Domtar Paper Company, LLC
Plymouth Mill
P. O. Box 747
Highway 149 North
Plymouth, N.C. 27962
Tel: (252)793-8111

February 28, 2019

Certified Mail
Return Receipt Requested

William Willets
NCDEQ, Division of Air Quality
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Subject: ***Major NSR Air Permit Application for the Lignin Solids Removal Plant Reconfiguration Project***
Domtar Paper Company, LLC Mill in Plymouth, North Carolina
Permit No. 04291T45/Facility ID 07/59/00069

Dear Mr. Willets:

Please find enclosed six (6) copies of the Major NSR Air Permit Application for the Lignin Solids Removal Plant Reconfiguration Project for the Domtar Paper Company, LLC Plymouth Mill (Domtar). Domtar is requesting this project be permitted using the one-step significant permitting process for a construction and operation permit. Appendix A of the enclosed application includes the A1 and E5 NC DAQ permit application forms signed by the responsible official. Appendix C contains the proof of Publication of Notice. A check in the amount of $15,119.00 is also enclosed to cover the processing fee.

Portions of this application contain Trade Secret Information, as defined pursuant to NCGS 661-152(3), and should not be copied. Confidential information has been removed from the enclosed application and a placeholder page is inserted that displays "Confidential Business Information Removed, OK To Copy". To protect the confidentiality of the information in this submittal, the trade secret information is being provided under a separate cover and will display "Confidential Business Information – Do Not Copy" on each page.

If you have any questions upon receipt of this package, please contact Ms. Diane Hardison of Domtar at 252-793-8611 or Ms. Claire Corta of AECOM at 919-461-1494.

Sincerely,

Everick W. Spence
Mill Manager

Diane R. Hardison
Environmental, Health and Safety Manager

cc: Don Wynne - Domtar
Claire Corta– AECOM
Greg Fullenwider - Domtar

Major NSR Air Permit Application for the Plymouth Mill Lignin Solids Removal Plant Reconfiguration Project

February 2019

Prepared for:

Domtar

Domtar Paper Company – Plymouth Mill
P.O. Box 747
Plymouth, North Carolina 27962

Prepared by:

AECOM

AECOM Technical Services of North Carolina, Inc.
1600 Perimeter Park Drive, Suite 400
Morrisville, North Carolina 27560

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1.0 INTRODUCTION

Domtar Paper Company operates a pulp manufacturing facility in Martin County near Plymouth, North Carolina. The Domtar Plymouth Mill currently operates under Title V Air Quality Permit (AQP) No. 04291T45 issued by the North Carolina Department of Environmental Quality (NCDEQ) on August 15, 2018.

The purpose of this major new source review (NSR) permit application is to request authorization to perform the Lignin Solids Removal Plant (LSRP) Reconfiguration Project.

1.1 Technical Conclusions

The following is a summary of the technical and regulatory conclusions in this permit application:

- In accordance with NCDAQ regulations governing the Prevention of Significant Deterioration (PSD) of Air Quality and other applicable State and Federal regulations, major New Source Review (NSR) is required for total reduced sulfur (TRS) compounds, hydrogen sulfide (H_2S), nitrogen oxide, and sulfur dioxide. The PSD applicability analysis shows that this project does not result in significant net emissions increases of PM/PM_{10}/$PM_{2.5}$, VOC, NO_X, CO, F, H_2SO_4, lead, and CO_2e. Appendix B contains project emissions calculations.

- A Best Available Control Technology (BACT) analysis was required for TRS and H_2S and proposed BACT limits are presented in Section 5. Sources that emit NO_X and SO_2 are not modified with this project, therefore only PSD modeling is required for these pollutants as discussed in Section 6.

- There are no new source performance standards (NSPS) or maximum achievable control technology (MACT) standards applicable to the process units modified with this project.

- A revised facility-wide air toxics analysis is included with this application for 26 compounds.

1.2 Permit Request

Domtar is requesting that the proposed modification be permitted using the procedures outlined in 15A NCAC 2Q .0501(c)(1). Under these regulations, the project would be permitted using the one-step significant permitting process for a construction and operation permit.

The following information is included in this application in order for DAQ to complete the permit review:

1. Completed permit application forms for the proposed project (Appendix A);
2. Emissions calculations (Appendix B);
3. Notification of proof of publication of public notice (Appendix C);
4. BACT analysis (Section 5 and Appendix D);

5. Modeling Analysis (Section 6, Section 7, and Appendix E), modeling files (on enclosed CD), and approved modeling protocol (Appendix F); and

6. An application fee of $15,119.

By signing the A1 and E5 application forms provided by NCDAQ, the responsible official certifies that this submittal constitutes a complete application. The responsible official for the Plymouth Mill has provided the required certification, and Domtar requests that NCDAQ provide the determination that this application is complete.

1.3 Contact Information

If there are any questions or comments regarding this application, please contact Ms. Diane Hardison of Domtar at 252-793-8611 or Ms. Claire Corta of AECOM at 919-461-1494.

1.4 Report Organization

The remainder of this report is divided into the following sections:

Section 2.0:	Facility Information and Proposed Project
Section 3.0:	Summary of Project Emissions
Section 4.0:	Regulatory Analysis
Section 5.0:	Best Available Control Technology Evaluation
Section 6.0:	Air Quality Modeling Analysis
Section 7.0:	Air Toxics Dispersion Modeling Analysis

The table of contents contains a detailed listing of tables, figures, and appendices.

2.0 FACILITY INFORMATION AND PROJECT DESCRIPTION

2.1 Site Location

The Domtar Plymouth Mill is located about 1 mile west of Plymouth, North Carolina at the junction of Bertie, Martin, and Washington counties in eastern North Carolina. The mill is located on approximately 4,400 acres along the Roanoke River. The approximate UTM coordinates are Zone 18,339.5 km east, and 3969.9 km north at an elevation of approximately 5 feet above mean sea level. Figure 2-1 identifies the location of Plymouth with respect to eastern North Carolina.

The largest city near the site is Greenville, North Carolina. The Plymouth area is located in the coastal area of North Carolina and the terrain surrounding the site is predominantly flat with terrain elevations changing only a few feet within a few kilometers of the plant site. Figure 2-2 depicts the plant site location and surrounding terrain features.

Based on area classification systems recognized by EPA, the facility is located in a rural section of the state. EPA guidance shows two alternative procedures to determine whether the character of an area is predominately urban or rural: (1) land use typing or (2) population density. The area classification system as described by Auer in the Journal of Applied Meteorology, Vol. 17 pg. 636-643, 1978, Correlation of Land Use and Cover With Meteorological Anomalies, was used to classify the area as rural. This system uses USGS maps and an area 3 kilometers in radius around a source in the determination.

2.1.1 Attainment Status of Area

The Plymouth Mill is located in Martin County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Martin County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM_{10}) and for the 1971 sulfur dioxide (SO_2) standard. Martin County is designated as "unclassifiable/attainment" for the 2010 sulfur dioxide NAAQS (Primary) standard, CO, 24-hour and annual $PM_{2.5}$, lead, 1-hr nitrogen dioxide (NO_2), and the 8-hour ozone standard. Martin County is designated as "cannot be classified or better than national standards" for the annual NO_2 Standard. Therefore, the Plymouth Mill is not located in an area currently designated as "nonattainment" for any compound regulated under the National Ambient Air Quality Standards (NAAQS).

2.2 Proposed Project

Lignin solids removal from black liquor is an emerging technology that focuses on the production of a new organic byproduct for sale. Domtar permitted construction of the Lignin Solids Removal Plant in 2011 and it began operation in 2013. The LSRP is operated at the direction of the corporate Domtar Biomaterials group and its purpose is to make a marketable product other than fluff pulp. The LSRP has faced reliability, maintenance, and operational challenges since initial startup and Domtar has been working with the vendor to redesign the existing system to achieve safe and reliable operation. Proposed modifications to the LSRP include redesigning the system to route a portion of the process gases to a caustic scrubber and replacing select tanks to improve operation of the plant by reducing corrosion and by avoiding over pressurizing the existing HVLC system. The permitted capacity of the lignin plant will be 35,000 metric tons per year post modification. Table 2-1 summarizes the LSRP source configuration pre and post project and any equipment modifications and Figure 2-3 presents a process flow diagram of the lignin plant post project. The mill is requesting to revise the naming conventions on the tanks to be more consistent with how the operations staff identify the tanks and the revised names are included in Table 2-1 as well as on Form A2 on Appendix A. Appendix A also includes required NC DAQ forms for the 502(b)(10) notification submitted on March 26, 2018 for replacement of three LSRP tanks as this is the next significant modification to the Title V permit.

New Scrubber and HVLC System Sources

In order to avoid operational challenges caused by the current LSRP control methodology, several sources that are currently routed to the HVLC system will be redirected to a new two stage packed bed caustic scrubber capable of controlling hydrogen sulfide (H_2S) and methyl mercaptan. Emissions from the Tank - 2 Lignin Filter Cloth Wash (ES-09-27.3100) and Filter - 1 Lignin (ES-09-27 .2100) that are currently uncontrolled will also be routed to the new caustic scrubber. The daisy chain arrangement will be eliminated and each tank will be collected directly to the header and pipe sizes will be modified as needed. The spent caustic solution will be circulated back into the mill's white liquor system.

Sources that will still be collected by the HVLC system for incineration are Tank - Lignin Acidification (09-27.2700), Tank - Lignin Foam (09-27.2770), and Tank - Acidic Lignin Conditioning (ES-09.2800). The listed tanks are currently routed through the carbonator tower prior to being routed for combustion via the HVLC system, however ES-09.2800 will bypass the Carbonator Tower.

Dust Collection

The Filter - 2 Lignin Filter (ES-09-27 .3000), which currently exhausts to the atmosphere via building exhaust fans, creates acidic dust during operation along with low concentrations of H_2S. The dust and gas will be collected from Conveyor - #2 Lignin Filter Horizontal (IES-09-27.3400) and truck loading area and will be sent to a dust collection scrubber. The dust collection scrubber removes particulates from the process area without releasing them to the atmosphere and brings them back into the process. The gases controlled by the dust collection scrubber will be exhausted through the new caustic scrubber stack, bypassing the caustic scrubber. The dust collection system will prevent the majority of Filter - 2 Lignin Filter (ES-09-27 .3000) H_2S emissions from escaping the conveyor chute. Existing wall fans will evacuate any remaining H_2S emissions from the building.

2.3 Proposed Project Schedule

The mill would like to implement these modifications immediately following issuance of the air permit.

3.0 PROJECT EMISSIONS

To determine the appropriate permitting path for the project, it was necessary to calculate the emission increases expected to occur as a direct result of the proposed project. An overview of emission factors and the emissions calculations is presented in the remainder of this section of the permit application. Detailed emissions calculations are presented in Appendix B.

3.1 Overview of Emission Factors

To facilitate calculation of emissions from the project, Domtar determined the appropriate emission factors and throughputs. Emission factors were obtained using various methodologies and sources. These sources include:

- U.S. Environmental Protection Agency (EPA) publications, such as AP-42 Compilation of Air Emission Factors (5th Edition, Revised);
- National Council for Air and Stream Improvement (NCASI) Data;
- Site Specific and Vendor Data; and
- U.S. EPA's Mandatory Greenhouse Gas Reporting Regulation (40 CFR 98).

The sources of information for emission factor determination and calculation methodologies are discussed in greater detail in the following sections.

3.1.1 U.S. EPA AP-42 Emission Factors

Emission factors from U.S. EPA's AP-42 database (5th edition unless otherwise noted) were relied upon to calculate emissions where test data and NCASI factors were not available or representative. The following AP-42 sections were utilized to obtain emission factor data for the specified sources:

- Section 1.3, Fuel Oil Combustion;
- Section 1.4, Natural Gas Combustion;
- Table 10.3-1, 1994 Edition; and
- Section 13.2.4, Aggregate Handling and Storage Piles.

3.1.2 National Council for Air and Stream Improvement (NCASI) Data

NCASI is "an independent, non-profit research institute that focuses on environmental topics of interest to the forest products industry and was established in 1943 by the pulp and paper industry to provide technical assistance." NCASI conducts research and provides technical information to all member companies through a variety of publications, including technical bulletins, special reports, handbooks, and newsletters. The emission factor information presented in the technical bulletins is deemed the most accurate available for the pulp and paper industry if facility-specific test data are unavailable. The following NCASI Technical Bulletins (TB) and publications were utilized to obtain emission factor data for the specified sources:

- 2014 NCASI Pulp and Paper Emission Factor Database;
- TB 973 (February 2010), A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources – A Second Update;
- TB 650 (June 1993), Compilation of 'Air Toxic' Emissions Data for Boilers, Pulp Mills, and Bleach Plants;
- TB 849 (August 2002), Compilation of Speciated Reduced Sulfur Compound and Total Reduced Sulfur Emissions Data for Kraft Mill Sources;
- TB No. 858 (February 2003), Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Sources at Kraft, Sulfite and Non-chemical Pulp Mills;
- TB No. 1013 (March 2013), A Comprehensive Compilation and Review of Wood-fired Boiler Emissions;
- NCASI Particulate Emissions Data for Pulp and Paper Industry; and
- NCASI SARA 313 Handbook.

3.1.3 Site Specific Data and Vendor Information

Historical stack test and CEMS data were used to estimate emissions from existing sources where data was available and is preferred over published emission factors. Vendor data was used to estimate emissions from the following sources at the Lignin Plant: the new caustic scrubber (will control emissions from the No. 1 Lignin Filter Press and various tanks), modified sources routed to the HVLC header, and fugitive emissions from the No. 2 Lignin Filter Press building, LSRP LVHC Drain Loop, and No. 1 Filtrate Sump.

3.1.4 Greenhouse Gas Emission Factors

The U.S. EPA Mandatory Greenhouse Gas (GHG) reporting rule emission factors and global warming potentials from Subparts C and AA were used to calculate emissions from carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) from combustion. Tables C-1 and C-2 to Subpart C of Part 98 list default CO_2, CH_4, and N_2O emission factors and high heat values for various fuel types. Tables AA-1 and AA-2 to Subpart AA of Part 98 list default CO_2, CH_4, and N_2O emission factors for Recovery Furnaces and Lime Kilns.

3.2 PSD Applicability Test Methodology

The Plymouth Mill has assessed the applicability of PSD to this project by performing a comparison of baseline actual emissions to potential emissions as prescribed under U.S. EPA's PSD rules (as adopted by North Carolina) at 40 CFR 51.166. The PSD applicability analysis has been completed for the applicable PSD-regulated air pollutants, including PM (filterable), PM_{10}, $PM_{2.5}$, F, H_2S, H_2SO_4, CO, carbon dioxide as CO_2e, Pb, NO_X, SO_2, TRS, and VOC. As presented in Table 3-1, the calculations demonstrate that project increases for SO_2, NO_X, TRS, and H_2S are above the PSD significant emission rates. Appendix B contains project emissions calculations.

3.3 Baseline Actual Emissions (BAE)

North Carolina has incorporated the federal PSD rules by reference with specified changes in the North Carolina Air Pollution Control Rule 15A NCAC 2D .0530. Changes made by North Carolina to the federal PSD rules include the definition of baseline actual emissions. Per 15A NCAC 2D .0530(b)(1)(A), baseline actual emissions are "the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period ... within the 5-year period immediately preceding the date that a complete permit application is received by the Division..." However, "the Director shall allow a different time period, not to exceed 10 years immediately preceding the date on which a complete permit application is received by the Division, if the owner or operator demonstrates that it is more representative of normal source operation." For this project, 5 years of monthly production data from the Lignin Plant was reviewed and a baseline of April 2016 through March 2018 was selected for all compounds.

3.4 Potential-to-Emit (PTE)

Potential-to-emit is defined by 40 CFR 51.166(b)(4) as "the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable." Post project emissions for the LSRP equipment are represented as potential emissions to provide the most conservative analysis of project emissions impacts. Potential emissions are estimated based on the replaced and/or reconfigured equipment running at full design capacity of the Lignin Plant at 35,000 metric tons and 8,760 hours per year. For existing equipment affected by this project, potential emissions are estimated from an expected decrease in black liquor solids production and an increase in blended hog fuel fired in the boiler due to the improved lignin removal efficiency when operating at the maximum production capacity of the lignin plant. The facility anticipates a reduction of 18,500 TBLS/yr in the recovery area and a 36,000 BDT/yr increase in blended hog fuel fired in No. 2 Hog Fuel boiler.

40 CFR 51.166(b)(40)(ii) allows the facility to "exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(47) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth." Emissions that could have accommodated during the baseline period have been estimated for the No. 2 Hog Fuel Boiler by annualizing fuel use in January 2017. The increase in blended hog fuel fired was applied on top of the annualized January 2017 fuel use in order to estimate potential emissions post project. Note that the facility is not utilizing could have accommodated for any lignin plant source since multiple tank replacements are included in the project. Since project emissions increases were estimated on a potential basis, projected actual emissions tracking is not required.

4.0 REGULATORY APPLICABILITY

This section summarizes all federally-enforceable and state-enforceable air regulations that are potentially applicable to the project. Both applicable and important non-applicable regulations are addressed. Supporting information for the proposed project is provided in the application forms contained in Appendix A. Information contained on the application forms is provided for determining regulatory applicability and demonstrating compliance with applicable requirements, and should not be considered proposed permit terms, limits, or conditions. Discussions pertaining to applicable regulatory requirements are separated into two categories: 1) Federal Air Quality Regulations and 2) North Carolina Air Quality Regulations.

4.1 Federal Air Quality Regulations

The federal regulations potentially applicable to the proposed project are Prevention of Significant Deterioration (PSD) regulations in 40 CFR 51.166; New Source Performance Standards (NSPS) in 40 CFR 60; National Emission Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63; Compliance Assurance Monitoring (CAM) in 40 CFR 64; and Title V Operating Permit regulations in 40 CFR 70. A discussion of these regulations is provided in the following subsections.

4.1.1 40 CFR 51 - New Source Review (NSR)/Prevention of Significant Deterioration (PSD)

Implementation of the PSD regulations has been delegated in full to NC DAQ. These air quality regulations are contained in NCAC 2D .0530. The PSD regulations apply to major modifications at major stationary sources, which are considered those sources belonging to any one of the 28 source categories listed in the regulations that has the potential to emit more than 100 tons per year of any PSD-regulated compound, or any other source which has the potential to emit more than 250 tons per year of any PSD compound. A major modification is defined as "any change to a major stationary source that would result in a significant emissions increase of any pollutant subject to regulation under the Act." Major modifications must meet certain pre-construction review and permitting requirements.

The Domtar Plymouth Mill is in one of the 28 PSD source categories (Kraft pulp mills) and is a major stationary source for the purposes of PSD applicability. As such, the proposed project's emissions were evaluated to determine whether PSD permitting is required. The emissions calculation methodology used to determine PSD applicability was described in Section 3 and the emission factors and throughputs used to estimate emissions are presented in Appendix B. Based on the PSD applicability analysis, the project results in a potential significant net emissions increase of sulfur dioxide, nitrogen oxide, total reduced sulfur, and hydrogen sulfide. A summary of all PSD compound emission increases and comparison of these increases against the respective PSD significant emission rates is presented in Table 3-1.

4.1.2 40 CFR 60 - New Source Performance Standards (NSPS)

NSPS apply to any stationary source for which standards are promulgated, and which is constructed, reconstructed, or modified after the effective date of the applicable standard to the affected facility. NSPS requirements are promulgated under 40 CFR 60 pursuant to Section 111 of the Clean Air Act.

According to 40 CFR 60.14, upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere. A modification is any physical change or operational change to an existing facility that results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies. There are no NSPS applicable to the lignin solids removal plant.

4.1.3 40 CFR 63 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

The Plymouth Mill is a major source of HAP and is subject to various emission standards under Part 63. This project will not result in construction or reconstruction of any new emission sources subject to Part 63 NESHAP.

4.1.3.1 Pulp and Paper NESHAP (MACT I) – 40 CFR 63, Subpart S

The Plymouth Mill is subject to 40 CFR 63, Subpart S, also referred to as MACT I for the pulp and paper industry. This standard regulates air emissions from pulping and bleaching systems. The affected source under this standard is the total of all HAP emission points in the pulping and bleaching systems. Pulping system means all process equipment, beginning with the digester system, and up to and including the last piece of pulp conditioning equipment prior to the bleaching system, including treatment with ozone, oxygen, or peroxide before the first application of a chemical bleaching agent intended to brighten pulp. The pulping system includes pulping process condensates and can include multiple pulping lines. Bleaching system means all process equipment after high-density pulp storage prior to the first application of oxidizing chemicals or reducing chemicals following the pulping system, up to and including the final bleaching stage.

Although the lignin dewatering process is not an affected source under Subpart S, it generates an HVLC stream that is captured and controlled in the same manner as the current HVLC sources. The No. 2 Hog Fuel Boiler is and will continue to be the primary control device for HVLC streams, with the No. 1 Hog Fuel Boiler, Recovery Boiler, and thermal oxidizer serving as backup. The HVLC sources from the lignin dewatering process are not subject to Subpart S. However, the HVLC system is incorporated into the mill's Leak Detection and Repair (LDAR) routine required under Subpart S.

4.1.4 40 CFR 64 - The Compliance Assurance Monitoring Rule (CAM)

The CAM Rule (40 CFR Part 64) applies to pollutant-specific emissions units (PSEU) that are pre-control major sources and use a control device to comply with an emissions limit. For the CAM Rule to apply to a specific emission unit/pollutant, the following four criteria must be met:

1. The emission unit must be located at a major source for which a Part 70 or Part 71 permit is required.
2. The emission unit must be subject to an emission limitation or standard.
3. The emission unit must use a control device to achieve compliance with the emission limitation or standard.

4. The emission unit must have potential, pre-controlled emissions of the pollutant of at least 100 percent of the major source threshold.

Part 64 does not apply to emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Clean Air Act (e.g., post-1990 NSPS or NESHAP) or where a continuous compliance determination method (e.g., CEMS) is used. CAM will apply to each lignin source with pre-controlled emissions greater than the major source threshold. A CAM plan will be submitted as part of the renewal application as required under 40 CFR Part 64.5(b) since post control emissions are less than 100 tpy for each PSEU.

4.1.5 40 CFR 70 - Title V Operating Permits

The Plymouth Mill currently operates under Title V Air Quality Permit (AQP) No. 04291T45 issued on August 15, 2018 by North Carolina Division of Air Quality (NCDAQ) and expiring on September 30, 2022. The Title V Renewal application is currently under review at NCDAQ. Domtar is requesting that the proposed modification be permitted using the one-step permitting process. Permit application forms are included in Appendix A.

4.2 North Carolina Air Quality Regulations

NC DAQ air quality regulations for stationary sources are codified in 15A of the North Carolina Administrative Code (NCAC), Subchapter 2D (Air Pollution Control Requirements) and Subchapter 2Q (Air Quality Permit Procedures).

4.2.1 Particulates from Pulp and Paper Mills – 2D .0508

This regulation applies to recovery furnaces, smelt dissolving tanks, and lime kilns. This project does not affect sources covered by this rule.

4.2.2 15A NCAC 2D .0521 - Control of Visible Emissions

This standard applies to fuel-burning operations and other industrial processes that may reasonably have a visible emission and are not subject to visible emission standards under 40 CFR 60 (New Source Performance Standards) or 40 CFR 63 (National Emission Standards for Hazardous Air Pollutants). The LSRP is not expected to have visible emissions therefore this regulation does not apply.

4.2.3 15A NCAC 2D .0524 - New Source Performance Standards

NSPS applicability was addressed in Section 4.1.2 above.

4.2.4 Total Reduced Sulfur from Kraft Pulp Mills – 2D .0528

This regulation applies to recovery furnaces, digester systems, multiple-effect evaporator systems, lime kilns, smelt dissolving tanks, and condensate stripping systems not subject to NSPS regulations. This project does not affect any sources subject to this rule.

4.2.5 15A NCAC 2D .0530 - Prevention of Significant Deterioration

PSD applicability was addressed in Section 4.1.1 above. Because the PSD applicability analysis was performed on an actual to potential emissions basis, a projected actual emissions tracking condition is not required.

4.2.6 15A NCAC 2D .0544 – Prevention of Significant Deterioration Requirements for Greenhouse Gases

Under this rule a major stationary source or major modification is not required to obtain a PSD permit due to GHG emissions alone. Domtar has incorporated greenhouse gas (GHG) emissions into the PSD applicability calculations and PSD review is not triggered this pollutant. PSD applicability calculations are presented in Appendix B.

