

**WASHINGTON STATE DEPARTMENT OF ECOLOGY
POST OFFICE BOX 47600
OLYMPIA, WASHINGTON 98504-7600**

IN THE MATTER OF:]	No. 01-03, Amendment 3
]	
Longview Fibre Paper and Packaging, Inc.]	
dba KapStone Kraft Paper Corporation]	FINAL APPROVAL
]	OF PREVENTION OF SIGNIFICANT
P.O. Box 639]	DETERIORATION APPLICATION
Longview, Washington 98632]	

Pursuant to the United States Environmental Protection Agency (EPA) regulations for the Prevention of Significant Deterioration (PSD) set forth in Title 40, Code of Federal Regulations, Part 52 and regulations set forth in the Washington Administrative Code 173-400-141, the Washington State Department of Ecology (Ecology) is proposing issuance of PSD 01-03, A. Based on the permit application from Longview Fibre Paper and Packaging, Inc. (now doing business as (dba) KapStone Kraft Paper Corporation (KapStone)), Ecology now finds the following:

FINDINGS

1. Longview Fibre Paper and Packaging, Inc. (LFPPI) is now dba KapStone Kraft Paper Corporation.
2. KapStone demonstrated their proposed modeling protocol is a viable option to ambient monitoring, as required in Approval Condition 12.
3. Amendment 3 will remove permanently closed emission units from the permit. The closed emission units removed were Recovery Furnace 15, Smelt Dissolving Tank 15, Lime Kiln 1, Lime Kiln 2, CoGen 23, Power Boiler 12, and Power Boiler 13.
4. Amendment 3 will not change the previous amendments clarifying corrections, as described below. However, some of the numbering and clarifying corrections were removed and re-numbered to reflect the removal of the permanently closed emission units.

PSD 01-03, Second Amendment Longview Fibre Paper and Packaging, Inc.	
Reason for change	Permit term(s)
Improve reporting and enforcement: Simplify/clarify calculations Specify averaging periods Enter approved test frequency changes	Approval Conditions 1.1, 1.7, 1.9, 1.13, 1.14, 1.16, 1.20, 1.21, 1.23, 1.27, 1.28, 1.29-1.32, 1.33, 1.34, 1.35-1.38, 1.39, 1.40, 1.41-1.44, 1.45, 1.46, 1.47-1.50, 1.51, 1.54, 1.57, 1.60, 1.63, 1.66, 1.69, 1.72, 1.78, 1.81, 1.83, 1.88, 1.93, 1.96, 1.100, 1.112 Table 2, table notes 1, 3(3), 4, 5(2)(b)(i) and (ii), 8

PSD 01-03, Second Amendment Longview Fibre Paper and Packaging, Inc.	
Reason for change	Permit term(s)
	(becomes table note 7), add new table note 8 Approval Condition 2.3
Delete permit terms for de-commissioned equipment: Power Boiler 17, four stack units	Approval Conditions 1.85-1.89 Table 2, table notes 3(3), 6(1)(c), 7 (deleted), and 8(2) Table note 8(2) becomes 7(2)
Completed and no longer active permit terms	Approval Conditions 1.101-1.103 and 1.104-1.112
Typographical corrections	Table 2, table notes 3(2), 8(3)(d)(iv), and 8(3)(d)(vii) Table notes 8(3)(d)(iv), and 8(3)(d)(vii) become 7(3)(d)(iv), and 7(3)(d)(vii)
Clarifying production basis terminology	Table 2, table notes 8(1) and 8(3)(xi) Table notes 8(1) and 8(3)(xi) become 7(1) and 7(3)(xi)
Insert approved test methods	Appendix 1: LFPP RM 311 allowed for SO ₂ , NO _x , and CO tests (approved by Marc Heffner, March 3, 2004 letter) Substitute EPA RM 5 for Ecology RM 5

5. After finalization of the original permit on February 14, 2002, LFPPI discovered the descriptive and typographical errors in the permit text listed below, and requested the first administrative amendment (approved May 22, 2002):

Amendment Item	Description
<u>Conditions 1.12 and 1.67</u> : Typo.	Correct numbering sequence.
<u>Conditions 1.26 and 1.94</u> : Recovery Furnace 22 TRS/H ₂ S and Power Boiler 20 NO _x emission limits.	Added decimal place (e.g., "3 ppm _{dv} " became "3.0 ppm _{dv} ") to achieve consistency with NSPS regulations.
<u>Condition 1.74</u> : Lime kiln 5 TRS/H ₂ S limit.	Correct to 8 ppm _{dv} from the 20 ppm _{dv} shown originally.
<u>Conditions 1.101-1.103</u> : Pre-modification completion plantwide mass emission limits.	Inserted to clarify that existing PSD-X81-10A, 2000 Revision and Ecology Order No. DE 00AQIS-704 governs plantwide emission limits until capacity modifications are complete.
<u>Condition 1.101 and 1.105</u> : Total production terminology.	Substitute and define "total primary production" for "total pulp." The later term is insufficiently clear.

Amendment Item	Description
<u>Table note 3, part (2)</u> : Define monthly and quarterly source test cycles.	Clarify for non full-time operated emission units in wording consistent with Title V permit.
<u>Table 2, note 3, part (3)</u> : Emission sampling from units with more than one stack.	Added Power Boiler 20 to units allowed to monitor unit emissions from the continuous emission monitor on one of the stacks, and allowed for future, similar installations.
<u>Table 2, note 5</u> : Compliance condition.	Substituted "compliance ... shall be monitored" for "compliance ... shall be determined" to achieve consistency with recent EPA Title V enforceability guidance.
<u>Table 2, note 5, part (1)(a)</u> : Emission factor calculation.	Added VOCs to list of applicable pollutants.
<u>Table 2, note 6, part (1)(c)</u> : Emission factor calculation.	Deleted TRS/H ₂ S that are not emitted by the referenced emission unit.
<u>Table note 8, part (3)</u> : Plant wide VOC calculation.	Detailed calculation procedure to include digesters and cooling tower.

