pounds per hour
1	13:30	14:29	60	13401	1155.1	72.4
2	15:47	16:46	60	13171	1212.2	74.6
3	17:10	18:09	60	13375	583.1	36.5
Averages			**180**	**13316**	**983.5**	**61.1**

Table 5

AASI

Chlorine Emissions Summary

USEPA Method 26A (40 CFR Part 60 Appendix A)

Georgia Pacific

Palatka, Fl.

October 29, 2002

AASI USEPA Method 26A 12 Point Template - Rev 0/11-7-2002

Run			Chlorine Emissions			Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number	Time (EDT)	GR/SCFD	PPM	LBS/HR	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
10/29/02	1	12:18 13:23	1.50E-04	0.233	0.016	16316	12775	144.3	10.7	34.421	104.7
10/29/02	2	14:33 15:38	1.03E-04	0.160	0.011	15336	12139	145.0	9.6	32.247	103.3
10/29/02	3	17:00 18:02	1.06E-04	0.164	0.012	16770	13454	142.2	8.8	36.523	105.5
Average			1.20E-04	0.186	0.013	16141	12789	143.8	9.7	34.397	104.5

Table 6

AASI

Chlorine Emissions Summary

USEPA Method 26A (40 CFR Part 60 Appendix A)

Georgia Pacific

Palatka, Fl.

October 31, 2002

AASI USEPA Method 26A 12 Point Template - Rev 0/11-14-2002

Run			Chlorine Emissions			Volumetric Flow Rates		Stack		Sample Volume	Percent
Date	Number	Time (EDT)	GR/SCFD	PPM	LBS/HR	ACFM	SCFMD	Temp °F	Moisture %	SCFD	Isokinetic
10/31/02	1	13 32 14 43	4.73E-05	0.073	0.005	16387	13401	142.0	7.4	35 830	103 9
10/31/02	2	15.50 16 56	1.29E-05	0.020	0.001	16475	13134	143.1	9 0	35.928	106 3
10/31/02	3	17 10 18 16	2.06E-05	0.032	0.002	16123	12870	140.3	9.3	35.118	106.1
Average			2.69E-05	0.042	0.003	16328	13135	141.8	8.6	35.625	105.4

3.0 Process Description

3.1 Source Operating Parameters

The following conditions were met and the required information was collected during the compliance test.

1. The Bleach Plant had been stabilized for one hour prior to testing.

2. The production rate, species, Kappa, and ClO2 application rates were recorded during the test.

3.2 Process Description

The absorbance of visible light by wood pulp fibers is caused mainly by lignin, one of the main constituents of wood. Residual lignin remaining after chemical pulping processes is highly colored. It also darkens with age. Most of the lignin is removed during the pulping process. Bleaching is a process whereby chemicals are applied to the pulp to increase its brightness by continuing the delignification process.

Bleaching increases the usefulness of the paper by enhancing its capacity for accepting printed or written images. It is also a means of purifying pulp, increasing its stability, and enhancing some of its properties.

The chemicals used in the Georgia-Pacific Palatka Mill include oxidants (chlorine dioxide, oxygen and peroxide) and an alkali (sodium hydroxide). The bleaching sequence is first a chlorine dioxide stage (D_0), followed by a caustic extraction stage enhanced with oxygen and peroxide (E_{op}), and finally another chlorine dioxide stage (D_1). These chemicals are mixed with pulp suspensions at prescribed pH, temperature, and concentration conditions for a specified time period. Bleaching chemicals are applied sequentially with intermediate washing between stages, because it is not possible to achieve sufficient delignification by the action of any one chemical in a single stage. Reaction times for bleaching chemicals range from a few minutes to several hours, requiring large towers to provide adequate retention time.

4.0 Sampling Point Location

Sample Site Diagram

Facility: Georgia Pacific

Location: Palatka, Florida

Source: Bleach Plant

Drawing Date 10/29/02

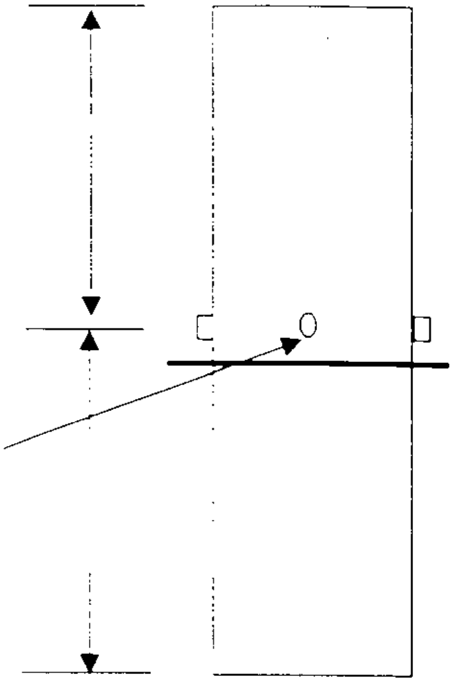
NOT TO SCALE

Stack Diameter: 42 Inches

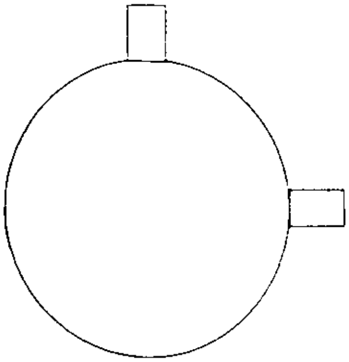
Diameters Downstream: 8.0

Diameters Upstream 5.7

Chlorine
Method 26a



Sampling Points	
1	1.8
2	6.1
3	12.4
4	29.6
5	35.9
6	40.2



Note: Two equal distances, ninety degree ports. Ports are 4 inches long
Two ports with 6 points per port 12 total points.

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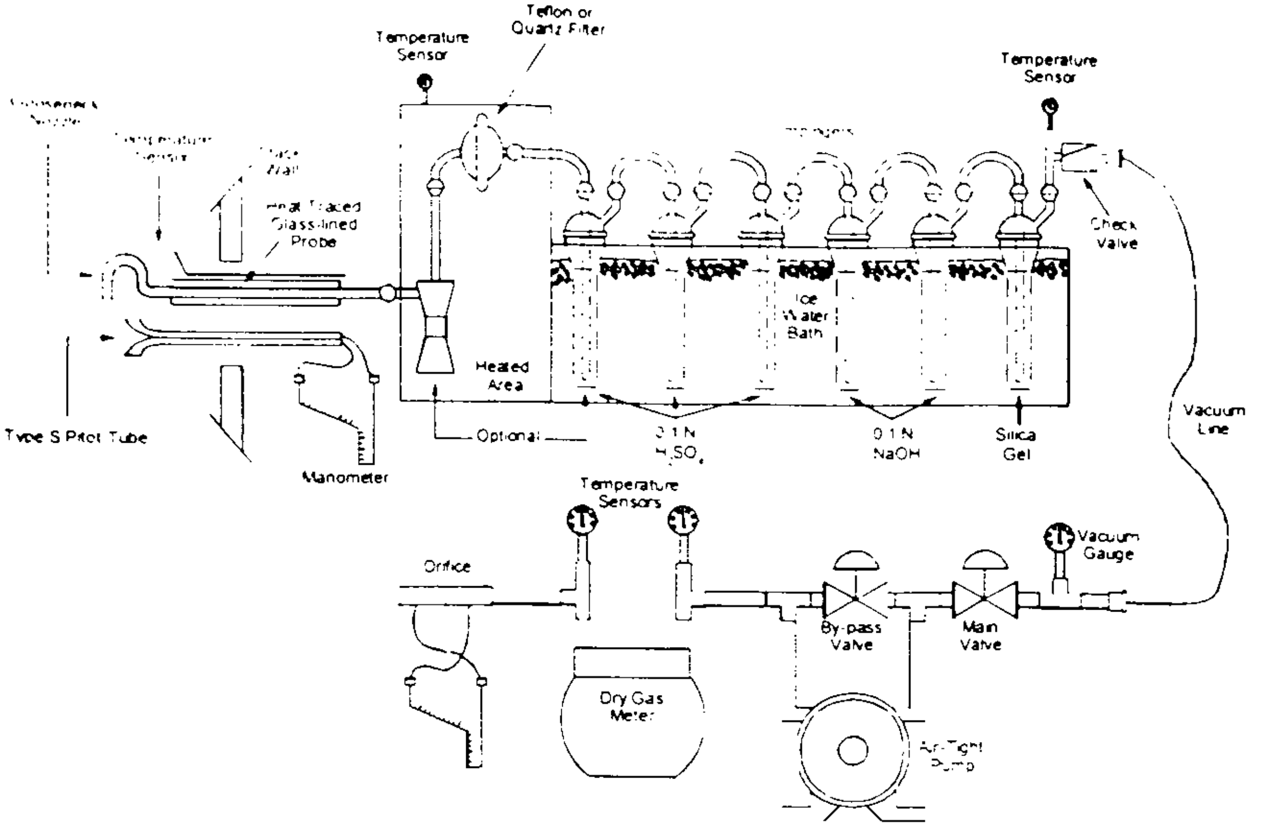
Figure 2-1

5.0 Testing Methodology and Procedures

5.1 Chlorine Testing (Method 26a)

USEPA method 26a was conducted on the Bleach Plant. The following is a synopsis of the method and a diagram illustrating the equipment in use.

Gaseous and particulate pollutants are withdrawn isokinetically from the source and collected in an optional cyclone, on a filter, and in absorbing solutions. The cyclone collects any liquid droplets and is not necessary if the source emissions do not contain them; however, it is preferable to include the cyclone in the sampling train to protect the filter from any liquid present. The filter collects particulate matter including halide salts but is not routinely recovered or analyzed. Acidic and alkaline absorbing solutions collect the gaseous hydrogen halides and halogens, respectively. Following sampling of emissions containing liquid droplets, any halides/halogens dissolved in the liquid in the cyclone and on the filter are vaporized to gas and collected in the impingers by pulling conditioned ambient air through the sampling train. The hydrogen halides are solubilized in the acidic solution and form chloride (Cl^-), bromide (Br^-), and fluoride (F^-) ions. The halogens have a very low solubility in the acidic solution and pass through to the alkaline solution where they are hydrolyzed to form a proton (H^+), the halide ion, and the hypohalous acid (HClO or HBrO). Sodium thiosulfate is added to the alkaline solution to assure reaction with the hypohalous acid to form a second halide ion such that 2 halide ions are formed for each molecule of halogen gas. The halide ions in the separate solutions are measured by ion chromatography (IC). If desired, the particulate matter recovered from the filter and the probe is analyzed following the procedures in Method 5.



5.2 Carbon Monoxide Testing (Method 10)

An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a Luft-type nondispersive infrared analyzer (NDIR) or equivalent.

APPENDICES

APPENDIX – A

Complete Emission Data

- Emissions Run Summaries
- Flow Calculation Data

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AASI USEPA Method 5 24 Point Template - Rev 0/11-7-2002

Cl Summary Run 1

Facility	Georgia Pacific	**Impinger Condensate**	81.0
Location	Palatka, Fl.	**Silica Gel Condensate**	7.0
Stack	Bleach Plant	**Volume Metered**	37.030
Run Date	10/29/02	**Meter Temp (Deg R)**	572.0
Run Number	1	**Carbon Dioxide, %**	0.0
Start Time	12:18	**Oxygen, %**	20.9
Finish Time	13:23	**Carbon Monoxide, %**	0.0
Weather	Clear, Warm	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	88.0
Barometric Pressure	30.03	**Delta H (inches H2O)**	1.2900
Stack Diameter (inches)	42.00	**Stack Pressure**	30.026
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	604.3
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	438.9
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4616	**Total**	334.6
Meter Correction (Y)	1.000		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF		4.142
Gas Volume Sampled, STPD		34.421
Total Volume, STP		38.563
Moisture in stack gas, volume fraction		0.107
Dry Stack Gas, volume fraction		0.893
Molecular Weight of Stack Gas (Dry Basis)		28.84
Molecular Weight of Stack Gas (Stack conditions)		27.66
Specific gravity of Stack Gas Relative to Air		0.955
Excess Air (%)		14864.9
Average Stack Velocity, FPM		1695.9
Actual Stack Gas Flow Rate, ACFM		16316
Actual Stack Gas Flow Rate, ACFMD		14570
Stack Gas Flow Rate, SCFMD		12775
Stack Gas Flow Rate Wet, SCFMW		14306
Percent Isokinetic		105
Stack Emissions:	**Grains per DSCF**	0.00015
	Pounds per Hour	0.016

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AASI USEPA Method 5 24 Point Template - Rev 0 11-7-2002

CI Summary Run 2

Facility	Georgia Pacific	**Impinger Condensate**	66.0
Location	Palatka, Fl.	**Silica Gel Condensate**	6.9
Stack	Bleach Plant	**Volume Metered**	35.145
Run Date	10/29/02	**Meter Temp (Deg R)**	579.3
Run Number	2	**Carbon Dioxide, %**	0.0
Start Time	14:33	**Oxygen, %**	20.9
Finish Time	15:38	**Carbon Monoxide, %**	0.0
Weather	Partial Clouds	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	72.9
Barometric Pressure	30.03	**Delta H (inches H2O)**	1.1530
Stack Diameter (inches)	42.00	**Stack Pressure**	30.018
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	605.0
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	320.0
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4345	**Total**	215.7
Meter Correction (Y)	1.000		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF		3.431
Gas Volume Sampled, STPD		32.247
Total Volume, STP		35.678
Moisture in stack gas, volume fraction		0.096
Dry Stack Gas, volume fraction		0.904
Molecular Weight of Stack Gas (Dry Basis)		28.84
Molecular Weight of Stack Gas (Stack conditions)		27.8
Specific gravity of Stack Gas Relative to Air		0.959
Excess Air (%)		14864.9
Average Stack Velocity, FPM		1594.0
Actual Stack Gas Flow Rate, ACFM		15336
Actual Stack Gas Flow Rate, ACFMD		13864
Stack Gas Flow Rate, SCFMD		12139
Stack Gas Flow Rate Wet, SCFMW		13428
Percent Isokinetic		103
Stack Emissions:	Grains per DSCF	0.00010
	Pounds per Hour	0.011

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AASI USEPA Method 5 24 Point Template - Rev 0/11-7-2002

CI Summary Run 3

Facility	Georgia Pacific	**Impinger Condensate**	68.0
Location	Palatka, Fl.	**Silica Gel Condensate**	7.1
Stack	Bleach Plant	**Volume Metered**	38.870
Run Date	10/29/02	**Meter Temp (Deg R)**	566.0
Run Number	3	**Carbon Dioxide, %**	0.0
Start Time	17:00	**Oxygen, %**	20.9
Finish Time	18:02	**Carbon Monoxide, %**	0.0
Weather	Partial Clouds	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	75.1
Barometric Pressure	30.03	**Delta H (inches H2O)**	1.3840
Stack Diameter (inches)	42.00	**Stack Pressure**	30.019
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	602.2
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	354.6
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4770	**Total**	250.3
Meter Correction (Y)	1.000		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF	3.535
Gas Volume Sampled, STPD	36.523
Total Volume, STP	40.058
Moisture in stack gas, volume fraction	0.088
Dry Stack Gas, volume fraction	0.912
Molecular Weight of Stack Gas (Dry Basis)	28.84
Molecular Weight of Stack Gas (Stack conditions)	27.89
Specific gravity of Stack Gas Relative to Air	0.962
Excess Air (%)	14864.9
Average Stack Velocity, FPM	1743.1
Actual Stack Gas Flow Rate, ACFM	16770
Actual Stack Gas Flow Rate, ACFMD	15294
Stack Gas Flow Rate, SCFMD	13454
Stack Gas Flow Rate Wet, SCFMW	14752
Percent Isokinetic	106

Stack Emissions:	Grains per DSCF	0.00011
	Pounds per Hour	0.012

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AASI USEPA Method 26A 12 Point Template - Rev 0 11-14-2002

Cl Summary Run 1

Facility	Georgia Pacific	**Impinger Condensate**	54.0
Location	Palatka, Fl.	**Silica Gel Condensate**	7.0
Stack	Bleach Plant	**Volume Metered**	37.945
Run Date	10/31/02	**Meter Temp (Deg R)**	564.1
Run Number	1	**Carbon Dioxide, %**	0.0
Start Time	13:32	**Oxygen, %**	20.9
Finish Time	14:43	**Carbon Monoxide, %**	0.0
Weather	Cloudy	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	61.0
Barometric Pressure	30.14	**Delta H (inches H2O)**	1.3530
Stack Diameter (inches)	42.00	**Stack Pressure**	30.128
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	602.0
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	214.2
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4683	**Total**	109.9
Meter Correction (Y)	0.998		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF		2.871
Gas Volume Sampled, STPD		35.830
Total Volume, STP		38.701
Moisture in stack gas, volume fraction		0.074
Dry Stack Gas, volume fraction		0.926
Molecular Weight of Stack Gas (Dry Basis)		28.84
Molecular Weight of Stack Gas (Stack conditions)		28.04
Specific gravity of Stack Gas Relative to Air		0.967
Excess Air (%)		14864.9
Average Stack Velocity, FPM		1703.3
Actual Stack Gas Flow Rate, ACFM		16387
Actual Stack Gas Flow Rate, ACFMD		15174
Stack Gas Flow Rate, SCFMD		13401
Stack Gas Flow Rate Wet, SCFMW		14472
Percent Isokinetic		104
Stack Emissions:	**Grains per DSCF**	0.00005
	Pounds per Hour	0.005

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AASI USEPA Method 26A 12 Point Template - Rev 0/11-14-2002

Cl Summary Run 2

Facility	Georgia Pacific	**Impinger Condensate**	68.0
Location	Palatka, Fl	**Silica Gel Condensate**	7.1
Stack	Bleach Plant	**Volume Metered**	38.025
Run Date	10/31/02	**Meter Temp (Deg R)**	560.2
Run Number	2	**Carbon Dioxide, %**	0.0
Start Time	15:50	**Oxygen, %**	20.9
Finish Time	16:56	**Carbon Monoxide, %**	0.0
Weather	Partial Clouds	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	75.1
Barometric Pressure	29.95	**Delta H (inches H2O)**	1.3480
Stack Diameter (inches)	42.00	**Stack Pressure**	29.940
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	603.1
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	134.3
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4674	**Total**	30.0
Meter Correction (Y)	0.998		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF		3.535
Gas Volume Sampled, STPD		35.928
Total Volume, STP		39.463
Moisture in stack gas, volume fraction		0.090
Dry Stack Gas, volume fraction		0.91
Molecular Weight of Stack Gas (Dry Basis)		28.84
Molecular Weight of Stack Gas (Stack conditions)		27.86
Specific gravity of Stack Gas Relative to Air		0.961
Excess Air (%)		14864.9
Average Stack Velocity, FPM		1712.4
Actual Stack Gas Flow Rate, ACFM		16475
Actual Stack Gas Flow Rate, ACFMD		14992
Stack Gas Flow Rate, SCFMD		13134
Stack Gas Flow Rate Wet, SCFMW		14433
Percent Isokinetic		106
Stack Emissions:	**Grains per DSCF**	0.00001
	Pounds per Hour	0.001

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AASI USEPA Method 26A 12 Point Template - Rev 0/11-14-2002

Cl Summary Run 3

Facility	Georgia Pacific	**Impinger Condensate**	70.0
Location	Palatka, Fl.	**Silica Gel Condensate**	6.9
Stack	Bleach Plant	**Volume Metered**	37.000
Run Date	10/31/02	**Meter Temp (Deg R)**	557.6
Run Number	3	**Carbon Dioxide, %**	0.0
Start Time	17:10	**Oxygen, %**	20.9
Finish Time	18:16	**Carbon Monoxide, %**	0.0
Weather	Partial Clouds	**Nitrogen, %**	79.1
Total Time (minutes)	60	**Condensate Volume**	76.9
Barometric Pressure	29.95	**Delta H (inches H2O)**	1.2970
Stack Diameter (inches)	42.00	**Stack Pressure**	29.938
Stack Area square feet	9.621	**Stack Temp (Rainkin Degrees)**	600.3
Nozzle Area square feet	0.0004125	**Laboratory Results (ug)**	151.1
Number of Points	12	**Blank Correction**	104.3
Avg of SQRT of V.H.	0.4582	**Total**	46.8
Meter Correction (Y)	0.998		
Nozzle Diameter	0.275		
Pitot Correction Factor	0.84		

Volume Water Vapor, SCF		3.620
Gas Volume Sampled, STPD		35.118
Total Volume, STP		38.738
Moisture in stack gas, volume fraction		0.093
Dry Stack Gas, volume fraction		0.907
Molecular Weight of Stack Gas (Dry Basis)		28.84
Molecular Weight of Stack Gas (Stack conditions)		27.83
Specific gravity of Stack Gas Relative to Air		0.960
Excess Air (%)		14864.9
Average Stack Velocity, FPM		1675.8
Actual Stack Gas Flow Rate, ACFM		16123
Actual Stack Gas Flow Rate, ACFMD		14624
Stack Gas Flow Rate, SCFMD		12870
Stack Gas Flow Rate Wet, SCFMW		14190
Percent Isokinetic		105
Stack Emissions:	**Grains per DSCF**	0.00002
	Pounds per Hour	0.002