4.2.7 15A NCAC 2D .1100 and 2Q .0700 - Control of Toxic Air Pollutants

15A NCAC 2Q .0700 requires facilities that emit toxic air pollutants (TAPs) for which they are required to have a permit under 15A NCAC 2D.1100 to demonstrate compliance with the Acceptable Ambient Levels (AALs). On June 21, 2012, the North Carolina General Assembly passed air toxics reform legislation HB 952. Under the bill, any source that is covered under a MACT or Generally Achievable Control Technology (GACT) standard and any source covered under a 112(j) permit is exempt from regulation under the state air toxics rule, except in those circumstances when the Division of Air Quality's (DAQ) Director makes a written finding that emissions from such a source presents an unacceptable risk to public health (e.g., a Director's call). The legislation requires that, upon receipt of any permit application that would result in an increase in TAP emissions, DAQ must review the application to determine if the emissions of TAPs from the facility present an unacceptable risk to human health. MACT affected sources were incorporated into the listed exemptions at 2Q .0702(a)(27) and 2Q .0702(c) states "the addition or modification of an activity identified in Paragraph (a) of this Rule shall not cause the source or facility to be evaluated for emissions of toxic air pollutants."

An updated facility-wide toxic air pollutant (TAP) analysis has been performed with this project. Please refer to Section 5 for a detailed analysis regarding NC TAPs.

4.2.8 15A NCAC 2D .1109 and 2D .1111 - Maximum Achievable Control Technology

Applicability of MACT standards was discussed in Section 4.1.3 of this report.

4.2.9 Notification in Areas without Zoning – 2Q .0113

The Domtar Plymouth Mill is located in an area without zoning. Therefore, the mill must follow the requirements presented in 2Q .0113. This rule requires that Domtar provide public notice prior to submitting the permit application. Proof of public notice is presented in Appendix C to this document.

- Legal Notice – Domtar was required to publish a legal notice in a newspaper of general circulation located in the area where the source is located at least two weeks prior to submitting the permit application. The notice was published on May 25, 2018 (Williamston

Enterprise) and on May 30, 2018 (Roanoke Beacon), and included the name of the facility, the name and address of the applicant, and a summary of the modification.

- Posting of Sign – At least 10 days prior to the submittal of the permit application, the facility was required to post a sign that is at least 6 square feet in size, less than ten feet from the highway right-of-way, at least six feet from the ground, contains lettering a person with 20/20 vision can view from the center of the road, and is placed parallel to the highway. The sign was posted on August 1, 2018. The sign contains the name of the facility, the name and address of the applicant, and a summary of the modification. The sign will remain in place for at least 30 days following the submittal of the permit application.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

The PSD regulations (40 CFR 51.166) as incorporated by North Carolina Statute, require a Best Available Control Technology (BACT) analysis for new emission units and modified emission units at an existing major source that will have an increase in emissions of a PSD-regulated compound subject to PSD review. As indicated earlier in this application, this project triggers PSD review for emissions of TRS, H_2S, NO_X, and SO_2. Note that NO_X and SO_2 are generated when combusting HVLC gases in the No. 2 hog fuel boiler and are not generated from any of the LSRP equipment. The No. 2 hog fuel boiler is not being modified with this project therefore a BACT analysis is not required for NO_X and SO_2. PSD modeling is required for NO_X and SO_2 and is discussed in Section 6. This section presents the BACT analysis for the Domtar LSRP reconfiguration project.

5.1 Top Down BACT Approach

The North Carolina regulations incorporate the federal PSD regulatory requirement to conduct a BACT analysis, which is set forth as follows in the PSD regulations [40 CFR 52.21(j)(2)]:

> *(j) Control Technology Review.*
>
> *(2) A new major stationary source shall apply best available control technology for each regulated NSR pollutant that it would have the potential to emit in significant amounts.*

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] as:

> *...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by- case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61.*
>
> *If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.*

Guidelines for the evaluation of BACT can be found in EPA's Guidelines for Determining Best Available Control Technology (BACT) (US EPA, 1978) and in the PSD Workshop Manual (US EPA, 1990). These guidelines were drafted by the EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. Unlike many of the Clean Air Act programs, the PSD program's BACT evaluation is determined on a case-by-case basis. To assist applicants and regulators with the case-by-case process, in 1987 U.S. EPA issued a memorandum that implemented certain program initiatives to improve the effectiveness of the PSD program within the confines of existing regulations and state implementation plans.[1] Among the initiatives was a "top-down" approach for determining BACT. In brief, the top-down process suggests that all available control technologies be ranked in descending order of control effectiveness. The most stringent or "top" control option is the default BACT emission limit unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option is not achievable in that case. Upon elimination of the most stringent control option based upon energy, environmental, and/or economic considerations, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

BACT is to be set at the lowest value that is achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life. As discussed by the DC Circuit Court of Appeals.

> In National Lime Ass'n v. EPA, 627 F.2d 416, 431 n.46 (D.C. Cir. 1980), we said that where a statute requires that a standard be "achievable," it must be achievable "under most adverse circumstances which can reasonably be expected to recur."[2]

U.S EPA has reached similar conclusions in prior determinations for PSD permits.

> "Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured 'emissions rates,' which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the 'emissions limitation' determined to be BACT and set forth in the permit, which the facility is required to continuously meet throughout the facility's life. Stated simply, if there is uncontrollable fluctuation or variability in the measured emission rate, then the lowest measured emission rate will necessarily be more stringent than the "emissions limitation" that is "achievable" for that pollution control method over the life of the facility. Accordingly, because the "emissions limitation" is applicable for the facility's life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the extent to which the available data demonstrate whether the emissions rate at issue has been achieved by other facilities over a long term."[3]

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[1] Memo dated December 1, 1987, from J. Craig Potter (EPA Headquarters) to EPA Regional Administrators, titled "Improving New Source Review Implementation."

[2] As quoted in Sierra Club v. EPA (97-1686).

[3] EPA Environmental Appeals Board decision, *In re: Newmont Nevada Energy Investment L.L.C.* PSD Appeal No. 05-04, decided December 21, 2005. Environmental Administrative Decisions, Volume 12, Page 442.

Thus, BACT must be set at the lowest feasible emission rate recognizing that the facility must be in compliance with that limit for the lifetime of the facility on a continuous basis. Thus, while viewing individual unit performance can be instructive in evaluating what BACT might be, any actual performance data must be viewed carefully, as rarely will the data be adequate to truly assess the performance that a unit will achieve during its entire operating life. While statistical variability of actual performance can be used to infer what is "achievable," such testing requires a detailed test plan akin to what teams in U.S. EPA use to develop MACT standards over a several year period, and is far beyond what is reasonable to expect of an individual source. In contrast to limited snapshots of actual performance data, emission limits from similar sources can reasonably be used to infer what is "achievable."[4]

A control technology must be "available" to be considered in a BACT determination. This means that the technology has progressed beyond the conceptual stage and pilot testing phase and must have been demonstrated successfully on full-scale operations for a sufficient period. Theoretical, experimental, or developing technologies are not "available" under BACT. A control technology is neither demonstrated nor available if government subsidies are required to fund evaluations of the technology. In many cases, a technology is not "available" for all sizes of a unit. A control technology must also be "commercially available." This means that the technology must be offered for sale through commercial channels with commercial terms.

To assist in meeting the BACT limit, the source must consider production processes or available methods, systems or techniques, as long as those considerations do not redefine the source. EPA does not consider the BACT requirement as a means to redefine the basic design of the source or change the fundamental scope of the project when considering available control alternatives.[5]

5.1.1 Top-Down BACT Assessment Methodology

The following sections provide detail on the BACT assessment methodology utilized in preparing the BACT analysis for the proposed modified emission units.

5.1.1.1 Step 1

The first step is to define the spectrum of process and/or add-on control alternatives potentially applicable to the subject emissions units. The following categories of technologies are addressed in identifying candidate control alternatives:

- Demonstrated add-on control technologies applied to the same emissions unit at other similar source types;
- Add-on controls not demonstrated for the source category in question but transferred from other source categories with similar emission stream characteristics;

[4] Emission limits must be used with care in assessing what is "achievable." Limits established for facilities which were never built must be viewed with care, as they have never been demonstrated and that company never took a significant liability in having to meet that limit. Likewise, permitted units which have not yet commenced construction must also be viewed with special care for similar reasons.

[5] https://www.epa.gov/sites/production/files/2015-01/documents/bact_source_definition_questions.pdf

- Process controls such as combustion or alternate production processes;
- Add-on control devices serving multiple emission units in parallel; and
- Equipment or work practices, especially for fugitive or area emission sources where add-on controls are not feasible.

A review of the RACT/BACT/LAER Clearinghouse and a review of technologies in use at similar sources were performed as part of this process.

5.1.1.2 Step 2

The second step in the top-down approach is to evaluate the technical feasibility of the alternatives identified in the first step and to reject those that can be demonstrated as technically infeasible based on an engineering evaluation or on chemical or physical principles. The following criteria were considered in determining technical feasibility: previous commercial-scale demonstrations, precedents based on issued PSD permits, state requirements for similar sources, technology transfer, and engineering evaluations for the control devices considered.

5.1.1.3 Step 3

The third step is an assessment, or ranking, of each technically feasible alternative considering the specific operating constraints of the emission units undergoing review. After determining what control efficiency is achievable with each technically feasible control alternative, the alternatives were ranked into a control hierarchy from most to least stringent, using the percent removal efficiency for the pollutant of concern.

5.1.1.4 Step 4

In the fourth step, a cost effectiveness and environmental and energy impact analysis is required if the top level of BACT control is not selected, starting with the most stringent control alternative. If the top level of control is selected as BACT, then a cost effectiveness evaluation is not required. An element of the environmental impacts analysis is the consideration of toxic or other pollutant impacts from the control alternative choice. The economic analysis is performed using procedures recommended by the EPA's Office of Air Quality Planning and Standards (OAQPS) Air Pollution Control Cost Manual. If the top level of control is determined to be economically infeasible based on high cost effectiveness, or to cause adverse energy or environmental impacts, the control technology is rejected as BACT and the impact analysis is performed on the next most stringent control alternative until all control alternatives have been assessed. The cost effectiveness analysis (total and incremental) looks at the annualized control cost (in dollars per ton of emissions removed) and compares the value to commonly accepted values for cost effective emission controls established by the state regulatory agency.

5.1.1.5 Step 5

The final step is to summarize the selection of BACT and propose the associated emission limits or work practices to be incorporated into the permit plus any recommended recordkeeping and monitoring conditions that should be incorporated into the final permit.

The following sections present the detailed BACT analysis for the modified equipment that will have a net emissions increase of TRS/H_2S due to the project.

5.2 BACT Analysis For TRS/H_2S Emissions from the LSRP

Domtar submitted a retroactive PSD application in October 2016 with proposed TRS and H_2S BACT limits for the LSRP. The permit application is currently under review at NC DAQ. Several LSRP sources are controlled by routing emissions to the existing HVLC system for combustion and the mill proposed no additional controls for the remaining uncontrolled sources. Domtar requests to replace the previously proposed BACT limits with the limits proposed within this application as discussed below.

Domtar Plymouth is reconfiguring their process to extract lignin from the liquor recovery stream during process chemical recovery. Currently emissions from all but a few sources are controlled by incineration in the either of the hog fuel boilers. The LSRP experiences operational issues due to corrosion and over pressurization of the HVLC system in the current configuration which has caused the mill to reevaluate how to control the LSRP sources. Since it has been demonstrated that the HVLC system cannot handle the load from the LSRP sources, the facility is proposing to control the majority of LSRP sources in the proposed caustic scrubber, while four sources will continue to be controlled via incineration in the hog fuel boilers. The remaining uncontrolled sources include the Lignin Feed Liquor Tank (ES-09.27.1000), No. 2 Filter Press (ES-09.27.3000), and insignificant fugitive sources. Note that the project includes controlling No. 1 Filter Press (ES-09.27.2100) and 2 Lignin Filter Cloth Wash tank (ES-09.27.3100) which were previously uncontrolled sources.

Table 2-1 summarizes the control scenarios pre and post project for each LSRP source. There are three groups of sources identified: 1) LSRP Sources Planned for Control in Proposed Caustic Scrubber, LSRP sources controlled by the hog fuel boilers, and 3) LSRP Sources controlled by work practices (other). Sources that will continue to be controlled by incineration in the hog fuel boilers are not discussed in the remainder of this section because the BACT for these sources is not changing.

5.2.1 Step 1 – Identification of TRS/H_2S Control Technologies – Typical Technologies in Use

The LSRP at the Domtar Plymouth Mill is the first commercial scale plant of its kind; therefore, identification of potential technologies was extended to other similar types of sources. A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) indicates three main technologies commonly used to control emissions of TRS and hydrogen sulfide. The typical means of controlling these two compounds include either incineration to form sulfur dioxide, limiting of sulfur content in the process feed stream, or wet scrubbing. The search included a review of the permit data entered in the RBLC TRS/H_2S emissions from any process. The RBLC search results are summarized in Table 5-1.

Various means of incineration at the Domtar Mill were explored and included use of the existing No. 5 Recovery Furnace, the back-up thermal oxidizer, a regenerative thermal oxidizer (RTO), a regenerative catalytic oxidizer (RCO), and installation of a new thermal oxidizer (TO). The evaluation also includes collection and treatment of LSRP streams in the proposed scrubber. Additionally, the Mill evaluated an unproven technology known as black liquor oxidation as a potential way of stabilizing the reduced sulfur compounds in the feed liquor stream to minimize volatilized emissions in the LSRP.

5.2.1.1 Incineration in the Recovery Furnace or Thermal Oxidizer

The TRS/H_2S laden gases produced by the LSRP have similar characteristics to HVLC gases currently required to be controlled per 40 CFR 63 Subpart S. Under Subpart S HVLC gases are required to be controlled to reduce emissions of HAP by 98%. Options for control include thermal oxidizers, or incineration in a lime kiln, boiler, or recovery furnace. The Domtar Mill is permitted to combust HVLC gases in the No. 1 Hog Fuel Boiler, the No. 2 Hog Fuel Boiler, the Recovery Furnace, or the backup thermal oxidizer. The existing HVLC collection system is currently configured to only send these gases to either of the hog fuel boilers. With the 2016 LSRP permitting project, the Mill had engineering firms Valmet and Robins and Morton conduct an evaluation of the current capacity of the existing system as part of the previous evaluation. Both vendors indicated that the existing collection system was at maximum collection capacity and will not be able to accept gases from the remaining uncontrolled sources. Additionally, the LSRP experiences operational issues due to corrosion and over pressurization of the HVLC system in the current configuration therefore to control the exhausts from LSRP sources other than the existing four sources identified in Table 2-1 is not possible. The remaining option was to construct an additional system to collect these gases for incineration into the recovery furnace or thermal oxidizer.

5.2.1.2 Regenerative Catalytic Oxidation (RCO)

Regenerative thermal oxidizers efficiently react TRS/H_2S with oxygen in the air to form sulfur dioxide. RCO systems use a catalyst to initiate the oxidation reaction instead of depending on heat alone. Reactions in an RCO usually take place between 500 and 600°F. This creates the opportunity to reduce fuel expenses and materials cost. These types of oxidizers are capable of removing TRS/H_2S from a gas stream if efficiency can be maintained. TRS/H_2S destruction efficiencies can be as high as 98% or greater with thermal efficiencies as high as 95% under optimum operating conditions.

5.2.1.3 Regenerative Thermal Oxidation (RTO)

Regenerative thermal oxidizers (RTOs) build on the principle of thermal oxidation, but with enhanced fuel efficiency (so they are generally preferred over recuperative thermal oxidizers). An RTO consists of two or more heat exchangers connected by a common combustion zone. The heat exchangers use beds of ceramic beads to store and release heat recovered from the oxidation process. The TRS/H_2S-laden air stream enters the first heat exchange bed where the air stream passes directly through the ceramic media and is then preheated before entering the combustion chamber. In the combustion chamber, a burner is used to supply any heat necessary to reach the optimum combustion temperature (usually 1,600°F or higher) and complete the oxidation process.

The cleaned air stream next enters a second heat exchanger where it passes directly through the ceramic media and is cooled while simultaneously heating the media before the air stream is exhausted to the atmosphere. The airflow through the heat exchange beds is reversed at regular intervals to conserve the heat of combustion within the RTO. TRS/H_2S destruction efficiencies can be 98% or greater with thermal efficiencies as high as 95%.

5.2.1.4 Wet Scrubbing

Wet scrubbing removes air pollutants by inertial or diffusional impaction, chemical reaction, or absorption into liquid solvent. Wet scrubbers are commonly used for removal of TRS and specifically hydrogen sulfide from vent gas streams. Total reduced sulfur is comprised of four main derivations from pulp mill processes. They include hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide. The vendor guaranteed a 95% removal efficiency of hydrogen sulfide and a 70-75% removal efficiency of methyl mercaptan for the caustic scrubber being installed with this project. Dimethyl sulfide and dimethyl disulfide are both highly volatile compounds for which wet scrubbers offer no real control.

5.2.1.5 Stabilization through Black Liquor Oxidation

Pulp and paper mills have, for a number of years, utilized a technique known as black liquor oxidation to stabilize reduced sulfur compounds in black liquor prior to combustion in direct contact recovery furnaces. Oxidation can occur using pure oxygen, hydrogen peroxide, or ambient air to convert the sulfides to sulfate or thiosulfate in solution. Emissions of reduced sulfur compounds from the LSRP are predominantly due to a shift in pH of the liquor as it is processed. Similar to the premise behind the use of an acidic buffer for removal of SO_2 in EPA Method 16, it is a common understanding that reduced sulfur compounds will not remain soluble in acidic solutions. Black liquor by nature is caustic; however, in order to achieve precipitation of the lignin out of solution the pH must become acidic to extract the lignin. These changes in pH are what drive the volatilization of the reduced sulfur emissions from this process.

5.2.2 Step 2 – Technical Feasibility Analysis

5.2.2.1 Incineration in Recovery Furnace

Destruction of the LSRP gases in the recovery furnace is a proven technology used by many Mills today and is technologically feasible.

5.2.2.2 Thermal Oxidation

Application of TO and RTO technology to control HVLC gases is technologically feasible. RCOs pose some risk due to fouling associated with the ammonia and sulfur compounds present in the gas that form ammonium bisulfate on the catalyst layer which results in dramatic reductions in destruction efficiency and intensive maintenance activities. For this reason, a TO or an RTO are the preferred technology over an RCO.

Potential generation of SO_2 from incinerating LSRP gases is over 800 TPY. Due to adverse environmental impacts of SO_2 generation from incineration, it is necessary to include a wet scrubber for SO2 control for all options involving thermal oxidation.

The mill plans to install a thermal oxidizer as a backup control device for the pulp mill HVLC gases as part of the previously permitted optimization project; however, the thermal oxidizer was specifically designed to handle the capacity of the HVLC system and Domtar engineering has determined that the system cannot handle the flow rate of the additional LSRP exhausts that are proposed for control in the caustic scrubber. Therefore, use of the backup thermal oxidizer is technically infeasible.

5.2.2.3 Wet Scrubbing

Wet scrubbing is a proven technology used by many Mills today and is technically feasible.

5.2.2.4 Stabilization through Black Liquor Oxidation

As discussed in the 2016 LSRP PSD permit application, stabilization though black liquor oxidation was determined to be technically infeasible due to the safety risks and detrimental to the mill operations. The previous study conducted by Valmet found that oxidization of black liquor via any method resulted in explosive conditions in the process creating an unsafe environment for workers.

5.2.3 Step 3 - Ranking of TRS/H_2S Control Technologies

A summary of the TRS/H_2S control efficiencies for each of the control technologies under consideration for removing TRS/H_2S emissions from the LSRP, ranked in order of decreasing control effectiveness, is presented below:

- RTO plus wet scrubbing: TRS and H_2S = 98%;
- TO plus wet scrubbing: TRS and H_2S = 98%;
- Recovery Furnace: TRS and H_2S = 98%;
- Wet Scrubbing: TRS = 90% / H_2S = 95%.

5.2.4 Step 4 – Control Effectiveness Evaluation

As discussed earlier, the top-down BACT approach requires an evaluation of economic and environmental impacts associated with the control options being considered. Domtar performed an economic and environmental impacts evaluation of each of the potential control technologies identified above. Economic impacts are discussed separately for the LSRP sources planned for control in the proposed scrubber and for the remaining sources.

5.2.4.1 Cost Effectiveness Evaluation

A cost effectiveness evaluation was conducted for each technically feasible control technology identified in Step 3. Budgetary estimates of capital and operating costs were determined and used to estimate the annualized costs for each control technology. The cost effectiveness for each technically feasible control technology was calculated based on the annualized control technology costs and the amount of TRS and H_2S removed based on the procedures presented in EPA's Control Cost Manual (6th and 7th Edition). The EPA is in currently updating the Cost Control Manual and the EPA expects to complete the updates by 2022. A cost effectiveness evaluation was not performed for the use of black liquor oxidation techniques (ambient air, pure oxygen, hydrogen peroxide, or otherwise), control in the RCO, and control in the backup thermal oxidizer as these options were deemed technologically infeasible. A cost evaluation is not provided for a standalone TO or RTO as the potential emissions of SO_2 from incineration in these control devices is over 800 TPY as discussed above.

5.2.4.2 Capital and Operating Costs

LSRP Sources Planned for Control in Proposed Scrubber

Capital, operating, and annual cost estimates for each TRS and H_2S control technique for the LSRP are presented in Appendix D. The cost evaluation considered applying the listed feasible control technologies to the gases that are planned for control in the proposed scrubber.

Caustic Scrubber

Capital costs including equipment, installation, and engineering for the caustic scrubber were provided by Valmet. The cost of NCG piping was provided from the NHWL cost estimate. Operating costs were calculated using the operating costs methodology from OAQPS Cost Control Manual, sixth edition, dated January 2002 and site specific data for wages and utility costs. The fan and pump sizes for the proposed scrubber were provided by Valmet. The annual cost for caustic is expected to be negligible because minimal additional caustic is required due to the sulfur recovery that occurs within to the mill.

Thermal Oxidizer followed by Caustic Scrubber

Capital costs for the thermal oxidizer were estimated based on the quote provided by Lundberg for the optimization project thermal oxidizer which includes the cost of equipment, installation, and engineering. The capital cost was scaled down using an engineering cost scaling factor of 0.6 and the ratio of LSRP volumetric flow vs. optimization TO volumetric flow. The cost of NCG piping was provided from the NHWL cost estimate. Operating costs were calculated using the operating costs methodology from OAQPS Cost Control Manual, seventh edition, dated November 2017 and site specific data for wages and utility costs. The burner and fan size were scaled down based on the reduction in volumetric flow from the optimization TO design. As discussed earlier, incineration control options considered in this BACT evaluation also included a packed bed caustic scrubber to remove SO_2 that is formed from combustion of TRS. The gas volume entering the scrubber from the TO is anticipated to be at least that of the project scrubber as water vapor will be added to the hot gas stream when the TO exhaust is quenched. The capital and annual costs were added to the cost of the caustic scrubber as described above.

Regenerative Thermal Oxidizer followed by Caustic Scrubber

Capital costs for the regenerative thermal oxidizer were estimated based on the quote provided by Durr which includes the cost of equipment, installation, and engineering. The quote from Durr excluded the cost of the foundation and piping, therefore the cost of NCG piping was included from the NHWL cost estimate and the foundation cost was included using the OAQPS Cost Control Manual, seventh edition, dated November 2017. Additionally, operating costs were calculated using the operating costs methodology from OAQPS Cost Control Manual and site specific data for wages and utility costs. The gas volume entering the scrubber from the RTO is anticipated to be at least that of the project scrubber as water vapor will be added to the hot gas stream when the RTO exhaust is quenched. The capital and annual costs were added to the cost of the caustic scrubber as described above.

