

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

**Title V Air Permit Review**

**Region:** Winston-Salem Regional Office  
**County:** Surry  
**NC Facility ID:** 8600108  
**Inspector's Name:** Ray Stewart  
**Date of Last Inspection:** 06/15/2005  
**Compliance Code:** 3/In Compliance - Inspection

<b>Facility Data</b>			<b>Permit Applicability (this application only)</b>		
<b>Applicant (Facility's Name):</b> Weyerhaeuser Company - Elkin Plant  <b>Facility Address:</b> Weyerhaeuser Company - Elkin Plant 184 Gentry Road Elkin, NC 28621  <b>SIC:</b> 2439 / Structural Wood Members, Nec <b>NAICS:</b> 321213 / Engineered Wood Member (except Truss) Manufacturing  <b>Facility Classification: Before:</b> Title V <b>After:</b> Title V <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V			<b>SIP:</b> <b>NSPS:</b> <b>NESHAP:</b> <b>PSD:</b> <b>PSD Avoidance:</b> 2Q .0317 <b>NC Toxics:</b> <b>112(r):</b> <b>Other:</b>		
<b>Contact Data</b>			<b>Application Data</b>		
<b>Facility Contact</b>	<b>Authorized Contact</b>	<b>Technical Contact</b>	<b>Application Number:</b> 8600108.05A <b>Date Received:</b> 08/09/2004 <b>Application Type:</b> Appeal <b>Application Schedule:</b> Appeal (2Q.0501(c)(2)) <b>Existing Permit Data</b> <b>Existing Permit Number:</b> 05678/R27 <b>Existing Permit Issue Date:</b> 02/11/2005 <b>Existing Permit Expiration Date:</b> 01/31/2010		
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<b>Review Engineer:</b> Charles F. Yirka <b>Review Engineer's Signature:</b>		<b>Date:</b> XX XX, 2005	<b>Comments / Recommendations:</b> Issue 05678T28 <b>Permit Issue Date:</b> -----, 2005 <b>Permit Expiration Date:</b> XX XX, 2010		

**I. Introduction**

This permit modification is in response to an appeal of the initial title V permit. The permit modification is in conformance with procedures 15A NCAC 2Q .0501(c)(2) (2nd step) as it is a significant modification to the existing title V permit. In conformance to the NC General Statutes 150B-23 the applicant made a timely request (within 30 days of the day of receipt) for a formal adjudicatory hearing.

**II. Application Chronology/History:**

December 31, 2003	Initial title V permit 05768T25 was issued by DAQ (Application No. 860108A5.A)
February 3, 2004	The title V permit 05768T25 was appealed. (In response Permit 05678T26 issued February 11, 2005 Application No. 8600108.04B)
August 12, 2004	While the permit was under the appeal a state 2Q .0300 permit (05678R26) was issued for the construction and operation of an improved bagfilter and cyclone installed on a wood dust collection system by Mr. Benson (Application No. 8600108.04A).
October 26, 2004	Application was received (while the permit was under the appeal) for the renewal of a state 300 permit (Application No. 8600108.04A). The application was consolidated with the appeal application
February 11, 2005	The title V permit 05678T26 was reissued (Application No. 8600108.04B)
April 13, 2005	The title V permit 05678T26 was appealed (Application No. 8600108.05A)

April 22, 2005	While the permit was under the appeal a state 2Q .0300 permit application was received for the approval of an increase in hours allowed for RO bypass.
June 23, 2005	A state 300 permit 05678R27 was issued in conformance with the modification procedures of 2Q .0300 with a permit condition requiring a permit application within 12 months.
July 25, 2005	Submitted permit to supervisor for review.

### III. Facility Description

The Weyerhaeuser Company's Elkin Facility manufactures oriented strand board (OSB). OSB is produced from oriented layers of dried wood strands or flakes. The wood utilized in the process is a mixture of hardwoods and softwoods. The flakes are bonded together with a resin. Wax is also added to the flakes for water resistance. The resin is cured in a press to form the panels. The panels are finished prior to shipping.

The facility operates 7 days a week, 24 hours per day, and 365 days per year. The facility may shut down temporarily for maintenance and typically has down-time on an annual basis associated with maintenance.

### IV. Background Information

The applicant correctly ascertained the following permit limitations in the appealed title V permit were in error. A brief explanation follows:

- a. Emissions from the dryers installed on wet ESP are limited to 4,847 hours per year.