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AASI USEPA Method 5 24 Point Template - Rev 0 11-7-2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	CI Run 1
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/29/02
Run Number	1
Start Time	12:18
Finish Time	13:23
Weather	Clear, Warm
Total Time (minutes)	60.00
Number of Points	12
Barometric Pressure	30.03
Static Pressure (inches of water)	-0.05
Stack Diameter (inches)	42.000
Nozzle Diameter (inches)	0.275
Meter Y Factor	1.000
Pitot Factor	0.84
Final Meter Reading (cubic feet)	193.480
Initial Meter Reading (cubic feet)	156.450
Condensate (ml)	81
Silica Gel Weight (grams)	7.0
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	0.0
Nitrogen (percent)	79.1
Laboratory Results (ug)	438.9
Blank Correction	104.3
Isokinetic Rate Factor	6.00

Ambient Air Services, Inc.
Environmental Consultants

106 Ambient Air Way
Starke, FL. 32091
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AASI USEPA Method 5 24 Point Template - Rev. 01-[illegible]-2002

Field Data Points - CI Run 1 **Georgia Pacific** **Bleach Plant**

Port	Traverse Point	Velocity Head	Meter Orifice	Stack Temp. (°F)	Meter Inlet Temp. (°F)	Meter Outlet Temp. (°F)	Square Root of Velocity Head
1	1	0.26	1.56	142	106	106	0.51
	2	0.26	1.56	142	107	107	0.51
	3	0.23	1.38	145	107	107	0.48
	4	0.22	1.32	145	108	108	0.47
	5	0.18	1.08	143	110	110	0.42
	6	0.16	0.96	141	111	111	0.40
2	7	0.26	1.56	144	113	113	0.51
	8	0.27	1.62	145	114	114	0.52
	9	0.22	1.32	148	115	115	0.47
	10	0.18	1.08	148	117	117	0.42
	11	0.18	1.08	145	118	118	0.42
	12	0.16	0.96	143	118	118	0.40

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AASI USEPA Method 5 24 Point Template - Rev 0/11-7-2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	CI Run 2
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/29/02
Run Number	2
Start Time	14:33
Finish Time	15:38
Weather	Partial Clouds
Total Time (minutes)	60.0
Number of Points	12
Barometric Pressure	30.03
Static Pressure (inches of water)	-0.16
Stack Diameter (inches)	42.00
Nozzle Diameter (inches)	0.275
Meter Y Factor	1.009
Pitot Factor	0.84
Final Meter Reading (cubic feet)	230.200
Initial Meter Reading (cubic feet)	195.055
Condensate (ml)	66
Silica Gel Weight (grams)	6.9
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	
Nitrogen (percent)	79.1
Laboratory Results (ug)	320.0
Blank Correction	104.3
Isokinetic Rate Factor	6.04

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AASI USEPA Method 5 24 Point Template - Rev 0/11-7-2002

Field Data Points - CI Run 2				Georgia Pacific		Bleach Plant	
Port	Traverse Point	Velocity Head	Meter Orifice	Stack Temp. (°F)	Meter Inlet Temp. (°F)	Meter Outlet Temp. (°F)	Square Root of Velocity Head
1	1	0.21	1.27	145	115	115	0.46
	2	0.2	1.21	145	117	117	0.45
	3	0.16	0.97	146	118	118	0.40
	4	0.16	0.97	147	118	118	0.40
	5	0.16	0.97	145	119	119	0.40
	6	0.12	0.72	139	120	120	0.35
2	7	0.25	1.51	146	120	120	0.50
	8	0.25	1.51	146	120	120	0.50
	9	0.22	1.33	147	121	121	0.47
	10	0.22	1.33	147	121	121	0.47
	11	0.18	1.09	144	121	121	0.42
	12	0.16	0.97	143	121	121	0.40

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AASI USEPA Method 5 24 Point Template Rev 0 11-7-2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	CI Run 3
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/29 02
Run Number	3
Start Time	17:00
Finish Time	18:02
Weather	Partial Clouds
Total Time (minutes)	60.0
Number of Points	12
Barometric Pressure	30.03
Static Pressure (inches of water)	-0.15
Stack Diameter (inches)	42.00
Nozzle Diameter (inches)	0.275
Meter Y Factor	1.000
Pitot Factor	0.84
Final Meter Reading (cubic feet)	269.620
Initial Meter Reading (cubic feet)	230.750
Condensate (ml)	68
Silica Gel Weight (grams)	7.1
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	
Nitrogen (percent)	79.1
Laboratory Results (ug)	354.6
Blank Correction	104.3
Isokinetic Rate Factor	6.04

Field Data Points - CI Run 3				Georgia Pacific		Bleach Plant	
Port	**Traverse Point**	**Velocity Head**	**Meter Orifice**	**Stack Temp. (°F)**	**Meter Inlet Temp. (°F)**	**Meter Outlet Temp. (°F)**	**Square Root of Velocity Head**
1	1	0.26	1.57	144	109	109	0.51
	2	0.28	1.69	142	102	102	0.53
	3	0.26	1.57	144	107	107	0.51
	4	0.25	1.51	143	107	107	0.50
	5	0.2	1.21	141	107	107	0.45
	6	0.18	1.09	140	107	107	0.42
2	7	0.26	1.57	141	106	106	0.51
	8	0.28	1.69	143	106	106	0.53
	9	0.22	1.33	144	106	106	0.47
	10	0.2	1.21	142	105	105	0.45
	11	0.18	1.09	142	105	105	0.42
	12	0.18	1.09	140	105	105	0.42

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AASI USEPA Method 26A 12 Point Template Rev 01 11-14-2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Cl Run 1
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/31/02
Run Number	1
Start Time	13:32
Finish Time	14:43
Weather	Cloudy
Total Time (minutes)	60.00
Number of Points	12
Barometric Pressure	30.14
Static Pressure (inches of water)	-0.17
Stack Diameter (inches)	42.000
Nozzle Diameter (inches)	0.275
Meter Y Factor	0.998
Pitot Factor	0.84
Final Meter Reading (cubic feet)	313.155
Initial Meter Reading (cubic feet)	275.210
Condensate (ml)	54
Silica Gel Weight (grams)	7.0
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	0.0
Nitrogen (percent)	79.1
Laboratory Results (ug)	214.2
Blank Correction	104.3
Isokinetic Rate Factor	6.08

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AASI USEPA Method 26A 12 Point Template - Rev 0 11-14-2002

Field Data Points - Cl Run 1 **Georgia Pacific** **Bleach Plant**

Port	Traverse Point	Velocity Head	Meter Orifice	Stack Temp. (°F)	Meter Inlet Temp. (°F)	Meter Outlet Temp. (°F)	Square Root of Velocity Head
1	1	0.28	1.70	142	100	101	0.53
	2	0.26	1.58	144	102	100	0.51
	3	0.24	1.46	141	103	99	0.49
	4	0.18	1.09	141	105	100	0.42
	5	0.16	0.97	141	108	101	0.40
	6	0.14	0.85	142	108	102	0.37
2	7	0.27	1.64	141	109	103	0.52
	8	0.29	1.76	141	109	103	0.54
	9	0.27	1.64	142	109	103	0.52
	10	0.24	1.46	142	109	102	0.49
	11	0.18	1.09	144	109	102	0.42
	12	0.16	0.97	143	109	102	0.40

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AASI USEPA Method 26A 12 Point Template - Rev 0/11-14 2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Cl Run 2
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/31/02
Run Number	2
Start Time	15:50
Finish Time	16:56
Weather	Partial Clouds
Total Time (minutes)	60.0
Number of Points	12
Barometric Pressure	29.95
Static Pressure (inches of water)	-0.14
Stack Diameter (inches)	42.00
Nozzle Diameter (inches)	0.275
Meter Y Factor	0.998
Pitot Factor	0.84
Final Meter Reading (cubic feet)	359.105
Initial Meter Reading (cubic feet)	321.080
Condensate (ml)	68
Silica Gel Weight (grams)	7.1
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	
Nitrogen (percent)	79.1
Laboratory Results (ug)	134.3
Blank Correction	104.3
Isokinetic Rate Factor	6.08

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AASI USEPA Method 26A 12 Point Template - Rev 0/11-14-2002

Field Data Points - Cl Run 2 Georgia Pacific Bleach Plant

Port	Traverse Point	Velocity Head	Meter Orifice	Stack Temp. (°F)	Meter Inlet Temp. (°F)	Meter Outlet Temp. (°F)	Square Root of Velocity Head
1	1	0.27	1.64	140	94	93	0.52
	2	0.28	1.70	141	95	92	0.53
	3	0.24	1.46	143	103	96	0.49
	4	0.22	1.34	145	103	96	0.47
	5	0.18	1.09	144	105	97	0.42
	6	0.16	0.97	144	105	97	0.40
2	7	0.29	1.76	141	105	97	0.54
	8	0.3	1.82	142	105	97	0.55
	9	0.22	1.34	144	108	99	0.47
	10	0.2	1.22	145	108	98	0.45
	11	0.16	0.97	144	108	98	0.40
	12	0.14	0.85	144	108	97	0.37

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AASI USEPA Method 26A 12 Point Template - Rev 0 11-14-2002

Volumetric Flow Calculations Worksheet

Data Request Entry Area	Cl Run 3
Facility	Georgia Pacific
Location	Palatka, Fl.
Source	Bleach Plant
Date	10/31/02
Run Number	3
Start Time	17:10
Finish Time	18:16
Weather	Partial Clouds
Total Time (minutes)	60.0
Number of Points	12
Barometric Pressure	29.95
Static Pressure (inches of water)	-0.16
Stack Diameter (inches)	42.00
Nozzle Diameter (inches)	0.275
Meter Y Factor	0.998
Pitot Factor	0.84
Final Meter Reading (cubic feet)	396.405
Initial Meter Reading (cubic feet)	359.405
Condensate (ml)	70
Silica Gel Weight (grams)	6.9
Carbon Dioxide (percent)	0.0
Oxygen (percent)	20.9
Carbon Monoxide (percent)	
Nitrogen (percent)	79.1
Laboratory Results (ug)	151.1
Blank Correction	104.3
Isokinetic Rate Factor	6.08

Ambient Air Services, Inc.
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AASI USEPA Method 26A 12 Point Template - Rev 0-11-14-2002

Field Data Points - Cl Run 3 **Georgia Pacific** **Bleach Plant**

Port	Traverse Point	Velocity Head	Meter Orifice	Stack Temp. (°F)	Meter Inlet Temp. (°F)	Meter Outlet Temp. (°F)	Square Root of Velocity Head
1	1	0.28	1.70	138	97	95	0.53
	2	0.26	1.58	140	100	96	0.51
	3	0.22	1.34	142	98	95	0.47
	4	0.2	1.22	140	100	93	0.45
	5	0.16	0.97	139	101	93	0.40
	6	0.14	0.85	142	102	94	0.37
2	7	0.3	1.82	142	102	94	0.55
	8	0.26	1.58	141	102	94	0.51
	9	0.24	1.46	140	102	94	0.49
	10	0.2	1.22	140	102	94	0.45
	11	0.16	0.97	139	103	95	0.40
	12	0.14	0.85	140	102	95	0.37

APPENDIX – B

Field Data Sheets

- Chlorine and Flow Data Sheets
- Carbon Monoxide Data

M CTM-027
HCl

AMBIENT AIR SERVICES
106 AMBIENT AIR WAY
STARKE FL 32091 (904) 964-8440

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: GP Palatka
SOURCE: Bleach
WEATHER: Partial Clouds
TYPE TEST: 027
TESTERS: RW, R
12 PTS. @ 5 MIN/PT = ______ MIN F.D.A. = .94
Y meter = .998 Filter No. = ______
COMMENTS: Nozzle .275, .275, .273 Avg .275

RUN No 1
DATE 10/29/02

PRE-TEST.
Ts = 142 602
Tm = 105 565

[illegible] ______
O2 20.9
[illegible] ______

BAROMETRIC PRESS. 30.03
METER BOX ID: ~~RS1~~ #10
METER DELTA H 2.050
PROBE ID 6B
PITOT CORR. FACTOR 0.84
NOZZLE DIA 0.275 in.
PROBE TEMP. n/a
STACK ID (IN.)= 42
UP/DOWN STREAM 28 22

TIME START 1218 START VOLUME 156.450
TIME END ______ END VOLUME 193.480

-1.9

9188.69
1529.08

PORT LENGTH (IN) 7" Factors: F = 6.01

LEAK CHECK
PRE TEST 0 CFM@15". POST: ______ " Hg.

PITOT LEAK CHECK
= ______ AT 3"

VOL. WATER COLLECTED = ML ~~200~~ 81
WEIGHT MOIS. SILICA GEL = GR

STAT PRESS=
-1.9

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORRIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg.	PROBE GAS TEMP
1	0 2.5	156.450	.26	1.6	142	106	240	76	5	n/a
2	5 5	159.8	.26	1.6	142	107	247	70	5.5	
3 ~~2~~	10 ~~7.5~~	162.9	.23	1.4	145	107	255	66	5	
4	15 ~~10~~	166.0	.22	~~1.4~~ 1.3	145	108	252	~~66~~ 59	5	
5 ~~3~~	~~20~~ ~~12.5~~	169.2	.18	1.1	143	110	220	60	5	
6	25 15	172.1	.16	.96	144	111	260	61	4.5	
2-1 ~~4~~	30 ~~12.5~~	174.98	.26	1.6	144	113	220	64	5.5	
2	35 ~~20~~	178.0	.2~~4~~7	1.6	145	114	274	62	5.5	
3 ~~5~~	40 ~~22.5~~	181.6	.22	1.3	148	115	247	62	5.5	
4	45 ~~25~~	~~184.9~~ 184.6	.18	1.1	148	117	209	63	5.5	
5 ~~6~~	50 ~~27.5~~	187.7	.18	1.1	145	118	264	63	5.5	
6	55 ~~30~~	190.7	.16	.96	143	118	229	64	5	
	60	193.480	-	—	—	—	—	—	—	

a) .005053
b) 1529.08
c) 58.25

CTM-027 4cc

HCL

AMBIENT AIR SERVICES
106 AMBIENT AIR WAY
STARKE FL. 32091 (904) 964-8440

SOURCE SAMPLING FIELD DATA SHEET

RUN No 2
DATE 10/29/02

FACILITY: GP Palatka
SOURCE: Bleach Plant
WEATHER: Partial Clouds
TYPE TEST: CTM-027
TESTERS: RW, RD

PRE-TEST
Ts = ~~140~~ 143 ~~600~~ 605
Tm = ~~105~~ 111 ~~565~~ 571

O2 ______
CO2 20.9
CO ______

BAROMETRIC PRESS. 30.03
METER BOX ID. ~~RS1~~ 10
METER DELTA H: 2.050
PROBE ID 6B
PITOT CORR. FACTOR 0.84
NOZZLE DIA. 0.275 in.
PROBE TEMP N/A
STACK ID (IN.)= 42"
UP/DOWN STREAM 78 72

12 PTS. @ 5 MIN/PT = 60 MIN F.D.A. = .94
Y meter = 0.998 Filter No. = ______
COMMENTS:

TIME START 1133 START VOLUME 195,055
TIME END 1538 END VOLUME ______

static
-.16

4286.22
1570 x .170, .55 x .005
1536.7

PORT LENGTH (IN) 7" Factors: 6.04

LEAK CHECK:
PRE.TEST 0 CFM@15". POST: .015 8" Hg.

PITOT LEAK CHECK = OK AT 3"

VOL. WATER COLLECTED = 66 ML
WEIGHT MOIS. SILICA GEL = GR

STAT PRESS=
-.16

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORRIFICE PRESS. DROP	STACK GAS TEMP	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg	PROBE GAS TEMP
1-1 ~~1~~	0 ~~2.5~~	195.055	.21	1.3	~~142~~ 145	115	125	76	~~205~~	N/A
2	5 ~~5~~	197.7	.2	1.2	145	117	274	60	6	
3 ~~2~~	10 ~~7.5~~	201.1	.16	.96	146	118	254	59	4.5	
4	15 ~~10~~	203.8	.16	.96	147	118	220	60	4.5	
5 ~~3~~	20 ~~12.5~~	206.5	.16	.96	145	119	263	56	4.5	
6	25 ~~15~~	209.2	.12	.72	139	120	245	54	4	
2-1 ~~4~~	30 ~~17.5~~	211.665	.25	1.5	146	120	274	54	5	
2	35 ~~20~~	214.7	.25	1.5	146	120	238	50	5	
3 ~~5~~	40 ~~22.5~~	218.0	.22	1.3	147	121	284	52	5	
4	45 ~~25~~	221.2	.22	1.3	147	121	272	52	5	
5 ~~6~~	50 ~~27.5~~	224.4	.18	1.1	144	121	221	54	5	
6	55 30	227.4	.16	.96	143	121	259	55	4.5	
	60	230.2	—	—	—	—	—	—	—	↓

a) $(.275^2 \times .94)^2$
b) $(1.65 \times .94) 605$
c) 571×2.05

AMBIENT AIR SERVICES
106 AMBIENT AIR WAY
STARKE FL 32091 (904) 964-8440

SOURCE SAMPLING FIELD DATA SHEET

3
DATE 10/29/02

FACILITY: GP Palatka
SOURCE: Bleach Plant
BAROMETRIC PRESS. 30.03
WEATHER: Partial Clouds
PRE-TEST.
METER BOX ID. ~~RS1~~ FF10
TYPE TEST: CTM-027 Hcl
Ts = 245 605
METER DELTA H: 2.05
TESTERS: RW
Tm = ~~[illegible]~~ 115 585
PROBE ID: CB
12 PTS. @ 5 MIN/PT = 60 MIN F.D.A. = .94
PITOT CORR. FACTOR 0.84
Y meter = 0.998 Filter No. =
NOZZLE DIA 0.275 in.
COMMENTS:
PROBE TEMP. N/A
STACK ID (IN.)= 42
UP/DOWN STREAM 28 22
PORT LENGTH (IN) 7"
Factors: 6.04

TIME	START	1700	START VOLUME 230.750
TIME	END	1802	END VOLUME 269.62

-.15

CCC
O2
CC

LEAK CHECK:
PRE.TEST 0 CFM@15". POST: " Hg.
PITOT LEAK CHECK = OK AT 3"
VOL. WATER COLLECTED = 68 ML
WEIGHT MOIS. SILICA GEL = GR
STAT.PRESS= -.15

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORRIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg.	PROBE GAS TEMP.
1-1 ~~1~~	0 ~~0825~~	230.750	.26	1.6	144	109	250	63	5.5	N/A
2	5 5	234.0	.28	1.7	142	102	243	52	5.5	
3 ~~2~~	10 ~~7.5~~	237.5	.26	1.6	144	107	278	51	5.5	
4	15 ~~10~~	240.9	.25	1.6	143	107	240	50	5.5	
5 ~~3~~	20 ~~12.5~~	244.3	.2	1.2	141	107	232	50	5.5	
6	25 ~~15~~	247.5	.18	1.1	140	107	291	50	5	
2-1 ~~4~~	30 ~~17.5~~	250.56	.26	1.6	141	106	222	52	7	
2	35 20	254.2	.28	1.7	143	106	278	50	7	
3 ~~5~~	40 ~~22.5~~	257.8	.22	1.3	144	106	263	50	6	
4	45 ~~25~~	261.0	.2	1.2	142	105	225	50	5	
5 ~~6~~	50 ~~27.5~~	264.2	.18	1.1	142	105	225	50	5	
6	55 ~~30~~	266.9	.18	1.1	140	105	242	50	5	
	60	269.620	—	—	—	—	—	—	—	

AMBIENT AIR SERVICES, INC.
STARKE, FL
(904)964-8440

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: **Georgia-Pacific, Palatka**
SOURCE: **Bleach Plant**
WEATHER: p. cloudy
TYPE TEST: HCl method 26A
TESTERS: ____
12 PTS. @ 5 MIN/PT = 60 MIN
Y meter = 0.998
Filter No. = ____
COMMENTS:

RUN No. 1
DATE 10/31/02

BAROMETRIC PRESS ____
METER BOX ID 10
METER DELTA Ha 2.05
PROBE ID ____
PITOT CORR FACTOR 0.84
NOZZLE DIA. 0.275 in.
PROBE TEMP. ~250
STACK ID (IN): 42"
PORT LENGTH 6"

PRE-TES
Ts = ____
Tm = 94
F.D.A. = 2.94

ORSAT
CO2 ____
O2 ____
CO ____

F=1570(aXc)/b
a = (Dn^2XFDA)^2
b= (1.6+FDA)Ts
c= Tm X DHa

TIME START 1332
TIME END 1443

START VOLUME 275.210
END VOLUME ____
Factors: ____

LEAK CHECK:
PRE.TEST 0.012 CFM@15". POS 0.016/@ " Hg.