Based on conversations with the RTO vendor consulted for this project, there are significant concerns regarding sulfuric acid condensation due to the high sulfur content of the stream being combusted and lower operating temperatures throughout the RTO in the heat recovery cycle. To address these concerns, the quotation provided by the vendor was based on manufacturing most equipment with hastelloy steel clad. While the improved corrosion resistance of hastelloy steel is well established, the vendor was unaware of an RTO system ever controlling such a high sulfur laden stream. There are considerable uncertainties regarding the durability of such a system even in hastelloy given the unknown concentration of condensing sulfuric acid within the RTO and elevated temperatures. Based on our research, dramatic corrosion within the system is still it is possible and perhaps likely that there could still be dramatic corrosion within the system[6]. When asked to provide an extended warranty on the materials of construction, the vendor would be willing to guarantee the integrity of this system for only two years. Accordingly, the RTO was amortized over 2 years.

Recovery Furnace

The capital cost for incinerating the LSRP gases in the recovery furnace were provided in estimates from Robins and Morton and included ductwork to collect exhausts and modifications to the boiler to accommodate the proposed changes. Operating cost were calculated using the operating costs methodology from OAQPS Cost Control Manual, seventh edition, dated November 2017 and site specific data for wages and utility costs.

Other LSRP Sources

The cost evaluation considered applying the listed feasible control technologies to the Filter - 2 Lignin Filter (ES-09-27 .3000), Conveyor - #2 Lignin Filter Horizontal (IES-09-27.3400), and remaining uncontrolled insignificant sources. Capital and annual cost estimates for each TRS and H_2S control technique for the LSRP are presented in Appendix D.

In order to collect gases for control associated with the Filter - 2 Lignin Filter area, an enclosure would be required along with ductwork, piping, and electrical equipment to transport the gases to the potential location of the control device. The cost for the enclosure, fan, ductwork, and installation was provided per SEI quote on May 12, 2017. The capital cost of electrical equipment, piping, engineering, and installation of piping and electrical was provided by Domtar December 13, 2018. The capital cost was annualized assuming a life expectancy of 20 years and 9% interest rate to obtain the additional annualized cost to control the Filter - 2 Lignin Filter area. Emissions from the tank ES-09-27.1000 and fugitive drainage sumps are included in the analysis however, additional cost to control these sources was not obtained.

[6] https://tantaline.com/technology/corrosion-performance/

5.2.4.3 Summary of Economic Impacts

LSRP Sources Planned for Control in Proposed Scrubber

Table 6 of Appendix D presents the economic impact of each control scenario including the incremental cost effectiveness of the other control scenarios compared to the caustic scrubber control scenario. The cost effectiveness to control the LSRP gases ranges from approximately $1,781-$4,573/ton TRS removed and $1,929-$5,111/ton H2S removed, with the caustic scrubber being the most cost effective control scenario. The incremental cost effectiveness was calculated based on the incremental capital costs and incremental emissions reductions associated with each option as compared to use of the stand-alone caustic scrubber which is being proposed as BACT. The incremental cost effectiveness to further control the LSRP gases ranges from approximately $17,000-$37,000/ton TRS removed and $38,000-$66,000/ton H2S removed. These values are not considered cost effective as they are in excess of $10,000/ton pollutant removed.

Other LSRP Sources

The cost effectiveness to control the remaining uncontrolled sources would be higher than the costs presented in Table 6 of Appendix D for control of the main LSRP process tanks due to the lower H2S concentrations present in these remaining sources. As shown in Figure 2-3, the flow rate from these other sources is similar to main LSRP process tanks (~11,000 cfm versus ~12,000 cfm), while the concentration of TRS gases in these other sources is only about 5 percent of the main LSRP sources (~5 ppm versus ~1000 ppm). A cursory economic impacts analysis was conducted for these other sources by estimating just the cost of installing enclosures around these sources and the necessary ductwork and ancillary equipment (e.g., electrical). This cost was amortized and divided by the emission reduction for each control option discussed earlier. Table 7 of Appendix D summarizes the cost effectiveness of this approach for each scenario. The cost effectiveness of controlling the Filter - 2 Lignin Filter area is greater than $30,000/ton of TRS/H2S for every control scenario, which is above the range of reasonable cost effectiveness. It should be noted for the options involving the caustic scrubber, thermal oxidizer, and RTO that the capital costs shown do not include the increased cost that would be associated with installation of larger control device designed to handle essentially twice the flow rate of just the main LSRP tanks.

5.2.4.4 Environmental and Energy Impacts

Table 8 of Appendix D summarizes the environmental impacts associated with each control option. Combustion of the gas streams as a control strategy will result in conversion of the reduced sulfur species to SO_2. Despite including post oxidation scrubbing, all of the combustion control options will result in generation of an additional 43 tpy of SO_2, which alone exceeds the PSD significant emission rate for SO_2. Operation of any of the control technologies evaluated would increase electricity usage and operation of either RTO or TO technology would increase natural gas consumption at the site, resulting in increased NO_X and GHG emissions to the atmosphere. There are no other notable additional environmental impacts associated with operation of any of the control options evaluated, such as significant generation/disposal of hazardous or solid wastes.

5.2.5 Step 5 - Proposed BACT for the LSRP

The mill proposes use of a caustic packed bed scrubber as the control technique for BACT for the majority of the sources at the lignin plant that can no longer be controlled in the HVLC system. Emissions limits are proposed for the Filter - 2 Lignin Filter (ES-09-27 .3000), IES-09-27.3400 (Conveyor - #2 Lignin Filter Horizontal), and remaining uncontrolled sources. A summary of proposed BACT for all LSRP sources is located in Table 5-2.

Packed Bed Caustic Scrubber

The mill proposes to monitor the caustic scrubber liquid flow rate and pH and will establish operating parameters during the initial performance test. Operating within the established ranges ensures compliance with the proposed limits. Scrubber liquid flow is a key indicator of gaseous pollutant control in a packed bed scrubber. Maintaining a minimum flow rate in combination with maintaining minimum pH will ensure that adequate scrubber efficiency is being maintained. pH is a key indicator of the reactive capacity of the scrubbing liquor (caustic) being used for TRS compounds removal in a packed bed scrubber. Maintaining a minimum flow rate in combination with maintaining minimum pH will ensure that adequate scrubber efficiency is being maintained.

The mill is considering installing dual pH probes to monitor pH to provide a redundant monitoring device in the event of primary pH probe failure or scaling, which could provide erroneous readings. In such an event, information from the malfunctioning meter will be discarded until corrective maintenance is completed. The proposed emission source compliance method for the caustic scrubber is presented within Appendix A, form E3. Instances of deviation from operating parameters including corrective action taken will be reported semi-annually.

Existing HVLC System

The mill proposes to continue to route emissions from the Carbonator - Feed Liquor (ES-09-27 .1400), Tank - Lignin Acidification (09-27.2700), Tank - Lignin Foam (09-27.2770), and Tank - Acidic Lignin Conditioning (ES-09.2800) to the existing HVLC system for control via incineration as proposed in the 2016 LSRP PSD application. Although the lignin dewatering process is not an affected source under Subpart S, it generates an HVLC stream that is captured and controlled in the same manner as the current HVLC sources. The mill is proposing no additional monitoring, recordkeeping, or reporting for these sources.

Uncontrolled LSRP Gases

The mill proposes the emissions limits listed in Table 5-2 for the Filter - 2 Lignin Filter (ES-09-27 .3000), IES-09-27.3400 (Conveyor - #2 Lignin Filter Horizontal), and remaining uncontrolled sources that were developed using vendor information and site specific data.

6.0 AIR QUALITY MODELING ANALYSIS

The dispersion modeling analyses conducted for the project adhere to the United States Environmental Protection Agency (US EPA) "Guideline on Air Quality Models" (GAQM, which is contained in 40 CFR 51, Appendix W) (EPA 2017), *North Carolina PSD Modeling Guidance* (NC DAQ 2012), direction received from the NC DAQ, and with the air dispersion modeling protocol approved by the DAQ on January 29, 2019. The following sections present the source data modeled, the procedures used for assessing ambient air impacts from the project's emissions, the standards to which the predicted impacts were compared, and the results of the analyses.

The location of the facility is provided in Figures 2-1 and 2-2. Figures 2-1 and 2-2 show the local land use and topography around the Mill. The land use is generally rural with agriculture and forested areas, as well as, large areas of wetlands. The topography is flat with terrain well below stack tops.

6.1 Introduction

The proposed project triggers PSD review for NO_2 and SO_2; therefore, a dispersion modeling analysis is required for these pollutants. Modeling analyses were performed to evaluate compliance with applicable PSD increments for these pollutants and compliance with the NAAQS. Although potential TRS and H_2S emissions trigger PSD review, there are no NAAQS or PSD increments for these regulated pollutants so modeling was not performed for them. The modeling also addresses impacts associated with secondary $PM_{2.5}$ and ozone as appropriate (See Section 6.10).

Maximum modeled concentrations due to the difference between the potential to emit (PTE) emissions and the could have accommodated (CHA) emissions for all affected sources were compared to the Significant Impact Levels (SILs), which are shown in Table 6-1. For those pollutants with modeled concentrations below the applicable SIL, no additional analyses were necessary since, by definition, the pollutant could not cause or contribute to a NAAQS violation or an exceedance of a PSD increment. For this analysis, as will be shown in Section 6.8, all modeled concentrations are less than their respective SILs.

Table 6-1. Criteria Pollutant Class II Significant Impact Levels

Pollutant	Averaging Period	SIL (μg/m3) (1)
NO_2	1-hour	7.5(2)
	Annual	1
SO_2	1-hour	7.8(2)
	3-hour	25
	24-hour	5
	Annual	1

(1) North Carolina PSD Modeling Guidance, January 6, 2012, Table 4-1.
(2) DAQ established interim 1-hr SILs of 10, these are the more conservative EPA interim SILs

6.2 Source Data

As mentioned in Section 3.4, the project will result in a decrease in black liquor solids production and an increase in blended hog fuel fired in the No. 2 Hog Fuel Boiler. To be conservative, the modeling will only include the increases in emissions; therefore, only the No. 2 Hog Fuel Boiler will be included in the Class II Area Preliminary Impact Air Quality Analysis.

This analysis was conducted with the stack gas exhaust characteristics shown in Table 6-2. No changes will be made to existing stack parameters for this project.

Table 6-2. PSD Dispersion Modeling Stack Parameters

Model ID/ Source ID	Source Description	Base Elevation	Stack Height	Exit Temperature	Exit Velocity	Stack Diameter
		(m)	(m)	(K)	(m/s)	(m)
PO13A/ ES-65-25-0310	No. 2 Hog Fuel Boiler	2.46	76.2	494.3	34.53	2.7

6.3 Air Dispersion Model Selection

The suitability of an air quality dispersion model for a particular application is dependent upon several factors.

The following selection criteria were evaluated:

(1) Stack height relative to nearby structures;

(2) Dispersion environment;

(3) Local terrain; and

(4) Representative meteorological data.

The US EPA GAQM (2017) prescribes a set of approved models for regulatory applications for a wide range of source types and dispersion environments. Based on a review of the above factors as discussed below, the latest version of AERMOD (18081) was used to assess air quality impacts for the project.

6.4 Meteorological Data

DAQ guidance suggests that for projects in this area, data from Elizabeth City Coast Guard Air Station should be considered representative. Therefore, a five-year meteorological data set (2013-2017) of surface meteorological data from the Elizabeth City Coast Guard Air Station in Elizabeth City, NC (Station No. 13786) and upper-air sounding data recorded at the Newport/Morehead City National Weather Service (NWS) Forecast Office, Newport NC (Station No. 93768) was used in the modeling analysis.

The meteorological data files were prepared by DAQ using AERMET (Version 18081) with the ADJ_U* option. A five-year wind rose is provided as Figure 6-1.

6.5 Good Engineering Practice (GEP) Stack Height Analysis

A Good Engineering Practice (GEP) stack height analysis was performed to determine the potential for building-induced aerodynamic downwash for all modeled stacks. The analysis procedures described in US EPA's *Guidelines for Determination of Good Engineering Practice Stack Height* (EPA 1985), Stack Height Regulations (40 CFR 51), and current Model Clearinghouse guidance was used.

The GEP formula height is based on the observed phenomena of disturbed atmospheric flow in the immediate vicinity of a structure resulting in higher ground level concentrations at a closer proximity to the building than would otherwise occur. It identifies the minimum stack height at which significant aerodynamic downwash is avoided. The GEP formula stack height, as defined in the 1985 final regulations, is calculated from:

$$H_{GEP} = H_{BLDG} + 1.5L$$

Where:

(5) H_{GEP} is the maximum GEP stack height

(6) H_{BLDG} is the height of the nearby structure, and

L is the lesser dimension (height or projected width) of the nearby structure

For a squat structure, i.e., height less than projected width, the formula reduces to:

$$H_{GEP} = 2.5H_{BLDG}$$

Both the height and width of the structure are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. In all instances, the GEP stack height is based on the plane projections of any nearby building which result in the greatest justifiable height. For purposes of the GEP analysis, nearby refers to the "sphere of influence", defined as five times the height or width of the building, whichever is less, downwind from the trailing edge of the structure. In the case where a stack is not influenced by nearby structures, the maximum GEP stack height is defined as 65 meters.

All stacks at the facility are less than their GEP formula stack height. As such, they were modeled with their actual stack heights.

In addition, the US EPA's Building Profile Input Program (BPIP-Version 04274) version that is appropriate for use with PRIME algorithms in AERMOD was used to incorporate downwash effects in the model for all modeled stacks. The stack locations and building dimensions of each structure were input in BPIPPRM program to determine direction specific building data. PRIME addresses the entire structure of the wake, from the cavity immediately downwind of the building, to the far wake.

Figure 6-2 presents the layout of buildings and sources included in the BPIP analysis. BPIP input and output files are provided in the modeling archive as part of Appendix E.

6.6 Ambient Air Boundary

Ambient air is defined by the US EPA in 40 CFR 50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access." In November of 2018, the US EPA released a draft Revised Policy on Exclusions from Ambient Air[7]. This draft guidance allows for more methods of precluding the public's access to property owned by the facility, other than just a fence or physical barrier. Figure 6-3 shows Domtar's ambient air boundary using a combination of fencing, 15 foot high river banks, impassable wetlands, no trespassing signage, and areas that are monitored by security personnel. All of these methods preclude the public's access to Domtar property.

6.7 Receptors

The Class II area receptor grid consists of receptors spaced 25 meters (m) apart along the ambient air boundary. A spacing of 100 m was used for the receptors beyond the fence line and extending out to 1 km from the fence line. Beyond 1 km from the fence line, a spacing of 250 m was used up to 3 km from the facility. Between 3 and 5 km, a spacing of 500 m was used. Between 5 and 10 km, a spacing of 1,000 m was used. The receptor grid used in the modeling analysis was based on NAD 83 datum and in zone 17. Figures 6-4 and 6-5 illustrate the near and far-field receptor grids used for modeling the project.

Warren Neck Creek and Welch Creek traverse Domtar property and are inside the ambient air boundary. The public is allowed to travel on these creeks; therefore, receptors were placed along the creeks for short-term averaging periods (1-hour, 3-hour, and 24-hour). Short-term receptors were also placed along Pulp Mill Road from the ambient boundary north to the gatehouse.

The extent of this grid was sufficient to capture maximum modeled concentrations in the Class II areas. All maximum concentrations were located in areas with 100 m receptor spacing.

[7] https://www.epa.gov/sites/production/files/2018-11/documents/draft_ambient_air_guidance_110818.pdf

AERMAP (version 18081), the AERMOD terrain preprocessor program, was used to calculate terrain elevations and critical hill heights for the modeled receptors (NAD83 datum and zone 17) using National Elevation Data (NED). The dataset that was downloaded from The National Map, maintained by the United States Geological Survey (USGS)[8] consisted of 1 arc second (~30 m resolution) NED.

6.8 Class II Area Modeling Analyses

A refined modeling analysis was conducted using AERMOD (version 18081). The analysis was conducted to demonstrate compliance with annual state and federal applicable ambient air quality standards.

6.8.1 Class II Area Preliminary Impact Air Quality Analysis

The Preliminary Impact Air Quality Analysis consisted of a Class II area SIL analysis conducted using five years of airport meteorological data as described in Section 6.4, and emissions consisting of the difference between the projected actual emissions and the could-have-accommodated emissions for the No. 2 Hog Fuel Boiler (Table 6-3). This modeling analysis was used to make a determination of significance for NO_2 and SO_2. For the NO_2 and SO_2 1-hour standards, the determination of significance was made using the highest maximum daily 1-hour modeled concentration averaged over the five years of meteorological data modeled. For all other averaging periods (3-hour, 24-hour, and annual), significance was determined based on the highest modeled concentration over the five years modeled. For this project, the modeled NO_2 concentrations were conservatively assessed assuming a 100 percent NO to NO_2 conversion.

Table 6-3. SIL Analysis Modeled Emission Rates

Source ID	NO_2 (g/s)	SO_2 (g/s)
PO13A	2.12	2.59

A comparison of the overall maximum modeled concentrations with the SILs is presented in Table 6-4. As is depicted in Table 6-4 all modeled concentrations are below their respective SILs. As such, no further analyses were required.

[8] https://viewer.nationalmap.gov/basic/

Table 6-4. Summary of Maximum AERMOD Concentrations to Significant Impact Levels

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)	SIL	Significant? (Yes or No)
NO_2	1-hour	1.9	7.5	N
	Annual	0.04	1	N
SO_2	1-hour	2.4	7.8	N
	3-hour	1.6	25	N
	24-hour	0.5	5	N
	Annual	0.05	1	N

6.9 Preconstruction Ambient Monitoring Data

The PSD regulations require that a PSD permit application contain an analysis of existing air quality for all regulated pollutants that the source has the potential to emit in significant amounts. The definition of existing air quality can be satisfied by air measurements from either a state-operated or private network, or by a pre-construction monitoring program that is specifically designed to collect data in the vicinity of the proposed source. To fulfill the pre-construction monitoring requirement for PSD without conducting on-site monitoring a source may either:

Justify that data collected from existing monitoring sites are conservatively representative of the air quality in the vicinity of the proposed project site;

Demonstrate through modeling the ambient impacts from the proposed project are less than the de minimis levels established by the US EPA (see Table 6-5).

For this proposed project, modeled concentrations were compared to the de minimis monitoring concentrations. Table 6-5 shows the modeled concentrations along with the de minimis monitoring concentrations for each pollutant and annual averaging period. The results in Table 6-5 show that all the project modeled concentrations (see Table 6-4) are below the de minimis monitoring concentrations. Therefore, preconstruction monitoring is not required for this project.

Table 6-5. De Minimis Monitoring Concentrations

Pollutant	Averaging Period	Modeled Concentration(1) µg/m^3	De Minimis Monitoring Concentration µg/m^3
NO_2	1-hour	1.9	NA
	Annual	0.04	14
SO_2	1-hour	2.4	NA
	3-hour	1.6	NA
	24-hour	0.5	13
	Annual	0.05	NA

(1) Modeled concentration taken from Table 6-4.

6.10 Secondary $PM_{2.5}$ and Ozone

In December 2016, EPA released the draft Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (EPA-454/R-16-006)[9] (EPA MERP Guidance). In February 2017, a data distribution and errata memorandum was released by the EPA to provide corrections to data tables within the draft guidance[10]. Section 7 of the draft EPA MERP Guidance provides several examples of MERP Tier 1 demonstrations for sources subject to PSD review. The examples focus on both secondary $PM_{2.5}$ and ozone precursor emissions and at what emission levels those precursors would result in a potential project insignificant impact, which would eliminate the need for project-specific modeling.

This guidance, was utilized to develop the approaches used to assess the extent of analysis required for secondary $PM_{2.5}$ and ozone for this project as described below.

6.10.1 Secondary $PM_{2.5}$

The project emission increases of SO_2 and NO_X do not exceed the lowest MERP for sources located in any section of the continental US, and the Project does not trigger PSD review for $PM_{2.5}$. Therefore, the secondary $PM_{2.5}$ analysis followed the example of Scenario B in Section 7 of the EPA MERP Guidance to determine if the air quality impacts expected from the project were below the critical air quality threshold.

In the calculations below, the proposed emissions increases are expressed as a percent of the lowest MERP for each precursor, and then summed. A total impact less than 100% indicates that the critical air quality impact will not be exceeded when considering the combined impacts of precursors on daily and annual $PM_{2.5}$.

[9] https://www3.epa.gov/ttn/scram/guidance/guide/EPA454_R_16_006.pdf

[10] https://www3.epa.gov/ttn/scram/guidance/guide/MERPs_Data_Distribution_and_Errata_Memo-02232017.pdf

Daily $PM_{2.5}$

(57 tpy NOx from source/1,075 tpy NOx daily $PM_{2.5}$ MERP) + (90 tpy SO_2 from source/210 tpy SO_2 daily $PM_{2.5}$ MERP) = 0.05 + 0.43 = 0.48 * 100% = 48%

Annual $PM_{2.5}$

(57 tpy NOx from source/3,184 tpy NOx annual $PM_{2.5}$ MERP) + (90 tpy SO_2 from source/839 tpy SO_2 annual $PM_{2.5}$ MERP) = 0.02 + 0.11 = 0.13 * 100% = 13%

6.10.2 Ozone

The project emissions increases of NO_X and VOC are lower than the lowest MERP developed by EPA in their December 2016 MERP Guidance (Table 7-1) for sources located in any section of the continental US. Therefore, the ozone analysis followed the example of Scenario A in Section 7 of the EPA MERP Guidance to determine if the air quality impacts expected from the project were below the critical air quality threshold.

In the calculations below, the proposed emissions increases are expressed as a percent of the lowest MERP for each precursor, and then summed. A total impact less than 100% indicates that the critical air quality impact will not be exceeded when considering the combined impacts of precursors on 8-hour daily maximum ozone.

(57 tpy NO_X from source/126 tpy NO_X 8-hour daily maximum O_3 MERP) + (27 tpy VOC from source/948 tpy VOC 8-hour daily maximum O_3 MERP) = 0.45 + 0.03 = 0.48 * 100% = 48%

6.11 Additional Impacts Analysis

Pursuant to the federal PSD regulations, additional impact analyses must be addressed for projects subject to PSD review. The various components of the additional impact analyses are discussed below.

6.11.1 Class I Area Modeling Analysis

DAQ sent information on the project emission increases and the distances to Class I areas to the Federal Land Managers at the National Park Service (NPS), United States Forest Service (USFS), and United States Fish and Wildlife Service (FWS) to determine if they would require an AQRV analysis. We do not anticipate that a Class I AQRV analysis would be required for this project based on historical responses to similar projects. Therefore, the Class I area analysis addressed only PSD increment consumption at the nearby Class I areas. Swanquarter Wilderness Area at 65 km from the Mill is the only Class I area within 300 km.

6.11.1.1 Class I PSD Increment Analysis

In accordance with Appendix W (Section 4.2.c.i), because AERMOD (Version 18081) was used for the project's nearfield assessment, it can be utilized as a screening-level analysis to estimate the project's potential for a significant modeled impact at the PSD Class I areas listed above. As such, AERMOD was used as a screening analysis with the meteorological data described in Section 6.4 and with a radial arc of receptors located 50 km from the proposed project. Receptors along the 50-km arc were placed every 1 degree and covered all 360 degrees surrounding the Mill (Figure 6-6).

The results of the PSD increment modeling are presented in Table 6-6. As shown in Table 6-6, all modeled concentrations are below their respective SILs. As such, no additional modeling is required.

Table 6-6. Class I Area — Significant Impact Modeling Results

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m³)	Class I SILs (µg/m³)(1)	% of SILs
NO_2	1-hour	--	DNE	--
	Annual	0.004	0.1	4%
SO_2	1-hour	--	DNE	--
	3-hour	0.2	1	20%
	24-hour	0.05	0.2	25%
	Annual	0.004	0.08	5%

(1) Class I SILs do not exist for the 1-hour standards.

6.11.2 Growth

A growth analysis examines the potential emissions from secondary sources associated with the proposed project. While these activities are not directly involved in project operation, the emissions involve those that can reasonably be expected to occur; for instance, industrial, commercial, and residential growth that will occur in the project area due to the project itself. Secondary emissions do not include any emissions which come directly from a mobile source, such as emissions from the tailpipe of any on-road motor vehicle or the propulsion of a train (EPA 1990). They also do not include sources that do not impact the same general area as the source under review.

The proposed project is not expected to employ additional employees at this time. Therefore, secondary growth is not expected, and thus an analysis of such growth was not performed.