The appeal correctly identifies the limit that the RO operate 3,913 hours per year as the only valid requirement in order to remain below the 903.5 limit for VOCs and the wet ESP limit of 4,847 as erroneous. An assumption was made in drafting the title V permit that since the emissions from the dryers vent to the ESP only when the RO is bypassed that emissions points are mutually exclusive implying that the wet ESP could not operate more than 4,847 hours per year (8,760 hours per year - 3,913 hours per year = 4,847 hours per year).

- b. The RO downtime is limited to 167 hours per year plus 8 hours per week.

The appeal correctly identifies this limit as having no basis in complying with the PSD/BACT limits. The DAQ did however find this limit in the permits preceding the draft initial title V permit and dutifully inserted the limit in this permit as a PSD/BACT limit. A possible explanation is the DAQ recognized that the RO required extended maintenance time and limit was an attempt to define a reasonable amount of time for maintenance and repair of the RO. A re-examination of the limit did not reveal a regulatory basis. See the regulatory review in Section V.b..

The purpose of this application is twofold and follows:

- a. Significant modifications to the appealed title V permit:
  - i. To demonstrate that the RO maintenance downtime allowances (under Specific Condition A.16. (b) and (e) 05678R26 that has had appeared in previous permits had no regulatory basis.

The facility provided additional information derived from the BACT analysis associated with the RTO that showed the facility could operate the drum dryers without the concurrent operation of its RTO for 4,847 hours per year out of 8,760 hours year and still meet the BACT emissions limitation in its permit. Even so, the DAQ negotiated improved Part 70 language that requires the applicant to calculate emissions based on hours of operation, and emission factors and control efficiency as demonstrated by testing. In this manner the DAQ seeks to lend transparency to the means of demonstrating compliance to this emissions limit while allowing the facility the desired flexibility in the operation of the RO.

- ii. To include those permit conditions appearing in the current air permit Air Permit Nos 05678R27 that do not limit the hours of bypass of the RO. Also include changes incorporated in the state permit 05678R26.

The title V permit conditions had limited downtime for the RO. (The company recognized that the current hourly limit allowing for a bypass of this control device would be exceeded when an anticipated shutdown for extended maintenance occurred). A permit application was required by North Carolina Division of Air Quality (NCDAQ) to determine if an allowed increase in hours of bypass would trigger a Prevention of Significant (PSD) review or have other regulatory impacts. See item i., above.

- iii. To revise the 903.5 tons per year PSD avoidance limit. This limit was first established and inserted in the draft title V permit as a result of EPA's comments during their 45-day review period. The applicant successfully demonstrated that the limit could be reset to 456.69 tpy by subtracting potential emissions contributions from some sources. See the regulatory review section.

- b. Reissue the title V permit.

## **V. Regulatory Review**

### **a. 15A NCAC 2Q .0317: "Avoidance Conditions" (for Prevention of Significant Deterioration)**

Emissions for three rotary drum dryers (ID Nos. 1611, 1622, 1631) are controlled by cyclones (ID Nos. 1612, 1622, and 1632) followed in series by a wet electrostatic precipitator (ESP) (ID No. 3450) and a RO (ID No. 3460). The current permit (and the adjudicated title V permit Air Permit No. 05678T26), Condition 16(b) and (e), allow the RO eight (8) hours per week of downtime for routine maintenance and 168 hours during any calendar year of downtime for routine maintenance and service on the RO. The current permit allowance for RO maintenance downtime resulted from a permit application dated December 20, 2001 requesting that the facility be granted these hours to correct RO performance issues determined after the RO commenced operation in June 2001.

It is important to note that Weyerhaeuser voluntarily installed the RO on the dryer system at the facility. However during the subsequent EPA Region IV review of Weyerhaeuser Elkin's draft title V operation permit, EPA asserted that operation of the RO was a federally enforceable requirement because the facility had later used emission reductions resulting from operation of the RO to net out of Prevention of Significant Deterioration (PSD) review for volatile organic compounds (VOCs) for a project undertaken in 2001. In response the NCDAQ inserted a 903.5 tons per year (tpy) VOC emissions limit in the draft title V operation permit. The applicant presented the following table documenting how the proposed VOC baseline limit was established:

**TABLE 1**  
**COMPLIANCE METHOD FOR 903.5 TPY VOC LIMIT**  
**WEYERHAEUSER COMPANY - ELKIN, NORTH CAROLINA**  
**URS PROJECT NO. 31824903**