PITOT LEAK CHECK = OK AT 3"

VOL.WATER COLLECT = 68 ML
WT. MOIS. SILICA GEL = GR
STAT.PRESS=

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGE TEMP.	VACUUM INCHES Hg
1-1	0	275.210	0.28	1.70	142	100	101	246	64	<5
2	5	78.64	0.26	1.58	144	102	100	256	56	<6
3	10	82.01	0.24	1.45	141	103	99	258	56	<5
4	15	85.32	0.18	1.09	141	105	100	259	55	<5
5	20	88.35	0.16	0.97	141	108	101	260	56	<5
6	25	91.11	0.14	0.85	142	108	102	258	56	<5
2-1	30	94.185	0.27	1.64	141	109	103	261	57	<6
2	35	97.45	0.29	1.76	141	109	103	260	55	<5
3	40	300.74	0.27	1.64	142	109	103	262	55	<6
4	45	04.18	0.24	1.45	142	109	102	259	56	<6
5	50	07.71	0.18	1.09	144	109	102	261	56	<5
6	55	10.44	0.16	0.97	143	109	102	258	56	<5
	60	313.155								

AMBIENT AIR SERVICES, INC.
STARKE, FL
(904)964-8440

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: **Georgia-Pacific, Palatka**
SOURCE: **Bleach Plant**
WEATHER: cloudy
TYPE TEST: HCl method 26A
TESTERS: ____
__12_ PTS. @ _5__ MIN/PT = _60__ MIN
Y meter = 0.998
Filter No. = ____
COMMENTS:

RUN No. 2
DATE 10/31/02

BAROMETRIC PRESS ____
METER BOX ID 10
METER DELTA Ha 2.050
PROBE ID
PITOT CORR. FACTOR 0.84
NOZZLE DIA 0.275 in.
PROBE TEMP. ~250
STACK ID (IN): 42
PORT LENGTH 6

TIME START 1550
TIME END 1656

START VOLUME 321.080
END VOLUME 359.105
Factors: ____

PRE-TES
Ts = ____
Tm = ____
F.D.A. = ____

ORSAT
CO2 ____
O2 ____
CO ____

F=1570(aXc)b
a = (Dn^2/FDA)^2
b= (1.6+FDA)Ts
c= Tm X DHa

LEAK CHECK:
PRE.TEST 0.014 CFM@15". POS 0.009 " Hg.

PITOT LEAK CHECK = OK AT 3"

VOL.WATER COLLECT = 68 ML
WT. MOIS. SILICA GEL = GR

STAT.PRESS= -0.14

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGER TEMP.	VACUUM INCHES Hg.
1-1	0	321.080	0.27	1.64	140	94	93	242	61	<5
2	5	24.27	0.28	1.70	141	95	92	256	55	<6
3	10	28.91	0.24	1.45	143	103	96	258	56	<6
4	15	31.16	0.22	1.34	149	103	96	260	56	<6
5	20	34.18	0.18	1.09	144	105	97	262	56	<5
6	25	37.14	0.16	0.97	144	105	97	259	56	<5
2-1	30	339.69	0.29	1.76	141	105	97	262	55	<6
2	35	43.12	0.30	1.82	142	105	97	260	56	<6
3	40	47.32	0.22	1.34	144	108	99	258	56	<6
4	45	50.51	0.20	1.22	145	108	98	260	57	<6
5	50	53.54	0.16	0.97	144	108	98	261	56	<6
6	55	56.52	0.14	0.85	144	108	97	259	56	<5
	60	359.105								

AMBIENT AIR SERVICES, INC.
STARKE, FL
(904)964-8440

SOURCE SAMPLING FIELD DATA SHEET

FACILITY: **Georgia-Pacific, Palatka**
SOURCE: **Bleach Plant**

RUN No 3
DATE 10/31/02

BAROMETRIC PRESS
METER BOX ID 10
METER DELTA Ha 2.050
PROBE ID
PITOT CORR. FACTOR 0.84
NOZZLE DIA 0.275 in.
PROBE TEMP ~250
STACK ID (IN). 42
PORT LENGTH 6"

WEATHER: cloudy
TYPE TEST: HCl method 26A
TESTERS: GH, RR
12 PTS. @ 5 MIN/PT = 60 MIN
Y meter = 0.998
Filter No. =
COMMENTS:

TIME START ~~170~~ 1710
TIME END 1816
START VOLUME 359.405
END VOLUME 396.405
Factors:

PRE-TES
Ts =
Tm =
F.D.A. =

ORSAT
CO2
O2
CO

F=1570(aXc)/b
a = (Dn^2XFDA)^2
b= (1.6+FDA)Ts
c= Tm X DHa

LEAK CHECK:
PRE.TEST 0.008 CFM@15". POS 0.006/7 " Hg.

PITOT LEAK CHECK = OK AT 3"

VOL.WATER COLLECT = 70 ML
WT. MOIS. SILICA GEL = GR

STAT.PRESS= -0.16

PORT & SAMPLE POINT	CLOCK TIME	GAS METER READING	STACK VELOCITY Dp	ORIFICE PRESS. DROP	STACK GAS TEMP.	METER TEMP (F)	METER TEMP (F)	FILTER TEMP. (F)	LAST IMPINGE TEMP.	VACUUM INCHES Hg
1-1	0	359.405	0.30	1.70	138	97	95	243	59	<6
2	5	62.62	0.26	1.58	140	100	96	257	54	<6
3	10	66.36	0.22	1.34	142	98	95	260	54	<4
4	15	69.28	0.20	1.21	140	100	93	257	54	<6
5	20	72.31	0.16	0.97	139	101	93	259	54	<6
6	25	75.50	0.14	0.85	142	102	94	260	54	<6
2-1	30	77.92	0.30	1.82	142	102	94	258	54	<6
2	35	81.40	0.26	1.58	141	102	94	259	55	<6
3	40	84.84	0.24	1.46	140	102	94	262	55	<6
4	45	88.22	0.20	1.21	140	102	94	263	55	<6
5	50	91.11	0.16	0.97	139	103	95	264	56	<6
6	55	93.91	0.14	0.85	140	102	95	263	56	<6
	60	396.405								

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/29/02 12:01	1982.2		1994 CO Cal						
10/29/02 12:02	1929.0								
10/29/02 12:03	982.2								
10/29/02 12:04	995.6		991 CO Cal						
10/29/02 12:05	995.1		991 CO Cal						
10/29/02 12:06	621.1								
10/29/02 12:07	580.7								
10/29/02 12:08	588.0		594.4 CO Cal						
10/29/02 12:09	588.0		594.4 CO Cal						
10/29/02 12:10	588.0		594.4 CO Cal						
10/29/02 12:11	572.3								
10/29/02 12:12	279.5								
10/29/02 12:13	299.1		301.9 CO Cal						
10/29/02 12:14	299.1		301.9 CO Cal						
10/29/02 12:15	299.1		301.9 CO Cal						
10/29/02 12:16	299.1		301.9 CO Cal						
10/29/02 12:17	299.1		301.9 CO Cal						
10/29/02 12:18	234.7								
10/29/02 12:19	10.2								
10/29/02 12:20	4.0		0 CO Cal						
10/29/02 12:21	4.6								
10/29/02 12:22	454.3								
10/29/02 12:23	917.7								
10/29/02 12:24	994.3								
10/29/02 12:25	969.3	1		4.80	996.85	991.00	963.5	12068	54.35
10/29/02 12:26	984.3	1		4.80	996.85	991.00	978.5	12676	57.97
10/29/02 12:27	1002.7	1		4.80	996.85	991.00	996.8	12676	59.06
10/29/02 12:28	987.7	1		4.80	996.85	991.00	981.8	12676	58.17
10/29/02 12:29	981.0	1		4.80	996.85	991.00	975.2	12676	57.78
10/29/02 12:30	996.0	1		4.80	996.85	991.00	990.2	12676	58.67
10/29/02 12:31	1009.3	1		4.80	996.85	991.00	1003.5	12676	59.45
10/29/02 12:32	987.7	1		4.80	996.85	991.00	981.8	12676	58.17
10/29/02 12:33	997.7	1		4.80	996.85	991.00	991.8	12676	58.76
10/29/02 12:34	1004.3	1		4.80	996.85	991.00	998.5	12676	59.16
10/29/02 12:35	996.0	1		4.80	996.85	991.00	990.2	12676	58.67
10/29/02 12:36	992.7	1		4.80	996.85	991.00	986.8	12676	58.47
10/29/02 12:37	976.0	1		4.80	996.85	991.00	970.2	12676	57.48
10/29/02 12:38	961.0	1		4.80	996.85	991.00	955.2	12676	56.59
10/29/02 12:39	954.3	1		4.80	996.85	991.00	948.5	12676	56.20
10/29/02 12:40	972.7	1		4.80	996.85	991.00	966.8	12676	57.28
10/29/02 12:41	959.3	1		4.80	996.85	991.00	953.5	12676	56.50
10/29/02 12:42	949.3	1		4.80	996.85	991.00	943.5	12676	55.90
10/29/02 12:43	977.7	1		4.80	996.85	991.00	971.8	12676	57.58
10/29/02 12:44	971.0	1		4.80	996.85	991.00	965.2	12676	57.19
10/29/02 12:45	974.3	1		4.80	996.85	991.00	968.5	12676	57.38
10/29/02 12:46	981.0	1		4.80	996.85	991.00	975.2	12676	57.78
10/29/02 12:47	956.0	1		4.80	996.85	991.00	950.2	12676	56.30
10/29/02 12:48	966.0	1		4.80	996.85	991.00	960.2	12676	56.89
10/29/02 12:49	957.7	1		4.80	996.85	991.00	951.9	12676	56.40

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/29/02 12:50	926.0	1		4.80	996.85	991.00	920.2	12676	54.52
10/29/02 12:51	937.7	1		4.80	996.85	991.00	931.9	12676	55.21
10/29/02 12:52	906.0	1		4.80	996.85	991.00	900.2	12676	53.34
10/29/02 12:53	934.3	1		4.80	996.85	991.00	928.5	12676	55.02
10/29/02 12:54	926.0	1		4.80	996.85	991.00	920.2	12676	54.52
10/29/02 12:55	887.7	1		4.80	996.85	991.00	881.9	12676	52.25
10/29/02 12:56	912.7	1		4.80	996.85	991.00	906.9	12676	53.73
10/29/02 12:57	921.0	1		4.80	996.85	991.00	915.2	12676	54.23
10/29/02 12:58	929.3	1		4.80	996.85	991.00	923.6	12676	54.72
10/29/02 12:59	962.7	1		4.80	996.85	991.00	956.9	12676	56.69
10/29/02 13:00	956.0	1		4.80	996.85	991.00	950.2	12676	56.30
10/29/02 13:01	979.3	1		4.80	996.85	991.00	973.5	12676	57.68
10/29/02 13:02	979.3	1		4.80	996.85	991.00	973.5	12676	57.68
10/29/02 13:03	1002.7	1		4.80	996.85	991.00	996.8	12676	59.06
10/29/02 13:04	1026.0	1		4.80	996.85	991.00	1020.1	12676	60.44
10/29/02 13:05	1011.0	1		4.80	996.85	991.00	1005.1	12676	59.55
10/29/02 13:06	1012.7	1		4.80	996.85	991.00	1006.8	12676	59.65
10/29/02 13:07	1014.3	1		4.80	996.85	991.00	1008.5	12676	59.75
10/29/02 13:08	996.0	1		4.80	996.85	991.00	990.2	12676	58.67
10/29/02 13:09	1014.3	1		4.80	996.85	991.00	1008.5	12676	59.75
10/29/02 13:10	1026.0	1		4.80	996.85	991.00	1020.1	12676	60.44
10/29/02 13:11	1007.7	1		4.80	996.85	991.00	1001.8	12676	59.36
10/29/02 13:12	1036.0	1		4.80	996.85	991.00	1030.1	12676	61.03
10/29/02 13:13	1024.3	1		4.80	996.85	991.00	1018.5	12676	60.34
10/29/02 13:14	1001.0	1		4.80	996.85	991.00	995.1	12676	58.96
10/29/02 13:15	1017.7	1		4.80	996.85	991.00	1011.8	12676	59.95
10/29/02 13:16	1032.7	1		4.80	996.85	991.00	1026.8	12676	60.84
10/29/02 13:17	1027.7	1		4.80	996.85	991.00	1021.8	12676	60.54
10/29/02 13:18	1011.0	1		4.80	996.85	991.00	1005.1	12676	59.55
10/29/02 13:19	1024.3	1		4.80	996.85	991.00	1018.5	12676	60.34
10/29/02 13:20	1026.0	1		4.80	996.85	991.00	1020.1	12676	60.44
10/29/02 13:21	1036.0	1		4.80	996.85	991.00	1030.1	12676	61.03
10/29/02 13:22	1051.0	1		4.80	996.85	991.00	1045.1	12676	61.92
10/29/02 13:23	1034.3	1		4.80	996.85	991.00	1028.4	12676	60.93
10/29/02 13:24	1034.3	1		4.80	996.85	991.00	1028.4	12676	60.93
10/29/02 13:25	1037.7			***Run 1 Average***			***979.0***		***57.96***
10/29/02 13:26	771.0								
10/29/02 13:27	54.0								
10/29/02 13:28	13.8								
10/29/02 13:29	13.8								
10/29/02 13:30	5.6		0 CO Cal						
10/29/02 13:31	723.3								
10/29/02 13:32	1990.0								
10/29/02 13:33	1993.1		1994 CO Cal						
10/29/02 13:34	1993.1		1994 CO Cal						
10/29/02 13:35	1993.1		1994 CO Cal						
10/29/02 13:36	1521.4								
10/29/02 13:37	978.7								
10/29/02 13:38	998.3		991 CO Cal						

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/29/02 13:39	645.1								
10/29/02 13:40	587.4		594.4 CO Cal						
10/29/02 13:41	464.9								
10/29/02 13:42	282.6								
10/29/02 13:43	300.1		301.9 CO Cal						
10/29/02 13:44	204.3								
10/29/02 13:45	212.6								
10/29/02 13:46	1138.3								
10/29/02 13:47	1186.7								
10/29/02 13:48	1184.7								
10/29/02 13:49	1186.7								
10/29/02 13:50	1190.9								
10/29/02 13:51	1201.2								
10/29/02 13:52	1212.5								
10/29/02 13:53	1192.9								
10/29/02 13:54	1207.3								
10/29/02 13:55	1193.9								
10/29/02 13:56	1187.8								
10/29/02 13:57	1191.9								
10/29/02 13:58	1190.9								
10/29/02 13:59	1208.4								
10/29/02 14:00	1241.3								
10/29/02 14:01	1223.8								
10/29/02 14:02	1219.7								
10/29/02 14:03	1213.5								
10/29/02 14:04	1212.5								
10/29/02 14:05	1235.1								
10/29/02 14:06	1251.6								
10/29/02 14:07	1234.1								
10/29/02 14:08	1223.8								
10/29/02 14:09	1224.8								
10/29/02 14:10	1227.9								
10/29/02 14:11	1269.1								
10/29/02 14:12	1271.2								
10/29/02 14:13	1253.7								
10/29/02 14:14	1269.1								
10/29/02 14:15	1250.6								
10/29/02 14:16	1227.9								
10/29/02 14:17	1246.5								
10/29/02 14:18	1245.4								
10/29/02 14:19	1193.9								
10/29/02 14:20	1220.7								
10/29/02 14:21	1215.6								
10/29/02 14:22	1155.8								
10/29/02 14:23	1162.0								
10/29/02 14:24	1153.8								
10/29/02 14:25	1111.6								
10/29/02 14:26	1081.7								
10/29/02 14:27	1051.8								

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/29/02 14:28	1024.0								
10/29/02 14:29	1026.1								
10/29/02 14:30	1002.4								
10/29/02 14:31	1007.6								
10/29/02 14:32	978.7								
10/29/02 14:33	961.2	2		4 05	997.8	991	954 5	12068	53 84
10/29/02 14:34	960.2	2		4 05	997.8	991	953 5	12068	53 78
10/29/02 14:35	933.4	2		4 05	997.8	991	926 8	12068	52 28
10/29/02 14:36	940.6	2		4 05	997.8	991	934 0	12068	52.68
10/29/02 14:37	930.3	2		4 05	997 8	991	923 7	12068	52 10
10/29/02 14:38	905.6	2		4 05	997.8	991	899 1	12068	50 71
10/29/02 14:39	923.1	2		4 05	997 8	991	916 5	12068	51.70
10/29/02 14:40	895.3	2		4 05	997 8	991	888 8	12068	50.13
10/29/02 14:41	897.4	2		4 05	997 8	991	890 8	12068	50 25
10/29/02 14:42	901.5	2		4 05	997 8	991	894 9	12068	50 48
10/29/02 14:43	890.2	2		4 05	997 8	991	883 7	12068	49 84
10/29/02 14:44	897.4	2		4 05	997 8	991	890 8	12068	50 25
10/29/02 14:45	880.9	2		4 05	997 8	991	874 4	12068	49 32
10/29/02 14:46	887.1	2		4 05	997 8	991	880 6	12068	49.67
10/29/02 14:47	853.1	2		4 05	997.8	991	846 7	12068	47 76
10/29/02 14:48	857.2	2		4 05	997 8	991	850 8	12068	47.99
10/29/02 14:49	862.4	2		4 05	997.8	991	855 9	12068	48 28
10/29/02 14:50	840.7	2		4 05	997 8	991	834 4	12068	47 06
10/29/02 14:51	856.2	2		4 05	997 8	991	849 8	12068	47.93
10/29/02 14:52	834.5	2		4 05	997 8	991	828.2	12068	46 72
10/29/02 14:53	811.9	2		4 05	997 8	991	805 6	12068	45 44
10/29/02 14:54	821.2	2		4 05	997 8	991	814 8	12068	45 96
10/29/02 14:55	807.8	2		4 05	997 8	991	801 5	12068	45 21
10/29/02 14:56	802.6	2		4 05	997 8	991	796.4	12068	44.92
10/29/02 14:57	789.2	2		4 05	997 8	991	783 0	12068	44 17
10/29/02 14:58	765.6	2		4 05	997.8	991	759 4	12068	42 84
10/29/02 14:59	768.6	2		4 05	997 8	991	762 5	12068	43 01
10/29/02 15:00	756.3	2		4 05	997 8	991	750 2	12068	42 31
10/29/02 15:01	778.9	2		4 05	997 8	991	772 7	12068	43 59
10/29/02 15:02	772.8	2		4 05	997 8	991	766 6	12068	43 24
10/29/02 15:03	763.5	2		4 05	997 8	991	757 3	12068	42 72
10/29/02 15:04	749.1	2		4 05	997 8	991	743 0	12068	41 91
10/29/02 15:05	728.5	2		4 05	997 8	991	722 4	12068	40 75
10/29/02 15:06	730.5	2		4 05	997 8	991	724 5	12068	40 87
10/29/02 15 07	732.6	2		4 05	997 8	991	726 5	12068	40 98
10/29/02 15:08	722.3	2		4 05	997 8	991	716 3	12068	40 40
10/29/02 15:09	736.7	2		4 05	997 8	991	730 6	12068	41 21
10/29/02 15:10	731.6	2		4 05	997 8	991	725 5	12068	40 92
10/29/02 15.11	742.9	2		4 05	997 8	991	736 8	12068	41 56
10/29/02 15:12	727.4	2		4 05	997 8	991	721 4	12068	40 69
10/29/02 15.13	735 7	2		4 05	997 8	991	729 6	12068	41 16
10/29/02 15:14	742.9	2		4 05	997 8	991	736 8	12068	41 56
10/29/02 15:15	735 7	2		4 05	997 8	991	729 6	12068	41 16
10/29/02 15 16	737 7	2		4 05	997 8	991	731 7	12068	41 27