6.11.3 Soils and Vegetation

An analysis of the project's potential impact on soils and vegetation in the vicinity of the facility was performed in accordance with the procedures recommended in EPA's *A Screening Procedure for Impacts of Air Pollution Sources on Plants, Soils and Animals* (EPA-450/2-81-078) (EPA 1980).

The highest modeled concentrations of NO_2 and SO_2 from this project were compared to the screening concentrations as shown in Table 6-7. As shown, the modeled concentrations are all well below their screening thresholds; therefore, no significant impacts on local vegetation are expected as a result of the project.

Table 6-7. Injury Threshold for Vegetation

Pollutant	Averaging Period	Maximum Concentration $\mu g/m^3$)	EPA's 1980 Screening Concentration ($\mu g/m^3$)(1)	Over Screening Concentration? (Yes or No)
NO_2	1-hour	1.9	3760(2)	No
	Annual	0.04	94	No
SO_2	1-hour	2.4	917	No
	3-hour	1.6	786	No
	Annual	0.05	18	No

(1) Source: "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals". EPA 450/2-81-078, December 1980.
(2) This is the 4-hour screen concentration.

6.11.4 Visibility Impairment

The PSD regulations require an evaluation of the impact of the project emissions on visibility. The primary pollutants responsible for visibility impairment are particulates and NO_X. A visibility analysis was conducted with US EPA's VISCREEN model for Pettigrew State Park in North Carolina, located approximately 25 km east of the Mill (Figure 6-7).

The analysis was conducted in accordance with US EPA's Workbook for Plume Visual Impacts Screening and Analysis (Revised) ("Workbook"; US EPA, 1992). The VISCREEN model was applied to estimate two visual impact parameters, plume perceptibility (ΔE) and plume contrast (C_p). Screening-level guidance indicates that values above 2.0 for ΔE and +/- 0.05 for C_p are considered perceptible.

The VISCREEN model Workbook offers two levels of analysis. Level 1 screening analysis is the most simplified and conservative approach employing worst-case default meteorological data. Level 2 analysis allows refinement of meteorological conditions and site specific conditions such as complex terrain. The Level 1 analysis was conducted and indicated ΔE and C_p values were below the screening thresholds (Table 6-8).

Table 6-8. VISCREEN Model Results

Background	Distance (km)	Plume Perceptibility (ΔE)			Plume Contrast (C_p) (2)		
		VISCREEN(1)		Criteria	VISCREEN(1)		Criteria
		Theta 10	Theta 140		Theta 10	Theta 140	
Sky	25.0	0.153	0.047	2.0	0.000	-0.001	0.05
Terrain	25.0	0.038	0.009	2.0	0.001	0.000	0.05

(1) VISCREEN results are provided for the two VISCREEN default worst-case theta angles. The two theta angles represent the sun being in front of the observer (theta = 10 degrees) or behind the observer (theta = 140 degrees).

(2) A negative C_p means the plume has a darker contrast than the background sky.

7.0 AIR TOXICS DISPERSION MODELING ANALYSIS

7.1 Introduction

Per 15A NCAC 2Q.0700, toxic air pollutant (TAP) compliance demonstrations are required for new or modified sources to ensure TAPs from the facility will not cause any acceptable ambient level (AAL) listed in 15A NCAC 02D.1104 to be exceeded beyond the property line. TAP emissions from not only the Project, but also from unmodified operations of the facility are required to demonstrate compliance with the AALs.

The Mill recently completed a toxics modeling analysis for the Optimization Project (Permit No. 04291T45); therefore, only compounds that exceed the toxic pollutant emission rate (TPER) and are affected by the Project will be included in this analysis. As shown in Appendix B Table 60, the following compounds will be included in the analysis:

- Acetaldehyde (75-07-0) – Hourly TPER exceeded;
- Acrolein (107-02-8) - Hourly TPER exceeded;
- Ammonia (7664-41-7) - Hourly TPER exceeded;
- Arsenic and inorganic arsenic compounds – Annual TPER exceeded;
- Benzene (71-43-2) - Annual TPER exceeded;
- Beryllium (7440-41-7) – Annual TPER exceeded;
- Butadiene, 1,3 (106-99-0) - Annual TPER exceeded;
- Cadmium (7440-43-9) – Annual TPER exceeded;
- Carbon Disulfide (75-15-0) – Daily TPER exceeded;
- Carbon tetrachloride (56-23-5) – Annual TPER exceeded;
- Chloroform (67-66-3) – Annual TPER exceeded;
- Chromium VI (soluble chromate compounds) – Daily TPER exceeded;
- 1,2 Dicholoethane (ethylene dichloride) (107-06-2) - Annual TPER exceeded;
- Fluorides – Hourly and Daily TPER exceeded;
- Formaldehyde (50-00-0) - Hourly TPER exceeded;
- N-hexane (110-54-3) - Daily TPER exceeded;
- Hydrogen Chloride (7647-01-0) - Hourly TPER exceeded;
- Hydrogen Sulfide (7783-06-4) – Daily TPER exceeded;
- Manganese and compounds – Daily TPER exceeded;
- Mercury, aryl and inorganic compounds – Daily TPER exceeded;
- Methylene chloride (75-09-2) – Hourly and Annual TPER exceeded;
- Methyl mercaptan (74-93-1) – Hourly TPER exceeded;

- Nickel metal (7440-02-0) – Daily TPER exceeded;
- Phenol (108-95-2) – Hourly TPER exceeded;
- Sulfuric acid (7664-93-9) – Hourly and Daily TPER exceeded;
- Vinyl chloride (75-01-4) – Annual TPER exceeded.

Facility-wide modeling was conducted for the compounds listed above, and the resulting modeled concentrations were compared to applicable AALs. The modeling methodology and assumptions are provided in the following sections.

7.2 Air Quality Analysis Approach

The analysis was based on requirements and recommendations contained in the NCDAQ's *Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina* (May 2018). The modeling system and meteorological data used were the same as that used for the air quality modeling analysis described in Section 6. The GEP analysis was similar to that described in Section 6, but included all sources at the Mill. Table D-1 lists heights of the buildings included in the GEP analysis and Figure 7-1 shows the toxics modeling setup.

7.3 Sources and Emissions

The highest potential to emit emission rates were modeled for all Mill sources that emit any of the pollutants that exceed the TPERs. Stack parameters and potential emission rates for all sources modeled are listed in Tables D-2 and D-3.

7.4 Receptors

According to the NCDAQ Toxic Modeling Guidance, receptors should be placed on the property boundary and extend outward. Shapefiles of property owned by Domtar Paper Company were downloaded from the Martin County[11] and Washington County[12] GIS websites, and a contiguous property boundary was defined (Figure 7-2).

Discrete receptors were placed along the northern property line at 25 m intervals, as this section of the property line is closest to the Mill sources. A 50 m interval was used elsewhere along the property line. A 100 m grid spacing was used from the property line out to a distance of approximately 1,500 meters. A 250 m grid spacing was used from 1,500 meters out to a distance of approximately 2,500 meters. Finally, a 500 m grid spacing was used from 2,500 meters out to a distance of approximately 8,000 meters.

Receptors on public right-of-ways such as Welch Creek, Warren Neck Creek, Ken Trowbridge Road, and Pulp Mill Road were included in the short term modeling but excluded from the long term modeling per DAQ Toxics Modeling Guidance. Figure 7-3 shows the short term and long term receptor grids.

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[11] http://maps.agdmaps.com/nc/martin/
[12] http://www.washconc.org/gis_mapping.aspx

All maximum concentrations were located in areas with 100 m or less receptor spacing.

7.5 Modeling Results

Potential emission rates for arsenic, beryllium, cadmium, chromium VI, mercury, nickel, and vinyl chloride were multiplied by 1,000,000 to ensure a non-zero modeling concentration was obtained. The resulting concentration was then divided by 1,000,000 before being compared to the AAL (Table D-4). Based on the resulting concentrations from the potential model run, the emission rates were then increased to an optimized rate such that modeled allowable emission rates result in ambient concentrations that are 98 percent of the AAL. The optimized emission rates are presented in Table D-5 and the optimized modeling results are in Table D-6. Optimizing the emission rates provides the facility with additional operational flexibility, and should reduce the need for future TAP modeling analyses for these sources at the facility.

Proposed facility wide emission limits for pollutants that had a potential modeled concentration less than 9.8% of the AAL are provided in Table D-7. For pollutants that had a potential modeled concentration greater than 9.8% of the AAL, proposed emission limits are provided for sources not subject to MACT in Table D-8.

The TAP modeling analysis demonstrates that the maximum optimized TAP emissions from the facility do not result in predicted ambient concentrations that exceed the respective AALs.

Tables

Table 2-1 - Summary of LSRP Project Changes

Existing				Post Modification		
Permit ID	**Emission Source Description[1]**	**Control Device ID**	**Control Device Description**	**Control Device ID**	**Control Device Description**	**Equipment Modifications**
ES-09-27.1000	40% Black Liquor Tank (Tank - Lignin Feed Liquor)	NA	NA	NA	NA	Replace tank to improve metallurgy due to corrosion and fit with an agitator to prevent solids buildup.
ES-09-27 .1100	40% Black Liquor Cooler (Cooler - 1 Feed Liquor)	ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)	HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).	ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	
ES-09-27.1200	Filtrate 1 Storage Tank (Tank - 1 Lignin Filter Filtrate Storage)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Fit with agitators to prevent solids buildup.
ES-09-27 .1400	Carbonator Tower (Carbonator - Feed Liquor)			ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-64-22-2000 (as backup)	HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).	
ES-09-27.1800	Agitated Conditioning Tank (Tank - Lignin Slurry Conditioning)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Replace with a taller tank to achieve more the surge capacity and metallurgy will be improved due to corrosion. Fit with agitators to prevent solids buildup.
ES-09-27-2000	Agitated Buffer Tank (Tank - Lignin Slurry Buffer)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Replace with a taller tank to achieve more the surge capacity and metallurgy will be improved due to corrosion. Fit with agitators to prevent solids buildup.
ES-09-27.2300	Cloth Wash Water Tank 1 (Tank - 1 Lignin Filter Cloth Wash)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	The Tank - 1 Lignin Filter Cloth Wash (2300) will be purged to one of the alkaline filtrate tanks via the existing #1 Lignin Filter Cloth Wash Recirculation Pump (2340) to prevent overflow. Fit with agitators to prevent solids buildup.
ES-09-27 .2400	Filtrate Tank 1 (Tank - 1 Lignin Filter Filtrate)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Fit with agitators to prevent solids buildup.
ES-09-27-2500	Filtrate 1 Buffer Tank (Tank - 1 Lignin Filter Filtrate Buffer)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Fit with agitators to prevent solids buildup.
ES-09-27.2610	Dewatered Lignin Conveyor 1 (Conveyor - #1 Lignin Filter Horizontal)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	
ES-09-27 .2620	Dewatered Lignin Conveyor 2 (Conveyor - #1 Lignin Filter Incline)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	
ES-09-27 .3200	Stage 2 Filtrate Tank 2 (Tank - 2 Lignin Filter Acidic Filtrate)			ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	The current Acidic Lignin Conditioning Tank (2800) will be repurposed as the new Tank - 2 Lignin Filter Acidic Filtrate (3200). LVHC loop seal will be routed to 3200.

Table 2-1 - Summary of LSRP Project Changes

Existing				Post Modification		
Permit ID	**Emission Source Description[1]**	**Control Device ID**	**Control Device Description**	**Control Device ID**	**Control Device Description**	**Equipment Modifications**
ES-09-27 .2100	Filter Press 1A (Filter - 1 Lignin)	Partially controlled by vacuum pull to HVLC system as noted in the permit.		ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	Add chambers to filter press to reach design capacity.
ES-09.2700 (09-27.2700)	Agitated Acidification Tank (Tank - Lignin Acidification)	ES-09-27.1400	Carbonator Tower	ES-09-27.1400, ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)	Carbonator Tower and HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).	
ES-09 .2770 (09-27.2770)	Acidification Overflow/Foam Tank (Tank - Lignin Foam)					
ES-09.2800	Agitated Acid Conditioning Tank (Tank - Acidic Lignin Conditioning)			ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)	HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).	The current Acidic Lignin Conditioning Tank (2800) will be repurposed as the new Tank - 2 Lignin Filter Acidic Filtrate (3200). A new tank will be built and serve as the new Acidic Lignin Conditioning Tank (2800) with improved metallurgy due to corrosion, increased surge capacity, and constant recirculation via a new dedicated pump for H2S stripping.
ES-09-27 .3000	Filter Press 2A (Filter - 2 Lignin Filter)	NA	NA	ES-09-27.3900	Dust Collection System including Wet Cyclone	Add chambers to filter press to reach design capacity. The dust collection system will prevent the majority of emissions from escaping the conveyor chute (IES-09-27.3400). Existing wall fans will evacuate any remaining emissions from the building.
ES-09-27.3100	Cloth Wash Water Tank 2 (Tank - 2 Lignin Filter Cloth Wash)	NA	NA	ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber	The Tank - 2 Lignin Filter Cloth Wash (3100) experiences issues with solids buildup. To manage this a larger tank drain, agitator, and recirculating shear pump will be installed to grind up solids and suspend them in the tank.
IES-09-27.2900	Wash water tank (Tank - Acid Wash Water)	NA	NA	NA	NA	
IES-09-27-3700	Acid Sump Pit (Sump - Lignin Acid Area)	NA	NA	NA	NA	
IES-09-27.3400	LRP Lignin Conveyor No. 3 (Conveyor - #2 Lignin Filter Horizontal)	NA	NA	ES-09-27.3900	Dust Collection System including Wet Cyclone	Dust collector ID # 09-27-3900. Purge from dust collector going into process, therefore the dust collector does not exhaust directly to the atmosphere.
IES-09-27-3600	Alkaline Sump Pit (Sump - Lignin Liquor Area)	NA	NA	NA	NA	

1. SAP name in ( ) for reference

Table 3-1
Domtar Plymouth Pulp Mill
Lignin Modification Project
PSD Compound Emissions Increase Summary

	PSD Emissions, tpy											
	VOC	PM	PM-10	PM-2.5	SO_2	NOx	CO	H_2S	TRS	H_2SO_4	Pb	CO_2e
Baseline Actual Emissions (BAE)	118.99	400.16	264.50	207.38	97.35	1,416	5,430	12.65	16.26	7.72	5.68E-02	1,747,854
Could Have Accommodated (CHA) Emissions (for Modified & Affected Units)	122.41	440.83	303.93	236.25	99.56	1,587	5,641	12.65	16.26	7.79	7.67E-02	1,911,816
Potential to Emit (PTE) Emissions (for Modified & Affected Units)	140.26	452.80	317.79	246.04	189.44	1,644	5,644	29.57	43.49	7.72	8.53E-02	1,959,512
Project Emissions Increases	17.85	11.97	13.86	9.79	89.89	56.87	2.91	16.91	27.23	-0.07	0.01	47,696
PSD Significant Emission Rates	40	25	15	10	40	40	100	10	10	7	0.6	75,000
Is PSD review required?	No	No	No	No	Yes	Yes	No	Yes	Yes	No	No	No

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PERMIT ISSUANCE DATE	FACILITY DESCRIPTION	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGHPUT UNIT
AR-0118	CLEARWATER PAPER CORPORATION	AR	2631	10/16/2012 ACT	KRAFT PULP MILL WITH ASSOCIATED PAPER MANUFACTURING OPERATIONS, WHICH PRODUCES A VARIETY OF PAPER PRODUCTS	RECOVERY FURNACE	30.211	BLACK LIQUOR SOLIDS (BLS)	62.5	T/H
KY-0099	RIO TINTO ALCAN-SEBREE WORKS	KY	3334	08/19/2010 ACT	PRODUCTION OF PRIMARY ALUMINUM RTA PROPOSED TO INCREASE ALUMINUM PRODUCTION THROUGH THE IMPLEMENTATION OF A NEW TECHNOLOGY PACKAGE ON THE ALUMINUM REDUCTION POTS IN THE EXISTING POTLINES. THESE POTLINES ARE DESIGNATED IN THE TITLE V PERMIT UNDER THE UNIT IDS E1-1, E1-2, E3-1, E3-2, E5-1 AND E5-2. EMISSIONS OF SULFUR DIOXIDE ARE RESTRICTED BY A SOURCE WIDE LIMIT AS EMISSIONS ARE LIMITED BY THE SULFUR CONTENT OF THE PET COKE AND PITCH..	3 POTLINES	82.111		253531	TONS OF ALUMINUM PRODUCTION
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/12/2016 ACT		cupola, open top, slag as a raw material	90.022	metallurgical coke	0	
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/12/2016 ACT		blowing chamber, vertical	90.022		0	
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/12/2016 ACT		curing oven	90.022	natural gas	0	
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/12/2016 ACT		cooling section	90.022		0	
MO-0090	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	04/18/2017 ACT	mineral wool manufacturing	cupola, open top, slag as a raw material, startup burner	90.022	metallurgical coke	0	
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/05/2017 ACT	mineral wool manufacturing	curing oven	90.022	natural gas	0	
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/05/2017 ACT	mineral wool manufacturing	cooling section	90.022		0	
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	05/05/2017 ACT	mineral wool manufacturing	blowing chamber, vertical	90.022		0	
NY-0103	CRICKET VALLEY ENERGY CENTER	NY	4911	02/03/2016 ACT	Cricket Valley Energy Center LLC (CVEC) constructed the Cricket Valley Energy Center (the Facility), a nominal net 1,000-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located in Dover, Dutchess County, New York. The Facility consists of three General Electric (GE) Model 7FA.05 combustion turbine generators (CTGs) operating in combined-cycle mode with supplemental firing of the heat recovery steam generators (HRSGs); natural gas will be the sole fuel fired in the CTGs and duct burners. The Facility will include a natural gas-fired auxiliary boiler, four ultra-low sulfur distillate (ULSD) fired black-start generator engines and a ULSD-fired emergency fire pump engine. In addition to the air emitting equipment, the Facility will include three steam turbine generators (STGs), an air cooled condenser (ACC) and associated auxiliary equipment and systems. Each combined cycle generating unit consisting of the CTG, HRSG and STG will be exhausted through its own stack. Air emissions from the proposed Facility primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary combustion sources. Dutchess County is designated as in attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants with the exception of ozone. Based upon the potential to emit (PTE) estimates, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements for emissions of carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM) with a diameter equal to or less than 10 microns (PM10), PM with a diameter equal to or less than 2.5 microns (PM2.5); greenhouse gases (GHG); sulfuric acid mist (H2SO4); and volatile organic compounds (VOC). In accordance with the NYSDECâ€™s Nonattainment New Source Review (NNSR) permitting program, the Facility is also subject to NNSR for emissions of NOx and VOC.	Turbines and duct burners	15.11	natural gas	228	mw
NY-0103	CRICKET VALLEY ENERGY CENTER	NY	4911	02/03/2016 ACT	Cricket Valley Energy Center LLC (CVEC) constructed the Cricket Valley Energy Center (the Facility), a nominal net 1,000-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located in Dover, Dutchess County, New York. The Facility consists of three General Electric (GE) Model 7FA.05 combustion turbine generators (CTGs) operating in combined-cycle mode with supplemental firing of the heat recovery steam generators (HRSGs); natural gas will be the sole fuel fired in the CTGs and duct burners. The Facility will include a natural gas-fired auxiliary boiler, four ultra-low sulfur distillate (ULSD) fired black-start generator engines and a ULSD-fired emergency fire pump engine. In addition to the air emitting equipment, the Facility will include three steam turbine generators (STGs), an air cooled condenser (ACC) and associated auxiliary equipment and systems. Each combined cycle generating unit consisting of the CTG, HRSG and STG will be exhausted through its own stack. Air emissions from the proposed Facility primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary combustion sources. Dutchess County is designated as in attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants with the exception of ozone. Based upon the potential to emit (PTE) estimates, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements for emissions of carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM) with a diameter equal to or less than 10 microns (PM10), PM with a diameter equal to or less than 2.5 microns (PM2.5); greenhouse gases (GHG); sulfuric acid mist (H2SO4); and volatile organic compounds (VOC). In accordance with the NYSDECâ€™s Nonattainment New Source Review (NNSR) permitting program, the Facility is also subject to NNSR for emissions of NOx and VOC.	Auxiliary boiler	13.31	natural gas	60	MMBTU/H

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PERMIT ISSUANCE DATE	FACILITY DESCRIPTION	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGHPUT UNIT
NY-0104	CPV VALLEY ENERGY CENTER	NY	4911	08/01/2013 ACT	CPV Valley Energy Center is a 680 MW combined cycle electric generating facility located in Middletown, NY. The combustion turbines are rated at 2,234 MMBTU/H firing natural gas and 2,145 MMBTU/H firing diesel fuel. The duct burners are rated for 500 MMBTU/H firing natural gas. In addition to the turbines their emission limits for the auxiliary boiler (73.5 MMBTU/H), emergency generator, fire pump, and gas heater	Turbines - diesel fuel	15.29	ultra low sulfur diesel	0	
NY-0104	CPV VALLEY ENERGY CENTER	NY	4911	08/01/2013 ACT	CPV Valley Energy Center is a 680 MW combined cycle electric generating facility located in Middletown, NY. The combustion turbines are rated at 2,234 MMBTU/H firing natural gas and 2,145 MMBTU/H firing diesel fuel. The duct burners are rated for 500 MMBTU/H firing natural gas. In addition to the turbines their emission limits for the auxiliary boiler (73.5 MMBTU/H), emergency generator, fire pump, and gas heater	Emergency generator	17.11	ultra low sulfur diesel	0	
NY-0104	CPV VALLEY ENERGY CENTER	NY	4911	08/01/2013 ACT	CPV Valley Energy Center is a 680 MW combined cycle electric generating facility located in Middletown, NY. The combustion turbines are rated at 2,234 MMBTU/H firing natural gas and 2,145 MMBTU/H firing diesel fuel. The duct burners are rated for 500 MMBTU/H firing natural gas. In addition to the turbines their emission limits for the auxiliary boiler (73.5 MMBTU/H), emergency generator, fire pump, and gas heater	Fire pump	17.21	ultra low sulfur diesel	0	
TX-0621	PAMPA PLANT	TX	2895	09/19/2012 ACT	Furnace Carbon Black Production	Carbon Black Production Units 3 and 4	69.015		0	
TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	TX	4925	09/12/2014 ACT	Corpus Christi Liquefaction, LLC (CCL) proposes to construct and operate natural gas liquefaction and export plant and import facilities with regasification capabilities. The liquefied natural gas (LNG) terminal will be capable of processing an annual average of approximately 2.1 billion standard cubic feet per day of pipeline-quality natural gas in the liquefaction mode and 400 million standard cubic feet per day in the vaporization mode. The project will involve liquefying natural gas into LNG to be stored in three 160,000 cubic meters storage tanks. There will be 3 identical trains. LNG will be imported or exported via LNG carriers that will arrive at the projectâ€™s marine terminal. The facility will have the capability to liquefy natural gas from the pipeline system for export as LNG or import LNG and regasify it to send it out into the pipeline system.	Thermal Oxidizer	50.002	natural gas	43467	LB/H
TX-0678	FREEPORT LNG PRETREATMENT FACILITY	TX	1321	07/16/2014 ACT	In support of the proposed Liquefaction Plant pending TCEQ review under Air Quality Permit Nos. 100114, PSDTX1282, and N150, Freeport LNG plans to construct a natural gas Pretreatment Facility to purify pipeline quality natural gas to be sent to the Liquefaction Plant for the production of LNG. The Pretreatment Facility will be located approximately 3.5 miles inland to the northeast of the Quintana Island Terminal along Freeport LNGâ€™s existing 42-inch natural gas pipeline route. Pipeline quality natural gas will be delivered from interconnecting intrastate pipeline systems through Freeport LNG Developmentâ€™s existing Stratton Ridge meter station. The gas will be pretreated in the Pretreatment Facility to remove carbon dioxide, sulfur compounds, water, mercury, BTEX, and natural gas liquids. The pre-treated natural gas will then be delivered to the Liquefaction Plant through Freeport LNGâ€™s existing 42-inch gas pipeline.	Thermal Oxidizer	50.002	natural gas	0	
FL-0321	OKEECHOBEE LANDFILL	FL	4953	04/19/2010 ACT	THE LANDFILL IS OPERATED BY OKEECHOBEE LANDFILL, INC. (OLI), A WASTE MANAGEMENT COMPANY. THE OL COMPRISES THE BERMAN ROAD LANDFILL AND THE CLAY FARMS LANDFILL. THE NEAREST CLASS I AREA IS THE LARGE EVERGLADES NATIONAL PARK (ENP). PERMIT TO CONSTRUCT A LFG TO ENERGY (LFGTE) PLANT AT THE EXISTING SITE WITH AN ULTIMATE CAPACITY OF 67.5 MEGAWATTS (MW)	Okeechobee landfill	21.4	landfill gas	13500	SCFM
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	FL	2869	12/23/2010 ACT	The SRF facility will be located just East of County Road (CR) 835 at the intersection with Hill Grade Road and approximately 13 miles south southwest of Clewiston/Lake Okeechobee in Hendry County. Hendry County is bounded by Lee County to the west, Glades County to the north, Collier County to the south, Palm Beach County to the east and Broward County to the southeast. Lake Okeechobee is located immediately northeast of Hendry County. The Big Cypress Seminole Indian Reservation is located approximately 18 miles south southeast of the site entrance. Most of Hendry County is agricultural.	Bioreactors and Biogas Flare	19.39	biogas	27.55	MMBTU/H
FL-0325	U.S. SUGAR CLEWISTON FACILITY	FL	2062	08/15/2011 ACT	U.S. Sugar operates a sugar mill and refinery in Hendry County, Florida. Sugarcane is harvested from nearby fields and transported to the mills by train. In the mill, sugarcane is cut into small pieces and processed in a series of presses to squeeze juice from the cane. The juice undergoes clarification, separation, evaporation, and crystallization to produce raw, unrefined sugar. In the refinery, raw sugar is decolorized, concentrated, crystallized, dried, conditioned, screened, packaged, stored, and distributed as refined sugar. The fibrous byproduct remaining from the sugarcane is called bagasse and is burned as boiler fuel to provide steam and heating requirements for the mill and refinery. Molasses is also produced as a byproduct. Molasses is stored and processed into an animal feed product for sale.	H2S Degasification Systems	70.9		2000	GAL/MIN WATER
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	FLARE 1-5 (15-77, 12-81, 2004-5A, 2004-5B & 2005-38)	50.008			