**Proposed Compliance Maximum for Wet ESP Stack Usage:** 4,847 hr/yr

Emission Unit Description	Emission Point ID No.	VOC Emission Factor	Reference	Annual Basis	Potential VOC Emission
Drum Dryers No. 1, 2, and 3;	3460-750 (RO)	0.32 lb/ODT furnish	1	101,830 ODT furnish	16.29 tpy
Wet Cells No. 1, 2, and 3; and	3450-500				
Suspension Burners No. 1, 2, and 3	(Wet ESP)	4.13 lb/ODT furnish	2	213,268 ODT furnish	440.40 tpy
Wet Cells No. 1 and 3	3340-100	0.017 lb/MMBtu	3	438,000 MMBtu	3.72 tpy
Wet Cell No. 2	3340-200	0.017 lb/MMBtu	3	219,000 MMBtu	1.86 tpy
OSB Press	4309	1.7757 lb/MSF	4	450,000 MSF	399.53 tpy
Dust Collection System	2801	0.17 lb/ODT	5	39,385 ODT	3.35 tpy
Dust Collection System	2811	0.12 lb/ODT	5	125,750 ODT	7.54
Dust Collection System	2831	0.12 lb/ODT	5	260,461 ODT	15.63 tpy
Sander Dust Collection System	2841	0.12 lb/ODT	5	27,476 ODT	1.65 tpy
Dust Collection System	2807	0.17 lb/ODT	5	62,332 ODT	5.30 tpy
Sander Dust Collection System	2670	0.12 lb/ODT	5	27,476 ODT	1.65 tpy
Dust Collection System	2607-100	0.12 lb/ODT	5	109,500 ODT	6.57 tpy
<b>Total Potential</b>					903.49 tpy
<b>PSD Avoidance Limit</b>					903.50 tpy

**Notes:**

- Emission factor from AP-42, Section 10.6.1, March 2002 for a direct wood-fired, softwood, rotary dryer with an RTO. Since the facility uses a mixture of hardwood and softwood, the worse case emission factor was used. The annual oven dry tons of strands furnished represent the remaining potential furnish throughput after allocating furnish to periods when emissions exhaust out the wet ESP stack.
- Emission factor for dryer wet ESP VOC emissions is based on statistical analysis performed on test results between 1991 and 1999 and represents the average emission. VOC emission testing was performed via Method 25A, and as-carbon emission factors were converted to each compound's molecular weight based on available emission factors with remaining VOCs as alpha-pinene. Method 25A does not account for formaldehyde, therefore, this compound was added to the VOC emission factor based on maximum formaldehyde stack test results. Since dryer emissions would be higher without the RO operating, the annual oven dry tons of strands furnished for periods when emissions exhaust through the wet ESP stack were calculated based on the maximum hourly dryer input of 44 ODT furnish and the maximum hours per year stated in the table.
- A wood debris firing operating condition exhibits the highest VOC emission rate. Emission factor from AP-42, Section 1.6, September 2003. Potential annual throughput was conservatively determined using the capacity of each wet cell (i.e., 25 MMBtu/hr) and operation of 8,760 hours per year.
- VOC emission testing was performed via Method 25A. Method 25A does not account for formaldehyde, therefore, the formaldehyde emissions were converted to carbon and added to the VOC emission rate. Emission factor is based on maximum emission test results. Emission factor increased by 13% to compensate for vents No. 5 and No. 8 which were not tested. Percent increase estimated from November 1991 and April 1991 test results.
- Emission factor from Weyerhaeuser Title V Cross Functional Team Bulletin No. 6 (rev), 3/22/95. Annual throughput is based on maximum wood throughput for the unit operating 8,760 hours per year.

The increase in the allowed hours of by-pass of the RO will not require a PSD review because the PSD avoidance limit will not be violated and the increase in hours is not considered "a change in the method of operation".

The applicant proposed that the hours of by-pass of the RO be increased to 4,357 hours per year as per the table above. However, the NCDAQ decided to instead to seek further refinement of the permit condition as it appeared in the draft title V now under appeal. First, the potential emissions were redefined by subtracting all the emissions from the all the affected units, except affected units Drum Dryers No. 1; 2, and 3, Wet Cells No. 1,; and 2, and 3; Suspension Burners No. 1, 2, and 3, as their emissions are based on worst case potential. The potential is then 456.69 from these emissions units. Next, emissions are to be calculated based on a minimum RO efficiency established during stack tests and emissions factors.