Georgia Pacific - Palatka, Florida

Bleach Plant Carbon Monoxide Test

October 29, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/29/02 15:17	730.5	2		4.05	997.8	991	724.5	12068	40.87
10/29/02 15:18	715.1	2		4.05	997.8	991	709.1	12068	40.00
10/29/02 15:19	731.6	2		4.05	997.8	991	725.5	12068	40.92
10/29/02 15:20	739.8	2		4.05	997.8	991	733.7	12068	41.39
10/29/02 15:21	732.6	2		4.05	997.8	991	726.5	12068	40.98
10/29/02 15:22	730.5	2		4.05	997.8	991	724.5	12068	40.87
10/29/02 15:23	720.2	2		4.05	997.8	991	714.2	12068	40.29
10/29/02 15:24	708.9	2		4.05	997.8	991	702.9	12068	39.65
10/29/02 15:25	723.3	2		4.05	997.8	991	717.3	12068	40.46
10/29/02 15:26	732.6	2		4.05	997.8	991	726.5	12068	40.98
10/29/02 15:27	713.0	2		4.05	997.8	991	707.0	12068	39.88
10/29/02 15:28	706.9	2		4.05	997.8	991	700.9	12068	39.53
10/29/02 15:29	714.1	2		4.05	997.8	991	708.0	12068	39.94
10/29/02 15:30	704.8	2		4.05	997.8	991	698.8	12068	39.42
10/29/02 15:31	740.8	2		4.05	997.8	991	734.7	12068	41.44
10/29/02 15:32	749.1	2		4.05	997.8	991	743.0	12068	41.91
10/29/02 15:33	737.7			*Run 2 Average*			***788.7***		***44.49***
10/29/02 15:34	739.8								
10/29/02 15:35	731.6								
10/29/02 15:36	720.2								
10/29/02 15:37	726.4								
10/29/02 15:38	723.3								
10/29/02 15:39	500.9								
10/29/02 15:40	6.6								
10/29/02 15:41	2.5		0 CO Cal						
10/29/02 15:42	2.5		0 CO Cal						
10/29/02 15:43	2.5		0 CO Cal						
10/29/02 15:44	8.7								
10/29/02 15:45	758.3								
10/29/02 15:46	996.2		991 CO Cal						
10/29/02 15:47	998.3		991 CO Cal						
10/29/02 15:48	850.0								
10/29/02 15:49	731.6								
10/29/02 15:50	716.1								
10/29/02 15:51	716.1								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 7:13	684.2								
10/31/02 7:14	691.4								
10/31/02 7:15	698.6								
10/31/02 7:16	687.3								
10/31/02 7:17	679.0								
10/31/02 7:18	229.0								
10/31/02 7:19	15.9								
10/31/02 7:20	8.7		0 cal						
10/31/02 7:21	8.7								
10/31/02 7:22	111.6								
10/31/02 7:23	896.3								
10/31/02 7:24	1019.9								
10/31/02 7:25	1022.0		991 cal						
10/31/02 7:26	1022.0		991 cal						
10/31/02 7:27	1022.0		991 cal						
10/31/02 7:28	1022.0		991 cal						
10/31/02 7:29	1022.0		991 cal						
10/31/02 7:30	1730.5								
10/31/02 7:31	1993.1		1994 cal						
10/31/02 7:32	1993.1		1994 cal						
10/31/02 7:33	1993.1		1994 cal						
10/31/02 7:34	1993.1		1994 cal						
10/31/02 7:35	1993.1		1994 cal						
10/31/02 7:36	1971.4								
10/31/02 7:37	1009.6								
10/31/02 7:38	610.1								
10/31/02 7:39	602.8		594 cal						
10/31/02 7:40	602.8								
10/31/02 7:41	599.8								
10/31/02 7:42	657.4								
10/31/02 7:43	558.6								
10/31/02 7:44	322.7								
10/31/02 7:45	309.4		301 cal						
10/31/02 7:46	309.4								
10/31/02 7:47	315.5								
10/31/02 7:48	583.3						#DIV/0!		#DIV/0!
10/31/02 7:49	679.0								
10/31/02 7:50	680.1								
10/31/02 7:51	688.3								
10/31/02 7:52	679.0								
10/31/02 7:53	673.9								
10/31/02 7:54	676.0								
10/31/02 7:55	661.5								
10/31/02 7:56	670.8								
10/31/02 7:57	682.1								
10/31/02 7:58	687.3								
10/31/02 7:59	683 2								
10/31/02 8:00	666 7								
10/31/02 8:01	683.2								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{ma}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 8:02	678.0								
10/31/02 8:03	673.9								
10/31/02 8:04	681.1								
10/31/02 8:05	692.4								
10/31/02 8:06	672.9								
10/31/02 8:07	692.4								
10/31/02 8:08	698.6								
10/31/02 8:09	680.1								
10/31/02 8:10	687.3								
10/31/02 8:11	685.2								
10/31/02 8:12	680.1								
10/31/02 8:13	689.3								
10/31/02 8:14	691.4								
10/31/02 8:15	682.1								
10/31/02 8:16	690.4								
10/31/02 8:17	688.3								
10/31/02 8:18	690.4								
10/31/02 8:19	688.3								
10/31/02 8:20	674.9								
10/31/02 8:21	682.1								
10/31/02 8:22	697.6								
10/31/02 8:23	682.1								
10/31/02 8:24	682.1								
10/31/02 8:25	693.5								
10/31/02 8:26	687.3								
10/31/02 8:27	692.4								
10/31/02 8:28	680.1								
10/31/02 8:29	689.3								
10/31/02 8:30	694.5								
10/31/02 8:31	681.1								
10/31/02 8:32	687.3								
10/31/02 8:33	687.3								
10/31/02 8:34	667.7								
10/31/02 8:35	664.6								
10/31/02 8:36	667.7								
10/31/02 8:37	655.4								
10/31/02 8:38	670.8								
10/31/02 8:39	667.7								
10/31/02 8:40	674.9								
10/31/02 8:41	691.4								
10/31/02 8:42	693.5								
10/31/02 8:43	704.8								
10/31/02 8:44	717.2								
10/31/02 8:45	717.2								
10/31/02 8:46	728.5								
10/31/02 8:47	721.3								
10/31/02 8:48	720.2								
10/31/02 8:49	719.2								
10/31/02 8:50	719.2								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 8:51	714.1								
10/31/02 8:52	708.9								
10/31/02 8:53	699.6								
10/31/02 8:54	702.7								
10/31/02 8:55	688.3								
10/31/02 8:56	698.6								
10/31/02 8:57	700.7								
10/31/02 8:58	695.5								
10/31/02 8:59	705.8								
10/31/02 9:00	707.9								
10/31/02 9:01	701.7								
10/31/02 9:02	711.0								
10/31/02 9:03	709.9								
10/31/02 9:04	705.8								
10/31/02 9:05	721.3								
10/31/02 9:06	681.1								
10/31/02 9:07	678.0								
10/31/02 9:08	681.1								
10/31/02 9:09	679.0								
10/31/02 9:10	679.0								
10/31/02 9:11	680.1								
10/31/02 9:12	673.9								
10/31/02 9:13	680.1								
10/31/02 9:14	674.9								
10/31/02 9:15	673.9								
10/31/02 9:16	676.0								
10/31/02 9:17	663.6								
10/31/02 9:18	667.7								
10/31/02 9:19	664.6								
10/31/02 9:20	648.2								
10/31/02 9:21	642.0								
10/31/02 9:22	633.7								
10/31/02 9:23	618.3								
10/31/02 9:24	616.2								
10/31/02 9:25	609.0								
10/31/02 9:26	597.7								
10/31/02 9:27	566.8								
10/31/02 9:28	553.4								
10/31/02 9:29	78.7								
10/31/02 9:30	6.6								
10/31/02 9:31	16.9								
10/31/02 9:32	263.0								
10/31/02 9:33	614.2								
10/31/02 9:34	685.2								
10/31/02 9:35	580.1								
10/31/02 9:36	689.3								
10/31/02 9:37	685.2								
10/31/02 9:38	673.9								
10/31/02 9:39	699.6								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 9:40	700.7								
10/31/02 9:41	686.3								
10/31/02 9:42	686.3								
10/31/02 9:43	690.4								
10/31/02 9:44	673.9								
10/31/02 9:45	679.0								
10/31/02 9:46	691.4								
10/31/02 9:47	680.1								
10/31/02 9:48	696.6								
10/31/02 9:49	689.3								
10/31/02 9:50	680.1								
10/31/02 9:51	679.0								
10/31/02 9:52	676.0								
10/31/02 9:53	671.8								
10/31/02 9:54	681.1								
10/31/02 9:55	670.8								
10/31/02 9:56	678.0								
10/31/02 9:57	668.8								
10/31/02 9:58	661.5								
10/31/02 9:59	661.5								
10/31/02 10:00	660.5								
10/31/02 10:01	654.3								
10/31/02 10:02	666.7								
10/31/02 10:03	664.6								
10/31/02 10:04	658.5								
10/31/02 10:05	674.9								
10/31/02 10:06	671.8								
10/31/02 10:07	666.7								
10/31/02 10:08	677.0								
10/31/02 10:09	685.2								
10/31/02 10:10	673.9								
10/31/02 10:11	671.8								
10/31/02 10:12	659.5								
10/31/02 10:13	662.6								
10/31/02 10:14	666.7								
10/31/02 10:15	650.2								
10/31/02 10:16	656.4								
10/31/02 10:17	660.5								
10/31/02 10:18	649.2								
10/31/02 10:19	658.5								
10/31/02 10:20	661.5								
10/31/02 10:21	654.3								
10/31/02 10:22	663.6								
10/31/02 10:23	662.6								
10/31/02 10:24	659.5								
10/31/02 10:25	678.0								
10/31/02 10:26	672.9								
10/31/02 10:27	667.7								
10/31/02 10:28	671.8								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 10:29	670.8								
10/31/02 10:30	676.0								
10/31/02 10:31	680.1								
10/31/02 10:32	670.8								
10/31/02 10:33	660.5								
10/31/02 10:34	664.6								
10/31/02 10:35	658.5								
10/31/02 10:36	664.6								
10/31/02 10:37	662.6								
10/31/02 10:38	658.5								
10/31/02 10:39	672.9								
10/31/02 10:40	662.6								
10/31/02 10:41	653.3								
10/31/02 10:42	666.7								
10/31/02 10:43	664.6								
10/31/02 10:44	678.0								
10/31/02 10:45	678.0								
10/31/02 10:46	671.8								
10/31/02 10:47	680.1								
10/31/02 10:48	684.2								
10/31/02 10:49	672.9								
10/31/02 10:50	681.1								
10/31/02 10:51	677.0								
10/31/02 10:52	666.7								
10/31/02 10:53	667.7								
10/31/02 10:54	661.5								
10/31/02 10:55	656.4								
10/31/02 10:56	655.4								
10/31/02 10:57	652.3								
10/31/02 10:58	662.6								
10/31/02 10:59	649.2								
10/31/02 11:00	657.4								
10/31/02 11:01	661.5								
10/31/02 11:02	661.5								
10/31/02 11:03	678.0								
10/31/02 11:04	666.7								
10/31/02 11:05	654.3								
10/31/02 11:06	673.9								
10/31/02 11:07	672.9								
10/31/02 11:08	669.8								
10/31/02 11:09	676.0								
10/31/02 11:10	666.7								
10/31/02 11:11	680.1								
10/31/02 11:12	674.9								
10/31/02 11:13	666.7								
10/31/02 11:14	679.0								
10/31/02 11:15	680.1								
10/31/02 11:16	672.9								
10/31/02 11:17	682.1								

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October 31, 2002

DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 11:18	673.9								
10/31/02 11:19	687.3								
10/31/02 11:20	691.4								
10/31/02 11:21	679.0								
10/31/02 11:22	690.4								
10/31/02 11:23	686.3								
10/31/02 11:24	681.1								
10/31/02 11:25	691.4								
10/31/02 11:26	693.5								
10/31/02 11:27	699.6								
10/31/02 11:28	704.8								
10/31/02 11:29	700.7								
10/31/02 11:30	695.5								
10/31/02 11:31	700.7								
10/31/02 11:32	694.5								
10/31/02 11:33	697.6								
10/31/02 11:34	697.6								
10/31/02 11:35	701.7								
10/31/02 11:36	699.6								
10/31/02 11:37	687.3								
10/31/02 11:38	680.1								
10/31/02 11:39	688.3								
10/31/02 11:40	686.3								
10/31/02 11:41	689.3								
10/31/02 11:42	700.7								
10/31/02 11:43	695.5								
10/31/02 11:44	699.6								
10/31/02 11:45	695.5								
10/31/02 11:46	703.8								
10/31/02 11:47	701.7								
10/31/02 11:48	706.9								
10/31/02 11:49	700.7								
10/31/02 11:50	705.8								
10/31/02 11:51	697.6								
10/31/02 11:52	701.7								
10/31/02 11:53	704.8								
10/31/02 11:54	698.6								
10/31/02 11:55	695.5								
10/31/02 11:56	704.8								
10/31/02 11:57	693.5								
10/31/02 11:58	694.5								
10/31/02 11:59	698.6								
10/31/02 12:00	685.3								
10/31/02 12:01	694.5								
10/31/02 12:02	699.6								
10/31/02 12:03	689.3								
10/31/02 12:04	703.8								
10/31/02 12:05	699.6								
10/31/02 12:06	699.6								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 12:07	704.8								
10/31/02 12:08	711.0								
10/31/02 12:09	697.6								
10/31/02 12:10	706.9								
10/31/02 12:11	715.1								
10/31/02 12:12	709.9								
10/31/02 12:13	693.5								
10/31/02 12:14	708.9								
10/31/02 12:15	712.0								
10/31/02 12:16	702.7								
10/31/02 12:17	708.9								
10/31/02 12:18	701.7								
10/31/02 12:19	760.4								
10/31/02 12:20	988.0								
10/31/02 12:21	1000.3		Interim Cal 991						
10/31/02 12:22	1000.3								
10/31/02 12:23	789.2								
10/31/02 12:24	56.0								
10/31/02 12:25	4.5		Interim Cal 0						
10/31/02 12:26	3.5								
10/31/02 12:27	103.4								
10/31/02 12:28	628.6								
10/31/02 12:29	717.2								
10/31/02 12:30	702.7								
10/31/02 12:31	705.8								
10/31/02 12:32	708.9								
10/31/02 12:33	708.9								
10/31/02 12:34	696.6								
10/31/02 12:35	702.7								
10/31/02 12:36	700.7								
10/31/02 12:37	699.6								
10/31/02 12:38	695.5								
10/31/02 12:39	702.7								
10/31/02 12:40	706.9								
10/31/02 12:41	703.8								
10/31/02 12:42	699.6								
10/31/02 12:43	700.7								
10/31/02 12:44	692.4								
10/31/02 12:45	701.7								
10/31/02 12:46	714.1								
10/31/02 12:47	706.9								
10/31/02 12:48	730.5								
10/31/02 12:49	719.2								
10/31/02 12:50	719.2								
10/31/02 12:51	735.7								
10/31/02 12:52	729.5								
10/31/02 12:53	723.3								
10/31/02 12:54	738.8								
10/31/02 12:55	753.2								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 12:56	764.5								
10/31/02 12:57	791.3								
10/31/02 12:58	805.7								
10/31/02 12:59	824.2								
10/31/02 13:00	852.1								
10/31/02 13:01	875.7								
10/31/02 13:02	887.1								
10/31/02 13:03	900.5								
10/31/02 13:04	941.6.								
10/31/02 13:05	969.4								
10/31/02 13:06	981.8								
10/31/02 13:07	1003.4								
10/31/02 13:08	1006.5								
10/31/02 13:09	1008.6								
10/31/02 13:10	1039.5								
10/31/02 13:11	1036.4								
10/31/02 13:12	1032.3								
10/31/02 13:13	1035.4								
10/31/02 13:14	1015.8								
10/31/02 13:15	1006.5								
10/31/02 13:16	1027.1								
10/31/02 13:17	1038.4								
10/31/02 13:18	1039.5								
10/31/02 13:19	1047.7								
10/31/02 13:20	1064.2								
10/31/02 13:21	1057.0								
10/31/02 13:22	1073.5								
10/31/02 13:23	1094.1								
10/31/02 13:24	1092.0								
10/31/02 13:25	1104.4								
10/31/02 13:26	1106.4								
10/31/02 13:27	1111.56								
10/31/02 13:28	1142.453								
10/31/02 13:29	1165.109		*Begin Run 1*						
10/31/02 13:30	1159.96	1		6.25	1008	991	1141.3	13401	71.49
10/31/02 13:31	1182.615	1		6.25	1008	991	1163.7	13401	72.89
10/31/02 13:32	1194.973	1		6.25	1008	991	1176.0	13401	73.66
10/31/02 13:33	1188.794	1		6.25	1008	991	1169.9	13401	73.28
10/31/02 13:34	1167.168	1		6.25	1008	991	1148.5	13401	71.94
10/31/02 13:35	1166.139	1		6.25	1008	991	1147.4	13401	71.87
10/31/02 13:36	1157.9	1		6.25	1008	991	1139.3	13401	71.36
10/31/02 13:37	1151.722	1		6.25	1008	991	1133.2	13401	70.98
10/31/02 13:38	1162.02	1		6.25	1008	991	1143.4	13401	71.62
10/31/02 13:39	1171.288	1		6.25	1008	991	1152.5	13401	72.19
10/31/02 13:40	1135.245	1		6.25	1008	991	1116.9	13401	69.96
10/31/02 13:41	1149.662	1		6.25	1008	991	1131.1	13401	70.85
10/31/02 13:42	1164.079	1		6.25	1008	991	1145.4	13401	71.75
10/31/02 13:43	1155.841	1		6.25	1008	991	1137.3	13401	71.24
10/31/02 13:44	1170.258	1		6.25	1008	991	1151.5	13401	72.13

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{ma}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 13:45	1171.288	1		6.25	1008	991	1152.5	13401	72.19
10/31/02 13:46	1153.781	1		6.25	1008	991	1135.2	13401	71.11
10/31/02 13:47	1178.496	1		6.25	1008	991	1159.7	13401	72.64
10/31/02 13:48	1194.973	1		6.25	1008	991	1176.0	13401	73.66
10/31/02 13:49	1194.973	1		6.25	1008	991	1176.0	13401	73.66
10/31/02 13:50	1215.569	1		6.25	1008	991	1196.3	13401	74.94
10/31/02 13:51	1181.585	1		6.25	1008	991	1162.7	13401	72.83
10/31/02 13:52	1190.854	1		6.25	1008	991	1171.9	13401	73.40
10/31/02 13:53	1165.109	1		6.25	1008	991	1146.4	13401	71.81
10/31/02 13:54	1147.602	1		6.25	1008	991	1129.1	13401	70.72
10/31/02 13:55	1141.424	1		6.25	1008	991	1123.0	13401	70.34
10/31/02 13:56	1135.245	1		6.25	1008	991	1116.9	13401	69.96
10/31/02 13:57	1142.453	1		6.25	1008	991	1124.0	13401	70.41
10/31/02 13:58	1144.513	1		6.25	1008	991	1126.0	13401	70.53
10/31/02 13:59	1130.096	1		6.25	1008	991	1111.8	13401	69.64
10/31/02 14:00	1141.424	1		6.25	1008	991	1123.0	13401	70.34
10/31/02 14:01	1115.679	1		6.25	1008	991	1097.5	13401	68.75
10/31/02 14:02	1139.364	1		6.25	1008	991	1121.0	13401	70.21
10/31/02 14:03	1142.453	1		6.25	1008	991	1124.0	13401	70.41
10/31/02 14:04	1132.156	1		6.25	1008	991	1113.8	13401	69.77
10/31/02 14:05	1147.602	1		6.25	1008	991	1129.1	13401	70.72
10/31/02 14:06	1182.615	1		6.25	1008	991	1163.7	13401	72.89
10/31/02 14:07	1173.347	1		6.25	1008	991	1154.6	13401	72.32
10/31/02 14:08	1190.854	1		6.25	1008	991	1171.9	13401	73.40
10/31/02 14:09	1227.926	1		6.25	1008	991	1208.6	13401	75.70
10/31/02 14:10	1205.271	1		6.25	1008	991	1186.2	13401	74.30
10/31/02 14:11	1191.883	1		6.25	1008	991	1172.9	13401	73.47
10/31/02 14:12	1225.866	1		6.25	1008	991	1206.5	13401	75.57
10/31/02 14:13	1212.479	1		6.25	1008	991	1193.3	13401	74.74
10/31/02 14:14	1186.734	1		6.25	1008	991	1167.8	13401	73.15
10/31/02 14:15	1221.747	1		6.25	1008	991	1202.5	13401	75.32
10/31/02 14:16	1196.003	1		6.25	1008	991	1177.0	13401	73.72
10/31/02 14:17	1157.9	1		6.25	1008	991	1139.3	13401	71.36
10/31/02 14:18	1186.734	1		6.25	1008	991	1167.8	13401	73.15
10/31/02 14:19	1186.734	1		6.25	1008	991	1167.8	13401	73.15
10/31/02 14:20	1178.496	1		6.25	1008	991	1159.7	13401	72.64
10/31/02 14:21	1200.122	1		6.25	1008	991	1181.1	13401	73.98
10/31/02 14:22	1172.317	1		6.25	1008	991	1153.6	13401	72.26
10/31/02 14:23	1178.496	1		6.25	1008	991	1159.7	13401	72.64
10/31/02 14:24	1200.122	1		6.25	1008	991	1181.1	13401	73.98
10/31/02 14:25	1184.675	1		6.25	1008	991	1165.8	13401	73.02
10/31/02 14:26	1194.973	1		6.25	1008	991	1176.0	13401	73.66
10/31/02 14:27	1186.734	1		6.25	1008	991	1167.8	13401	73.15
10/31/02 14:28	1185.705	1		6.25	1008	991	1166.8	13401	73.09
10/31/02 14:29	1218.658	1		6.25	1008	991	1199.4	13401	75.13
10/31/02 14:30	1220.718			***Run 1 Average***			***1155.1***		***72.35***
10/31/02 14:31	1206.3								
10/31/02 14:32	1235.164								
10/31/02 14:33	1118.768								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_O	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 14:34	159.004								
10/31/02 14:35	6.5951								
10/31/02 14:36	3.5057		Zero CO Cal						
10/31/02 14:37	3.5057		Zero CO Cal						
10/31/02 14:38	8.6546								
10/31/02 14:39	656.3926								
10/31/02 14:40	989.0148								
10/31/02 14:41	995.1935		991 CO Cal						
10/31/02 14:42	995.1935		991 CO Cal						
10/31/02 14:43	1068.309								
10/31/02 14:44	1213.509								
10/31/02 14:45	1194.973								
10/31/02 14:46	1191.883								
10/31/02 14:47	1166.139								
10/31/02 14:48	1138.334								
10/31/02 14:49	1182.615								
10/31/02 14:50	1179.526								
10/31/02 14:51	1163.049								
10/31/02 14:52	1172.317								
10/31/02 14:53	1160.99								
10/31/02 14:54	1174.377								
10/31/02 14:55	1160.99								
10/31/02 14:56	1171.288								
10/31/02 14:57	1190.854								
10/31/02 14:58	1191.883								
10/31/02 14:59	1176.437								
10/31/02 15:00	1190.854								
10/31/02 15:01	1192.913								
10/31/02 15:02	1191.883								
10/31/02 15:03	1215.569								
10/31/02 15:04	1186.734								
10/31/02 15:05	1169.228								
10/31/02 15:06	1178.496								
10/31/02 15:07	1181.585								
10/31/02 15:08	1187.764								
10/31/02 15:09	1217.628								
10/31/02 15:10	1228.956								
10/31/02 15:11	1193.943								
10/31/02 15:12	1201.151								
10/31/02 15:13	1210.42								
10/31/02 15:14	1228.956								
10/31/02 15:15	1200.122								
10/31/02 15:16	1233.075								
10/31/02 15:17	1228.956								
10/31/02 15:18	1199.092								
10/31/02 15:19	1219.688								
10/31/02 15:20	1237.194								
10/31/02 15:21	1208.36								
10/31/02 15:22	1221.747								