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PERMIT ISSUANCE DATE	FACILITY DESCRIPTION	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGHPUT UNIT
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	COOLING TOWERS (13-81, 2004-6, 2005-42, 2005-43, 2008-35)	99.009			
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	SRU THERMAL OXIDIZERS (99-3, 99-4, 2005-39, 2007-4)	50.006		50	MMBTU/H
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	FCCU REGENERATOR (16-77)	50.003			
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	FUGITIVE EMISSIONS	50.007			
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	MVR THERMAL OXIDIZER NO. 1 (94-8)	50.008		240	MMBTU/H
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	LOADINGS - REFINERY	50.004			
LA-0213	ST. CHARLES REFINERY	LA	2911	11/17/2009 ACT	PETROLEUM REFINERY. PROJECT INVOLVES INCREASE IN CAPACITY FROM 220,000 TO 380,000 BARRELS PER DAY.	PROCESS VENTS - REFINERY (CCEX)	50.999			
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	OH	2911	02/23/2009 ACT	PETROLEUM REFINERY, INCREASE IN PRODUCTION FOR TWO FLUID CATALYTIC CRACKING UNITS (FCCU) AND TO MEET COMPLIANCE WITH A CONSENT DECREE FOR THE INSTALLATION OF AIR POLLUTION CONTROL EQUIPMENT. THIS PERMIT IS PSD FOR PM10 AND CO. THE FACILITY HAS NETTED-OUT OF NONATTAINMENT NEW SOURCE REVIEW FOR VOC EMISSIONS.	SULFUR RECOVERY UNIT	50.006	REFINERY FUEL GAS	17	MMBTU/H
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	Emergency fire pump engine	17.21	diesel	300	HP
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	2 Combined Cycle Combustion Turbines-Siemens, without duct burners	15.21	Natural Gas	515600	MMSCF/rolling 12-months
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	2 Combined Cycle Combustion Turbines-Siemens, with duct burners	15.21	Natural Gas	51560	MMSCF/rolling 12-MO
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	2 Combined Cycle Combustion Turbines-Mitsubishi, without duct burners	15.21	Natural Gas	47917	MMSCF/rolling 12-MO
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	Emergency generator	17.11	diesel	2250	KW
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	06/18/2013 ACT	799 Megawatt Combined Cycle Combustion Turbine Power Plant	2 Combined Cycle Combustion Turbines-Mitsubishi, with duct burners	15.21	Natural Gas	47917	MMSCF/rolling 12-MO
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Sulfur Recovery Unit (3), Claus sulfur recovery plant	50.006	Refinery fuel gas	120	LT/D

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PERMIT ISSUANCE DATE	FACILITY DESCRIPTION	PROCESS NAME	PROCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGHPUT UNIT
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	A-Diesel Hydrotreater Furnace	50.003	Refinery fuel gas	22.8	MMBtu/H
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Refinery Process Heater / Vacuum Furnace	50.003	Refinery fuel gas	150	MMBtu/H
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Refinery Process Heaters / Crude furnaces (2)	50.003	Refinery fuel gas	225	MMBtu/H
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Crude Vacuum Furnace	50.003	Refinery fuel gas	258	MMBtu/H
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Coker 2 Heater & Naptha Treater Heater	50.006	Refinery fuel gas	77	MMBtu/H
OH-0357	BP-HUSKY REFINING LLC	OH	2911	09/20/2013 ACT	Refinery Processing of Crude Oils into Petroleum Products.	Coker 3 Furnace	50.003	Refinery fuel gas	247	MMBtu/H
OH-0358	RUMPKE SANITARY LANDFILL	OH	4953	09/24/2013 ACT	Municipal Waste Landfill with Gas Recovery	Fugitive emissions from 4 Gas Recovery Plants	29.3	Landfill Gas	0	
OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	1321	09/12/2012 ACT	Mid-America Midstream Gas Services (MAMGS)proposes to construct a natural gas plant with ten natural gas-fired reciprocating internal combustion engines, two natural gas-fired turbines, a 230-MMSCFD amine unit with a 11.04 MMBTUH reboiler, an acid gas flare, eight condensate tanks, and six produced water tanks. Associated support operations include condensate truck loading, blowdowns and fugitive emissions.	Amine Unit / Sweetening Unit	50.999	NA	230	MMSCFD
*OR-0052	COLUMBIA RIDGE LANDFILL AND RECYCLING CENTER	OR	4911	06/21/2013 ACT	1. Waste Management Disposal Services of Oregon, Inc. (Columbia Ridge Landfill and Recycling Center) operates a municipal solid waste landfill located approximately 10 miles south of the City of Arlington, Oregon. The process includes landfilling of primarily municipal solid waste. The landfill maintains a landfill gas (LFG) collection system. The landfill gas is either sent to enclosed flares or to landfill gas engines to generate electricity. In 2011 the facility installed a commercial demonstration facility utilizing a plasma gasifier to create a synthesis gas (syngas) from municipal solid waste. The syngas is currently sent to the flare. The landfill was originally sited in 1988 while the LFG management system was installed in 1998. The landfill gas collection system has expanded as the landfill continues to accept waste. The facilityâ€™s design or permitted capacity is approximately 354,275,000 cubic yards of solid waste based on the plans approved under the permitteeâ€™s solid waste permit.	Caterpillar 3520C internal combustion engines which drive electric generators	17.14	landfill gas	2328	MMdscf/year
PA-0291	HICKORY RUN ENERGY STATION	PA	4911	04/23/2013 ACT	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 900 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The project will also include a natural gasfired auxiliary boiler; a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other balance of plant equipment.	EMERGENCY GENERATOR	17.11	Ultra Low sulfur Distillate	7.8	MMBTU/H
TX-0592	CORPUS CHRISTI WEST REFINERY	TX	2911	03/29/2010 ACT	Refinery	Sulfur Recovery Unit (SRU)	50.006		0	
TX-0595	CORPUS CHRISTI EAST REFINERY	TX	2911	08/19/2010 ACT	Refinery	Sulfur recovery Unit (SRU)	50.006		0	
TX-0605	ACID GAS FLARE	TX	1311	01/12/2012 ACT	Acid Gas Flare	Acid Gas flare	19.39	Natural gas	0	

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PERMIT ISSUANCE DATE	FACILITY DESCRIPTION	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGHPUT UNIT
TX-0621	PAMPA PLANT	TX	2895	09/19/2012 ACT	Furnace Carbon Black Production	Carbon Black Production Units 3 and 4	69.015		0	
TX-0701	ECTOR COUNTY ENERGY CENTER	TX	4911	05/13/2013 ACT	The proposed project is for two natural gas fired simple cycle CTGs. The proposed models include GE7Fa.03 and GE7Fa.05. They have an output of 165-193 MW. The new CTGs will operate as peaking units and will be limited to 2500 hours per year of operation each.	Simple Cycle Combustion Turbines	15.11	natural gas	180	MW
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	TX	2911	04/10/2015 ACT	100 MBpd topping refinery	Petroleum Liquids Storage in Floating Roof Tanks	42.006		8	MMBbl/yr/tank
TX-0745	TEXAS DOCK & RAIL	TX	5171	06/03/2015 ACT	Marine Terminal	Petroleum Liquids Storage in Floating Roof Tanks - 45 MMbbl	42.006		48	turnovers/yr/tank
TX-0745	TEXAS DOCK & RAIL	TX	5171	06/03/2015 ACT	Marine Terminal	Petroleum Liquids Storage in Floating Roof Tanks - 50 MMBbl	42.006		60	turnovers/yr/tank
TX-0745	TEXAS DOCK & RAIL	TX	5171	06/03/2015 ACT	Marine Terminal	Petroleum Liquids Storage in Floating Roof Tanks -115 MMBbl	42.006		60	turnovers/yr/tank
TX-0745	TEXAS DOCK & RAIL	TX	5171	06/03/2015 ACT	Marine Terminal	Petroleum Liquids Storage in Floating Roof Tanks - 285 MMBbl	42.006		36	turnovers/yr/tank
TX-0755	RAMSEY GAS PLANT	TX	1321	05/21/2015 ACT	Ramsey IV, V and VI Gas Plants and associated Amine I and II Plants. Each Ramsey Plant will have gas gathering, treating, conditioning, compression and processing capabilities. This expansion project will increase the processing capacity of the existing plant with three 200 MMSCF/day cryogenic plants and two amine plants with a combined capacity of 2000 gallon per minute (gpm). A percentage of the acid gas from the amine still vents (EPNs: A-4 and A-5) will be captured and routed to a pipeline for Carbon capture and Sequestration (CCS) purposes and the remaining acid gas from the amine still vents will be routed to the regenerative thermal oxidizers (EPNs: RTO-4 and RTO-5)	Amine Units I and II	12.39		2000	GAL/MIN
TX-0819	GAINES COUNTY POWER PLANT	TX	4911	04/28/2017 ACT	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.	Simple Cycle Turbine	15.11	natural gas	227.5	MW
TX-0819	GAINES COUNTY POWER PLANT	TX	4911	04/28/2017 ACT	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.	Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW
WY-0072	GRANGER FACILITY	WY	1474	06/12/2013 ACT	Mine water processing facility (Trona ore)	H2S Vent Absorber	62.018		0	

Table 5-1
RBLC Search Results

RBLCID	FACILITY NAME	FACILITY STATE	SIC CODE	PROCESS NOTES	POLLUTANT	TESTMETHOD	POLLUTANT GROUP(S)	CAS NUMBER	CONTROL METHOD CODE	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	EMISSION LIMIT 1 AVG TIME CONDITION	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	EMISSION LIMIT 2 AVGERAGE TIME CONDITION
AR-0118	CLEARWATER PAPER CORPORATION	AR	2631	MAXIMUM THROUGHPUT: 62.5 TPH BLS 520,125 TPY BLS	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	GOOD COMBUSTION PRACTICES	3	PPMDV	12-HR @ 8% O2 FOR NORMAL OPERATIONS	5	PPMDV	12-HR @ 8% O2 FOR STARTUP AND SHUTDOWN
KY-0099	RIO TINTO ALCAN-SEBREE WORKS	KY	3334		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	A	DRY ALUMINA SCRUBBER/BAGHOUSE	1.9	LB/T ALUM PRODUC	8 HOUR	0		
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	B	good combustion, thermal oxidizer, dry sorbent injection	0	LB/T	MELT, 30 DAY AVG, INCLUSIVE S&S	0		
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	good operating practices	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	B	good operating practices, good combustion practices, regenerative thermal oxidizer	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
MO-0089	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	good operating practices	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
MO-0090	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296	startup burner is natural gas fired	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	B	good combustion practices, dry sorbent injection, thermal oxidizer	0	LB/T	MELT, 30 DAY AVG, INCLUSIVE S&S	0		
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	B	good operating practices, regenerative thermal oxidizer	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	good operating practices	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
MO-0091	OWENS CORNING INSULATION SYSTEMS, LLC	MO	3296		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	good operating practices	0	LB/T	MELT, 3 HR AVG, INCLUSIVE S&S	0		
NY-0103	CRICKET VALLEY ENERGY CENTER	NY	4911		Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	natural gas with maximum sulfur content 0.4 grains/100 dscf	0			0		
NY-0103	CRICKET VALLEY ENERGY CENTER	NY	4911	Limited to 4,500 H/YR	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	P	natural gas with maximum sulfur content 0.4 grains/100 dscf	0			0		

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NY-0104	CPV VALLEY ENERGY CENTER	NY	4911	Combined cycle units heat rate 7,605 BTU/KW-H (HHV) or less without duct burner firing to achieve design thermal efficiency of 57.4% (LHV).	Sulfur, Total Reduced (TRS)	Other - ASTM D-2880-71	(InOrganic Compounds)	7704	P	Ultra low sulfur diesel with maximum sulfur content 0.0015 percent.	0			0		
NY-0104	CPV VALLEY ENERGY CENTER	NY	4911		Sulfur, Total Reduced (TRS)	Other - ASTM D-2880-71	(InOrganic Compounds)	7704	P	Ultra low sulfur diesel with maximum sulfur content 0.0015 percent.	0			0		
NY-0104	CPV VALLEY ENERGY CENTER	NY	4911		Sulfur, Total Reduced (TRS)	Other - ASTM D-2880-71	(InOrganic Compounds)	7704	P	Ultra low sulfur diesel with maximum sulfur content 0.0015 percent.	0			0		
TX-0621	PAMPA PLANT	TX	2895	Cabot Corporation (Cabot) operates a furnace process carbon black production facility that has four production lines identified as GP- 2, GP-3, GP-4 and GP-5. The purpose of this project is to replace the main unit filter (MUF) for GP-3 and GP-4. Cabot is seeking authorization for the replacement of the main unit filters (MUFs) for GP-3 and GP-4 with no increase in throughput for any averaging time.	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	B	Limiting sulfur content of the feedstock to 2.25% hourly average basis and the use of a flare with a 98% conversion to SO2	1.96	LB/H		0		
TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	TX	4925	This is the throughput of acid gas for each train. Each LNG train has an identical thermal oxidizer.	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	A	99% DRE for all sulfur compounds in acid gas	0			0		
TX-0678	FREEPORT LNG PRETREATMENT FACILITY	TX	1321	There are 3 LNG trains and each train has a thermal oxidizer.	Sulfur, Total Reduced (TRS)	Unspecified	(InOrganic Compounds)	7704	A	95% control of TRS in acid gas	0			0		
FL-0321	OKEECHOBEE LANDFILL	FL	4953	The permitted capacity of the landfill gas collection system (LFGCS) is 13,500 scfm on a 30 day rolling average basis. The maximum permitted capacity of the gas desulfurizacion plant (GDP) is 32,500 scfm of LFG on a 30 day rolling average basis.	Hydrogen Sulfide	Other - CMS	(InOrganic Compounds)	6/4/7783	A	A gas desulfurization plant (GDP) to control all collected LFG to a concentration less than or equal to 200 ppmv H2S (12 gr S/100 SCF) prior to combustion whether or not the permittee builds a LFGTE plant.	200	PPM		12	GR S/100 SCF	
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	FL	2869	The SRF facility will include bioreactors to treat process wastewaters and to condition the resulting biogas for use as fuel in the biomass boiler or to flare it when it cannot be used in the boiler. During ethanol production, wastewaters from production are collected and treated in the bioreactors to reduce the chemical and biological oxygen demand prior to discharging the waters. The permittee shall construct one flare system with a continuous pilot and combustion chambers to combust the biogas from the bioreactors when the biomass boiler is not available. The flare shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.	Hydrogen Sulfide	EPA/OAR Mthd 15	(InOrganic Compounds)	6/4/7783	B	Wet scrubber	0			0		
FL-0325	U.S. SUGAR CLEWISTON FACILITY	FL	2062	Install and operate two H2S degasification systems and the associated five water wells at the sugar refinery.	Hydrogen Sulfide	Other - Water samples	(InOrganic Compounds)	6/4/7783	N		18	T/YR	12 MONTH ROLLING TOTAL (RECORDS)	0		
LA-0213	ST. CHARLES REFINERY	LA	2911		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	COMPLY WITH 40 CFR 63 SUBPART A	0		SEE NOTE	0		

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LA-0213	ST. CHARLES REFINERY	LA	2911	13-81: 61,000 GPM 2004-6: 42,000 GPM 2005-42: 32,000 GPM 2005-43: 32,000 GPM 2008-35: 50,000 GPM (AROMATIC RECOVERY UNIT)	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0.01	LB/H	HOURLY MAXIMUM	0.01	T/YR	ANNUAL MAXIMUM
LA-0213	ST. CHARLES REFINERY	LA	2911	99-3: 60 MM BTU/HR 99-4: 60 MM BTU/HR 2005-39: 50 MM BTU/HR 2007-4: 50 MM BTU/HR	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	1.73	LB/H	HOURLY MAXIMUM	0		
LA-0213	ST. CHARLES REFINERY	LA	2911	130,000 BBLS/DAY	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0.9	LB/H		1.68	T/YR	
LA-0213	ST. CHARLES REFINERY	LA	2911	INCLUDING: ROAD DUST 90-0: REFINERY FUGITIVES 2008-39: ARU FUGITIVES 2008-37: ARU MARINE LOADING DOCK FUGITIVES	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0		SEE NOTE	0		
LA-0213	ST. CHARLES REFINERY	LA	2911		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0.95	LB/H	HOURLY MAXIMUM	0		
LA-0213	ST. CHARLES REFINERY	LA	2911	SULFURIC ACID LOADING TRUCK/RAILCAR LOADING SULFUR LOADING	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	PROPER DESIGN AND OPERATION	0		SEEE NOTE	0		
LA-0213	ST. CHARLES REFINERY	LA	2911		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	B	ROUTE TO FUEL GAS SYSTEMS OR FLARES	0		SEE NOTE	0		
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	OH	2911	CLAUS SULFUR RECOVERY UNIT AND SULFUR PIT WITH TAIL GAS UNIT AND INCINERATOR CONTROL. STACK GAS FLOW RATE OF 4020 DSCFM OR 3899 DSCFM AT 0% O2. BURN NATURAL GAS OR REFINERY FUEL GAS ONLY CONTINUOUS MONITORING SYSTEM FOR SO2 EACH SRU IS SUBJECT TO THE REQUIREMENTS OF PART 60 SUBPARTS A AND J, AND PART 63 SUBPARTS A AND UUU	Hydrogen Sulfide	Other - 40 CFR 60.106	(InOrganic Compounds)	6/4/7783	A	THERMAL OXIDIZER, 7 MMBTU/HR	10	PPMVD		0.95	T/YR	BASED ON 365-DAY SUM OF DAILY EMISSIONS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	223.8 kW. Emergency fire pump engine restricted to 500 hours of operation per rolling 12 months.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	N		0.0001	LB/H		0	T/YR	PER ROLLING 12-MONTHS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	P	low sulfur fuels, natural gas only	1.6	LB/H		6.57	T/YR	PER ROLLING 12-MONTHS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	Two Siemens 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	P	low sulfur fuels, natural gas only	1.5	LB/H		6.57	T/YR	PER ROLLING 12-MONTHS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	P	low sulfur fuels, natural gas only	1.2	LB/H		5.26	T/YR	PER ROLLING 12-MONTHS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	Emergency diesel fired generator restricted to 500 hours of operation per rolling 12-months.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	N		0.0006	LB/H		0.0002	T/YR	PER ROLLING 12-MONTHS
OH-0352	OREGON CLEAN ENERGY CENTER	OH	4931	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Hydrogen Sulfide	Other - Method 8	(InOrganic Compounds)	6/4/7783	P	low sulfur fuels, natural gas only	1.2	LB/H		5.26	T/YR	PER ROLLING 12-MONTHS
OH-0357	BP-HUSKY REFINING LLC	OH	2911	Three existing sulfur recovery units together have been restricted to not exceed 75 tons of SO2 per rolling 12-months in order to avoid PSD for SO2. All 3 are equiped with a fuel gas combustion device (incinerator) and were constructed after 10/4/76 and prior to 5/14/07, making them subject to Part 60 Subpart J.	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0.1	GR/DSCF	AS VOLUME-WEIGHTED 3-H ROLLING AVERAGE	0		

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OH-0357	BP-HUSKY REFINING LLC	OH	2911	Can only burn refinery fuel gas, natural gas, and/or liquid petroleum gas. Because hydrotreater is designed to burn gas 1 subcategory fuels, only work practice standards from Table 3 of Part 63 Subpart DDDDD apply.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	0.1	GR/DSCF	AS VOLUME-WEIGHTED 3-H ROLLING AVERAGE	0		
OH-0357	BP-HUSKY REFINING LLC	OH	2911	Process heater fired with any combination of refinery fuel gas, natural gas, or liquid petroleum gas. Because they are designed to burn gas 1 subcategory fuels, only work practice standards from Table 3 of Part 63 Subpart DDDDD apply. Using continuous oxygen trim system to maintain optimum air to fuel ratio, with tune up every 5 years.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	60	PPMV	BASED ON A 365-DAY ROLLING AVERAGE	0		
OH-0357	BP-HUSKY REFINING LLC	OH	2911	Two furnaces/refinery process heaters fired with any combination of refinery fuel gas, natural gas, or liquid petroleum gas. Because they are designed to burn gas 1 subcategory fuels, only work practice standards from Table 3 of Part 63 Subpart DDDDD apply. Using continuous oxygen trim system to maintain optimum air to fuel ratio, with tune up every 5 years.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	60	PPMV	BASED ON A 365-DAY ROLLING AVERAGE	0		
OH-0357	BP-HUSKY REFINING LLC	OH	2911	258 MMBtu/H at HHV basis. Furnace can only burn refinery fuel gas, natural gas, and/or liquid petroleum gas. Because they are designed to burn gas 1 subcategory fuels, only work practice standards from Table 3 of Part 63 Subpart DDDDD apply.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	0.1	GR/DSCF	AS VOLUME-WEIGHTED 3-H ROLLING AVERAGE	0		
OH-0357	BP-HUSKY REFINING LLC	OH	2911	Coker 2 heater is 77 MMBru/H and Naptha Treater Heater is 77 MMBtu/H. Because they are designed to burn gas 1 subcategory fuels, only work practice standards from Table 3 of Part 63 Subpart DDDDD apply.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	0.1	GR/DSCF	AS VOLUME-WEIGHTED 3-H ROLLING AVERAGE	0		
OH-0357	BP-HUSKY REFINING LLC	OH	2911	247 MMBtu/H at HHV basis. Using refinery fuel gas and/or natural gas.	Hydrogen Sulfide	EPA/OAR Mthd 11	(InOrganic Compounds)	6/4/7783	P	Restriction on the H2S content of the fuel gas, continuously monitor and record the concentration of H2S in refinery fuel gas.	0.1	GR/DSCF	AS VOLUME-WEIGHTED 3-H ROLLING AVERAGE	0		
OH-0358	RUMPKE SANITARY LANDFILL	OH	4953		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		10.47	T/YR		0		
[illegible]-0148	BUFFALO CREEK PROCESSING PLANT	OK	1321	The amine unit (MDEA) is equipped with a reboiler for regeneration of the amine. The off-gases from the reboiler are routed to the Acid Gas Flare. The waste gas combusted in the Acid Gas Flare is estimated at 10 MMBTUH. The Acid Gas Flare is a control device for control of emission of H2S. The flare will also control emissions of CH4 and VOC.	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	A	Flare.	0			0		
*OR-0052	COLUMBIA RIDGE LANDFILL AND RECYCLING CENTER	OR	4911	The engines are Caterpillar 3520C internal combustion engines which drive electric generators.	Hydrogen Sulfide	EPA/OAR Mthd 15	(InOrganic Compounds)	6/4/7783	N		300	PPM 98% DRE		0.53	LB/MMDSCF	
PA-0291	HICKORY RUN ENERGY STATION	PA	4911	EMERGENCY GENERATOR (1,135 BHP - 750 KW)	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	N		0.0028	LB/H		0.0001	T/YR	12-MONTH ROLLING TOTAL
TX-0592	CORPUS CHRISTI WEST REFINERY	TX	2911	Startup and shutdown of SRU	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	B	Minimize Tail gas Combustion Unit (TGCU) down time to <72 hrs/yr. Maintain 99.9% DRE on TGCU.	0.4	LB/H		0.01	T/YR	
TX-0595	CORPUS CHRISTI EAST REFINERY	TX	2911	Startup and shutdown of SRU	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	B	Minimize downtime of Tail gas Combustion Unit (TGCU) to <72 hrs, maintain 99.9% DRE on tail gas incineration.	0.14	LB/H		0.01	T/YR	
TX-0605	ACID GAS FLARE	TX	1311		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	B	98% control efficiency for hydrogen sulfide is used from the Acid Gas Faire.	12.76	T/YR		0		