Following is the new PSD avoidance language (See the permit page 35; 2.2B.1.):

**15A NCAC 2Q .0317 AVOIDANCE CONDITIONS for**  
**15A NCAC 2D. 0530: PREVENTION OF SIGNIFICANT DETERIORATION**

- In order to avoid applicability of 15A NCAC 2D .0530 as requested by the Permittee, the volatile organic compound (VOC) emissions from the Drum Dryers No. 1, 2, and 3; Wet Cells No. 1, 2, and 3; and Suspension Burners No. 1, 2, and 3 shall be less than 456.69 tons per consecutive twelve-month period.

**Monitoring/Recordkeeping** [15A NCAC 2Q .0508(f)]

- b. The Permittee shall calculate the VOC emissions on a monthly basis to ensure compliance with Section 2.2 B.1.a. above.

VOC tons per month shall be determined by the sum of the following:

$$[18.17 \times t_{RO} + 181.7 \times t_{WESP}] \times 1/2000 = E_{VOC}$$

where:

- 18.17 = pounds of VOC per hour calculated by 44 ODT / hour x 4.13 lb VOC / ODT x (1-90%)  
 $t_{RO}$  = hours when RO is not bypassed and RO temperature is **greater than or equal** to 1450F (hourly block average temperatures)  
181.7 = pounds of VOC per hour calculated by 44 ODT / hour x 4.13 lb VOC / ODT  
 $t_{WESP}$  = hours when RO is bypassed **or** hourly periods when the RO temperature is **less than** 1450F (hourly block average temperatures **including** hourly RO periods of start-up, shutdown, and malfunction)  
 $E_{VOC}$  = number of tons of VOC emissions per month

- c. To ensure compliance, the Permittee shall:
- i. establish an inspection and maintenance schedule/checklist that will include an annual inspection of the RO heating unit and associated inlet/outlet valves to ensure structural integrity;
  - ii. continuously monitor and electronically record the combustion chamber temperatures in the RO and the state of the bypass valve. These records shall be maintained on-site and made available to an authorized representative upon request. (A 2 percent monitor downtime shall be acceptable); and
  - iii. calibrate, operate, and maintain the monitoring device using procedures that take into account manufacturer's specifications to ensure quality.
- The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if:
- i. the combustion chamber temperature readings are not recorded;
  - ii. the hourly block average temperature monitoring device is not maintained. (A 2 percent monitor downtime shall be acceptable); or
  - iii. the VOC emissions exceed the limit in Section 2.2 B.1.a. above.
- d. The results of the inspection, maintenance, and monitoring for combustion chamber temperatures shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
- i. the date and time of each recorded action;
  - ii. the results of each inspection or observation; and
  - iii. the results of any corrective actions performed.
- The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if these records are not maintained.

**Reporting** [15A NCAC 2Q .0508(f)]

- e. The Permittee shall submit a semi-annual summary report, acceptable to the Regional Air Quality Supervisor, of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December, and July 30 of each calendar year for the preceding six-month period between January and June. The report shall contain the following:
- i. The monthly VOC emissions for the previous 17 months. The emissions must be calculated for each of the 12-month periods over the previous 17 months; and
  - ii. All instances of deviations from the requirements of this permit must be clearly identified.

**b. 40CFR 50/ 15A NCAC 2D .0400 - Ambient Air Quality Standards**

The RO downtime effect on previous criteria compound emissions modeling results was evaluated. Previous NAAQS modeling was conducted in February 1993, December 1995 and estimated considering a previously allowed production capacity increase.

The annual concentration of short-term (i.e., 1-hour, 3-hour, 8-hour, and 24-hour) modeling results would not be affected because potential were previously estimated at maximum short-term operating conditions without a RO. Annual TSP, PM-10 and NOx concentrations were conservatively estimated for the current production capacity of 450 MMSF/yr by multiplying the previously modeled annual concentration by the ratio of 450 to 350 MMSF/yr. These modeled concentration are based on emissions prior to installation of the RO. Thus, the annual concentrations would remain below ambient standards without operation of the RO. Therefore, emissions from the dryers during the RO bypass will not result in modeled concentration greater than the NAAQS.