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DATA RECORDER PRINTOUT and TEST SUMMARY

Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 15:23	1214.539								
10/31/02 15:24	1203.211								
10/31/02 15:25	1205.271								
10/31/02 15:26	1229.986								
10/31/02 15:27	1212.479								
10/31/02 15:28	1200.122								
10/31/02 15:29	1242.343								
10/31/02 15:30	1227.926								
10/31/02 15:31	1227.926								
10/31/02 15:32	1243.373								
10/31/02 15:33	1216.598								
10/31/02 15:34	1221.747								
10/31/02 15:35	1202.181								
10/31/02 15:36	1218.658								
10/31/02 15:37	1213.509								
10/31/02 15:38	1211.449								
10/31/02 15:39	1221.747								
10/31/02 15:40	1209.39								
10/31/02 15:41	1217.628								
10/31/02 15:42	1234.105								
10/31/02 15:43	1216.598								
10/31/02 15:44	1205.271								
10/31/02 15:45	1209.39								
10/31/02 15:46	1194.973		*Begin Run 2*						
10/31/02 15:47	1190.854	2		4	995.5	991	1186 3	13171	73 03
10/31/02 15:48	1209.39	2		4	995.5	991	1204.8	13171	74 17
10/31/02 15:49	1221.747	2		4	995.5	991	1217.1	13171	74 93
10/31/02 15:50	1209.39	2		4	995.5	991	1204.8	13171	74 17
10/31/02 15:51	1240.284	2		4	995.5	991	1235 7	13171	76 07
10/31/02 15:52	1235.135	2		4	995.5	991	1230.5	13171	75 75
10/31/02 15:53	1231.015	2		4	995.5	991	1226 4	13171	75 50
10/31/02 15:54	1245.432	2		4	995.5	991	1240.8	13171	76 39
10/31/02 15:55	1211.449	2		4	995.5	991	1206 8	13171	74 30
10/31/02 15:56	1201.151	2		4	995.5	991	1196.5	13171	73 56
10/31/02 15:57	1229.986	2		4	995.5	991	1225.4	13171	75 44
10/31/02 15:58	1215.569	2		4	995.5	991	1211.0	13171	74 55
10/31/02 15:59	1216.598	2		4	995.5	991	1212.0	13171	74 61
10/31/02 16:00	1223.807	2		4	995.5	991	1219.2	13171	75 06
10/31/02 16:01	1196.003	2		4	995.5	991	1191 4	13171	73 35
10/31/02 16:02	1197.032	2		4	995.5	991	1192 4	13171	73 41
10/31/02 16:03	1182.615	2		4	995.5	991	1178 0	13171	72 52
10/31/02 16:04	1170.258	2		4	995.5	991	1165 7	13171	71 76
10/31/02 16:05	1185.705	2		4	995.5	991	1181 1	13171	72 71
10/31/02 16.06	1177.466	2		4	995.5	991	1172 9	13171	72 21
10/31/02 16.07	1186.734	2		4	995 5	991	1182 1	13171	72 78
10/31/02 16 08	1192.913	2		4	995.5	991	1188 3	13171	73 16
10/31/02 16 09	1198.062	2		4	995 5	991	1193 5	13171	73 47
10/31/02 16 10	1226.896	2		4	995.5	991	1222 3	13171	75 25
10/31/02 16 11	1211.449	2		4	995.5	991	1206 8	13171	74 30

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Time	CO, ppm	Run Number	COMMENTS	CO C_O	CO C_M	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 16:12	1214.539	2		4	995.5	991	1209.9	13171	74 49
10/31/02 16:13	1219.688	2		4	995.5	991	1215.1	13171	74 80
10/31/02 16:14	1215.569	2		4	995.5	991	1211.0	13171	74 55
10/31/02 16:15	1200.122	2		4	995.5	991	1195.5	13171	73 60
10/31/02 16:16	1198.062	2		4	995.5	991	1193.5	13171	73 47
10/31/02 16:17	1194.973	2		4	995.5	991	1190.4	13171	73 28
10/31/02 16:18	1206.3	2		4	995.5	991	1201.7	13171	73 98
10/31/02 16:19	1210.42	2		4	995.5	991	1205.8	13171	74 23
10/31/02 16:20	1221.747	2		4	995.5	991	1217.1	13171	74 93
10/31/02 16:21	1216.598	2		4	995.5	991	1212.0	13171	74 61
10/31/02 16:22	1208.36	2		4	995.5	991	1203.8	13171	74 11
10/31/02 16:23	1199.092	2		4	995.5	991	1194.5	13171	73 54
10/31/02 16:24	1219.688	2		4	995.5	991	1215.1	13171	74 80
10/31/02 16:25	1216.598	2		4	995.5	991	1212.0	13171	74 61
10/31/02 16:26	1207.33	2		4	995.5	991	1202.7	13171	74 04
10/31/02 16:27	1217.628	2		4	995.5	991	1213.0	13171	74 68
10/31/02 16:28	1211.449	2		4	995.5	991	1206.8	13171	74 30
10/31/02 16:29	1224.837	2		4	995.5	991	1220.2	13171	75 12
10/31/02 16:30	1244.403	2		4	995.5	991	1239.8	13171	76 32
10/31/02 16:31	1240.284	2		4	995.5	991	1235.7	13171	76 07
10/31/02 16:32	1235.135	2		4	995.5	991	1230.5	13171	75 75
10/31/02 16:33	1241.313	2		4	995.5	991	1236.7	13171	76 13
10/31/02 16:34	1231.015	2		4	995.5	991	1226 4	13171	75 50
10/31/02 16:35	1238.224	2		4	995.5	991	1233 6	13171	75 94
10/31/02 16:36	1251.611	2		4	995.5	991	1247.0	13171	76 77
10/31/02 16:37	1236.164	2		4	995.5	991	1231.5	13171	75 82
10/31/02 16:38	1234.105	2		4	995.5	991	1229 5	13171	75 69
10/31/02 16:39	1234.105	2		4	995.5	991	1229.5	13171	75 69
10/31/02 16:40	1232.045	2		4	995.5	991	1227.4	13171	75 56
10/31/02 16:41	1222.777	2		4	995.5	991	1218 2	13171	74 99
10/31/02 16:42	1225.866	2		4	995.5	991	1221 2	13171	75 18
10/31/02 16:43	1233.075	2		4	995.5	991	1228 5	13171	75 63
10/31/02 16:44	1225.866	2		4	995.5	991	1221 2	13171	75 18
10/31/02 16:45	1233.075	2		4	995 5	991	1228 5	13171	75 63
10/31/02 16:46	1241.313	2		4	995.5	991	1236.7	13171	76 13
10/31/02 16:47	1240.284			*Run 2 Average*			***1212.2***		***74.6***
10/31/02 16:48	1232.045								
10/31/02 16:49	1254.701								
10/31/02 16:50	1280.445								
10/31/02 16:51	1276.326								
10/31/02 16:52	1218.658								
10/31/02 16:53	982.836								
10/31/02 16:54	996.2233		991 CO Cal						
10/31/02 16 55	996.2233								
10/31/02 16 56	862.3506								
10/31/02 16 57	81.7697								
10/31/02 16 58	4.5355								
10/31/02 16 59	4.5355		0 CO Cal						
10/31/02 17 00	4.5355								

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Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{MA}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 17:01	4.5355								
10/31/02 17:02	4.5355								
10/31/02 17:03	713.031								
10/31/02 17:04	1258.82								
10/31/02 17:05	1270.147								
10/31/02 17:06	1279.416								
10/31/02 17:07	1303.101								
10/31/02 17:08	1293.833								
10/31/02 17:09	1296.922		*Begin Run 3*						
10/31/02 17:10	1322.667	3		4.5	996.5	991	1316.8	12999	80.01
10/31/02 17:11	1314.428	3		4.5	996.5	991	1308.6	12999	79.51
10/31/02 17:12	1292.803	3		4.5	996.5	991	1287.0	12999	78.20
10/31/02 17:13	1296.922	3		4.5	996.5	991	1291.1	12999	78.45
10/31/02 17:14	1282.505	3		4.5	996.5	991	1276.7	12999	77.57
10/31/02 17:15	1256.76	3		4.5	996.5	991	1251.0	12999	76.01
10/31/02 17:16	1223.807	3		4.5	996.5	991	1218.1	12999	74.01
10/31/02 17:17	1246.462	3		4.5	996.5	991	1240.7	12999	75.38
10/31/02 17:18	1213.509	3		4.5	996.5	991	1207.8	12999	73.38
10/31/02 17:19	1224.837	3		4.5	996.5	991	1219.1	12999	74.07
10/31/02 17:20	1255.73	3		4.5	996.5	991	1250.0	12999	75.95
10/31/02 17:21	1256.76	3		4.5	996.5	991	1251.0	12999	76.01
10/31/02 17:22	1245.432	3		4.5	996.5	991	1239.7	12999	75.32
10/31/02 17:23	1259.849	3		4.5	996.5	991	1254.1	12999	76.20
10/31/02 17:24	1260.879	3		4.5	996.5	991	1255.1	12999	76.26
10/31/02 17:25	1267.058	3		4.5	996.5	991	1261.3	12999	76.63
10/31/02 17:26	1287.654	3		4.5	996.5	991	1281.9	12999	77.88
10/31/02 17:27	1280.445	3		4.5	996.5	991	1274.7	12999	77.45
10/31/02 17:28	1263.969	3		4.5	996.5	991	1258.2	12999	76.45
10/31/02 17:29	1277.356	3		4.5	996.5	991	1271.6	12999	77.26
10/31/02 17:30	1294.862	3		4.5	996.5	991	1289.1	12999	78.32
10/31/02 17:31	1281.475	3		4.5	996.5	991	1275.7	12999	77.51
10/31/02 17:32	1269.118	3		4.5	996.5	991	1263.3	12999	76.76
10/31/02 17:33	1268.088	3		4.5	996.5	991	1262.3	12999	76.70
10/31/02 17:34	1252.641	3		4.5	996.5	991	1246.9	12999	75.76
10/31/02 17:35	1231.015	3		4.5	996.5	991	1225.3	12999	74.45
10/31/02 17:36	1248.522	3		4.5	996.5	991	1242.8	12999	75.51
10/31/02 17:37	1234.105	3		4.5	996.5	991	1228.4	12999	74.63
10/31/02 17:38	1242.343	3		4.5	996.5	991	1236.6	12999	75.13
10/31/02 17:39	1253.671	3		4.5	996.5	991	1247.9	12999	75.82
10/31/02 17:40	1234.105	3		4.5	996.5	991	1228.4	12999	74.63
10/31/02 17:41	1227.926	3		4.5	996.5	991	1222.2	12999	74.26
10/31/02 17:42	1250.581	3		4.5	996.5	991	1244.5	12999	75.63
10/31/02 17:43	1240.284	3		4.5	996.5	991	1234.5	12999	[illegible]
10/31/02 17:44	1247.492	3		4.5	996.5	991	[illegible]	12999	75.45
10/31/02 17:45	1254.701	3		4.5	996.5	991	[illegible]	12999	75.88
10/31/02 17:46	1238.224	3		4.5	996.5	991	1232.5	12999	74.82
10/31/02 17:47	1240.284	3		4.5	996.5	991	1234.5	12999	[illegible]
10/31/02 17:48	1256.76	3		4.5	996.5	991	[illegible]	12999	[illegible]
10/31/02 17:49	1249.552	3		4.5	996.5	991	[illegible]	12999	[illegible]

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Time	CO, ppm	Run Number	COMMENTS	CO C_o	CO C_m	CO C_{ma}	CO, ppm Drift Corrected	Flow, SCFM-Dry	CO, pounds per hour
10/31/02 17:50	1278 386	3		4.5	996.5	991	1272 6	12999	77 32
10/31/02 17:51	1292.803	3		4.5	996.5	991	1287.0	12999	78 20
10/31/02 17:52	1252.641	3		4.5	996.5	991	1246.9	12999	75 76
10/31/02 17:53	1244.403	3		4.5	996.5	991	1238.7	12999	75 26
10/31/02 17:54	1267.058	3		4.5	996.5	991	1261.3	12999	76 63
10/31/02 17:55	1237.194	3		4.5	996.5	991	1231.5	12999	74 82
10/31/02 17:56	1227.926	3		4.5	996.5	991	1222.2	12999	74 26
10/31/02 17:57	1244.403	3		4.5	996.5	991	1238.7	12999	75 26
10/31/02 17:58	1236.164	3		4.5	996.5	991	1230.4	12999	74 76
10/31/02 17:59	1232.045	3		4.5	996.5	991	1226.3	12999	74 51
10/31/02 18:00	1203.211	3		4.5	996.5	991	1197.5	12999	72 76
10/31/02 18:01	1145.543	3		4.5	996.5	991	1139.9	12999	69 26
10/31/02 18:02	1080.666	3		4.5	996.5	991	1075.1	12999	65 32
10/31/02 18:03	1049.772	3		4.5	996.5	991	1044.2	12999	63 45
10/31/02 18:04	1069.338	3		4.5	996.5	991	1063.8	12999	64 63
10/31/02 18:05	1129.066	3		4.5	996.5	991	1123.4	12999	68 26
10/31/02 18:06	1173.347	3		4.5	996.5	991	1167.7	12999	70 95
10/31/02 18:07	1174.377	3		4.5	996.5	991	1168.7	12999	71 01
10/31/02 18:08	1167.168	3		4.5	996.5	991	1161.5	12999	70 57
10/31/02 18:09	1150.692	3		4.5	996.5	991	1145.0	12999	69 57
10/31/02 18:10	1134.215			***Run 3 Average***			***1231.0***		***74.8***
10/31/02 18:11	1163.049								
10/31/02 18:12	350.5449								
10/31/02 18:13	17.9228								
10/31/02 18:14	4.5355		0 CO Cal						
10/31/02 18:15	4.5355								
10/31/02 18:16	149.7359								
10/31/02 18:17	894.274								
10/31/02 18:18	997.2531		991 CO Cal						
10/31/02 18:19	998.2829								
10/31/02 18:20	968 4189								

APPENDIX – C

Laboratory Analysis

TECHNICAL SERVICES, INC.
ENVIRONMENTAL CONSULTANTS

For Ambient Air Services, Inc.
106 AMBIENT AIR WAY
STARKE, FL 32091
Contact: Joe Cooksey

Report Date *11-Nov-02*
Date Received 11/01/2002 @ 16 15
Purchase Order #

CERTIFICATE OF ANALYSIS

LAB SAMPLE DESCRIPTION	MATRIX	SAMPLE DATE	SAMPLE TIME	SAMPLED BY
02110037 GP/PALATKA, BLEACH PLANT, RUN 1	IMP. CATCH	10/31/2002	UNKNOWN	
02110038 GP/PALATKA, BLEACH PLANT, RUN 2	IMP. CATCH	10/31/2002	UNKNOWN	
02110039 GP/PALATKA, BLEACH PLANT, RUN 3	IMP. CATCH	10/31/2002	UNKNOWN	
02110040 GP/PALATKA, BLEACH PLANT, RUN 1	IMP. CATCH	10/29/2002	UNKNOWN	
02110041 GP/PALATKA, BLEACH PLANT, RUN 2	IMP. CATCH	10/29/2002	UNKNOWN	
02110042 GP/PALATKA, BLEACH PLANT, RUN 3	IMP. CATCH	10/29/2002	UNKNOWN	
02110043 GP/PALATKA, BLEACH PLANT, FIELD BLANK		UNKNOWN	UNKNOWN	

Respectfully submitted,
Technical Services, Inc

Air and Water Pollution Sampling, Surveys, Testing and Analytical Services

2301 Dareste Street • Jacksonville, Florida 32206 • 904 353-5761 • FAX 904 358-3308

Lab No	Parameter	Result		Code	Method	Detection Limit
02110037	Chloride in base	214.2	ug/ml Cl-	A	Method 26A	0.02
02110038	Chloride in base	134.3	ug/ml Cl-		Method 26A	0.02
02110039	Chloride in base	151.1	TOTAL UG		Method 26A	0.02
02110040	Chloride in base	438.9	TOTAL UG		Method 26A	0.02
02110041	Chloride in base	320.0	TOTAL UG		Method 26A	0.02
02110042	Chloride in base	354.6	TOTAL UG		Method 26A	0.02
02110043	Chloride in base	104.3	TOTAL UG	A	Method 26A	0.02

Lab No	Parameter	Date of Analysis	Analysis Time	Analyst	Prep Date
02110037	Chloride in base	11/11/2002		CRB	
02110038	Chloride in base	11/11/2002		CRB	
02110039	Chloride in base	11/11/2002		CRB	
02110040	Chloride in base	11/11/2002		CRB	
02110041	Chloride in base	11/11/2002		CRB	
02110042	Chloride in base	11/11/2002		CRB	
02110043	Chloride in base	11/11/2002		CRB	

APPENDIX – D

Equipment Calibration Data

- Carbon Monoxide Analyzer Calibration
- Annual Meter Calibration
- Post Test Meter Calibration
- Pitot Tube Calibration
- Thermocouple Calibration

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test

October 29, 2002

Equipment List

Carbon Monoxide Instrument: **Manufacturer -** Thermo Environmental Instruments **Model -** 48 CHL
Serial Number - 63892-341
CO Range - zero to 2000 ppm

Calibration Gas Standards		Concentration	Manufacturer	Cylinder Number	Expiration Date	PSI
Zero	Zero	0.00	Air Products	Nitrogen	N/A	1200
Low	CO	991.00	Air Liquide	CC121974	Jul-04	800
	CO	1994.00	Air Liquide	CC70989	Jul-04	900
Mid	CO	594.40	Praxair	SA12251	Jan-04	1200
High	CO	301.90	Air Liquide	CC121974	Jul-04	1100

Description of Sampling System :

6', 1/4" SS probe to valve to H_2O condenser to 200 feet 3/8 Teflon sample line to SS pump to instruments
all calibration gases injected direct to probe valve location
Sampling probe located nominally mid of 42" stack

Test Participants :

CO Testing - Joe Cooksey, Ambient Air Services, Inc.
Joe Taylor - Georgia-Pacific Representitive

Other Comments :