Previous findings:

6. LFPPI qualifies as a major stationary source because it is a Kraft pulp mill that has the potential to emit more than 100 tons per year (TPY) of several pollutants. It is located in an area which has been designated Class II for the purpose of PSD evaluation. The site is within an area that is in attainment for the National Ambient Air Quality Standards (NAAQS).
7. In 2001, LFPPI proposed a modification to its Longview, Washington, Kraft pulp and paper mill that would increase paper machine primary production capacity from approximately 3,000 machine dry tons of paper (MDTP) per day to approximately 3,600 MDTP/day, on an annual average basis.
8. LFPPI submitted a Notice of construction (NOC) application to Ecology for the proposed project on November 14, 2000. On December 13, 2000, LFPPI requested an extension to the completeness determination period in order to submit supplementary information. Ecology determined the NOC to be complete on March 6, 2001. A draft approval of the PSD application was released for public comment on October 22, 2001. The comment period

closed December 6, 2001. A summary of Ecology's response to public comment is available in the permanent record for this approval.

9. Ecology issued a Determination of Nonsignificance relative to the State Environmental Policy Act (SEPA) on November 1, 2001. The public comment period ended November 19, 2001. Ecology received no comments.
10. Projected changes in the emission amounts due to the previous project and estimated emissions from the plant upon completion of that project were:

Table 1. Emissions Increases		
Pollutant	Net Change in Emissions for PSD Applicability¹ (TPY)	Most Recent Two Years Actual Emissions (1998-99)
Nitrogen oxides (NO _x)	951.5	2,077
Carbon monoxide (CO)	3,387.5	3,669
Sulfur dioxide (SO ₂)	670	1,215
Particulate matter <10 microns (PM ₁₀)	372.5	326
Volatile organic compounds (VOCs)	439	1,235
Total reduced sulfur (TRS/H ₂ S) ²	53	210 ³
<p>¹Net emissions increase for PSD applicability determination is future potential to emit (PTE) minus the average of the most recent two years' actual emissions. LFFPI's recent levels of actual emissions have been substantially below its current PTE. This has been the result of a combination of operation below maximum plant capacity and achieving better-than-expected control of emissions. Actual emissions increases that will accompany the proposed 20% increase in plant capacity will depend on the plant's operating ratio and ability to maintain its recent quality of emissions control. Consequently, the net increases shown in the table represent a worst anticipated case.</p> <p>²All TRS is assumed to be H₂S.</p> <p>³No data available for 1998 and 1999. 40 CFR 52.21(b)(21)(iii) provides that allowable emissions may be presumed equivalent to actual emissions in the event actual emissions data are unavailable. Data submitted after the application for this permit modification indicated 18 tons actual TRS emissions for the year 2000.</p>		

The proposed modification was expected to result in increased emissions of each of the above criteria pollutants in quantities greater than the significant emission rates (SER) as specified in 40 CFR 52.21(b)(23)(i) for PSD. Consequently, it is required that each of the above criteria pollutants undergo review under EPA New Source Review (NSR) guidance.

11. Best available control technology (BACT) is required for any individual emissions unit that contributes to the emissions increase that necessitated the PSD permit and that will be

modified as part of the proposed project. BACT will be used to control VOCs from the paper machines, and NO_x, CO, VOCs, PM₁₀, SO₂, H₂S, and TRS from Recovery Furnaces 18 and 19.

- BACT for the paper machines is use of low-VOC additives.
- BACT for Recovery Furnaces 18 and 19 for each criteria pollutant is as follows:
- For NO_x: Good combustion practice with an emissions limit of 95 ppm NO_x.
- For CO/VOCs: Good combustion control of flame temperature and excess air. Corresponding emissions limits are 612 tons VOCs per year and 360 lb CO/hr for Recovery Furnace 18 and 1,020 tons VOCs per year and 600 lb CO/hr for Recovery Furnace 19.
- For SO₂ and PM₁₀: LFPPI has a federally enforceable limit on emissions of these pollutants representing a 53 percent reduction for SO₂ and a 20 percent reduction for PM₁₀ from the currently allowed emissions levels. With this new baseline for potential SO₂ and PM₁₀, BACT is no further control application.
- For H₂S and TRS: No further control application is either feasible or economically justifiable.

12. The proposed pollutant increases did not significantly impact air quality attainment under the NAAQS:

- The proposed increases in emissions did not cause an exceedance of the NAAQS.
- The proposed emissions increases are not significant contributors to the modeled increment consumption.

13. None of the toxic air pollutant emission increases gave ambient concentration increases in excess of their corresponding acceptable source impact levels under Chapter 173-460 WAC.

14. Criteria pollutant concentrations related to the proposed emissions increases did not exceed significance levels in any Class I area or the Columbia River Gorge.

15. Visibility was not significantly impaired in any Class I area or the Columbia River Gorge due to the emissions.

16. Projected deposition of sulfur and nitrogen oxide chemical species on the Class I areas and the Columbia River Gorge is not significant.

17. The proposed pollutant increases did not significantly impact sensitive plant or animal species in any Class I or Class II area.

18. The proposed modifications and production increase did not have a significant effect on the surrounding area's population or economic growth.
19. Ecology found that all requirements were satisfied for PSD and NSR and for the first administrative amendment (First Amendment).
20. Ecology finds that all requirements for the second administrative amendment were satisfied.
21. Approval of the PSD permit was granted subject to the following conditions.