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TX-0621	PAMPA PLANT	TX	2895	Cabot Corporation (Cabot) operates a furnace process carbon black production facility that has four production lines identified as GP- 2, GP-3, GP-4 and GP-5. The purpose of this project is to replace the main unit filter (MUF) for GP-3 and GP-4. Cabot is seeking authorization for the replacement of the main unit filters (MUFs) for GP-3 and GP-4 with no increase in throughput for any averaging time.	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	B	Limiting sulfur content of the feedstock to 2.25% hourly average basis and the use of a flare with a 98% conversion to SO2	0.97	LB/H		0		
TX-0701	ECTOR COUNTY ENERGY CENTER	TX	4911		Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	Firing pipeline quality natural gas and good combustion practices.	0			0		
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	TX	2911	(19) internal floating roof tanks for storage of crude oil/condensate, light naphtha, heavy naphtha, jet fuel and distillate.	Hydrogen Sulfide	Other - ASTM UOP163-10 or ASTM D7621-14	(InOrganic Compounds)	6/4/7783	B	Restrict crude oils stored in tanks to those with a liquid phase H2S concentration not to exceed 5 ppmv	0.01	TONS/YR/TANK		0		
TX-0745	TEXAS DOCK & RAIL	TX	5171	(2) internal floating roof tanks with storage capacity of 45 MMBbl/tank for storage of heavy crude oil (canadian bitumen) and asphalt.	Hydrogen Sulfide	Other - Method 21, colorimetric gas detector tubes	(InOrganic Compounds)	6/4/7783	P	For tanks in crude oil service, crude oils shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.	24	PPMV		0		
TX-0745	TEXAS DOCK & RAIL	TX	5171	(3) internal floating roof tanks with capacities of 50 MMBbl/tank for storage of crude oil/condensate, and petroleum products.	Hydrogen Sulfide	Other - Method 21, colorimetric gas detector tubes	(InOrganic Compounds)	6/4/7783	P	For tanks in crude oil service, crude oils shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.	24	PPMV		0		
TX-0745	TEXAS DOCK & RAIL	TX	5171	(4) internal floating roof tanks with capacities of 115 MMBbl/tank for storage of crude oil/condensate, and petroleum products.	Hydrogen Sulfide	Other - Method 21, colorimetric gas detector tubes	(InOrganic Compounds)	6/4/7783	P	For tanks in crude oil service, crude oils shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.	24	PPMV		0		
TX-0745	TEXAS DOCK & RAIL	TX	5171	(6) internal floating roof tanks with capacities of 285 MMBbl/tank for storage of crude oil/condensate, and petroleum products.	Hydrogen Sulfide	Other - Method 21, colorimetric gas detector tubes	(InOrganic Compounds)	6/4/7783	P	For tanks in crude oil service, crude oils shall be limited to those which give rise to a vapor space H2S concentration of 24 ppmv or less. Sampling to be performed annually.	24	PPMV		0		
TX-0755	RAMSEY GAS PLANT	TX	1321	Combined capacity for both Units. In the amine units, lean amine solution will be fed to the amine contactor and absorbs the acid gases (H2S and CO2) in the inlet gas. The rich amine solution from the amine contactor will be flashed in the amine flash drum and routed to an amine still where acid gas is stripped from the amine solution with heat from vent gases generated from hot oil heaters. A small RTO (8MMBtu/hr) will be used to abate the amine still vent gases. Estimated destruction efficiency (DRE) for VOC and H2S by each RTO will be 99%. When RTOs are down for maintenance, emissions from the amine plants will be routed to an existing flare meeting the requirements of 40CFR 60.18. Flare operation will be limited to 288 hrs/yr.	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	A	An RTO will be used as an add-on control device to control the emissions from each amine still vent. Each amine plant will have its own RTO. Each RTO will have a self-sustaining operation.	0			0		
TX-0819	GAINES COUNTY POWER PLANT	TX	4911	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	Pipeline quality natural gas; limited hours; good combustion practices	1.54	GR/100 DSCF		0		
TX-0819	GAINES COUNTY POWER PLANT	TX	4911	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Hydrogen Sulfide	Unspecified	(InOrganic Compounds)	6/4/7783	P	Pipeline quality natural gas	1.54	GR/100 DSCF		0		
WY-0072	GRANGER FACILITY	WY	1474	Absorber to control vapor stream from stripper column for sodium bicarbonate conversion to sodium carbonate	Hydrogen Sulfide	EPA/OAR Mthd 15	(InOrganic Compounds)	6/4/7783	A	H2S Absorber column	3.6	LB/H	3-HR AVERAGE	15.8	TONS PER YEAR	

Table 5-2 - Summary of Proposed BACT

Permit ID	Emission Source Description[1]	Proposed BACT	BACT Limit TRS as Compounds	BACT Limit H2S	Monitoring
ES-09-27 .1100	40% Black Liquor Cooler (Cooler - 1 Feed Liquor)	Caustic Scrubber	8.3 lb/hr (24-hr Block Average)	4.8 lb/hr (24-hr Block Average)	Flow Rate and pH (24-hr Block Average)
ES-09-27.1200	Filtrate 1 Storage Tank (Tank - 1 Lignin Filter Filtrate Storage)				
ES-09-27.1800	Agitated Conditioning Tank (Tank - Lignin Slurry Conditioning)				
ES-09-27-2000	Agitated Buffer Tank (Tank - Lignin Slurry Buffer)				
ES-09-27.2300	Cloth Wash Water Tank 1 (Tank - 1 Lignin Filter Cloth Wash)				
ES-09-27 .2400	Filtrate Tank 1 (Tank - 1 Lignin Filter Filtrate)				
ES-09-27-2500	Filtrate 1 Buffer Tank (Tank - 1 Lignin Filter Filtrate Buffer)				
ES-09-27.2610	Dewatered Lignin Conveyor 1 (Conveyor - #1 Lignin Filter Horizontal)				
ES-09-27 .2620	Dewatered Lignin Conveyor 2 (Conveyor - #1 Lignin Filter Incline)				
ES-09-27 .3200	Stage 2 Filtrate Tank 2 (Tank - 2 Lignin Filter Acidic Filtrate)				
ES-09-27 .2100	Filter Press 1A (Filter - 1 Lignin)				
ES-09-27.3100	Cloth Wash Water Tank 2 (Tank - 2 Lignin Filter Cloth Wash)				
ES-09-27 .1400	Carbonator Tower (Carbonator - Feed Liquor)	Existing HVLC collection system to incineration	2.9 TPY	2.2 TPY	None - Capture and control the HVLC streams in the same manner as the current HVLC sources.
ES-09.2700 (09-27.2700)	Agitated Acidification Tank (Tank - Lignin Acidification)				
ES-09 .2770 (09-27.2770)	Acidification Overflow/Foam Tank (Tank - Lignin Foam)				
ES-09.2800	Agitated Acid Conditioning Tank (Tank - Acidic Lignin Conditioning)				
ES-09-27 .3000	Filter Press 2A (Filter - 2 Lignin Filter)	No additional controls [2]	2.6 TPY	2.0 TPY	Uncontrolled sources are insignificant. Annual emissions are reported with the air emissions inventory.
IES-09-27.3400	LRP Lignin Conveyor No. 3 (Conveyor - #2 Lignin Filter Horizontal)				
ES-09-27.1000	40% Black Liquor Tank (Tank - Lignin Feed Liquor)				
IES-09-27.2900	Wash water tank (Tank - Acid Wash Water)				
IES-09-27-3700	Acid Sump Pit (Sump - Lignin Acid Area)				
IES-09-27-3600	Alkaline Sump Pit (Sump - Lignin Liquor Area)				

1. SAP name in ( ) for reference

2. Note 0.5 TPY of uncontrolled H2S from the No. 2 Lignin Filter area is accounted for in the total exhaust from the scrubber stack.

Figures

Locus Map

Legend

★ Site Location

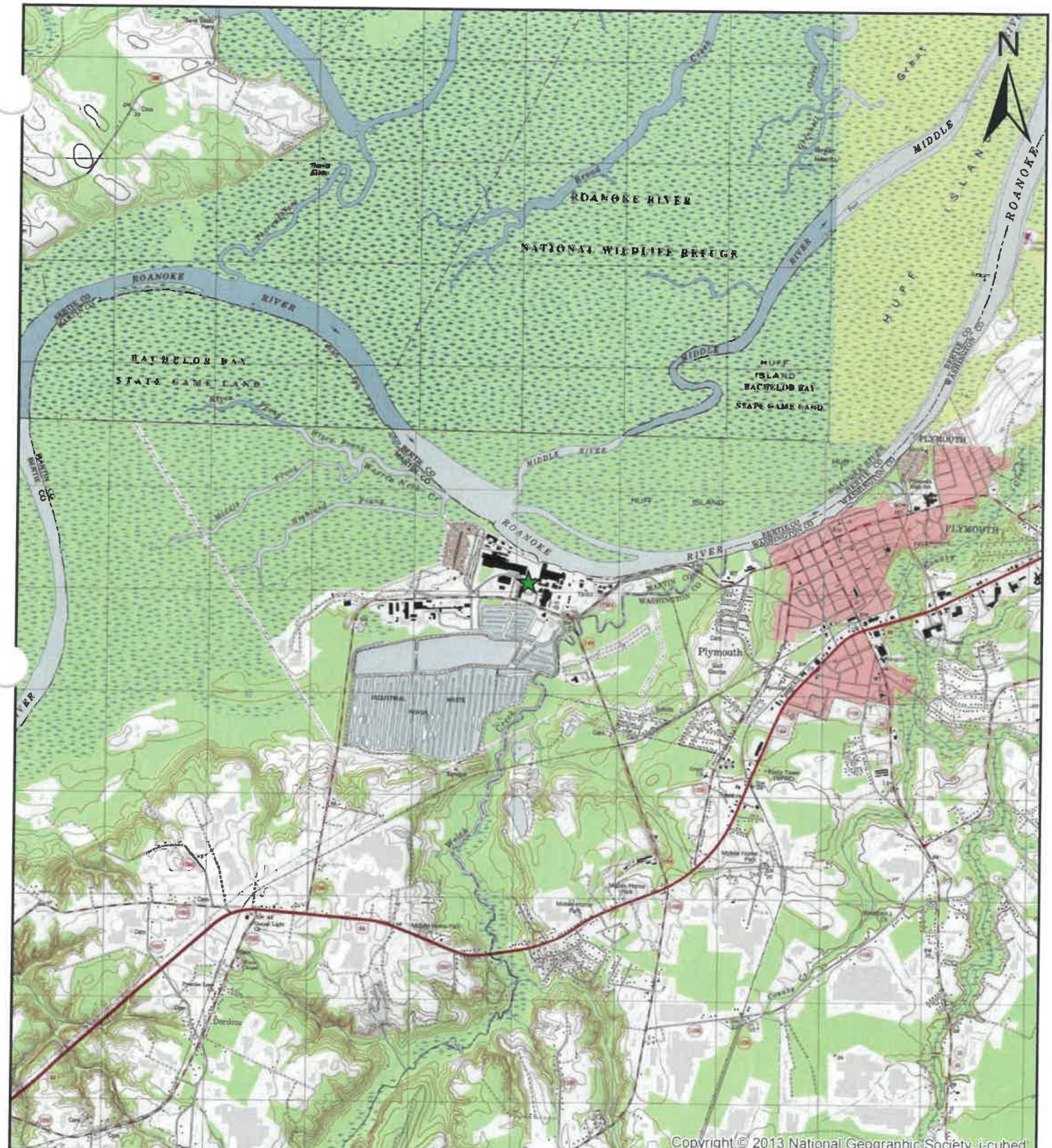
Domtar Paper Company

Figure 2-1
Location of the
Plymouth Mill (Aerial)

Domtar

AECOM

Scale 0 1 2 4 6 Kilometers



Locus Map

Legend

★ Site Location

Domtar Paper Company

Figure 2-2
Location of the
Plymouth Mill (Topography)

Domtar

AECOM

Scale 0 1 2 4 6 Kilometers

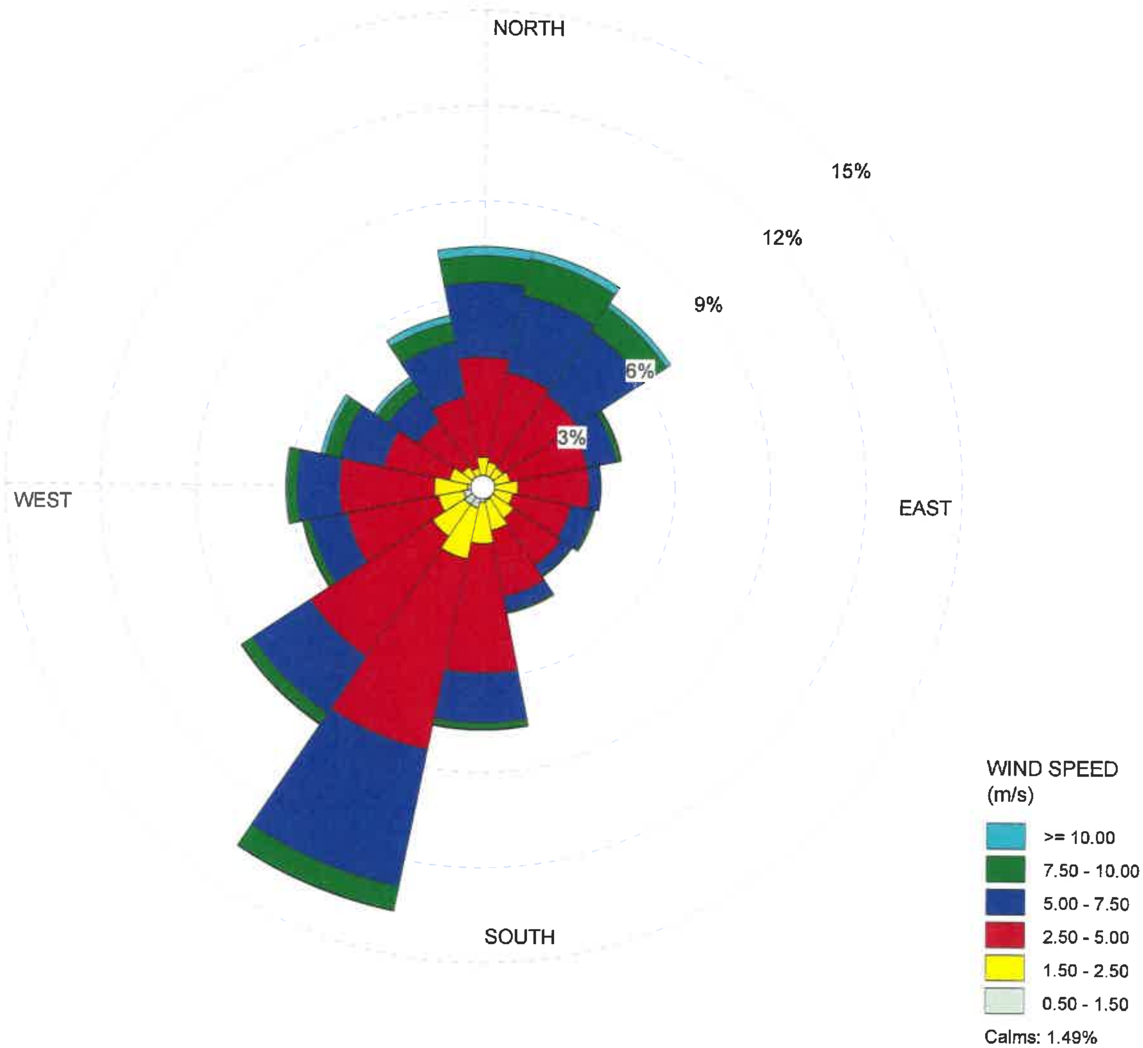
CONFIDENTIAL BUSINESS INFORMATION REMOVED – OK TO COPY

WIND ROSE PLOT:

Station #13786 - ELIZABETH CITY COAST GUARD AIR STATION

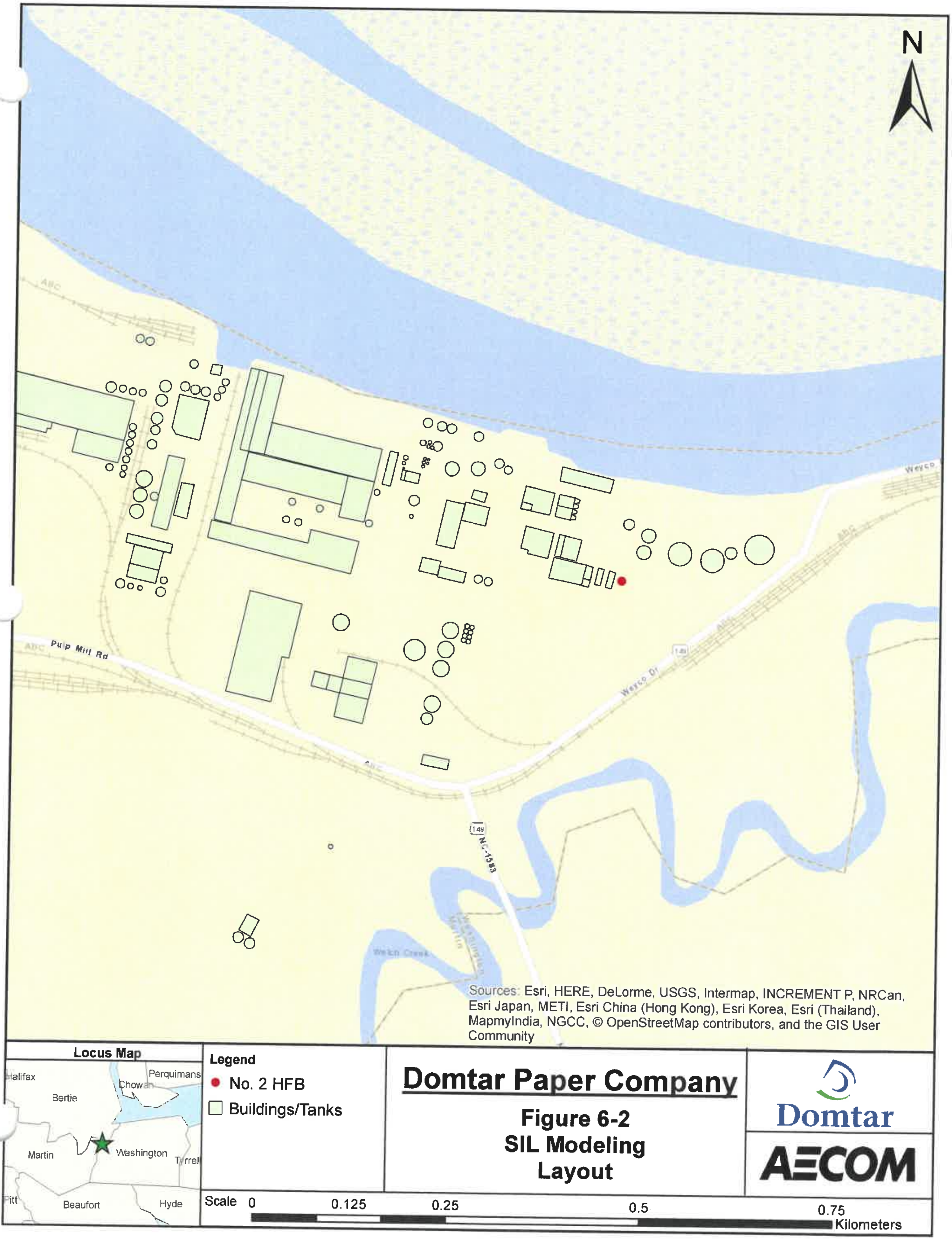
DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
Figure 6-1. Wind Rose for Elizabeth City Coast Guard Air Station (2013-2017)	**Start Date: 1/1/2013 - 00:00** **End Date: 12/31/2017 - 23:59**	**AECOM**	
	CALM WINDS: **1.49%**	TOTAL COUNT: **43678 hrs.**	AECOM
	AVG. WIND SPEED: **4.31 m/s**	DATE: **1/30/2019**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