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 29, 2002
Calibration Sheet

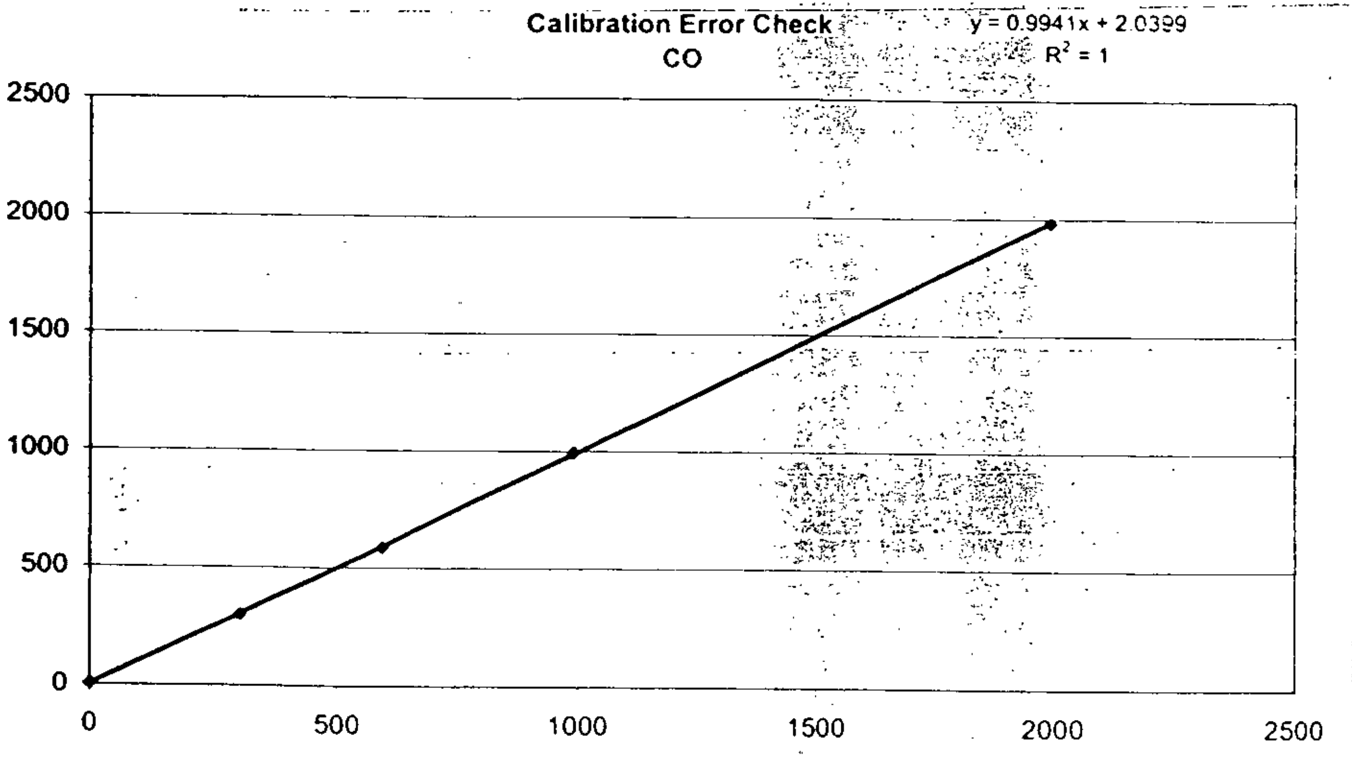
Initial Calibration

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	12:00	4
CO	991	12:00	995.4
CO	1994	12:00	1982.2
CO	594.4	12:00	588
CO	301.9	12:00	299.1

% Error of Range Table

Inject (ppm)		Time	% Error of Range
Gas	Conc.		CO
Zero	0	12:00	0.20%
CO	991	12:00	0.22%
CO	1994	12:00	-0.59%
CO	594.4	12:00	-0.32%
CO	301.9	12:00	-0.14%



Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 29, 2002

Calibration Sheet

Calibration - Post Run 1

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	13:30	5.6
CO	991	13:30	998 3

Drift Analysis From Initial Calibrations to the End of Run 1

Inject (ppm)		Time	Drift Analysis (%)
Gas	Conc.		CO
Zero	0	13:30	0.08%
CO	991	13:30	0.14%

Drift Variables for Run 1

Variable	CO	
Co	4.80	
Cm	996.85	
Cma	991.00	

Calibration - Post Run 2

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0		2.5
CO	991		997.3

Drift Analysis From Initial Calibrations to the End of Run 2

Inject (ppm)		Time	Drift Analysis (%)
Gas	Conc.		CO
Zero	0	0:00	-0.08%
CO	991	0:00	0.09%

Drift Variables for Run 2

Variable	CO	
Co	4.05	
Cm	997.80	
Cma	991	

Calibration - Post Run 3

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0		
CO	991		

Drift Analysis From Initial Calibrations to the End of Run 3

Inject (ppm)	Time	Drift Analysis (%)

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 29, 2002

Calibration Sheet

Gas	Conc.		CO
Zero	0	0:00	-0.20%
CO	991	0:00	-49.77%

Drift Variables for Run 3

Variable	CO	
Co	1.25	
Cm	498.65	
Cma	991	

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test

October 31, 2002

Equipment List

Carbon Monoxide Instrument: **Manufacturer -** Thermo Environmental Instruments **Model -** 48 CHL
Serial Number - 63892-341
CO Range - zero to 2000 ppm

Calibration Gas Standards		Concentration	Manufacturer	Cylinder Number	Expiration Date	PSI
Zero	Zero	0.00	Air Products	Nitrogen	N/A	1200
Low	CO	991.00	Air Liquide	CC121974	Jul-04	800
	CO	1994.00	Air Liquide	CC70989	Jul-04	900
Mid	CO	594.40	Praxair	SA12251	Jan-04	1200
High	CO	301.90	Air Liquide	CC121974	Jul-04	1100

Description of Sampling System :

6', 1/4" SS probe to valve to H_2O condenser to 200 feet 3/8 Teflon sample line to SS pump to instruments
all calibration gases injected direct to probe valve location
Sampling probe located nominally mid of 42" stack

Test Participants :

CO Testing - Randy Weston, Ambient Air Services, Inc.
Joe Taylor, Georgia Pacific Palatka Environmental contact

Other Comments :

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 31, 2002

Calibration Sheet

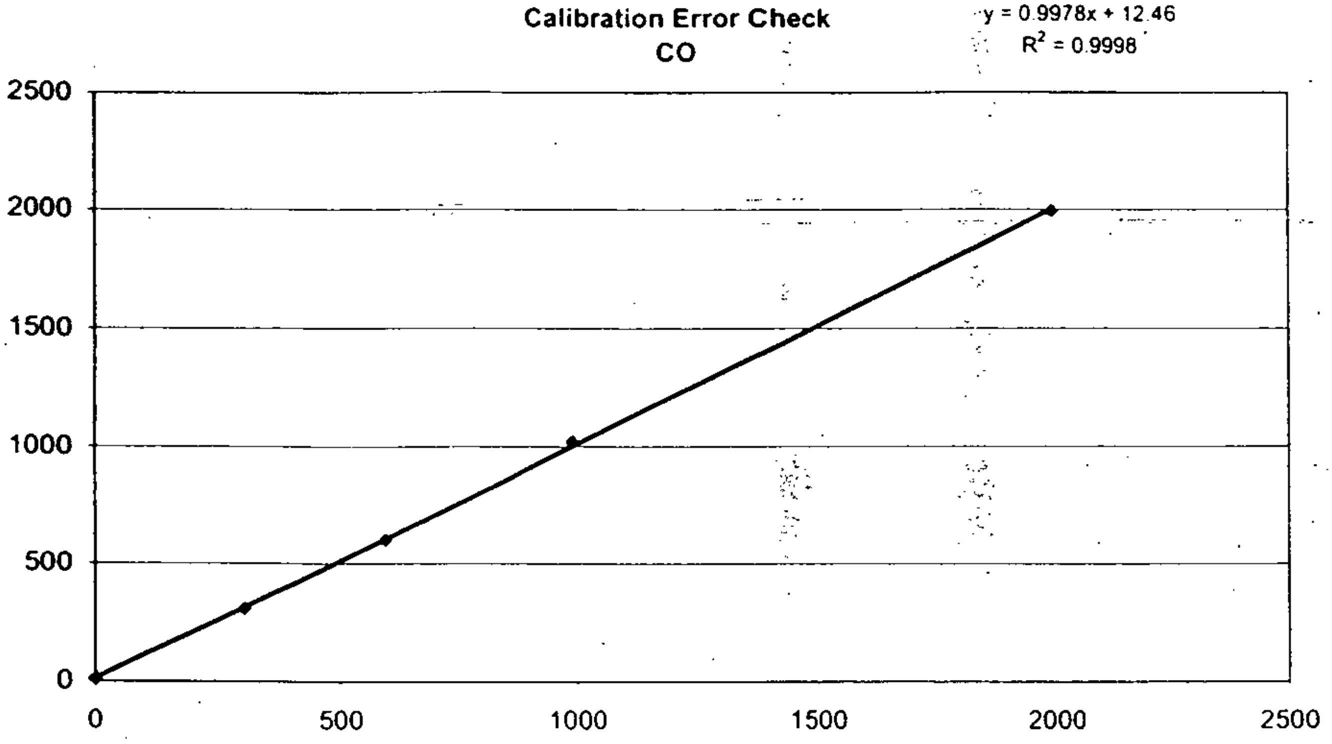
Initial Calibration

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	12:00	9
CO	991	12:00	1021
CO	1994	12:00	1994
CO	594.4	12:00	602
CO	301.9	12:00	309

% Error of Range Table

Inject (ppm)		Time	% Error of Range
Gas	Conc.		CO
Zero	0	12:00	0.45%
CO	991	12:00	1.50%
CO	1994	12:00	0.00%
CO	594.4	12:00	0.38%
CO	301.9	12:00	0.36%



Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 31, 2002
Calibration Sheet

Calibration - Post Run 1

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	14:36	3.5
CO	991	14:42	995

Drift Analysis From Initial Calibrations to the End of Run 1

Inject (ppm)		Time	Drift Analysis (%)
Gas	Conc.		CO
Zero	0	14:36	-0.28%
CO	991	14:42	-1.30%

Drift Variables for Run 1

Variable	CO	
Co	6.25	
Cm	1008.00	
Cma	991.00	

Calibration - Post Run 2

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	16:59	4.5
CO	991	16:54	996

Drift Analysis From Initial Calibrations to the End of Run 2

Inject (ppm)		Time	Drift Analysis (%)
Gas	Conc.		CO
Zero	0	16:59	-0.23%
CO	991	16:54	-1.25%

Drift Variables for Run 2

Variable	CO	
Co	4	
Cm	995.50	
Cma	991	

Calibration - Post Run 3

Response Table

Inject (ppm)		Time	Response (ppm)
Gas	Conc.		CO
Zero	0	18:14	4.5
CO	991	18:18	997

Drift Analysis From Initial Calibrations to the End of Run 3

Inject (ppm)	Time	Drift Analysis (%)

Georgia Pacific - Palatka, Florida
Bleach Plant Carbon Monoxide Test
0
October 31, 2002

Calibration Sheet

Gas	Conc.		CO
Zero	0	18:14	-0.23%
CO	991	18:18	-1.20%

Drift Variables for Run 3

Variable	CO	
Co	4.5	
Cm	996.50	
Cma	991	

Ambient Air Services, Inc. - Method 5 Dry Gas Meter Annual Calibration
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	AASI
Console Serial Number	Box 10
DGM Model Number	6947372
DGM Serial Number	

Calibration Conditions			
Date	Time	5-Sep-02	10 00
Barometric Pressure		29 8	in Hg
Theoretical Critical Vacuum[1]		14 1	in Hg
Calibration Technician		JOE ELLIOTT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29 92	in Hg
K_1	17 647	°R/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot {}^{\circ}R^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{ambi})	(t_{ambf})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
14 1	2 8	55 603	67 154	92	92	63	0 6213	89	89	21
6 0	4 6	67 154	75 011	98	98	73	0 8486	83	80	19
11 7	1 4	75 011	82 876	99	98	55	0 4793	81	79	22
13 4	0 8	82 876	88 974	98	99	48	0 3740	79	77	24
18 4	0 4	88 974	95 110	99	99	40	0 2511	77	77	24

Results

Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
$(V_{m(std)})$	$(Q_{m(std)})$	$(Vcr_{(std)})$	$(Q_{cr(std)})$	(Y)	(ΔY)	$(Q_{m(std)(corr)})$	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
11 080	0 786	11.142	0.790	1.006	0 007	0 790	2.438	0 388
7 480	1 248	8 520	1 087	0 871	-0 128	1 087	2 114	0 063
7 431	0 635	7 191	0 615	0 988	-0 031	0 615	1 978	-0 072
5 753	0 429	6 439	0 481	1 119	0 121	0 481	1.890	-0 160
5 778	0 314	5 941	0 323	1.028	0 030	0 323	1 832	-0 219
				0 998	Y Average		2 050	ΔH@ Average

Note : For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0 02

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N I S T)

Signature Joe Elliott Date 5 Sept 02

Quality Assurance Data Review

Signature Date 5 Sept 02

Ambient Air Services, Inc. - Method 5 Post Test Dry Gas Meter Calibration
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	AASI
Console Serial Number	Box 10
Pre Test Y Value	0 989
DGM Serial Number	###############

Calibration Conditions			
Date	Time	1-Nov-02	13 12
Barometric Pressure		29 9	in Hg
Theoretical Critical Vacuum[1]		14 1	in Hg
Calibration Technician		JE	

Factors/Conversions		
Std Temp	528	°R
Std Press	29 92	in Hg
K_1	17 647	°R/in Hg

[1]For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

[2]The Critical Orifice Coefficient, K', must be entered in English units, $(ft^3 \cdot R^{1/2})/(in.Hg \cdot min)$.

Calibration Data

Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P_m)	(V_{mi})	(V_{mf})	(t_{mi})	(t_{mf})		K'	(t_{ambi})	(t_{ambf})	
min	in H_2O	cubic feet	cubic feet	°F	°F		see above2	°F	°F	in Hg
7 5	2 3	401 578	407 667	72	75	63	0 6213	71	72	21
62 9	2 3	407.667	459 392	75	76	63	0 6213	73	74	21
14 5	2 3	459 392	471 442	79	79	63	0 6213	74	75	21

Results

Standardized Data				Dry Gas Meter				
				Calibration Factor		Flowrate	ΔH @	
Dry Gas Meter		Critical Orifice		Value	Variation	Std & Corr	0.75 SCFM	Variation
($V_{m(std)}$)	($Q_{m(std)}$)	($Vcr_{(std)}$)	($Q_{cr(std)}$)	(Y)	(ΔY)	($Q_{m(std)(corr)}$)	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H2O	
6 050	0 808	6 043	0 806	0 998	0 009	0 806	1 995	0 003
51 255	0 815	50 589	0 804	0 987	-0 002	0 804	1 995	0 003
11 863	0 818	11 651	0 804	0 982	-0 007	0 804	1 985	-0 006
				0 989	Y Average		1.992	ΔH@ Average

Note For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0 02

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N I S T)

Signature Joe Elliott Date 11-01-02

Quality Assurance Data Review

Signature Date 11-01-02

AAS Inc. AMBIENT AIR SERVICES INCORPORATED
ENVIRONMENTAL CONSULTANTS

PITOT TUBE CALIBRATION MEASUREMENTS

DATE CALIBRATED 11/02/02 PITOT TUBE 6B

Pitot tube assembly level? ✓ [✓ Yes] No

Pitot tube openings damaged? Yes (explain below) ✓ [✓ No]

α_1 = 10 ° (<10°), α_2 = 0.5 ° (<10°), β_1 = 0.0 ° (<5°),

β_2 = 0.0 ° (<5°)

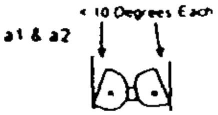
γ = 1.5 °, θ = .5 °, A = 1202 in. = (Pa + Pb)

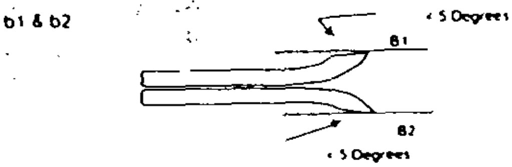
z = A sin γ = 0031 in.; <0.32 / <1/8 in.

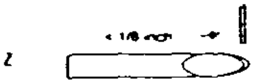
w = A sin θ = 0010 in.; <0.08 / <1/32 in.

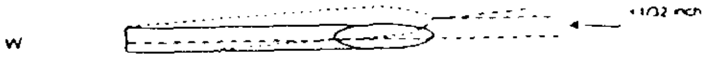
P_a .600 in. P_b .602 in. D_t = .375

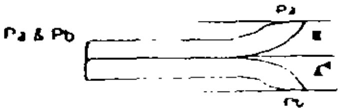
Calibration required? Yes ✓ [✓ No]

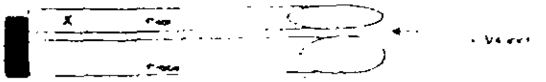


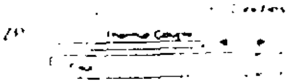


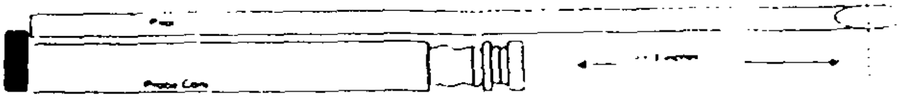












THERMOCOUPLE CALIBRATION FORM

11/02/02 Time 08 30

ent Temperature 79 Source (GP PALATKA)

metric Pressure 30.05 Source

ician's Signature

Standard Thermometer Type MERCURY IN GLASS

Manufacturer PRINCO

Serial Number 0932

Pyrometer Manufacturer ATKINS Model 396K

Serial Number AASI #4 Meter Box # 10

EMPERATURE SOURCE (A)													
FERENCE RMOMETER	Actual Reading	AMBIENT AIR			BOILING H_2O			ICE BATH					
	Corrected Temperature	79°			212°			32°					
IBRATED THERMOCOUPLE													
al Number	Location	Indicated Temp.	Difference (B)	Percent Diff. (C)	Indicated Temp.	Difference	Percent Diff.	Indicated Temp.	Difference	Percent Diff.	Indicated Temp	Difference	Percent Diff
B	Stack	79	0		212	0		32	0				
x 10	Filter	78	-1		211	-1		32	0				
x 4	Impinger	80	+1		212	0		31	-1				
x 10	Meter In	79	0		212	0		32	0				
x 10	Meter Out	79	0		213	+1		33	+1				

ion Tolerances Stack = 1.5% of value, Filter Box = ±5.4°F, Impinger = ±2°F, Meter = ±5.4°F (40CFR Pt 60, App. A Method 5, and QA Handbook Section 3.4, Method 5, page 13, Rev. O)

Type of calibration system used (B) Reference - Indicated = Difference

$$\left[\frac{(\text{ref. temp °F + 460}) - (\text{indicated temp °F + 460})}{(\text{reference temp °F + 460})}\right] \times 100$$

AASI 68A

APPENDIX – E

Sample Chain of Custody

0211037-1
thru
0211043

Technical Services, Inc.
2901 Danese St., Jacksonville, FL 32206
(904) 353-5761 / fax (904) 358-2908

CHAIN of CUSTODY RECORD

CLIENT NAME & ADDRESS (REPORT TO BE SENT TO) Ambient Air Services, Inc.

REMARKS Na2S2O3 added in sampling @ TS

PROJ. NO.