APPROVAL CONDITIONS

1. **Emissions Limits, Monitoring, and Reporting Requirements:** Table 2 encompasses Approval Conditions 1.1 through 1.104. The emission limits in Table 2 shall not be exceeded. Monitoring and reporting requirements in Table 2 shall be followed.
2. **Exhaust Stack Flow Correlations:** At least annually, KapStone shall update equations for calculation of gas flow from each recovery furnace and lime kiln exhaust stack.
 - 2.1. The equations shall correlate exhaust stack gas flows to process rate from the emissions units (see Appendix 2). The correlation shall be based on linear regression analysis.
 - 2.2. By January 31 of each year, KapStone shall submit the updated equations, the data on which they are based, and the regression analyses to Ecology for approval. KapStone may submit proposed updates more frequently at its option. An update for an emissions unit shall have occurred only when new data are submitted.
 - 2.3. For emission units operated 6,000 hours or more since the last update, each update shall include at least 12 hours of new data, and drop an equal amount of the oldest data. For emission units operated less than 6,000 hours since the last update, the minimum hours of new data (and dropped oldest data) shall be:

$$\text{(Hours of operation since last update)} \times 12 \div 6,545, \text{ rounded to the nearest whole number.}$$

The updated equations shall take effect upon approval from Ecology.

3. **Initial Performance Tests:** Within six months after completion of the respective modifications to Recovery Furnaces 18 and 19 that are subject to this permit, Recovery Furnaces 18 and 19 shall be subjected to initial performance tests.
 - 3.1. KapStone is to provide not less than two weeks prior notice to Ecology in writing of the scheduled performance test. Such notification shall include a detailed description of the intended performance test plan(s).

3.2. The performance tests shall include determination of emission concentrations and pounds per ton black liquor solids across Recovery Furnaces 18 and 19's range of operating levels. The lowest operating level during the test shall not be greater than 70 percent of the respective recovery furnace's "Operating Limit" in Table 2. The highest operating level during the test shall not be less than 90 percent of the respective recovery furnace's "Operating Limit" in Table 2.

3.3. Following are the relevant pollutants and corresponding test methods:

- PM and PM₁₀: Reference Method 5 of 40 CFR, Part 60, Appendix A, or Ecology Method 5 as found in the Source Test Manual - Procedures for Compliance Testing, 1983, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM₁₀.
- SO₂: Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO₂ source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFPPI Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO₂ monitoring mode.
- CO: Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.
- NO_x: Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.
- H₂S/TRS: Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H₂S, or an alternative approved by Ecology.
- VOCs: Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.

4. **Paper Machines:** Additives used in the paper-making process on the paper machines shall be "low-VOC." KapStone shall annually submit a list of additives used in the paper-making process on the paper machines and identify those that are not "low-VOC."
5. **Stack Modifications and Replacements:** The exhaust stacks for Power Boilers 16 and 20, and Lime Kilns 3 and 4 shall be modified or replaced. The modified or replaced exhaust stacks shall be designed in such a way that modeled exhaust gas dispersion is equal to or better than that indicated for the originally-proposed design in the modeling reported in the application for this PSD permit. Plans for the stack design must be approved in writing by Ecology prior to initiation of construction of the stack. Construction of the modified or replacement stacks shall be consistent with design.
6. **Alternate Compliance Test Methods:** Ecology may approve alternate compliance test methods that are of equivalent stringency for any air pollutant regulated by this permit.

7. **CEM QA Plan:** Ecology may require periodically updating the continuous emission monitoring quality assurance plan submitted to Ecology on July 26, 1991. The updates shall satisfy 40 CFR, Part 60, Appendix F, dated July 1, 1992, or latest revision.
8. **Enforcement:** Any activity that is undertaken by KapStone or others, in a manner, which is inconsistent with the application and this determination, shall be subject to Ecology enforcement under applicable regulations. Nothing in this determination shall be construed to relieve KapStone of its obligations under any state, local, or federal laws or regulations.
9. **Reporting:** KapStone shall retain copies of all required reports to Ecology for at least five years. CEMS, source test, and process data shall be reported in written form to Ecology's Industrial Section or its authorized representative at least monthly (unless a different testing and reporting schedule has been approved by Ecology). The report shall be submitted in conformance with the time requirements included in Chapter 173-405 WAC, but in no case later than 30 days after the end of the calendar month being reported. The report shall be in a format approved by Ecology that shall include but not be limited to the following:
 - 9.1. Process or control equipment operating parameters.
 - 9.2. For each applicable emission unit, the pollutant concentrations in the units and averaging times of the standard shown in Table 2.
 - 9.3. For each applicable emission unit, total pollutant mass emissions in the units and averaging times of the standard shown in Table 2.
 - 9.4. The duration and nature of any monitor downtime.
 - 9.5. Results of any monitor audits or accuracy checks.
 - 9.6. Results of any stack tests performed since the last report.
10. **Exceedance Reporting:** For each occurrence of monitored or measured emissions in excess of the standard, the report to Ecology's Industrial Section or its authorized representative shall include the following:
 - 10.1. The time of the occurrence.
 - 10.2. Magnitude of the emission or process parameters excess.
 - 10.3. The duration of the excess.
 - 10.4. The probable cause.
 - 10.5. Corrective actions taken or planned.
 - 10.6. Any other agency contacted besides Ecology.

11. **O&M Manuals:** Operating and maintenance manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies of the manuals shall be available to Ecology. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.
12. **Post-Construction Ambient Air Monitoring:** Within six months of the issuance of this permit, LFPPI was required to submit to Ecology a monitoring plan for PM₁₀. As a minimum, the monitoring plan was required to satisfy the guidelines in the latest edition of Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) (U.S. Environmental Protection Agency, Research Triangle Park, EPA Publication No. EPA-450/4-87-007, May 1987 or latest revision).

Amendment 3 adds the option for KapStone to model their air emissions instead of conducting ambient air monitoring.

For the ambient air monitoring option, KapStone shall monitor PM₁₀ consistent with the terms in the January 2003 Quality Assurance Project Plan (QAPP) submitted by LFPPI, or with revisions as approved by Ecology. Sampling will be considered to have commenced upon start-up of the ambient monitor at the Ecology and KapStone agreed upon location. Monitoring will proceed for two years, after which, if the monitoring results show one or fewer days greater than 150 µg/m³ for a 24-hour average, or 50 µg/m³ for an annual average for PM₁₀, then KapStone will have met all requirements of this condition.