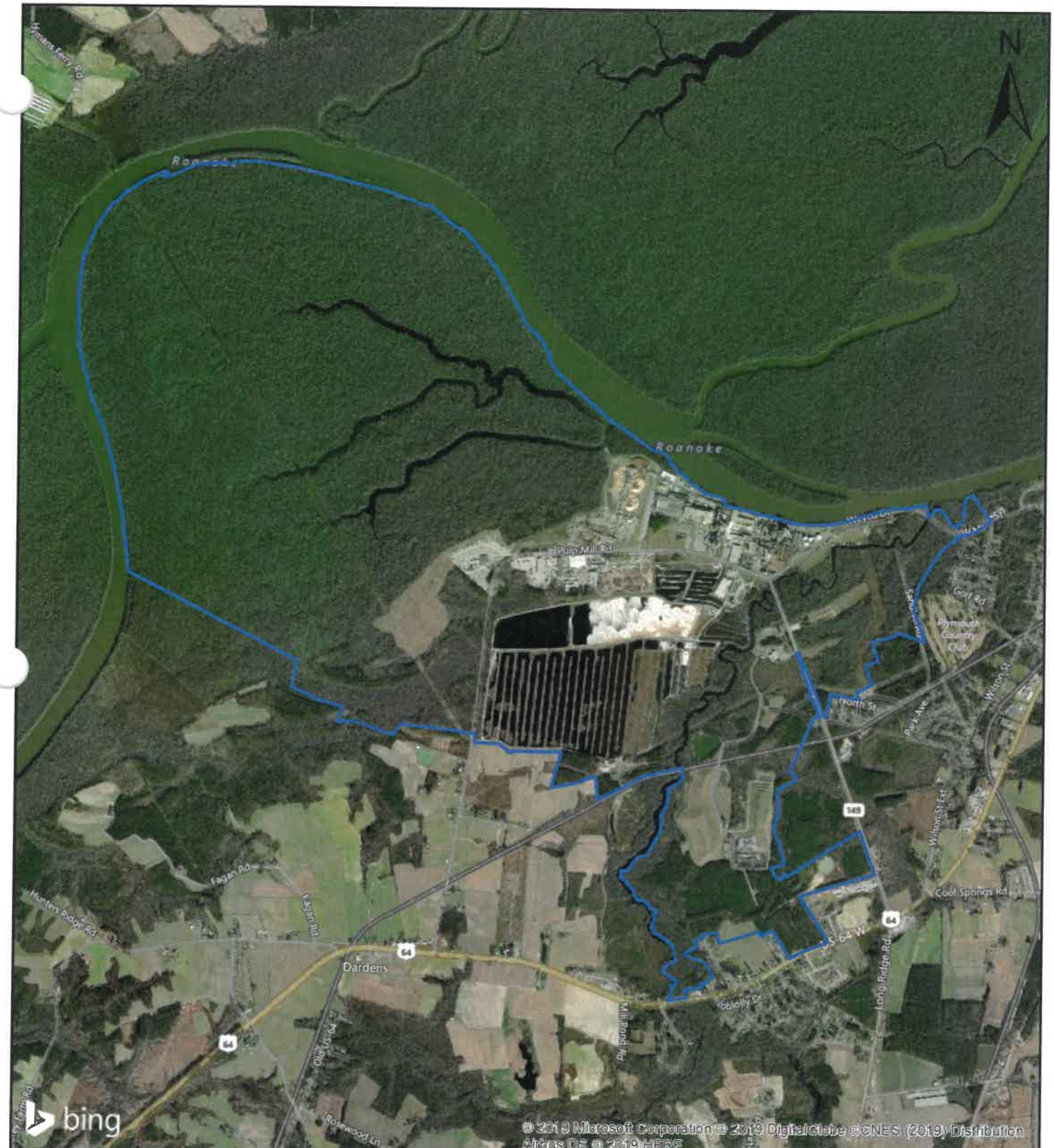


Domtar Paper Company

Figure 6-2
SIL Modeling Layout

Domtar

AECOM



Locus Map

Legend

Ambient Air Boundary

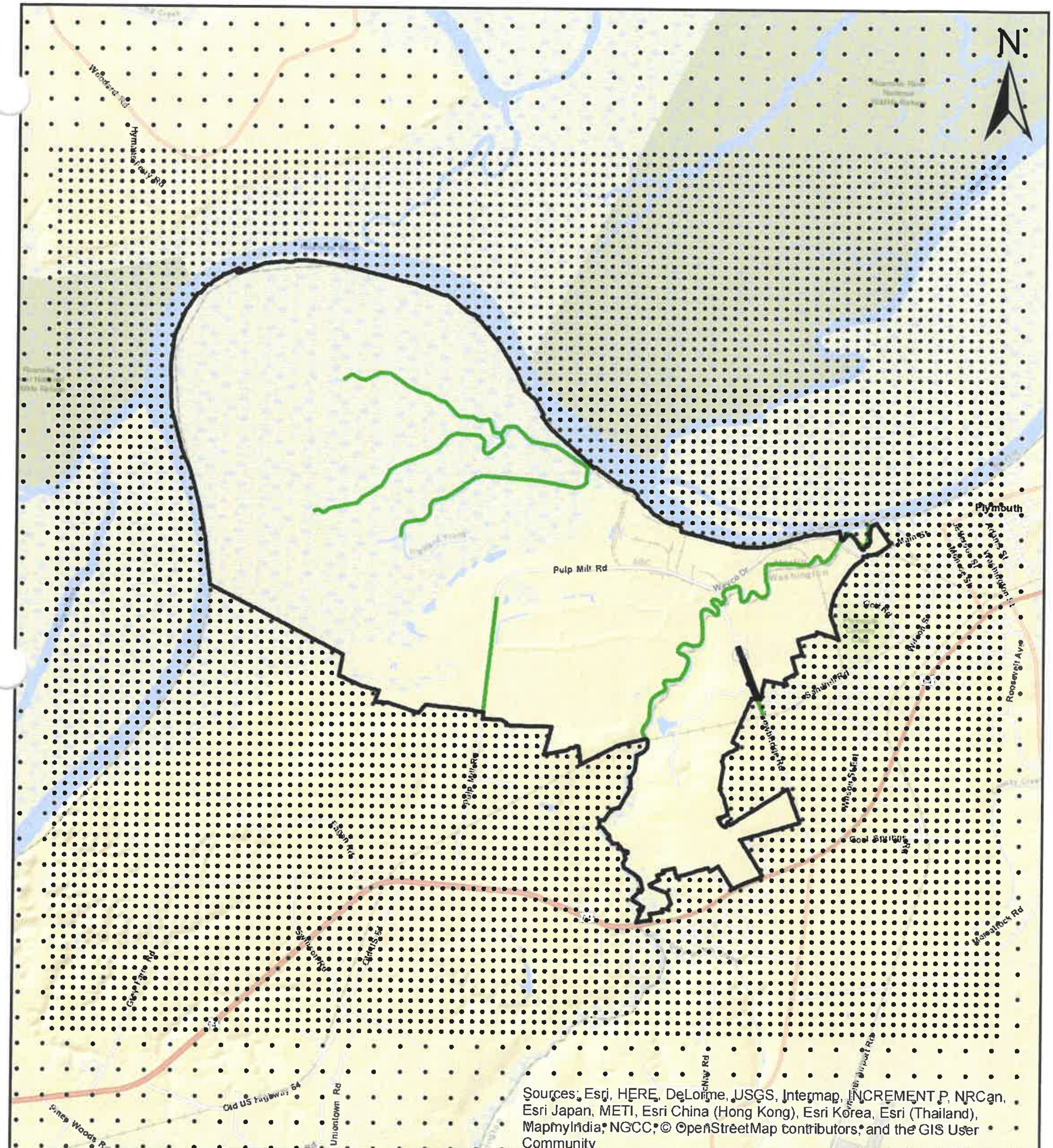
Domtar Paper Company

Figure 6-3
Ambient Air Boundary

Domtar

AECOM

Scale 0 0.75 1.5 3 4.5 Kilometers



Locus Map

Legend

- Long-term Receptors
- Short-term Receptors

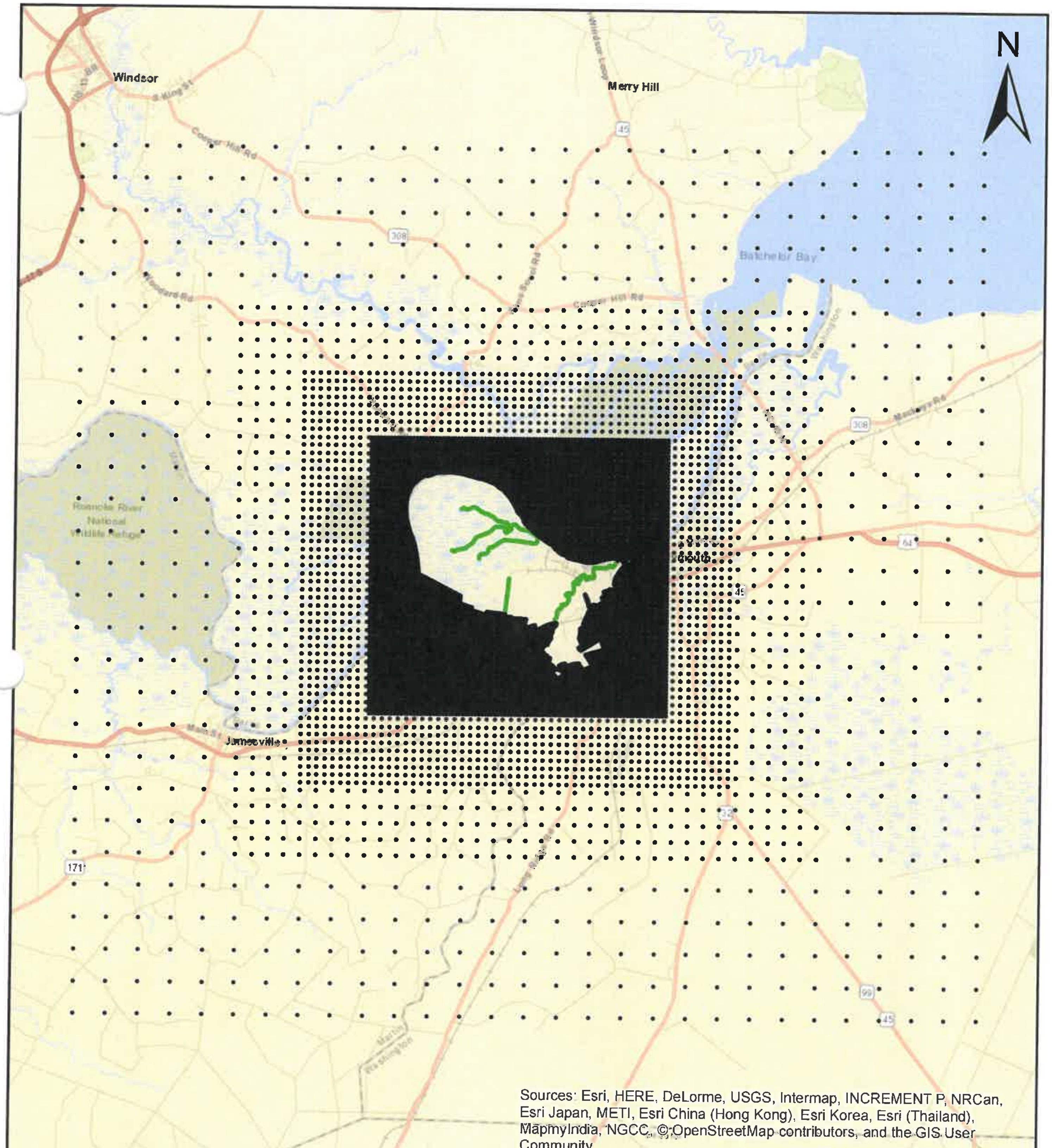
Domtar Paper Company

Figure 6-4
SIL Modeling
Near-field Receptors

Domtar

AECOM

Scale 0 1 2 4 6 Kilometers



Locus Map

Legend

- Long-term Receptors
- Short-term Receptors

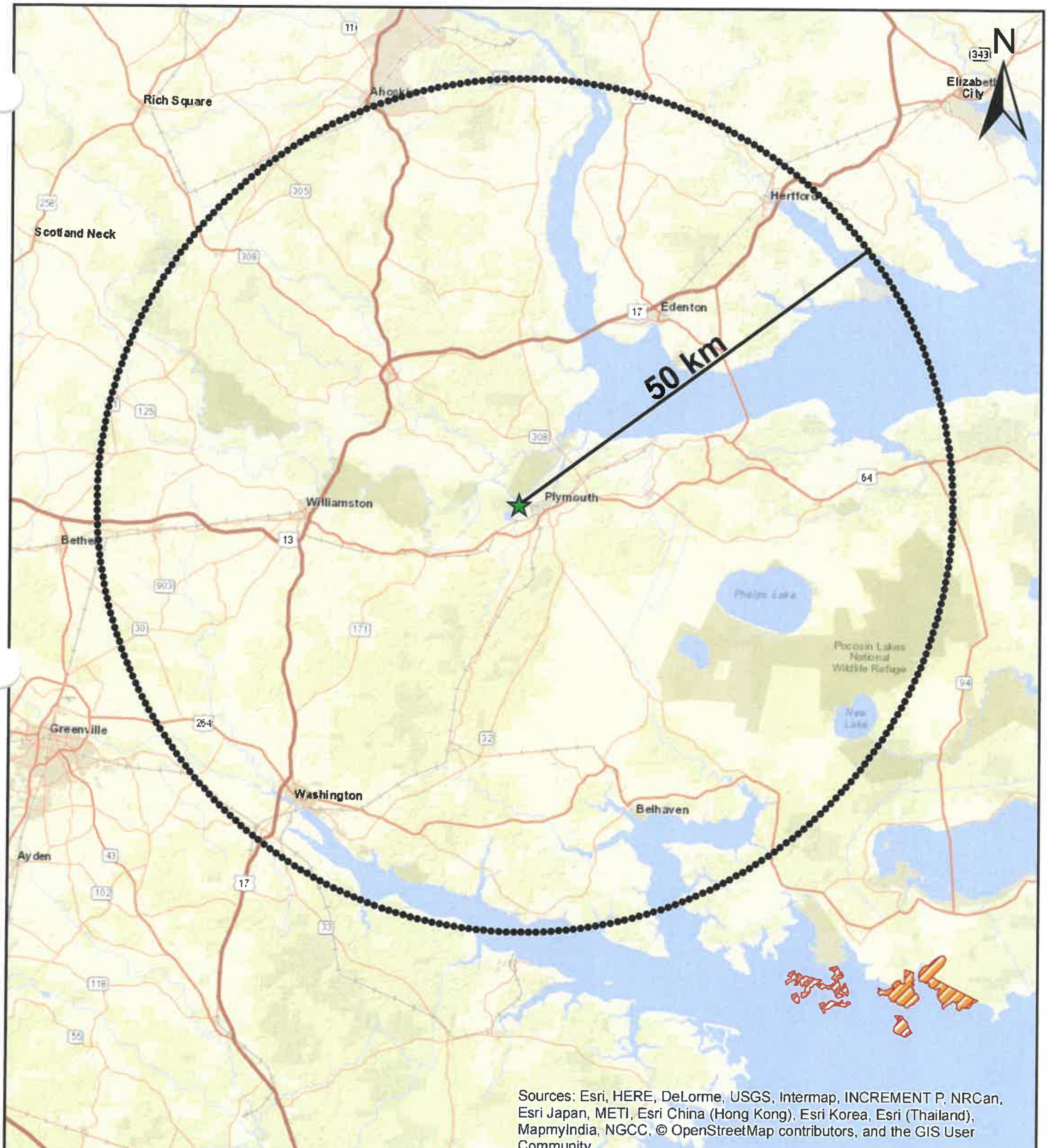
Domtar Paper Company

Figure 6-5
SIL Modeling
Far-field Receptors

Domtar

AECOM

Scale 0 3.25 6.5 13 19.5 Kilometers



Locus Map

Legend

- Site Location
- Class I Receptors
- Swanquarter Wilderness

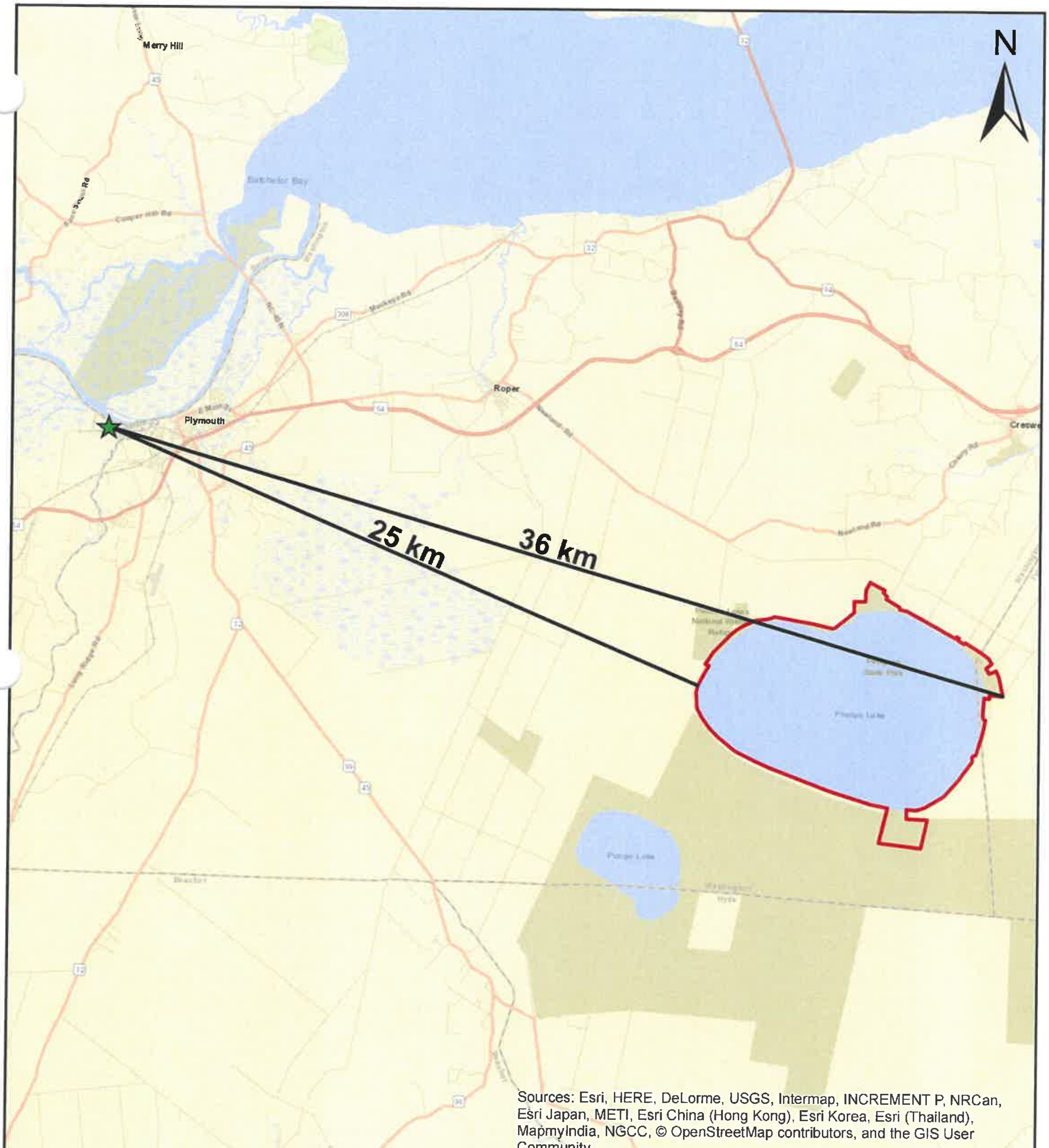
Domtar Paper Company

Figure 6-6
Class I SIL Receptors

Domtar

AECOM

Scale 0 12.5 25 50 75 Kilometers



Locus Map

Legend

- Site Location
- Pettigrew State Park

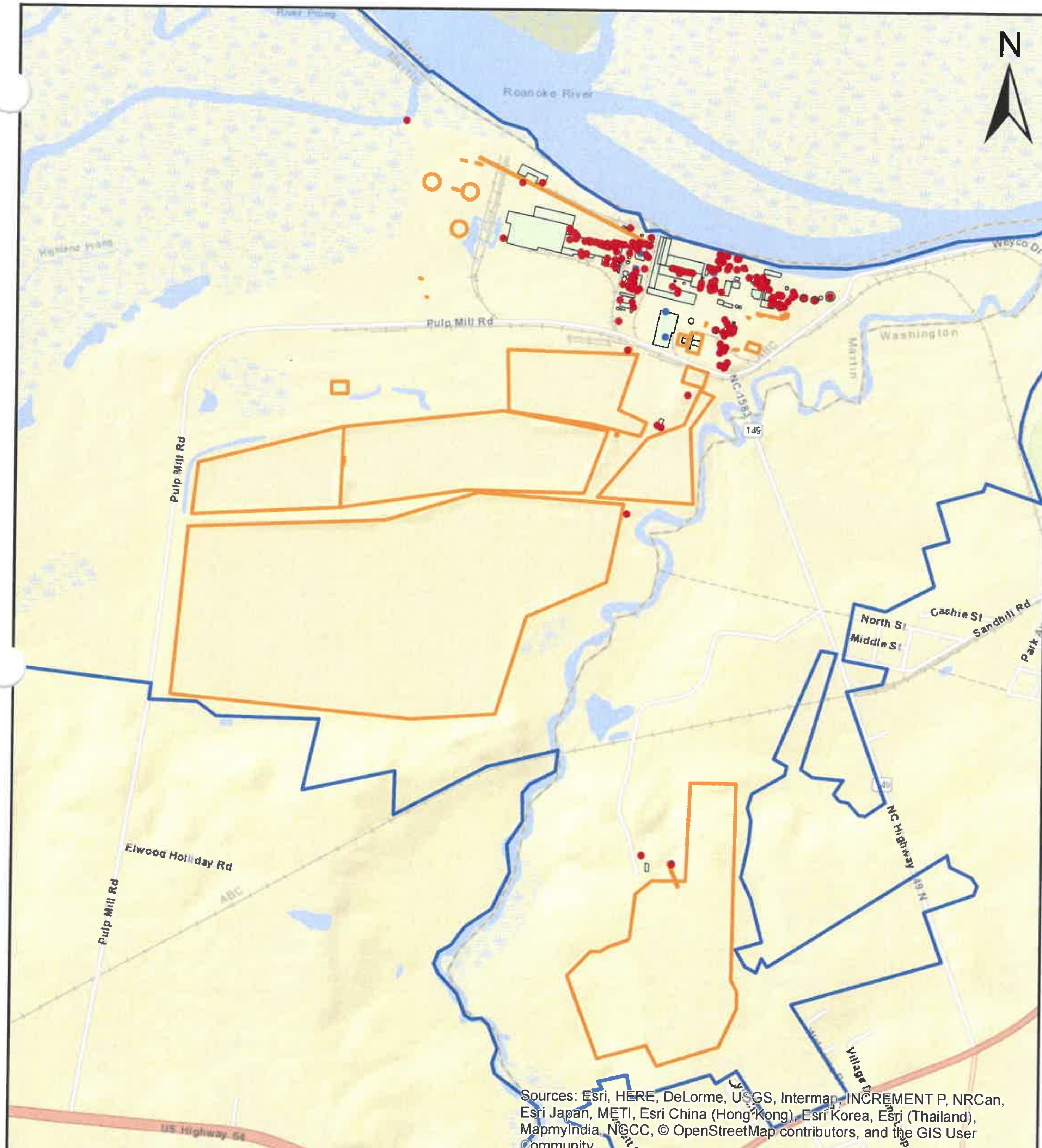
Scale 0 4.25 8.5 17 25.5 Kilometers

Domtar Paper Company

Figure 6-7
Location of Pettigrew State Park

Domtar

AECOM



Locus Map

Legend
- Point Sources
- Volume Sources
- Area Sources
- Buildings/Tanks
- Property Boundary