PROJECT NAME/ ADDRESS: GP/Palatka Bleach Plant

SAMPLERS: (SIGNATURE)

Sample Location ID	SAMPLE DATE	TIME	COMP	GRAB	TOTAL NO. of Containers	BOTTLE MAKEUP 0.1 N NaOH ½ L Poly	Amber Glass w/ 0.1 N NaOH	½ Gal. Poly w/ NaOH	PARAMETERS
Run 1 Imp. Catch	10/31/02				1	✓			Cl- / BASE
2 ↓	↓				1	✓			↓
3 ↓	↓				1	✓			
Run 1 Imp Catch	10/29/02				1		✓		
2 ↓	↓				1		✓		
3 ↓	↓				1		✓		
Field Blank					1			1	

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
			02
		RECEIVED FOR LABORATORY BY	DATE TIME 11/1/02

02110037-1
thru
02110043-1

Technical Services, Inc.
2901 Danese St., Jacksonville, FL 32206
(904) 353-5761 / fax (904) 358-2908

CHAIN of CUSTODY RECORD

CLIENT NAME & ADDRESS (REPORT TO BE SENT TO) Ambient Air Services, Inc	REMARKS

PROJ NO	PROJECT NAME/ ADDRESS GP/Palatka Bleach Plant	TOTAL NO of Containers	BOTTLE MAKEUP
SAMPLERS (SIGNATURE)			

Sample Location ID	SAMPLE DATE	TIME	COMP/GRAB	TOTAL NO of Containers	0.1 N NaOH 4L Poly	Amber Glass 4L 0.1N NaOH			PARAMETERS
Run 1 Imp Catch	10/31/02			1	✓				Cl- / BASE
2	↓			1	✓				↓
3	↓			1	✓				↓
Run 1 Imp Catch	10/29/02			1		✓			↓
2	↓			1		✓			↓
3	↓			1		✓			↓
Field Blank				1					↓

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
Roy Selling	0900 10-30-02	Don Satterfield	10/30/02 09:00
Don Satterfield	11/1/02 1430	H. C. Gray	1430 - 11/1/02
H C Gray	[illegible]15-11/02		
		RECEIVED FOR LABORATORY BY: Debra S. Baker	DATE/TIME 11/1/02 1615

APPENDIX - F

Calibration Gas Certificates

145 Shimersville Road
Bethlehem, PA 18015
Tel (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST **P.O NUMBER** 333045 [illegible]

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503 2PPM GMIS VS	1680B	CLM-009396	[illegible] PPM

ANALYZER READINGS

R = REFERENCE STANDARD ***Z = ZERO GAS*** ***C = GAS CANDIDATE***

1. **COMPONENT** CARBON MONOXIDE 503 2PPM GMI **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N 88-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED **LAST CALIBRATION DATE** [illegible]

FIRST ANALYSIS DATE [illegible] **SECOND ANALYSIS DATE**

Z		**R**	[illegible]	**C**	[illegible]	**CONC**		**Z**		**R**	[illegible]	**C**	[illegible]	**CONC**	
R	502	**Z**	[illegible]	**C**	[illegible]	**CONC.**	[illegible]	**R**	[illegible]	**Z**	[illegible]	**C**	[illegible]	**CONC**	
Z	0	**C**	302	**R**	[illegible]	**CONC.**	[illegible]	**Z**	[illegible]	**C**	[illegible]	**R**	[illegible]	**CONC**	

U/M ppm **MEAN TEST ASSAY** [illegible] **U/M** ppm **MEAN TEST ASSAY**

VALUES NOT VALID BELOW 150 PSIG
UNCERTAINTY OF CARBON MONOXIDE [illegible] PPM

THIS CYLINDER NO. [illegible]
HAS BEEN CERTIFIED ACCORDING TO SECTION [illegible]
OF TRACEABILITY PROTOCOL NO EPA [illegible]
PROCEDURE [illegible]
CERTIFIED ACCURACY [illegible] % **NIST TRACEABLE**
CYLINDER PRESSURE [illegible] **PSIG**
CERTIFICATION DATE
EXPIRATION DATE [illegible] **TERM**

CERTIFIED CONCENTRATION

CARBON MONOXIDE	[illegible] PPM
AIR	BALANCE

ANALYZED BY [illegible]

CERTIFIED BY [illegible]

145 Shimersville Road
Bethlehem, PA 18015
Tel. (610) 691-2474
Fax (610) 758-8384

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER PRAXAIR SOUTHEAST **P.O NUMBER** 333045-00

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE 503.2PPM GMIS VS	1680B	CLM-009396	492.4 PPM

ANALYZER READINGS

R = REFERENCE STANDARD *Z = ZERO GAS* *C = GAS CANDIDATE*

1. **COMPONENT** CARBON MONOXIDE 503.2PPM GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N 88-900

ANALYTICAL PRINCIPLE NON-DISPERSIVE INFRARED **LAST CALIBRATION DATE** 12/31/00

FIRST ANALYSIS DATE 12/27/00 **SECOND ANALYSIS DATE** 01/03/01

Z 0	**R** 503	**C** 595	**CONC.** 595.6	**Z** 0	**R** 504	**C** 595	**CONC.** 594.[illegible]
R 503	**Z** 0	**C** 595	**CONC.** 595.6	**R** 504	**Z** 0	**C** 595	**CONC.** 594.[illegible]
Z 0	**C** 594	**R** 503	**CONC.** 594.6	**Z** 0	**C** 595	**R** 504	**CONC.** 594.[illegible]
U/M ppm		**MEAN TEST ASSAY**	595.3	**U/M** ppm		**MEAN TEST ASSAY**	594.[illegible]

VALUES NOT VALID BELOW 150 PSIG
UNCERTAINTIY OF CARBON MONOXIDE ±4 2PPM

THIS CYLINDER NO. SA12251
HAS BEEN CERTIFIED ACCORDING TO SECTION 2.2
OF TRACEABILITY PROTOCOL NO. EPA-600/R97/121
PROCEDURE
CERTIFIED ACCURACY % NIST TRACEABLE
CYLINDER PRESSURE PSIG
CERTIFICATION DATE
EXPIRATION DATE TERM

CERTIFIED CONCENTRATION

CARBON MONOXIDE	594 PPM
AIR	BALANCE

ANALYZED BY *CERTIFIED BY*

[illegible]

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

Cyl. Number: CC121974	**Cyl. Pressure:*** 1667psig	**Document Number:** 9032348
Assay Date. 07/23/01	**Expiration Date:** 07/22/04	**Item Number:**
Customer: Technical Services	**P.O. Number:** 070601	**Notes:**

*Mixture is valid only to 150 psig

COMPONENT Name	REQUESTED Concentration	ASSAY Concentration
Carbon Monoxide	1000 ppm	991 ±15
Nitrogen	Balance	Balance

EPA Protocol Section No. 2.2
Procedure: G1

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/123

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

Std Name	[illegible]	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample
GMIS91	GMIS91	1500.0	ppm	21.0	CO	N2	CC113811	06/22/03	N A

Component 1: Carbon Monoxide Gas Analyzer Employed		Component 2: None Gas Analyzer Employed		Component 3: Gas Analyzer Employed	
Manufacturer:	KVB/Analect	**Manufacturer:**		**Manufacturer:**	
Model Number:	EN3024	**Model Number:**		**Model Number:**	
Serial Number:	3024	**Serial Number:**		**Serial Number:**	
Analytical Principle:	FTIR	**Analytical Principle:**		**Analytical Principle:**	
MPC Calibrated:	07/05/01	**MPC Calibrated:**		**MPC Calibrated:**	

07/16/01	Trial 1	Trial 2	Trial 3	Units
Zero	-0.11	-0.33	-0.28	
Reference 1	1614.16	1639.01	1648.95	
Reference 2				
Candidate	1061.20	1082.36	1088.32	
Result	974.23	993.65	999.12	ppm
		Mean Result:	989.00	ppm

Component 1

Carbon Monoxide

07/23/01	Trial 1	Trial 2	Trial 3	Units
Zero	-0.02	0.05	0.16	
Reference 1	1673.01	1678.36	1674.41	
Reference 2				
Candidate	1113.28	1105.85	1105.95	
Result	996.79	990.14	990.23	ppm
		Mean Result:	992.39	ppm

Analyst

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

Cyl. Number: CC70989	Cyl. Pressure:* 1667psig	Document Number: 9032348
Assay Date: 07/23/01	Expiration Date: 07/22/04	Item Number:
Customer: Technical Services	P.O. Number: 070601	Notes:

*Mixture is valid only to 150 psig

COMPONENT Name	REQUESTED Concentration	ASSAY Concentration
Carbon Monoxide	2000 ppm	1994 ±3 pp
Nitrogen	Balance	Balance

EPA Protocol Section No. 2.2
Procedure: G-1

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/123

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

Std Name	Std ID	Conc	Units	Std Error	Comp	Balance	CYL No	Exp Date	Sample No
GMIS91	GMIS91	1500.0	ppm	21 0	CO	N2	CC113811	06/22/03	N A

Component 1: Carbon Monoxide Gas Analyzer Employed		Component 2: None Gas Analyzer Employed	Component 3: Gas Analyzer Employed
Manufacturer:	KVB/Analect	Manufacturer:	Manufacturer:
Model Number:	EN3024	Model Number:	Model Number:
Serial Number:	3024	Serial Number:	Serial Number:
Analytical Principle:	FTIR	Analytical Principle:	Analytical Principle:
MPC Calibrated:	07/05/01	MPC Calibrated:	MPC Calibrated:

Component 1

Carbon Monoxide

07/16/01	Trial 1	Trial 2	Trial 3	Units
Zero	-0.11	-0.33	-0.28	
Reference 1	1614.16	1639.01	1648.95	
Reference 2				
Candidate	2132.25	2176.69	2193.10	
Result	1957.28	1998.07	2013.12	ppm
Mean Result:			1989.49	ppm

07/23/01	Trial 1	Trial 2	Trial 3	Units
Zero	-0.02	0.05	0.16	
Reference 1	1673.01	1678.36	1674.41	
Reference 2				
Candidate	2226.87	2236.96	2235.43	
Result	1993.92	2002.95	2001.58	ppm
Mean Result:			1999.49	ppm

Analyst

Air Liquide America Corporation
11426 Fairmont Parkway La Porte Texas 77571-6000
Phone (281) 474 8400 Fax (281) 474-8419

Airgas

Airgas Specialty Gases
[illegible] South Wentworth [illegible]
[illegible]
[illegible]
www.[illegible]

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Certification performed in accordance with "EPA Traceability Protocol (Sept.1997)" using assay procedures listed.

Cylinder No.	SG9140092BAL	Order No:	008973-00
Certification Date:	09/9/2002	Expiration Date:	09/9/2005
Cylinder Pressure:	2000	Part No:	E02NI95E15A0077

*Do not use cylinder below 150 psig.

Component	Certified Concentration	Unit of Measure	Accuracy	Procedure	Analytical Principle
Carbon Dioxide	5.049	%	1%	G-1	NDIR
Nitrogen	Balance				

Nox (Reference Value Only) ppm

Reference Standard Information

Type	Component	Concentration	Unit	Cylinder Number
Ntrm	Carbon Dioxide	4.204	%	SG9169571BAL

Analytical Data

Component 1 Carbon Dioxide

1st Analysis Date: 09/9/2002

Zero	0.000	Cand	5.046	Ref	4.202
Zero	0.000	Cand	5.045	Ref	4.200
Zero	0.000	Cand	5.046	Ref	4.201

2nd Analysis Date:

Zero		Cand		Ref	
Zero		Cand		Ref	
Zero		Cand		Ref	

Analyzed by:

Approved by:

APPENDIX – G

Process Data

PRODUCTION DATA FOR OCTOBER 29 AND 31, 2002 CO TESTING

DATE	10/29/02		10/31/02		
RUN	1	2	1	2	3
TIME	1225-1324	1433-1532	1330-1429	1547-1646	1710-1809

Notes: ADTBPH is air-dried tons of bleached pulp per hour
Kappa is the pre-washer kappa
%ClO2 is the %ClO2 applied in that stage

		Do Stage				Eop Stage		D1 Stage		
Run	ADTBPH	%SW	%HW	Kappa	%ClO2	%SW	%HW	%SW	%HW	%ClO2
1 (29th)	49.8	100	0	22.0	2.0	100	0	100	0	0.5
2 (29th)	30.1	100	0	22.4	2.0	100	0	100	0	0.6
1 (31st)	50.0	100	0	22.8	2.2	100	0	100	0	0.7
2 (31st)	50.2	100	0	23.3	2.2	100	0	100	0	0.7
3 (31st)	50.1	100	0	23.3	2.2	100	0	100	0	0.7

THE KAPPA AND %ClO2 APPLIED ARE CONFIDENTIAL BUSINESS INFORMATION.

PRODUCTION AND SCRUBBER DATA FOR OCTOBER 29 AND 31, 2002 CHLORINATED HAP (METHOD 26A) TESTS

DATE	10/29/02			10/31/02		
RUN	1	2	3	1	2	3
TIME	1218-1323	1433-1538	1700-1802	1332-1443	1550-1656	1710-1816

Notes: ADTBPH is air-dried tons of bleached pulp per hour
Kappa is the pre-washer kappa
%ClO$_2$ is the %ClO$_2$ applied in that stage

		Do Stage				Eop Stage		D1 Stage		
Run	ADTBPH	%SW	%HW	Kappa	%ClO$_2$	%SW	%HW	%SW	%HW	%ClO$_2$
1 (29th)	49.8	100 0	0.0	21.9	2.0	100.0	0 0	100.0	0 0	0 5
2 (29th)	30 1	100 0	0.0	22.4	2.0	100 0	0 0	100.0	0 0	0 7
3 (29th)	30.0	100 0	0 0	22.9	1.6	100.0	0.0	100.0	0 0	0 7
1 (31st)	49 8	100 0	0.0	21.9	2 2	100 0	0 0	100.0	0 0	0.5
2 (31st)	49 8	100 0	0.0	21 9	2.2	100.0	0.0	100 0	0 0	0.5
3 (31st)	49.8	100.0	0.0	21.9	2.2	100.0	0.0	100 0	0 0	0.5

THE KAPPA AND %ClO$_2$ APPLIED ARE CONFIDENTIAL BUSINESS INFORMATION.

Run	Flow, gpm	pH	Fan Load, %	Fan Amps	Fan Differential, in. H_2O
1 (29th)	1262	9 2	84	15.0	20 8
2 (29th)	1207	8.9	84	15.1	20 8
3 (29th)	1153	9.0	85	15 2	21.1
1 (31st)	1252	9.3	85	15.4	21.3
2 (31st)	1258	9.3	85	15.4	21.3
3 (31st)	1263	9.2	86	15.4	21.4

Cl2 Testing Raw Scrubber Data

Run 1 10/29/02 1218-1323

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential, in H2O
1218-1233	1263	9.2	85	15 2	20 9
1233-1248	1263	9.1	84	15.1	20 9
1248-1303	1263	9 1	84	15 1	20 8
1303-1318	1262	9.0	83	15 0	20 8
Average	1262	9.1	84	15.1	20 9

Cl2 Testing Raw Scrubber Data

Run 2 10/29/02 1433-1538

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential, in H2O
1433-1448	1239	8.9	83	15.0	20.8
1448-1503	1228	8.9	83	15.0	20.8
1503-1518	1217	8.9	83	15.0	20.8
1518-1533	1207	8.9	84	15.1	20.9
Average	1223	8.9	84	15.0	20.8

Cl2 Testing Raw Scrubber Data

Run 3 10/29/02 1700-1802

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential, in H2O
1700-1715	1163	9.0	84	15.2	21.1
1715-1730	1159	9.0	84	15.2	21.1
1730-1745	1156	9.0	85	15.2	21.1
1745-1800	1153	9.0	85	15.2	21.1
Average	1158	9.0	84	15.2	21.1

Cl_2 Testing Raw Scrubber Data

Run 1 10/31/02 1332-1443

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential, in. H_2O
1332-1347	1252	9.3	86	15.4	21.4
1347-1402	1252	9.3	85	15.4	21.3
1402-1417	1252	9.3	85	15.4	21.3
1417-1432	1254	9.3	86	15.4	21.3
1432-1447	1254	9.3	86	15.4	21.3
Average	1253	9.3	85	15.4	21.3

Cl2 Testing Raw Scrubber Data

Run 2 10/31/02 1550-1656

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential in H2O
1550-1605	1258	9 3	85	15 4	21 3
1605-1620	1258	9.3	85	15.4	21 4
1620-1635	1259	9 3	85	15 4	21 4
1635-1650	1259	9 3	86	15 4	21 4
Average	1259	9 3	85	15 4	21 4

Cl2 Testing Raw Scrubber Data

Run 3 10/31/02 1710-1816

	Flow, gpm	pH	Fan Load, %	Fan Amps	Scrubber Differential in H2O
1710-1725	1261	9.3	86	15.5	21.4
1725-1740	1261	9.3	86	15.4	21.4
1740-1755	1262	9.3	86	15.5	21.5
1755-1810	1263	9.2	86	15.4	21.5
Average	1262	9.3	86	15.4	21.4

APPENDIX – H

Project Participants

Joe Cooksey of AASI	Report Review
Randy L Weston of AASI	Project Manager Report Preparation Field Testing
George Hawkins of AASI	Field Testing
Roger Dilinger of AASI	Field Testing
Joe Taylor of GP	Testing Support

ATTACHMENT C

Subsection K. This section addresses the following emissions unit(s).

E.U. ID No.	Brief Description
036	Elemental Chlorine Free (ECF) No. 3 Bleach Plant

Emissions Unit 036 consists of an ECF bleach plant. This plant uses chlorine dioxide in the bleaching process. Emissions are controlled by a wet scrubber. This emissions unit is regulated under 40 CFR 63 Subpart S - National Emission Standards for Hazardous Air Pollutants for Pulp Mills, adopted and incorporated by reference in Rule 62-204.800, F.A.C.; Rule 212.400(5), F.A.C., Prevention of Significant Deterioration (PSD): Permit(s) No. PSD-FL-264; Rule 62-212.400(6), F.A.C., and Best Available Control Technology (BACT) Determination, dated June 30, 1999.

The following specific conditions apply to the emissions unit(s) listed above:

Operational Parameters

K.0. The Permittee shall meet the compliance milestones stated in Appendix CP-Compliance Plan.

K.1. Permitted Capacity. Until compliance is demonstrated with the air construction permit issued pursuant to the PSD review identified in the Compliance Schedule of the Compliance Plan, Appendix CP, Condition X.1, the maximum production rate of this emissions unit shall not exceed 840 tons per day of air-dried bleached pulp (ADBP) as a maximum monthly average. [Consent Order OGC File No. 02-1886]

K.2. Hours of Operation. The hours of operation are not restricted, i.e. 8,760 hours per year. [Rules 62-4.1610(2) and 62-210.200(PTE), F.A.C., Construction Permit No. 1070005-006-AC/PSD/FL-264]

Operating Standards

K.3. Bleaching Stage Equipment. The equipment at each bleaching stage, of the No. 3 Bleach Plant, where chlorinated compounds are introduced shall be enclosed and vented into a closed-vent system and routed to the wet scrubber stack for control. The enclosures and closed-vent system shall meet the requirements specified in Condition K.5.
[63.445(b)]

K.4. Chloroform air emissions. To reduce chloroform air emissions to the atmosphere, the No. 3 Bleach Plant shall not use hypochlorite or chlorine for bleaching in the bleaching system or line. [63.445(d)(2), Construction Permit No. 1070005-006-AC/PSD-FL-264]

K.5. Enclosures and Closed-Vent Systems. The enclosure and closed-vent system specified in Condition K.3 for capturing and transporting vent streams that contain HAP shall meet the following requirements:

(a) Each enclosure shall maintain negative pressure at each enclosure or hood opening as demonstrated by the procedures specified in Condition K.18. Each enclosure or hood opening closed during the initial performance test specified in 40 CFR 63.457(a) shall be maintained in the same closed and sealed position as during the performance test at all times except when necessary to use the opening for sampling, inspection, maintenance, or repairs.
(b) Each component of the closed-vent system used to comply with Condition K.3. that is operated at positive pressure and located prior to a control device shall be designed for and operated with no detectable leaks as indicated by an instrument reading of less than 500 parts per million by volume above background, as measured by the procedures specified in Condition K.17..
(c)Each bypass line in the closed-vent system that could divert vent streams containing HAP to the atmosphere without meeting the emission limitations in 40 CFR 63.445 shall comply with either of the following requirements:
  (1) On each bypass line, the owner or operator shall install, calibrate, maintain, and operate according to manufacturer's specifications a flow indicator that provides a record of the presence of gas stream flow in the bypass line at least once every 15 minutes. The flow indicator shall be installed in the bypass line in such a way as to indicate flow in the bypass line; or
  (2) For bypass line valves that are not computer controlled, the owner or operator shall maintain the bypass line valve in the closed position with a car seal or a seal placed on the valve or closure mechanism in such a way that valve or closure mechanism cannot be opened without breaking the seal.

[63.450]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

{Permitting Note: Unless otherwise specified, the averaging time for this condition is based on the specified averaging time of the applicable test method.}

K.6. Carbon Monoxide. Carbon monoxide emissions shall not exceed 46 lbs/hr and 201 tons per year[1]. Carbon monoxide emissions shall be minimized to the extent practicable by efficient bleaching operations.

[1] Compliance issues associated with CO emissions from this emissions unit are addressed within Consent Order OGC File No. 02-1886 until compliance is demonstrated with the air construction permit issued pursuant to the PSD review identified in the Compliance Schedule of the Compliance Plan. Appendix CP. Condition X.1.

[Rule 62-212.410, F.A.C., Construction Permit No. 1070005-006-AC/PSD-FL-264, Consent Order OGC File No. 02-1886]

K.7. Total Chlorinated HAPs. The total chlorinated HAP outlet concentration shall not exceed 10 parts per million by volume
[63.445(c)(2); Construction Permit No. 1070005-006-AC/PSD-FL-264]

K.8. Visible Emissions. Visible Emissions fonn this emissions unit shall not exceed 20% opacity. The visible emissions limit shall only be effective if the visible emission measurement can be made without being substantially affected by plume mixing or moisture condensation.
[Rule 62-296.320, F.A.C.; Rule 62-296.404(2)(b), F.A.C.; Construction Permit No. 1070005-006-AC/PSD-FL-264]

Excess Emissions

K.9. Excess emissions resulting from startup, shutdown or malfunction of any source shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration.
[62-201.700(1), F.A.C.]

K.10. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited.
[Rule 62-210.700(4), F.A.C.]

K.11. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest.
[Rule 62-210.700(5), F.A.C.]

K.12. In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department.
[Rule 62-210.700(6), F.A.C.]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

K.13. Carbon Monoxide. The test method for carbon monoxide emissions shall be EPA Method 10 as incorporated in 40 CFR 60, Appendix A. The compliance testing shall be conducted annually with a frequency base date of 05/25[1].

[1]. Compliance issues associated with CO emissions from this emissions unit are addressed within Consent Order OGC File No. 02-1886 until compliance is demonstrated with the air construction permit issued pursuant to the PSD review identified in the Compliance Schedule of the Compliance Plan. Appendix CP. Condition X.1.