For the modeling option, KapStone will conduct PM₁₀ modeling demonstrating compliance with the 150 µg/m³ 24-hour PM₁₀ NAAQS. The modeling will be conducted following an Ecology-approved modeling protocol. Sampling will be considered to have commenced upon submittal of the protocol. Following Ecology approval of the modeling protocol, KapStone shall expeditiously submit to Ecology PM₁₀ modeling demonstrating compliance with the 150 µg/m³ 24-hour PM₁₀ NAAQS. If the modeling demonstrates compliance with the 150 µg/m³ 24-hour PM₁₀ NAAQS, then KapStone will have met all requirements of this condition. If the modeling results do not demonstrate compliance, KapStone shall commence ambient monitoring within six months of the date Ecology was notified that the modeling results did not demonstrate compliance.

13. **Deadline:** This approval shall become invalid if construction of the project is not commenced within eighteen (18) months after receipt of final approval, or if construction of the facility is discontinued for a period of eighteen (18) months, unless Ecology extends the 18-month period upon a satisfactory showing that an extension is justified, pursuant to 40 CFR 52.21(r) (2) and applicable EPA guidance.
14. **Access** to the source by the U.S. Environmental Protection Agency, Ecology, or local regulatory personnel shall be permitted upon request for the purpose of compliance assurance

inspections. Failure to allow access is grounds for revocation of this determination of approval.

Prepared by:

Marc E. Crooks, P.E.
Science and Engineering Section
Air Quality Program

Date

Approved by:

Stuart A. Clark
Air Quality Program Manager

Date

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)			
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting	
1.1 – 1.6	Reserved.								
1.7	Recovery Furnace 18 (see table note 4)	1,200 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.			
1.8			PM & PM ₁₀	0.044 gr/dscf @ 8% O ₂ , 1-hr avg.	219 TPY	RM 5	M/Q		
1.9			SO ₂	94 lb/hr, 3-hr avg.	202 TPY	PS 2	C		
1.10			CO	360 lb/hr, 8-hr avg.	1,577 TPY	RM 10	A/M		
1.11			NO _x	95 ppmdv @ 8% O ₂ , 24-hr avg.	452 TPY	RM 7			
1.12			TRS/H ₂ S (assume all TRS is H ₂ S)	17.5 ppmdv @ 8% O ₂ , 24-hr avg.	62 TPY	PS 5	C		
1.13			VOCs	None	612 TPY	RM 25A	Triennially		
1.14			Recovery Furnace 19 (see table note 4)	2,000 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.	
1.15				PM & PM ₁₀	0.040 gr/dscf @ 8% O ₂ , 1-hr avg.	292 TPY	RM 5	M/Q	
1.16		SO ₂		149 lb/hr, 3-hr avg.	301 TPY	PS 2	C		
1.17		CO		600 lb/hr, 8-hr avg.	2,628 TPY	RM 10	A/M		
1.18		NO _x		95 ppmdv @ 8% O ₂ , 24-hr avg.	753 TPY	RM 7			
1.19		TRS/H ₂ S (assume all TRS is H ₂ S)		10.0 ppmdv @ 8% O ₂ , 24-hr avg.	59 TPY	PS 5	C		
1.20		VOCs		None	1,020 TPY	RM 25A	Triennially		
1.21		Recovery Furnace 22 (see table note 4)	1,950 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.		
1.22			PM & PM ₁₀	0.027 gr/dscf @ 8%	256 TPY	RM 5	M/Q		

Monthly (see table note 5)

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				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
				O ₂ , 1-hr avg.				
1.23			SO ₂	295 lb/hr, 3-hr avg.	1,291 TPY	PS 2	C	
1.24			CO	300 ppm _{dv} @ 8% O ₂ , 8-hr avg.	1,380 TPY	PS 4	C	
1.25			NO _x	95 ppm _{dv} @ 8% O ₂ , 3-hr avg.	735 TPY	PS 2	C	
1.26			TRS/H ₂ S (assume all TRS is H ₂ S)	3.0 ppm _{dv} @ 8% O ₂ , 12-hr avg.	17 TPY	PS 5	C	
1.27 – 1.32	Reserved.							
1.33	Smelt Dissolving Tank 18	1,200 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.		
1.34			PM & PM ₁₀	0.12 lb/TBLS, 1-hr avg.	26 TPY	RM 5	M/Q	
1.35			SO ₂	None	4 TPY	RM 6C	T/M	
1.36			CO	None	40 TPY	RM 10		
1.37			NO _x	None	7 TPY	RM 7		
1.38			TRS/H ₂ S (assume all TRS is H ₂ S)	None	67 TPY	RM 16		
1.39	Smelt Dissolving Tank 19	2,000 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.		
1.40			PM & PM ₁₀	0.12 lb/TBLS, 1-hr avg.	44 TPY	RM 5	M/Q	
1.41			SO ₂	None	16 TPY	RM 6C	T/M	
1.42			CO	None	66 TPY	RM 10		
1.43			NO _x	None	11 TPY	RM 7		

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				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
1.44			TRS/H ₂ S (assume all TRS is H ₂ S)	None	114 TPY	RM 16		
1.45	Smelt Dissolving Tank 22	1,950 TBLS/day	N/A	None	None	Report avg. daily BLS production in tons.		
1.46			PM & PM ₁₀	0.12 lb/TBLS, 1-hr avg.	44 TPY	RM 5	M/Q	
1.47			SO ₂	None	31 TPY	RM 6C	T/M	
1.48			CO	None	65 TPY	RM 10		
1.49			NO _x	None	11 TPY	RM 7		
1.50			TRS/H ₂ S (assume all TRS is H ₂ S)	0.0168 lb/TBLS, 24-hr avg.	6 TPY	RM 16		
1.51 – 1.56			Reserved.					
1.57	Lime Kiln 3	240 tons CaO/day	N/A	None	None	Report avg. daily CaO production in tons.		
1.58			PM & PM ₁₀	0.030 gr/dscf @ 10% O ₂ , 1-hr avg.	34 TPY	RM 5	M/Q	
1.59			SO ₂	20 ppmdv @ 10% O ₂ , 3-hr avg.	27 TPY	RM 6C		
1.60			CO	133 lb/hr, 8-hr avg.	581 TPY	RM 10	A/M (Use table note 5(1)(a) w/o dividing by CaO production)	
1.61			NO _x	340 ppmdv @ 10% O ₂ , 24-hr avg.	238 TPY	RM 7		
1.62			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 24-hr avg.	10 TPY	PS 5	C (See table note 8)	