**c. 15A NCAC 2D .1100- Control of Toxic Air Pollutants**

Toxic air pollutants (TAP) emissions are currently permitted based on all drying system emissions venting out the wet ESP stack (i.e., prior to the RO). The short-term capacity does not change due to this application, therefore, short-term TAP emissions for the wet ESP stack are not increasing.

It was demonstrated the emissions from the dryers would not exceed long-term TAP permit limits even if the RO did not operate for an entire year. Therefore, TAP emissions from the facility would continue to have modeled concentrations below the acceptable ambient levels listed in 15A NCAC .1104 during the requested RO bypass.

**d. NSPS, MACT, 112(r), CAM, PSD Increment, and Zoning:**

This facility will be subject to three separate NESHAP: the Reciprocating Internal Combustion Engine NESHAP (Subpart ZZZZ, final compliance date of 6/15/2007), the Plywood NESHAP (Subpart DDDD, final compliance date of 10/1/2007), and the Boiler NESHAP (Subpart DDDDD, final compliance date of September 13, 2007). The facility has already conducted the Air Toxics Review required by DAQ Air Toxics regulations for facilities subject to NESHAP standards. The facility is not subject to 112(r). CAM issues should be evaluated at permit renewal.

Surry County has been triggered for PSD increment tracking for PM10, SO2, and NO2. However PSD increment is not affected by this application. A professional engineer's seal was not required for this modification. This application was not for a new facility or an expansion of an existing facility, notification requirements, as per 15A NCAC 2Q .0113 for facilities without zoning do not apply to this application.

**VI. Emissions Summary:**

This summary was obtained from the 6/15/05 inspection report and is based on the 2002 and 2003 emissions inventory.

<b><u>Comparison of 2002 and 2003 Criteria Pollutant Emissions</u></b>			
<b><u>Pollutant</u></b>	<b><u>2002 Actual Emissions (tons)</u></b>	<b><u>2003 Actual Emissions (tons)</u></b>	<b><u>Differential between 2002 and 2003 Actual Emissions (% mass)</u></b>
CO	394.21	385.3	-2.3
NOx	43.22	41.0	-5.1
PM <sub>10</sub>	50.2	46.5	-7.4
SO <sub>2</sub>	22.01	15.0	-31.8
TSP	79.40	76.0	-4.3
VOC	507.4	512.4	+1.0
<b><u>Comparison of 2002 and 2003 HAP Emissions</u></b>			
<b><u>Pollutant</u></b>	<b><u>2002 Actual Emissions (lbs.)</u></b>	<b><u>2003 Actual Emissions (lbs.)</u></b>	<b><u>Differential between 2002 and 2003 Actual Emissions (% mass)</u></b>
Hydrogen chloride	581.2	341.4	-41.3
Methylene chloride	581.4	341.4	-41.3
Chlorine	1,312.4	770.4	-41.3
Acetaldehyde	6,306.0	6,073.5	-3.7
Acrolein	3,109.5	2,998.4	-3.6

Formaldehyde	42,324.9	42,908.1	1.4
Methanol	132,275.7	145,100.2	+9.7
Methyl ethyl ketone	21.3	17.4	-18.3
Methyl isobutyl ketone	128.8	105.2	-18.3
Phenol	10,733.1	10,870.7	+1.3
Polycyclic organic matter	32.5	18.2	-44.0
Styrene	36.9	30.7	-16.8
Toluene	253.1	207.6	-18.0
Xylene	137.3	112.6	-18.0

In addition to being a Title V facility for actual emissions exceeding the thresholds for criteria pollutants, the facility also exceeds the 10/25 TPY thresholds for HAP emissions.

## **VII. Statement of Compliance**

The DAQ has reviewed the compliance status of this facility. The most recent inspection of the facility was performed on June 15, 2005. No violations have been noted for the facility.

The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

## **VIII. Permit Shield (including non-applicable requirements)**

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

## **IX. General Conditions**

The General Conditions section of the Title V Operating Permits lists additional applicable rule requirements that the Permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

## **X. Public Notice**

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit will be placed in a newspaper of general circulation in the area where the facility is located. The notice provided for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice were sent to persons on the Title V mailing list and EPA.

## **XII. Recommendations**

The title V application for Weyerhaeuser Company - Elkin Facility, has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the proposed permit with all applicable requirements. Therefore, the DAQ proposes issuing the Title V Operating Permit once the public comment period and the EPA review are complete.