[Construction Permit No. 1070005-006-AC/PSD-FL-264, Rule 62-204.800, F.A.C., Consent Order OGC File No. 02-1886]

K.14. Total Chlorinated HAPs. The test method for total chlorinated HAPs shall be EPA Method 26A as incorporated in 40 CFR 60, Appendix A. The compliance testing shall be conducted annually with a frequency base date of 05/26.
[Construction Permit No. 1070005-006-AC/PSD-FL-264; Rule 62-297.310(7)(a)4.c., F.A.C.]

K.15. Visible Emissions. The test method for visible emissions shall be EPA Method 9 as incorporated in 40 CFR 60, Appendix A. The compliance testing shall be conducted annually with a frequency base date of 05/25.
[Construction Permit No. 1070005-006-AC/PSD-FL-264, Rule 62-204.800, F.A.C.]

K.16. Vent sampling port locations and gas stream properties. For purposes of selecting vent sampling port locations and determining vent gas stream properties, required in 40 CFR 63.445, the owner or operator shall comply with the following procedures:

(1) Method 1 or 1A of part 60, appendix A, as appropriate, shall be used for selection of the sampling site as follows:

(i) To sample for vent gas concentrations and volumetric flow rates, the sampling site shall be located prior to dilution of the vent gas stream and prior to release to the atmosphere;

(ii) For determining compliance with percent reduction requirements, sampling sites shall be located prior to the inlet of the control device and at the outlet of the control device; measurements shall be performed simultaneously at the two sampling sites; and

(iii) For determining compliance with concentration limits or mass emission rate limits, the sampling site shall be located at the outlet of the control device.

(2) No traverse site selection method is needed for vents smaller than 0.10 meter (4.0 inches) in diameter.

(3) The vent gas volumetric flow rate shall be determined using Method 2, 2A, 2C, or 2D of part 60, appendix A, as appropriate.

(4) The moisture content of the vent gas shall be measured using Method 4 of part 60, appendix A.

(5) To determine vent gas concentrations, the owner or operator shall collect a minimum of three test runs that are representative of normal conditions and average the resulting pollutant concentrations using the following procedures.

(i) Method 308 in Appendix A of this part shall be used to determine the methanol concentration.

(ii) Except for the modifications specified in paragraphs (b)(5)(ii)(A) through (b)(5)(ii)(K) of this section, Method 26A of part 60, appendix A shall be used to determine chlorine concentration in the vent stream.

(A) *Probe/Sampling Line.* A separate probe is not required. The sampling line shall be an appropriate length of 0.64 cm (0.25 in) OD Teflon® tubing. The sample inlet end of the sampling line shall be inserted into the stack in such a way as to not entrain liquid condensation from the vent gases. The other end shall be connected to the impingers. The length of the tubing may vary from one sampling site to another, but shall be as short as possible in each situation. If sampling is conducted in sunlight, opaque tubing shall be used. Alternatively, if transparent tubing is used, it shall be covered with opaque tape.

(B) *Impinger Train.* Three 30 milliliter (ml) capacity midget impingers shall be connected in series to the sampling line. The impingers shall have regular tapered stems.

Silica gel shall be placed in the third impinger as a desiccant. All impinger train connectors shall be glass and/or Teflon®.

(C) *Critical Orifice*. The critical orifice shall have a flow rate of 200 to 250 ml/min and shall be followed by a vacuum pump capable of providing a vacuum of 640 millimeters of mercury (mm Hg). A 45 millimeter diameter in-line Teflon® 0.8 micrometer filter shall follow the impingers to project the critical orifice and vacuum pump.

(D) The following are necessary for the analysis apparatus:

(*1*) Wash bottle filled with deionized water;
(*2*) 25 or 50 ml graduated burette and stand;
(*3*) Magnetic stirring apparatus and stir bar;
(*4*) Calibrated pH Meter;
(*5*) 150-250 ml beaker or flask; and
(*6*) A 5 ml pipette.

(E) The procedures listed in paragraphs (b)(5)(ii)(E)(*1*) through (b)(5)(ii)(E)(*7*) of this section shall be used to prepare the reagents.

(*1*) To prepare the 1 molarity (M) potassium dihydrogen phosphate solution, dissolve 13.61 grams (g) of potassium dihydrogen phosphate in water and dilute to 100 ml.

(*2*) To prepare the 1 M sodium hydroxide solution (NaOH), dissolve 4.0 g of sodium hydroxide in water and dilute to 100 ml.

(*3*) To prepare the buffered 2 percent potassium iodide solution, dissolve 20 g of potassium iodide in 900 ml water. Add 50 ml of the 1 M potassium dihydrogen phosphate solution and 30 ml of the 1 M sodium hydroxide solution. While stirring solution, measure the pH of solution electrometrically and add the 1 M sodium hydroxide solution to bring pH to between 6.95 and 7.05.

(*4*) To prepare the 0.1 normality (N) sodium thiosulfate solution, dissolve 25 g of sodium thiosulfate, pentahydrate, in 800 ml of freshly boiled and cooled distilled water in a 1-liter volumetric flask. Dilute to volume. To prepare the 0.01 N sodium thiosulfate solution, add 10.0 ml standardized 0.1 N sodium thiosulfate solution to a 100 ml volumetric flask, and dilute to volume with water.

(*5*)To standardize the 0.1 N sodium thiosulfate solution, dissolve 3.249 g of anhydrous potassium bi-iodate, primary standard quality, or 3.567 g potassium iodate dried at 103 +/- 2 degrees Centigrade for 1 hour, in distilled water and dilute to 1000 ml to yield a 0.1000 N solution. Store in a glass-stoppered bottle. To 80 ml distilled water, add, with constant stirring, 1 ml concentrated sulfuric acid, 10.00 ml 0.1000 N anhydrous potassium bi-iodate, and 1 g potassium iodide. Titrate immediately with 0.1 n sodium thiosulfate titrant until the yellow color of the liberated iodine is almost discharged. Add 1 ml starch indicator solution and continue titrating until the blue color disappears. The normality of the sodium thiosulfate solution is inversely proportional to the ml of sodium thiosulfate solution consumed:

$$\text{Normality of Sodium Thiosulfate} = \frac{1}{\text{ml Sodium Thiosulfate Consumed}}$$

(*6*) To prepare the starch indicator solution, add a small amount of cold water to 5 g starch and grind in a mortar to obtain a thin paste. Pour paste into 1 L of boiling distilled water, stir, and let settle overnight. Use clear supernate for starch indicator solution.

(*7*) To prepare the 10 percent sulfuric acid solution, add 10 ml of concentrated sulfuric acid to 80 ml water in an 100 ml volumetric flask. Dilute to volume.

(F) The procedures specified in paragraphs (b)(5)(ii)(F)(*1*) through (b)(5)(ii)(F)(5) of this section shall be used to perform the sampling.

(*1*) Preparation of Collection Train. Measure 20 ml buffered potassium iodide solution into each of the first two impingers and connect probe, impingers, filter, critical orifice, and pump. The sampling line and the impingers shall be shielded from sunlight.

(2) Leak and Flow Check Procedure. Plug sampling line inlet tip and turn on pump. If a flow of bubbles is visible in either of the liquid impingers, tighten fittings and adjust connections and impingers. A leakage rate not in excess of 2 percent of the sampling rate is acceptable. Carefully remove the plug from the end of the probe. Check the flow rate at the probe inlet with a bubble tube flow meter. The flow should be comparable or slightly less than the flow rate of the critical orifice with the impingers off-line. Record the flow and turn off the pump.

(*3*) Sample Collection. Insert the sampling line into the stack and secure it with the tip slightly lower than the port height. Start the pump, recording the time. End the sampling after 60 minutes, or after yellow color is observed in the second in-line impinger. Record time and remove the tubing from the vent. Recheck flow rate at sampling line inlet and turn off pump. If the flow rate has changed significantly, redo sampling with fresh capture solution. A slight variation (less than 5 percent) in flow may be averaged. With the inlet end of the line elevated above the impingers, add about 5 ml water into the inlet tip to rinse the line into the first impinger.

(*4*) Sample Analysis. Fill the burette with 0.01 N sodium thiosulfate solution to the zero mark. Combine the contents of the impingers in the beaker or flask. Stir the solution and titrate with thiosulfate until the solution is colorless. Record the volume of the first endpoint (TN, ml). Add 5 ml of the 10 percent sulfuric acid solution, and continue the titration until the contents of the flask are again colorless. Record the total volume of titrant required to go through the first and to the second endpoint (TA, ml). If the volume of neutral titer is less than 0.5 ml, repeat the testing for a longer period of time. It is important that sufficient lighting be present to clearly see the endpoints, which are determined when the solution turns from pale yellow to colorless. A lighted stirring plate and a white background are useful for this purpose.

(5) Interferences. Known interfering agents of this method are sulfur dioxide and hydrogen peroxide. Sulfur dioxide, which is used to reduce oxidant residuals in some bleaching systems, reduces formed iodine to iodide in the capture solution. It is therefore a negative interference for chlorine, and in some cases could result in erroneous negative chlorine concentrations. Any agent capable of reducing iodine to iodide could interfere in this manner. A chromium trioxide impregnated filter will capture sulfur dioxide and pass chlorine and chlorine dioxide. Hydrogen peroxide, which is commonly used as a bleaching agent in modern bleaching systems, reacts with iodide to form iodine and thus can cause a positive interference in the chlorine measurement. Due to the chemistry involved, the precision of the chlorine analysis will decrease as the ratio of chlorine dioxide to chlorine increases. Slightly negative calculated concentrations of chlorine may occur when sampling a vent gas with high concentrations of chlorine dioxide and very low concentrations of chlorine.

(6) The minimum sampling time for each of the three test runs shall be 1 hour in which either an integrated sample or four grab samples shall be taken. If grab sampling is used, then the samples shall be taken at approximately equal intervals in time, such as 15 minute intervals during the test run.

(G) The following calculation shall be performed to determine the corrected sampling flow rate:

$$S_c = \frac{S_u(BP - PW)(293)}{(760)(273 + t)}$$

where:

S_C = Corrected (dry standard) sampling flow rate, liters per minute;
S_U = Uncorrected sampling flow rate, L/min;
BP = Barometric pressure at time of sampling;
PW = Saturated partial pressure of water vapor, mm Hg at temperature; and
t = Ambient temperature, °C.

(H) The following calculation shall be performed to determine the moles of chlorine in the sample:

Cl_2 Moles = 1/8000 (5 T_N - T_A) x N_{Thio}

where:

T_N = Volume neutral titer, ml;
T_A = Volume acid titer (total), ml; and
N_{Thio} = Normality of sodium thiosulfate titrant.

(I) The following calculation shall be performed to determine the concentration of chlorine in the sample:

$$ClO_2\ Moles = 1/4000\,(T_A - T_N) \times N_{Thio}$$

where:

T_A = Volume acid titer (total), ml;
T_N = Volume neutral titer, ml; and
N_{Thio} = Normality of sodium thiosulfate titrant.

(K) The following calculation shall be performed to determine the concentration of chlorine dioxide in the sample:

$$ClO_2\ ppmv = \frac{6010(T_A - T_N) \times N_{Thio}}{S_c \times t_s}$$

where:

S_C = Corrected (dry standard) sampling flow rate, liters per minute;
t_S = Time sampled, minutes;
T_A = Volume acid titer (total), ml;
T_N = Volume neutral titer, ml; and
N_{Thio} = Normality of sodium thiosulfate titrant.

(iii) Any other method that measures the total HAP or methanol concentration that has been demonstrated to the Administrator's satisfaction.

(6) The minimum sampling time for each of the three runs per method shall be 1 hour in which either an integrated sample or four grab samples shall be taken. If grab sampling is used, then the samples shall be taken at approximately equal intervals in time, such as 15 minute intervals during the run.
[63.457(b)]

K.17. Detectable leak procedures. To measure detectable leaks for closed-vent systems as specified in Condition K.5., the owner or operator shall comply with the following:

(1) Method 21, of Part 60, Appendix A; and

(2) The instrument specified in Method 21 shall be calibrated before use according to the procedures specified in Method 21 on each day that leak checks are performed. The following calibration gases shall be used:

(i) Zero air (less than 10 parts per million by volume of hydrocarbon in air); and

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 parts per million by volume methane or n-hexane.
[63.457(d)]

K.18. Negative pressure procedures. To demonstrate negative pressure at process equipment enclosure openings as specified in Condition K.5., the owner or operator shall use one of the following procedures:

(1) An anemometer to demonstrate flow into the enclosure opening;

(2) Measure the static pressure across the opening;

(3) Smoke tubes to demonstrate flow into the enclosure opening; or

(4) Any other industrial ventilation test method demonstrated to the Administrator's satisfaction.
[63.457(e)]

K.19. Bleaching HAP concentration measurement. For purposes of complying with the bleaching system requirements in § 63.445, the owner or operator shall measure the total HAP concentration as the sum of all individual chlorinated HAPs or as chlorine.
[63.457(h)]

Continuous Monitoring Requirements

K.20. The permittee shall install, calibrate, certify, operate, and maintain according to the manufacturer's specifications, a continuous monitoring system (CMS, as defined in §63.2) as specified in Condition K.21. The CMS shall include a continuous recorder.
[63.453(a), Construction Permit No. 1070005-006-AC/PSD-FL-264]

K.21. A CMS shall be operated to measure the following parameters:
(1) The pH or the oxidation/reduction potential of the gas scrubber effluent;
(2) Fan amperage of the bleaching system vent gas fan*; and
(3) The gas scrubber liquid influent flow rate.

*EPA Approved Alternative Monitoring Parameter dated December 22, 2000
[63.453(c), Construction Permit No. 1070005-006-AC/PSD-FL-264]

K.22. Enclosure and Closed-Vent System. The enclosure and closed-vent system shall comply with the following requirements:

(1) For each enclosure opening, a visual inspection of the closure mechanism specified in K.5.(a) shall be performed at least once every 30 days to ensure the opening is maintained in the closed position and sealed.

(2) The closed-vent system shall be visually inspected every 30 days and at other times as requested by the Administrator. The visual inspection shall include inspection of ductwork, piping, enclosures, and connections to covers for visible evidence of defects.

(3) For positive pressure closed-vent systems or portions of closed-vent systems, demonstrate no detectable leaks as specified in Condition K.5.(b) measured initially and annually by the procedures in Condition K.17..

(4) Demonstrate initially and annually that each enclosure opening is maintained at negative pressure as specified in Condition K.18..

(5) The valve or closure mechanism specified in Condition K.5.(c)(2) shall be inspected at least once every 30 days to ensure that the valve is maintained in the closed position and the emission point gas stream is not diverted through the bypass line.

(6) If an inspection required by paragraphs (1) through (5) of this Condition identifies visible defects in ductwork, piping, enclosures or connections to covers required by Condition K.5., or if an instrument reading of 500 parts per million by volume or greater above background is measured, or if enclosure openings are not maintained at negative pressure, then the following corrective actions shall be taken as soon as practicable.

(i) A first effort to repair or correct the closed-vent system shall be made as soon as practicable but no later than 5 calendar days after the problem is identified.

(ii) The repair or corrective action shall be completed no later than 15 calendar days after the problem is identified. Delay of repair or corrective action is allowed if the repair or corrective action is technically infeasible without a process unit shutdown or if the owner or

operator determines that the emissions resulting from immediate repair would be greater than the emissions likely to result from delay of repair. Repair of such equipment shall be completed by the end of the next process unit shutdown.
[63.453(k)]

K.23. Wet Scrubber Operating Parameters. The wet scrubber shall be operated in a manner consistent with the minimum pH of the scrubbing medium effluent at 9.1 s.u., the minimum fan motor loading of 85% (15.3 amps), and the minimum scrubber recirculation flow rate of 1,229 gpm. Operation of the wet scrubber below these minimum operating parameter values or failure to perform procedures required by 40 CFR 63 Subpart S shall constitute a violation of Condition K.7. and be reported as a period of excess emissions.

{Permitting Note: Unless otherwise specified, the averaging time for this condition is based on the specified averaging time of the applicable test method.}
[63.453(o), Applicant Request dated 12/20/02]

Recordkeeping Requirements

K.24. The permittee shall maintain daily records of the following information in order to document continuous compliance with Condition Nos. K.1., K.6.., K.7., and K.21.:

- Quantity of pulp processed through the No. 3 Bleach Plant in air-dried bleach tons.
- Scrubber parameters monitored per Condition K.21.

K.25. The permittee shall comply with the recordkeeping requirements of 40 CFR 63.10, as shown in Table 1 of 40 CFR Part 63 Subpart S.
[63.454(a)]

K.26. Enclosure Opening, Closed-Vent System and Closed Collection System. For each applicable enclosure opening, closed-vent system, and closed collection system, the owner or operator shall prepare and maintain a site-specific inspection plan including a drawing or schematic of the components of applicable affected equipment and shall record the following information for each inspection:

(1) Date of inspection;
(2) The equipment type and identification;
(3) Results of negative pressure tests for enclosures;
(4) Results of leak detection tests;
(5) The nature of the defect or leak and the method of detection (i.e., visual inspection or instrument detection);
(6) The date the defect or leak was detected and the date of each attempt to repair the defect or leak;
(7) Repair methods applied in each attempt to repair the defect or leak;
(8) The reason for the delay if the defect or leak is not repaired within 15 days after discovery;
(9) The expected date of successful repair of the defect or leak if the repair is not completed within 15 days;
(10) The date of successful repair of the defect or leak;

(11) The position and duration of opening of bypass line valves and the condition of any valve seals; and

(12) The duration of the use of bypass valves on computer controlled valves.
[63.454(b)]

K.27. New affected Process Equipment. The permittee shall record the CMS parameters specified in §63.453 and meet the requirements specified in Condition K.25., for any new affected process equipment that becomes subject to the standards of 40 CFR Part 63 Subpart S due to a process change or modification.
[63.454(d)]

Reporting Requirements

K.28. The permittee shall comply with the reporting requirements of 40 CFR Part 63, Subpart A as specified in Table 1 of Subpart S.
[63.455(a)]

Common Conditions - F.A.C. Test Requirements

K.29. This emissions unit is also subject to applicable F.A.C. Test Requirements in Subsection N.

Common Conditions - Periodic Monitoring

K.30. This emissions unit is also subject to applicable Periodic Monitoring Requirements in Subsection P.

Appendix CP- Compliance Plan

X.1. Compliance Schedule. The following dates shall be met to satisfy measurable progress milestones for the facility to come into compliance with Conditions A.10., K.6., and K.7.

E.U. ID. No.	Milestone	Milestone Date
036 014	Responsible Official to enter into a consent order agreement with Department concerning the No. 3 ECF Bleach Plant, and initiate agreements concerning any other non-compliant conditions.	November 12, 2002
036	Facility to submit a complete application, including completed responses to Department requests for additional information, for an air construction permit/PSD Determination.	February 1, 2003
Facility	Responsible Official to submit "Certification of Compliance", addressing the entire facility, indicating what is not in compliance, when non-compliance started, the degree or amount of non-compliance, the duration of non-compliant operations, steps taken to identify and correct non-compliant conditions, and actions (with time table), to correct any current non-compliant conditions and achieve compliance.	March 1, 2003
036	Initiation of on-site construction and/or installation of emission control equipment or process change authorized by air construction permit	No later than 3 months from the date of issuance of the resulting air construction permit/PSD Determination
036	Completion of on-site construction or installation of emission control equipment or process change authorized by air construction permit	No later than 9 months from the date of issuance of the resulting air construction permit/PSD Determination
036	Compliance Testing conducted and test reports submitted pursuant to requirements of air construction permit	Pursuant to the timeframes established in the air construction permit/PSD Determination
014	Compliance Testing conducted and test reports submitted for the No. 4 Power Boiler	April 1, 2003
036	Submittal of Title V Operation Permit Revision for the incorporation of the air construction permit/PSD Determination for the No. 3 ECF Bleach Plant	At least 90 days prior to expiration of air construction permit, but no later than 180 days after commencement of operation

036	Final Compliance	No later than 11 months from the date of issuance of the resulting air construction permit/PSD Determination
Facility	Responsible Official to submit "Certification of Compliance", addressing the entire facility, indicating what is not in compliance, when non-compliance started, the degree or amount of non-compliance, the duration of non-compliant operations, steps taken to identify and correct non-compliant conditions, and actions (with time table), to correct any current non-compliant conditions and achieve compliance.	No later than 12 months from the date of issuance of the resulting air construction permit/PSD Determination

X.2. Permitted Capacity. Until compliance is demonstrated with the air construction permit issued pursuant to the PSD review identified in the Compliance Schedule of Condition X.1, above, the maximum throughput rate of this emissions unit shall not exceed 840 tons per day of air-dried bleached pulp (ADBP) as a maximum monthly average.
[Consent Order OGC File No. 02-1886]

X.3. Recordkeeping. The Permittee shall maintain material throughput logs that indicate the type and amount of material used daily.
[Consent Order OGC File No. 02-1886]