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
1.63	Lime Kiln 4	250 tons CaO/day	N/A	None	None	Report avg. daily CaO production in tons.		
1.64			PM & PM ₁₀	0.030 gr/dscf @ 10% O ₂ , 1-hr avg.	35.6 TPY	RM 5	M/Q	
1.65			SO ₂	20 ppmdv @ 10% O ₂ , 3-hr avg.	28 TPY	RM 6C		
1.66			CO	138 lb/hr, 8-hr avg.	605 TPY	RM 10	A/M (use table note 5(1)(a) w/o dividing by CaO production)	
1.67			NO _x	340 ppmdv @ 10% O ₂ , 24-hr avg.	248 TPY	RM 7		
1.68			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 24-hr avg.	11 TPY	PS 5	C (see table note 8)	
1.69			Lime Kiln 5	325 tons CaO/day	N/A	None	None	
1.70	PM & PM ₁₀	When firing natural gas: 0.035 gr/dscf @ 10% O ₂ , 1-hr avg.		69 TPY	RM 5	M/Q		
1.71		When firing fuel oil: 0.060 gr/dscf @ 10% O ₂ , 1-hr avg.						
1.72	SO ₂	20 ppmdv @ 10% O ₂ , 3-hr avg.		28 TPY	RM 6C			
1.73	CO	64 lb/hr, 8-hr avg.		282 TPY	PS 4	C (use table note 5(1)(b) w/o dividing by CaO production)		
1.73	NO _x	275 ppmdv @ 10%	262 TPY	RM 7	A/M			

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				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
				O ₂ , 24-hr avg.				
1.74			TRS/H ₂ S (assume all TRS is H ₂ S)	8 ppmdv @ 10% O ₂ , 12-hr avg.	6 TPY	PS 5	C (see table note 8)	
1.75 – 1.79	Reserved.							
1.80	Power Boiler 16	525 MMBtu/hr fuel application rate	N/A	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.81			PM & PM ₁₀	0.1 gr/dscf @ 7% O ₂ , 1-hr avg.	475 TPY	RM 5	M/Q (oil-fired) T/M (natural gas-fired) (see table note 3(4))	Monthly (see table note 6)
1.82			SO ₂	250 ppmdv @ 7% O ₂ , 3-hr avg.	1,357 TPY	Fuel sulfur reporting		Monthly by purchase records and vendor's reports
1.83			CO	525 lb/hr, 8-hr avg.	2,300 TPY	RM 10	A/M (use table note 6(1)(b) w/o dividing by fuel applied)	Monthly (see table note 6)
1.84			NO _x	410 ppmdv @ 7% O ₂ , 24-hr avg.	1,679 TPY	RM 7		
1.85		900 MMBtu/hr fuel application rate	N/A	None	None	Report daily maximum fuel consumption in MMBtu/hr		
1.86	Power Boiler 20		PM & PM ₁₀	0.048 gr/dscf @ 7% O ₂ , 1-hr avg.	365 TPY	RM 5	M/Q	
1.87			SO ₂	100 ppmdv @ 7% O ₂ ,	946 TPY	PS 2	C	

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
				3-hr avg.				
1.88			CO	900 lb/hr, 8-hr avg.	3,942 TPY	RM 10	A/M (use table note 6(1)(b) w/o dividing by fuel applied)	
1.89			NO _x	Gas fired: 0.20 lb/MMBtu fuel application rate, 3-hr avg.	1,183 TPY	PS 2	C	
				Other fuel: 0.30 lb/MMBtu fuel application rate, 3-hr avg.				
1.90 – 1.95	Reserved.							
1.96	Plantwide	Kraft pulp: 2,800 MDT/day, 12-mo rolling avg.	N/A	None	None	See table note 7.		Monthly
1.97		Total primary production (see (4) under table note 1): 3,600 MDT/day, 12-mo rolling avg.						
1.98			PM & PM ₁₀		698.5 TPY			
1.99			SO ₂		1,885 TPY			
1.100			CO		7,056.5 TPY			
1.101			NO _x		3,028.5 TPY			
1.102			TRS/H ₂ S		263 TPY			

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
1.103			(assume all TRS is H ₂ S) VOCs		1,674 TPY			
1.104		2.6 million lb/hr steam production @ 800 psig @ the main header, 1-hr avg.	N/A		None	Report daily maximum steam rate @ the main header, lb/hr @ 800 psig		

¹ **Compliance with the operating limit** for each emission unit shall be made by recording and reporting the quantities from number (3) below:

- (1) Record the number of hours of operation of the emissions unit since the last report.
- (2) Record the total production through the emissions unit since the last report.
- (3) Average production rates:
 - (a) For power boilers, divide the quantity from (2) by the quantity from (1) to get the average hourly production.
 - (b) For recovery furnaces, smelt dissolving tanks, and lime kilns, divide the quantity from (2) by the quantity from (1), and multiply by twenty-four to get the avg. (24-hr) daily production.
- (4) Total primary production is the total paper and board saleable product from the paper machines. All trim and cull go back into pulp furnish to the paper machines.
 - (a) Record daily total primary production.
 - (b) Total for the days since end of the last reporting period.
 - (c) Add to annual total in last report.
 - (d) Subtract the amount of the corresponding period from the immediately previous year.

² **Abbreviations:** ADTP = Air Dry Ton Pulp, gr/dscf = grains per dry standard cubic foot, MDT = machine dry tons, MMBtu = Million Btu, ppm_{dv} = parts per million based on dry volume, TPY = tons per year, TBLS = tons black liquor solids

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- (1) Test methods indicated are abbreviations. Details are in **Appendix 1** of this permit.
 - (2) **“A/M”** means source test is to be performed annually. If any single source exceeds 75% of the limitation, source testing shall be performed monthly (see qualification below) until six consecutive month’s tests are below 75% of the limitation, at which time testing may return to an annual schedule.
“M/Q” means source test is to be performed monthly (see qualification, below). Source testing may be reduced to quarterly (see qualification, below) if six consecutive month’s tests are below 75% of the limitation. If any single source exceeds 75% of the limitation, source testing shall revert to monthly until six consecutive month’s tests are below 75% of the limitation.
“T/M” means source test is to be performed triennially. If any single source test exceeds 75% of the limitation, source testing shall be performed monthly (see qualification, below) until six

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
<p>consecutive month's tests are below 75% of the limitation, after which source testing may return to triennially.</p> <p>Qualification:</p> <p>"Monthly" test cycle: A source test must be performed in any month wherein the unit was operated more than 216 hours. A source test must be performed prior to the emissions unit having been operated a total of 720 hours since the end of the month of the last source test.</p> <p>"Quarterly" test cycle: A source test must be performed in any quarter wherein the unit was operated more than 648 hours. A source test must be performed prior to the emissions unit having been operated a total of 2,160 hours since the end of the quarter of the last source test.</p> <p>"Annual" test cycle: A source test must be performed in any calendar year wherein the unit was operated more than 2,628 hours. A source test must be performed prior to the emissions unit having been operated a total of 8,640 hours since the end of the calendar year of the last source test.</p> <p>"A" relative to reporting frequency means annually.</p> <p>"C" means testing is continuous by virtue of the CEM.</p> <p>"M" relative to reporting frequency, means monthly.</p> <p>"Q" relative to reporting frequency, means quarterly.</p> <p>"T" relative to reporting frequency, means triennially.</p> <p>(3) Compliance determination using source testing shall be as follows:</p> <ul style="list-style-type: none"> • During all emissions testing (source testing) runs, the concurrent process rate of the emission unit shall be recorded in units of measurement characteristic of the emission unit, and submitted with the source test data. • An emissions unit with one stack: The arithmetic mean of three or more runs of at least one hour each in duration. NOTE: Compliance may be demonstrated for NO_x and SO₂ emission concentration limit on Lime Kiln 5 and for the CO emission concentration limit on Power Boiler 20 by applying this three-run protocol on one of their two respective stacks. • An emissions unit with two stacks: The arithmetic mean of runs made on both stacks. Two or more runs of at least one hour each in duration must be made on each stack. • Any test runs KapStone believes to be invalid due to procedural error may be dropped from the arithmetic mean calculation. Results of such "invalid" runs are to be included in the monthly report with an explanation of the "invalid" determination. <p>⁴ During source tests for PM and PM₁₀ on all recovery furnaces, primary voltage, primary current, opacity, and spark rate for the electrostatic precipitator shall be recorded for each field once during each source test. In addition, secondary voltage and secondary current data shall also be collected once during each source test when available. All precipitator data shall be maintained in a file with corresponding test data. Precipitator data shall be submitted to Ecology when the PM and PM10 source test results exceed the permit limit. The department may modify or waive this requirement.</p> <p>⁵ Compliance with the mass rate limit for the recovery furnaces, smelt dissolving tanks, and lime kilns shall be monitored as follows:</p> <p>(1) Emission factor: Pounds pollutant per ton process quantity for each emissions unit.</p> <p>(a) Using source test data: Use source test data for emissions units and pollutants not having CEMS. From the most recent source test results, convert the emission concentration, corresponding stack gas flow rate, and emission unit process rate for each run to the equivalent pounds of pollutant emission per process unit of measurement, such as lb SO₂/lb black</p>								

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
liquor solids. Example 1: $\{[source\ test\ ppm\ SO_2] \times (10^{-6}) \times [source\ test\ dscfm] \times (60\ min/hr) \times (64\ lb\ SO_2)\}$ $\div [(385\ scf\ SO_2) \times (source\ test\ tons\ BLS/hr)] = lb\ SO_2/TBLS$ The same equation may be used for CO, NO _x , H ₂ S/TRS, and VOCs by making the following respective substitutions for the term "64 lb SO ₂ :" 28 lb CO, 46 lb NO _x , 34 lb H ₂ S/TRS, and 12 lb VOCs as carbon. Example 2: $\{[source\ test\ gr/dscf\ PM_{10}] \times (lb/7,000\ gr) \times [source\ test\ dscfm] \times (60\ min/hr) \div (source\ test\ tons\ BLS/hr)\} = lb\ PM_{10}/TBLS$ Example 3, Dry kilns: $\{[source\ test\ ppm\ SO_2] \times (10^{-6}) \times [source\ test\ dscfm] \times (60\ min/hr) \times (64\ lb\ SO_2)\}$ $\div [(385\ scf\ SO_2) \times (source\ test\ tons\ CaO/hr)] = lb\ SO_2/ton\ CaO$ The equation may be used for CO, NO _x , and H ₂ S/TRS by making the following respective substitutions for the term "64 lb SO ₂ :" 28 lb CO, 46 lb NO _x , and 34 lb H ₂ S/TRS Example 4, Dry kilns: $\{[source\ test\ gr/dscf\ PM_{10}] \times (lb/7,000\ gr) \times [source\ test\ dscfm] \times (60\ min/hr) \div (source\ test\ tons\ CaO/hr)\} = lb\ PM_{10}/ton\ CaO$ Calculate the arithmetic mean of the source test runs for each pollutant and each emission unit as described in table note 3, above.								
(b) Using CEMS data: Use CEMS data for applicable emissions units and pollutants.								
(i) Determine the average daily process throughput for each emissions unit: Recovery furnaces – tons black liquor solids per hour (TBLS/hr); Lime kilns – tons calcium oxide per hour (CaO/hr).								
(ii) From each average daily process throughput, calculate the related stack exhaust flow. Use the equations relating process throughput to stack exhaust flow currently approved by Ecology (see Appendix 2 of this permit).								
(iii) Determine the daily average emission concentration for each emissions unit and pollutant having a related CEMS.								
(iv) Calculate the emissions factors for the reporting period. The examples in (1)(a), above may be used by substituting the corresponding quantities from (1)(b)(i), (ii), and (iii) for the "source test" quantities.								
(2) TPY:								
(a) Amount processed through the emissions unit since the closing date of the last report.								
(i) For recovery furnaces and smelt dissolving tanks: Determine the total tons BLS processed through the emission unit since the closing date of the last report.								
(ii) For the lime kilns: Determine the total tons CaO processed through the emission unit since the closing date of the last report.								
(b) For each pollutant and emissions unit, multiply the emission factor from (1) by the quantity processed [(2)(a)(i) for the recovery furnaces and smelt dissolving tanks or (2)(a)(ii) for the lime kilns], and divide by 2,000 lb/ton. The result should be the tons of each pollutant that have been emitted from each emissions unit since the closing date of the last report. Add up the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of pollutant emissions for each emissions unit. Each such quantity must be less than the								

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting

corresponding limit (TPY) in Table 2 to demonstrate compliance.

⁶ **Compliance with mass rate limits** for the power boilers:

- (1) **Emission factor**, pounds pollutant per ton process quantity for each emissions unit: Convert each emission concentration, corresponding stack gas flow rate, and power boiler to the equivalent pounds of pollutant emission per million Btu (lb/MMBtu). In the examples below,
 - (a) If continuous emissions monitoring (CEM) has been installed: Apply the examples in this table note below. Pollutant “concentration” is the average daily concentration. “Exhaust gas flow” may be calculated from the appropriate “F-factor(s)” from 40 CFR Part 60, Appendix A, Method 19 if not otherwise known. “Fuel applied” is to be determined from the average daily fuel composition. Exclude boiler downtime from all calculations.
 - (b) If CEM data are not available, the pollutant *concentration*, *exhaust gas flow*, and *fuel applied* are from the most recent source test run results. Where source test data are used, apply the examples in this table note, below, to each of the source test runs for each pollutant and each power boiler. Calculate the arithmetic mean as described in table note 3 above.
 - (c) For Power Boiler 16, calculate SO₂ emissions (lb SO₂/MMBtu) from the purchase records and vendor’s reports on fuel sulfur content for the fuel applied during the reporting period.

Example 1: $\{[SO_2 \text{ concentration ppmvd}] \times (10-6) \times [exhaust \text{ gas flow dscfm}] \times (60 \text{ min/hr}) \times (64 \text{ lb SO}_2)\} \div [(385 \text{ scf SO}_2) \times (fuel \text{ applied MMBtu/hr.})] = \text{lb SO}_2/\text{MMBtu}$

The equation may be used for CO and NO_x by making the following respective substitutions for the term “64 lb SO₂”:

28 lb CO, and 46 lb NO_x.

Example 2: $\{[PM_{10} \text{ concentration gr/dscf}] \times (lb/7,000 \text{ gr}) \times [exhaust \text{ gas flow dscfm}] \times (60 \text{ min/hr}) \div (fuel \text{ applied MMBtu/hr})\} = \text{lb PM}_{10}/\text{MMBtu}$

(2) **TPY:**

- (a) Determine the total fuel applied to each power boiler since the closing date of the last report in MMBtu.
- (b) For each pollutant emitted from each power boiler, multiply the respective quantities from (1) and (2)(a), and divide by 2,000 lb/ton. The result should be the tons of each pollutant emitted from each power boiler since the closing date of the last report. Add this quantity to the analogous quantities calculated for sufficient contiguous prior periods to total one year’s worth of emissions for each power boiler. This quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance.

⁷ **Compliance determination for plantwide limits:**

- (1) Report daily Kraft and total primary production in tons. Add sufficient contiguous periods including the current reporting period to give a 12-month total.
- (2) For PM & PM₁₀, SO₂, CO, and NO_x: For each pollutant, add the emissions calculated for the period since the close of the last report from the recovery furnaces (18, 19, and 22), the smelt dissolving tanks (18, 19, and 22), the lime kilns (3 through 5), and the power boilers (16 and 20) to the analogous quantities calculated for sufficient contiguous prior periods to total one year’s worth of emissions concluding with the close of the current reporting period.
- (3) For VOCs:
 - (a) Determine the total tons of black liquor solids processed through each recovery furnace and all smelt dissolving tanks for the one year period ending with the close of the reporting period.

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
<p>(b) Determine the total tons of CaO produced by each lime kiln for the one year period ending with the close of the reporting period.</p> <p>(c) Determine the average fuel application rate for each power boiler (MMBtu/hr) for the one year period ending with the close of the reporting period. Add them together.</p> <p>(d) Kraft digesters, brownstock washer, knotter, primary black liquor oxidizer, paper machines, and cooling tower:</p> <p>(i) Abbreviations: B = Batch Kraft digester, MDTP CT = Cooling tower, MDTP K1 = #1 Kamyrdigester, MDTP K2 = #2 Kamyrdigester, MDTP M&D = Continuous Kraft digester, MDTP OxMDTP = Primary black liquor oxidizer, MDTP PPMP = Primary paper machines, MDTP</p> <p>(ii) Determine the sum of the tons of black liquor solids processed through Recovery Furnaces 18, and 19 tanks for the one year period ending with the close of the reporting period.</p> <p>(iii) Determine the sum of the tons of black liquor solids processed through Recovery Furnaces 18, 19, and 22 tanks for the one year period ending with the close of the reporting period.</p> <p>(iv) Divide the number from (ii) by the number from (iii).</p> <p>(v) Determine the production in MDTP from each of K1, K2, B, and M&D tanks for the one year period ending with the close of the reporting period.</p> <p>(vi) Sum K1 + K2 + B + M&D from (v).</p> <p>(vii) Multiply the number from (iv) by the number from (vi) to give OxMDTP for the one year period ending with the close of the reporting period.</p> <p>(viii) Multiply the sum of K1 and K2 from (v) by 0.992 to give the pounds of VOCs for the one year period ending with the close of the reporting period from Kamyrdigesters #1 and #2.</p> <p>(ix) Multiply the sum of B and M&D from (v) by 0.96 and add the product of B times 0.136 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the Batch and Continuous Kraft digesters.</p> <p>(x) Multiply OxMDTP from (vii) by 0.355 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the Primary black liquor oxidizer.</p> <p>(xi) Multiply the total primary production from (1) by 1.075 to give the pounds of VOCs for the one year period ending with the close of the reporting period from the primary paper machines and cooling tower.</p> <p>(xii) Sum the quantities from (viii), (ix), and (x) and (xi) to give the plant wide pounds of VOCs for the one year period ending with the close of the reporting period.</p> <p>(e) Multiply the quantity from (3)(a) by 0.21 to give the pounds of VOCs during the past twelve months from recovery furnaces and smelt dissolving tanks.</p> <p>(f) Multiply the quantity from (3)(b) by 0.026 to give the pounds of VOCs during the past twelve months from the lime kilns and related lime recovery equipment.</p>								

**Table 2. Emissions Limits, Monitoring, and Reporting Requirements
 PSD 01-03**

Condition Number	Applicable Units	Operating Limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring & Reporting (see table note 3)		
				Concentration	Mass Rate (see table notes 5 & 6)	Test Method	Test Frequency	Reporting
<p>(g) Multiply the quantity from (3) (c) by 117.4 to give VOCs from the power boilers.</p> <p>(h) Add the quantities from (3)(d) through (3)(g), and divide the result by 2,000 to give TPY VOCs, plantwide.</p> <p>(4) For daily maximum steam production: Divide the daily total steam production by 24, and report result in units of the limit</p> <p>⁸ Continuous TRS monitoring does not apply during periods when TRS monitoring equipment is being used to conduct required SO₂ source testing.</p>								

APPENDIX 1. PSD 01-03

Test Methods: Abbreviations for the test methods indicated as required in Table 2 of PSD 01-03 are defined as follows:

- RM 5 Determination of Particulate Emissions from Stationary Sources
Reference Method 5 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM₁₀.
- RM 6C Determination of Sulfur Dioxide Emissions from Stationary Sources
Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO₂ source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFPP Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO₂ monitoring mode. LFPP Source Test Method No. 311 which uses a certified portable SO₂ emission monitor may be used as an approved test procedure.
- RM 7 Determination of Nitrogen Oxide Emissions from Stationary Sources
Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFPP Source Test Method 311, which uses a certified portable NO_x emission monitor, may be used as an approved test procedure.
- RM 10 Determination of Carbon Monoxide Emissions from Stationary Sources
Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFPP Source Test Method 311, which uses a certified portable CO emission monitor, may be used as an approved test procedure.
- RM 16 Semicontinuous Determination of Sulfur Emissions from Stationary Sources
Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H₂S, or an alternative approved by Ecology. LFPP Source Test Method 202, which captures gas in a Tedlar bag for analysis, may be used to test smelt dissolving tank TRS emissions.
- RM 25A Determination of Total Gaseous Organic Concentration using Flame Ionization analyzer
Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.
- PS 2 Performance Specification 2 of 40 CFR, Part 60, Appendix B, "Specification and Test Procedures for SO₂ and NO_x Continuous Emissions Monitoring Systems in Stationary Sources."
- PS 4 Performance Specification 4 of 40 CFR, Part 60, Appendix B, "Specification and Test Procedures for Carbon Monoxide Continuous Emissions Monitoring Systems in Stationary Sources."
- PS 5 Performance Specification 5 of 40 CFR, Part 60, Appendix B, "Specification and Test Procedures for TRS Continuous Emissions Monitoring Systems in Stationary Sources."

APPENDIX 2. PSD 01-03

Exhaust Stack Flow Correlations:

1. **Recovery Furnaces:** Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

$$\text{Exhaust stack flow (dscfm @ 8\% O}_2\text{)} = a + b \times (\text{BLS production rate, lb./hr.})$$

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

$$a = 19,631$$

$$b = 1.3758$$

2. **Lime Kilns:** Exhaust stack flow from lime kilns is the sum of combustion exhaust and carbon dioxide generated by the calcine reaction. Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

$$\begin{aligned} \text{Combustion exhaust flow (dscfm @ 10\% O}_2\text{)} &= 1.917^a \times (\text{F-factor}^b, \text{ dscf/MMBtu}) \\ &\quad \times (\text{lime kiln economy, Btu/ton CaO}) \\ &\quad \times \text{CaO production rate, tons/hr.}) \\ &\quad \div (60 \text{ min./hr.}) \end{aligned}$$

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

$$\text{F-factor} = 8,740 \text{ dscf/MMBtu}$$

$$\text{Lime kiln economy} = 10 \times 10^6 \text{ Btu/ton CaO for lime kilns \#1 through \#4}$$

$$6.5 \times 10^6 \text{ Btu/ton CaO for lime kiln \#5}$$

$$\begin{aligned} \text{Calcine exhaust flow (dscfm @ 10\% O}_2\text{)} &= 1.917^c \times (13,750^d \text{ dscf @ 10\% O}_2\text{ per ton CaO}) \\ &\quad \times \text{CaO production rate, tons/hr.}) \\ &\quad \div (60 \text{ min./hr.}) \end{aligned}$$

Add Combustion exhaust flow and Calcine exhaust flow for total Lime Kiln exhaust flow.

^a This coefficient adjusts to 10% O₂.

^b From 40 CFR Part 60, Appendix A, Method 19.

^c This coefficient adjusts to 10% O₂.

^d Assuming ideal gas behavior, and based on the standard calcine reaction products.