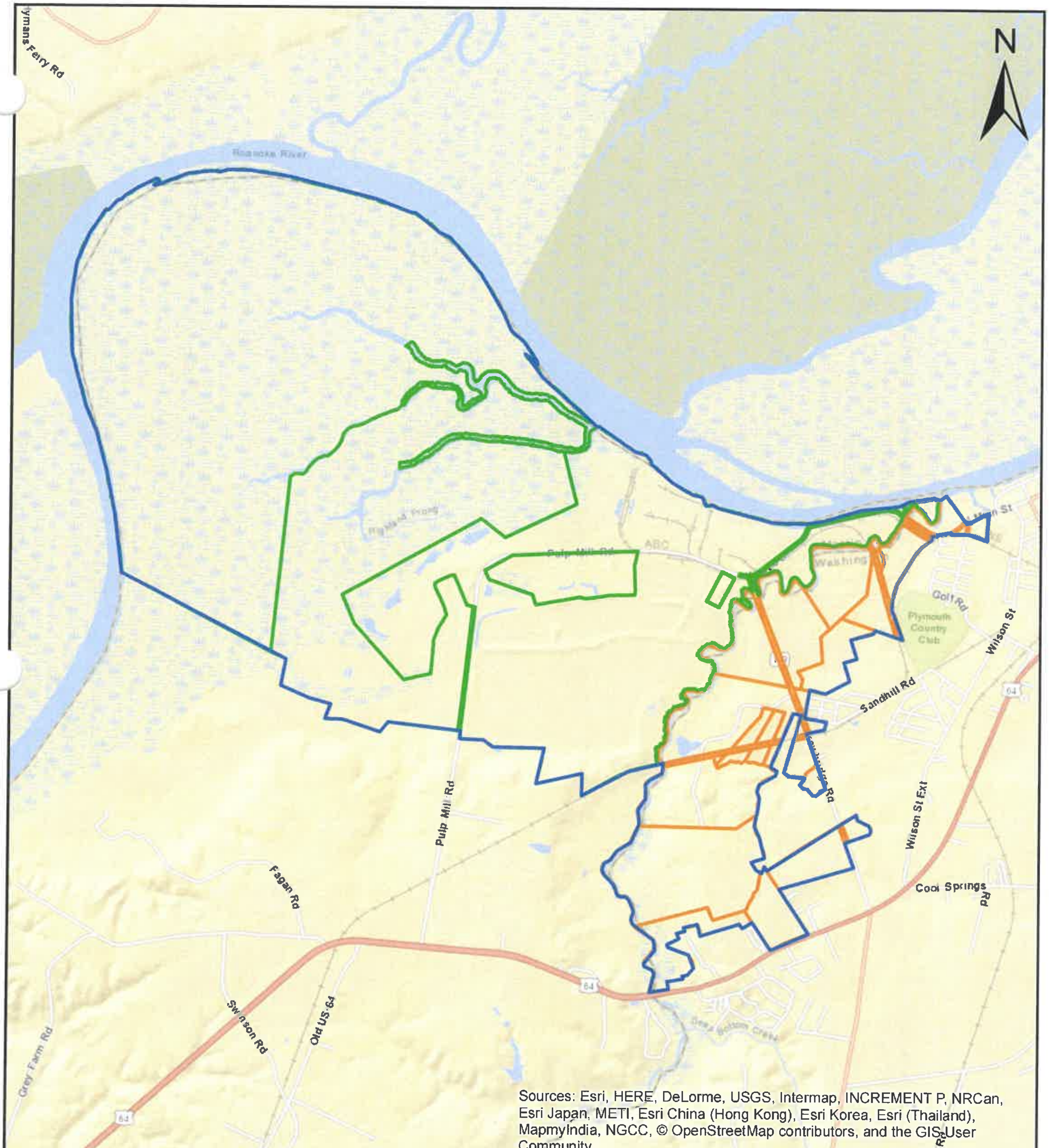
Domtar Paper Company

Figure 7-1
Toxics Modeling Layout

Domtar

AECOM

Scale 0 0.425 0.85 1.7 2.55 Kilometers



Locus Map

Legend

- Property Boundary
- Martin County Parcels
- Washington County Parcels

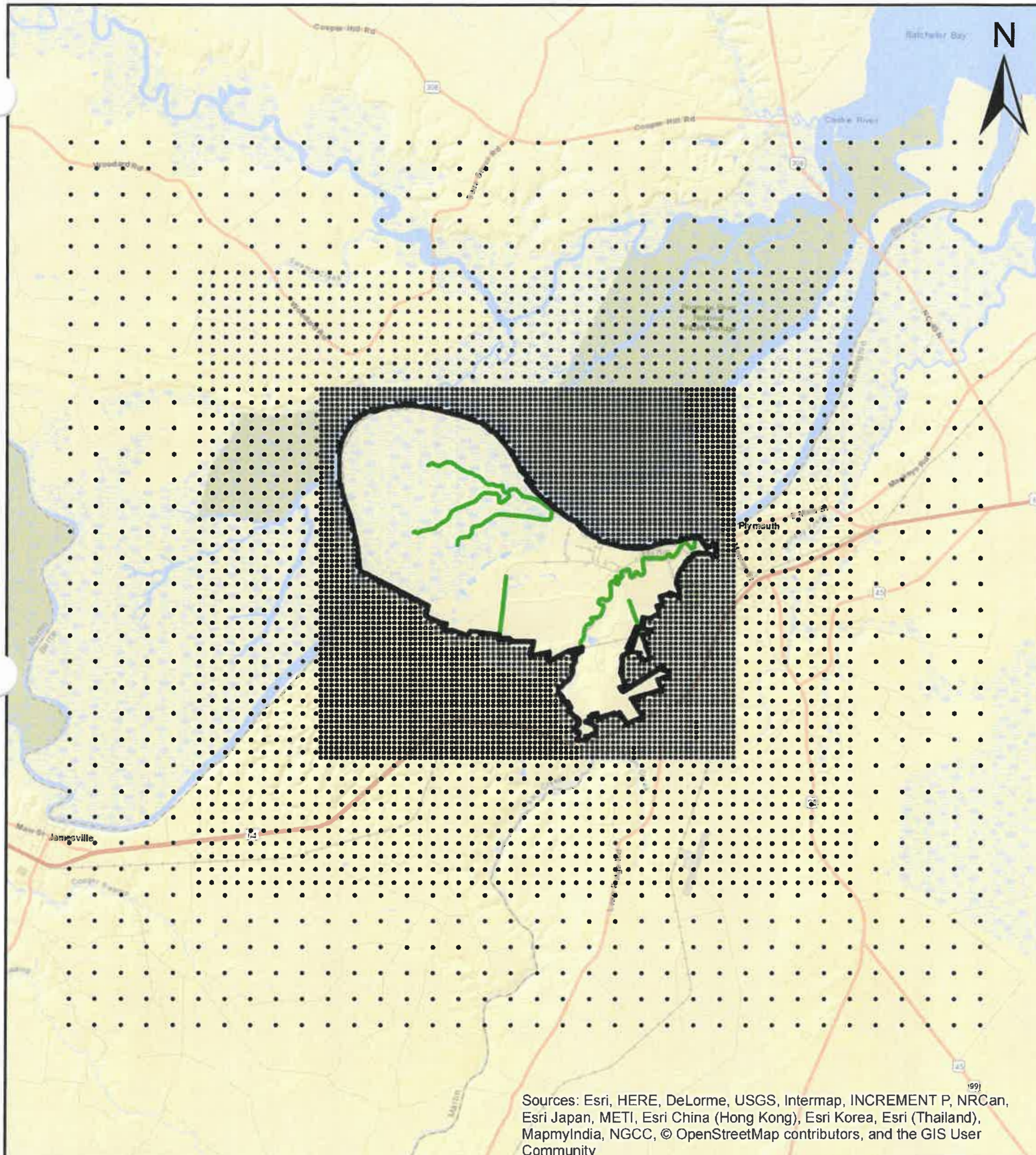
Scale 0 0.75 1.5 3 4.5 Kilometers

Domtar Paper Company

Figure 7-2
Property Boundary

Domtar

AECOM



Locus Map

Legend

- Long-term Receptors
- Short-term Receptors

Domtar Paper Company

Figure 7-3
Toxics Modeling Receptors

Domtar

AECOM

Scale 0 2 4 8 12 Kilometers

Appendix A

Permit Application Forms

Received

MAR 0 5 2019

Air Permits Section

FORM A

GENERAL FACILITY INFORMATION

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

☑ Local Zoning Consistency Determination (new or modification only) [Note: area without zoning] ☑ Appropriate Number of Copies of Application ☑ Application Fee (if required)

☑ Responsible Official/Authorized Contact Signature ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name: Domtar Paper Company, LLC	
Site Name: Domtar Paper Company - Plymouth Mill	
Site Address (911 Address) Line 1: 149 Highway North	
Site Address Line 2:	
City: Plymouth	State: NC
Zip Code: 27962	County: Martin

CONTACT INFORMATION

Responsible Official/Authorized Contact:		***Invoice Contact:***	
Name/Title: Diane R. Hardison, Environmental Manager		Name/Title: Diane R. Hardison, Environmental Manager	
Mailing Address Line 1: PO Box 747		Mailing Address Line 1: PO Box 747	
Mailing Address Line 2:		Mailing Address Line 2:	
City: Plymouth State: NC Zip Code: 27962		City: Plymouth State: NC Zip Code: 27962	
Primary Phone No.: (252) 793-8611	Fax No.: (252) 793-8871	Primary Phone No.: (252) 793-8611	Fax No.: (252) 793-8871
Secondary Phone No.:		Secondary Phone No.:	
Email Address: diane.hardison@domtar.com		Email Address: diane.hardison@domtar.com	
Facility/Inspection Contact:		***Permit/Technical Contact:***	
Name/Title: Everick W. Spence, Mill Manager		Name/Title: Diane R. Hardison, Environmental Manager	
Mailing Address Line 1: PO Box 747		Mailing Address Line 1: PO Box 747	
Mailing Address Line 2:		Mailing Address Line 2:	
City: Plymouth State: NC Zip Code: 27962		City: Plymouth State: NC Zip Code: 27962	
Primary Phone No.:	Fax No.: N/A	Primary Phone No.: (252) 793-8611	Fax No.: (252) 793-8871
Secondary Phone No.:		Secondary Phone No.:	
Email Address: everick.spence@domtar.com		Email Address: diane.hardison@domtar.com	

APPLICATION IS BEING MADE FOR

☐ New Non-permitted Facility/Greenfield ☑ Modification of Facility (permitted) ☐ Renewal Title V ☐ Renewal Non-Title V

☐ Name Change ☐ Ownership Change ☐ Administrative Amendment ☐ Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General ☐ Small ☐ Prohibitory Small ☐ Synthetic Minor ☑ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): Manufacture of fluff pulp

	Facility ID No. 07/59/00069
Primary SIC/NAICS Code: SIC: 2611	Current/Previous Air Permit No. 04291T45 Expiration Date: 9/30/2022
Facility Coordinates: Latitude: 35°51'49"N	Longitude: 79°47'06"N
Does this application contain confidential data? ☐ **YES** ☑ **NO**	*****If yes, please contact the DAQ Regional Office prior to submitting this application.*** (See Instructions)**

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Claire A. Galie, PE		Firm Name: AECOM	
Mailing Address Line 1: 1600 Perimeter Park Drive		Mailing Address Line 2:	
City: Morrisville	State: NC	Zip Code: 27560	County: Wake
Phone No.: (919) 461-1494	Fax No.: (919) 461-1415	Email Address: claire.galie@aecom.com	

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Everick W. Spence	Title: Mill Manager
X Signature(Blue Ink): Everick W. Spence	Date: 2/28/2019

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **A2**

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted			
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
Existing Permitted Equipment To Be MODIFIED By This Application			
ES-09-27.3000	~~Filter Press 2A~~ Filter - 2 Lignin Filter	~~NA~~ ES-09-27.3900	Dust collection system including wet cyclone
ES-09-27.3100	~~Cloth Wash Water Tank 2~~ Tank - 2 Lignin Filter Cloth Wash	ES-09-27.3800	Two-Phase Packed-Bed Caustic Scrubber
ES-09-27.1400	~~Carbonator Tower~~ Carbonator - Feed Liquor	ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-64-22-2000 (as backup)	HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup)
ES-09-27.1000	~~40% Black Liquor Tank~~ Tank - Lignin Feed Liquor	NA	NA
ES-09-27.1100	~~40% Black Liquor Cooler~~ Cooler - 1 Feed Liquor	~~ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-64-22-2000 (as backup)~~ ES-09-27.3800	~~HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup)~~ Two-Phase Packed-Bed Caustic Scrubber.
ES-09-27.1200	~~Filtrate 1 Storage Tank~~ Tank - 1 Lignin Filter Filtrate Storage		
ES-09-27.1800	~~Agitated Conditioning Tank~~ Tank - Lignin Slurry Conditioning		
ES-09-27.2000	~~Agitated Buffer Tank~~ Tank - Lignin Slurry Buffer		
ES-09-27 .2100	~~Filter Press 1A~~ Filter - 1 Lignin		
ES-09-27.2300	~~Cloth Wash Water Tank 1~~ Tank - 1 Lignin Filter Cloth Wash		
ES-09-27.2400	~~Filtrate Tank 1~~ Tank - 1 Lignin Filter Filtrate		
ES-09-27.2500	~~Filtrate 1 Buffer Tank~~ Tank - 1 Lignin Filter Filtrate Buffer		
ES-09-27.2610	~~Dewatered Lignin Conveyor 1~~ Conveyor - #1 Lignin Filter Horizontal		
ES-09-27.2620	~~Dewatered Lignin Conveyor 2~~ Conveyor - #1 Lignin Filter Incline		
ES-09-27.3200	~~Stage 2 Filtrate Tank 2~~ Tank - 2 Lignin Filter Acidic Filtrate		
~~ES-09.2700~~ ES-09-27.2700	~~Agitated Acidification Tank~~ Tank - Lignin Acidification	~~ES-09-27.1400~~, ES-09-27.1400, ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)	~~Carbonator Tower~~ Carbonator Tower and HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).
~~ES-09.2770~~ ES-09-27.2770	~~Acidification Overflow/Foam Tank~~ Tank - Lignin Foam		
ES-09-27.2800	~~Agitated Acid Conditioning Tank~~ Tank - Acidic Lignin Conditioning	~~ES-09-27.1400~~ ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)	~~Carbonator Tower~~ HVLC collection system to No. 2 hog fuel boiler (primary) or No. 1 hog fuel boiler (secondary) or No. 5 recovery boiler or thermal oxidizer (as backup).
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION — A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☑ Yes ☐ No

If No, please specify in detail how your facility avoided applicability: ______________________

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?
☑ Yes ☐ No Specify required RMP submittal date: 7/22/15 If submitted, RMP submittal date: 7/22/15

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?
☐ Yes ☑ No If yes, please specify: ______________________

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)
Chlorine dioxide generation	3	Chlorine dioxide	30240

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: Tank - Lignin Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1000
	CONTROL DEVICE ID NO(S): NA
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.1000

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Lignin feed liquor tank.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25	JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	3.38E-01	1.48E+00	3.38E-01	1.48E+00	3.38E-01	1.48E+00
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRS as Compounds**		2.03E-01	8.90E-01	2.03E-01	8.90E-01	2.03E-01	8.90E-01

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
Acetaldehyde	75070	PSD Calcs	2.02E-02	8.85E-02	2.02E-02	8.85E-02	2.02E-02	8.85E-02
Acrolein	107028	PSD Calcs	1.79E-05	7.84E-05	1.79E-05	7.84E-05	1.79E-05	7.84E-05
Benzene	71432	PSD Calcs	9.00E-06	3.94E-05	9.00E-06	3.94E-05	9.00E-06	3.94E-05
1,3-Butadiene	106990	PSD Calcs	3.57E-05	1.56E-04	3.57E-05	1.56E-04	3.57E-05	1.56E-04
Carbon Disulfide	75150	PSD Calcs	1.99E-03	8.72E-03	1.99E-03	8.72E-03	1.99E-03	8.72E-03
Chlorobenzene	108907	PSD Calcs	7.00E-07	3.07E-06	7.00E-07	3.07E-06	7.00E-07	3.07E-06
Chloroform	67663	PSD Calcs	8.00E-06	3.50E-05	8.00E-06	3.50E-05	8.00E-06	3.50E-05
Cumene	98828	PSD Calcs	8.19E-06	3.59E-05	8.19E-06	3.59E-05	8.19E-06	3.59E-05
Ethyl Benzene	100414	PSD Calcs	1.20E-06	5.26E-06	1.20E-06	5.26E-06	1.20E-06	5.26E-06
Formaldehyde	50000	PSD Calcs	5.00E-04	2.19E-03	5.00E-04	2.19E-03	5.00E-04	2.19E-03
Hexane-n	110543	PSD Calcs	3.97E-05	1.74E-04	3.97E-05	1.74E-04	3.97E-05	1.74E-04
Methanol	67561	PSD Calcs	1.30E-01	5.69E-01	1.30E-01	5.69E-01	1.30E-01	5.69E-01
Methyl Isobutyl Ketone	108101	PSD Calcs	8.57E-04	3.75E-03	8.57E-04	3.75E-03	8.57E-04	3.75E-03
Methylene Chloride	75092	PSD Calcs	3.69E-05	1.62E-04	3.69E-05	1.62E-04	3.69E-05	1.62E-04
Phenol	108952	PSD Calcs	1.01E-03	4.42E-03	1.01E-03	4.42E-03	1.01E-03	4.42E-03
Propionaldehyde	123386	PSD Calcs	2.30E-03	1.01E-02	2.30E-03	1.01E-02	2.30E-03	1.01E-02
Styrene	100425	PSD Calcs	1.40E-04	6.13E-04	1.40E-04	6.13E-04	1.40E-04	6.13E-04
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	5.43E-05	1.24E-05	5.43E-05	1.24E-05	5.43E-05
1,1,2-Trichloroethane	79005	PSD Calcs	2.59E-04	1.13E-03	2.59E-04	1.13E-03	2.59E-04	1.13E-03
1,2,4-Trichlorobenzene	120821	PSD Calcs	3.50E-05	1.53E-04	3.50E-05	1.53E-04	3.50E-05	1.53E-04
Toluene	108883	PSD Calcs	9.28E-04	4.06E-03	9.28E-04	4.06E-03	9.28E-04	4.06E-03
Trichloroethylene	79016	PSD Calcs	3.42E-05	1.50E-04	3.42E-05	1.50E-04	3.42E-05	1.50E-04
Xylenes	1330207	PSD Calcs	1.01E-04	4.40E-04	1.01E-04	4.40E-04	1.01E-04	4.40E-04

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	2.02E-02	4.85E-01	1.77E+02
Acrolein	107028	PSD Calcs	1.79E-05	4.30E-04	1.57E-01
Benzene	71432	PSD Calcs	9.00E-06	2.16E-04	7.88E-02
1,3-Butadiene	106990	PSD Calcs	3.57E-05	8.57E-04	3.13E-01
Carbon Disulfide	75150	PSD Calcs	1.99E-03	4.78E-02	1.74E+01
Chlorobenzene	108907	PSD Calcs	7.00E-07	1.68E-05	6.13E-03
Chloroform	67663	PSD Calcs	8.00E-06	1.92E-04	7.01E-02
Formaldehyde	50000	PSD Calcs	5.00E-04	1.20E-02	4.38E+00
Hexane-n	110543	PSD Calcs	3.97E-05	9.53E-04	3.48E-01
H2S	7783064	PSD Calcs	4.89E-02	1.17E+00	4.28E+02
Methyl Ethyl Ketone	78933	PSD Calcs	1.10E-02	2.64E-01	9.64E+01
Methyl Isobutyl Ketone	108101	PSD Calcs	8.57E-04	2.06E-02	7.51E+00
Methylene Chloride	75092	PSD Calcs	3.69E-05	8.86E-04	3.23E-01
Methyl Mercaptan	74931	PSD Calcs	1.00E-04	2.40E-03	8.76E-01
Phenol	108952	PSD Calcs	1.01E-03	2.42E-02	8.85E+00
Styrene	100425	PSD Calcs	1.40E-04	3.36E-03	1.23E+00
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	2.98E-04	1.09E-01
Toluene	108883	PSD Calcs	9.28E-04	2.23E-02	8.13E+00
Trichloroethylene	79016	PSD Calcs	3.42E-05	8.21E-04	3.00E-01
Xylenes	1330207	PSD Calcs	1.01E-04	2.41E-03	8.80E-01

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Tank - Lignin Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1000
	CONTROL DEVICE ID NO(S): NA
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.1000

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Lignin feed liquor tank.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: Cooler - 1 Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1100
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Feed liquor cooler routed to two phase packed-bed caustic scrubber.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

	SOURCE OF	EXPECTED ACTUAL*		POTENTIAL EMISSIONS			
	EMISSION	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	1.83E-01	8.01E-01	1.83E-01	8.01E-01	1.83E-01	8.01E-01
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

		SOURCE OF	EXPECTED ACTUAL*		POTENTIAL EMISSIONS			
		EMISSION	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
Acetaldehyde	75070	PSD Calcs	2.02E-02	8.85E-02	2.02E-02	8.85E-02	2.02E-02	8.85E-02
Acrolein	107028	PSD Calcs	1.79E-05	7.84E-05	1.79E-05	7.84E-05	1.79E-05	7.84E-05
Benzene	71432	PSD Calcs	9.00E-06	3.94E-05	9.00E-06	3.94E-05	9.00E-06	3.94E-05
1,3-Butadiene	106990	PSD Calcs	3.57E-05	1.56E-04	3.57E-05	1.56E-04	3.57E-05	1.56E-04
Carbon Disulfide	75150	PSD Calcs	1.99E-03	8.72E-03	1.99E-03	8.72E-03	1.99E-03	8.72E-03
Chlorobenzene	108907	PSD Calcs	7.00E-07	3.07E-06	7.00E-07	3.07E-06	7.00E-07	3.07E-06
Chloroform	67663	PSD Calcs	5.44E-05	2.38E-04	5.44E-05	2.38E-04	5.44E-05	2.38E-04
Cumene	98828	PSD Calcs	8.19E-06	3.59E-05	8.19E-06	3.59E-05	8.19E-06	3.59E-05
Ethyl Benzene	100414	PSD Calcs	1.20E-06	5.26E-06	1.20E-06	5.26E-06	1.20E-06	5.26E-06
Formaldehyde	50000	PSD Calcs	5.00E-04	2.19E-03	5.00E-04	2.19E-03	5.00E-04	2.19E-03
Hexane-n	110543	PSD Calcs	3.97E-05	1.74E-04	3.97E-05	1.74E-04	3.97E-05	1.74E-04
Methanol	67561	PSD Calcs	1.30E-01	5.69E-01	1.30E-01	5.69E-01	1.30E-01	5.69E-01
Methyl Isobutyl Ketone	108101	PSD Calcs	8.57E-04	3.75E-03	8.57E-04	3.75E-03	8.57E-04	3.75E-03
Methylene Chloride	75092	PSD Calcs	3.69E-05	1.62E-04	3.69E-05	1.62E-04	3.69E-05	1.62E-04
Phenol	108952	PSD Calcs	1.01E-03	4.42E-03	1.01E-03	4.42E-03	1.01E-03	4.42E-03
Propionaldehyde	123386	PSD Calcs	2.30E-03	1.01E-02	2.30E-03	1.01E-02	2.30E-03	1.01E-02
Styrene	100425	PSD Calcs	1.40E-04	6.13E-04	1.40E-04	6.13E-04	1.40E-04	6.13E-04
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	5.43E-05	1.24E-05	5.43E-05	1.24E-05	5.43E-05
1,1,2-Trichloroethane	79005	PSD Calcs	2.59E-04	1.13E-03	2.59E-04	1.13E-03	2.59E-04	1.13E-03
1,2,4-Trichlorobenzene	120821	PSD Calcs	3.50E-05	1.53E-04	3.50E-05	1.53E-04	3.50E-05	1.53E-04
Toluene	108883	PSD Calcs	9.28E-04	4.06E-03	9.28E-04	4.06E-03	9.28E-04	4.06E-03
Trichloroethylene	79016	PSD Calcs	3.42E-05	1.50E-04	3.42E-05	1.50E-04	3.42E-05	1.50E-04
Xylenes	1330207	PSD Calcs	1.01E-04	4.40E-04	1.01E-04	4.40E-04	1.01E-04	4.40E-04

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	2.02E-02	4.85E-01	176.95
Acrolein	107028	PSD Calcs	1.79E-05	4.30E-04	0.16
Benzene	71432	PSD Calcs	9.00E-06	2.16E-04	0.08
1,3-Butadiene	106990	PSD Calcs	3.57E-05	8.57E-04	0.31
Carbon Disulfide	75150	PSD Calcs	1.99E-03	4.78E-02	17.43
Chlorobenzene	108907	PSD Calcs	7.00E-07	1.68E-05	0.01
Chloroform	67663	PSD Calcs	5.44E-05	1.31E-03	0.48
Formaldehyde	50000	PSD Calcs	5.00E-04	1.20E-02	4.38
Hexane-n	110543	PSD Calcs	3.97E-05	9.53E-04	0.35
Methyl Ethyl Ketone	78933	PSD Calcs	1.10E-02	2.64E-01	96.36
Methyl Isobutyl Ketone	108101	PSD Calcs	8.57E-04	2.06E-02	7.51
Methylene Chloride	75092	PSD Calcs	3.69E-05	8.86E-04	0.32
Phenol	108952	PSD Calcs	1.01E-03	2.42E-02	8.85
Styrene	100425	PSD Calcs	1.40E-04	3.36E-03	1.23
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	2.98E-04	0.11
Toluene	108883	PSD Calcs	9.28E-04	2.23E-02	8.13
Trichloroethylene	79016	PSD Calcs	3.42E-05	8.21E-04	0.30
Xylenes	1330207	PSD Calcs	1.01E-04	2.41E-03	0.88

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Cooler - 1 Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1100
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Feed liquor cooler routed to two phase packed-bed caustic scrubber.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: Carbonator - Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1400
	CONTROL DEVICE ID NO(S): ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-65-25-0310

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Feed Liquor Carbonator routed to HVLC Collection system.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	**DATE MANUFACTURED: 2012**
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	3.66E-03	1.60E-02	1.83E-01	8.01E-01	3.66E-03	1.60E-02
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
Acetaldehyde	75070	PSD Calcs	4.04E-04	1.77E-03	2.02E-02	8.85E-02	4.04E-04	1.77E-03
Acrolein	107028	PSD Calcs	3.58E-07	1.57E-06	1.79E-05	7.84E-05	3.58E-07	1.57E-06
Benzene	71432	PSD Calcs	1.80E-07	7.88E-07	9.00E-06	3.94E-05	1.80E-07	7.88E-07
1,3-Butadiene	106990	PSD Calcs	7.14E-07	3.13E-06	3.57E-05	1.56E-04	7.14E-07	3.13E-06
Carbon Disulfide	75150	PSD Calcs	3.98E-05	1.74E-04	1.99E-03	8.72E-03	3.98E-05	1.74E-04
Chlorobenzene	108907	PSD Calcs	1.40E-08	6.13E-08	7.00E-07	3.07E-06	1.40E-08	6.13E-08
Chloroform	67663	PSD Calcs	1.09E-06	4.77E-06	5.44E-05	2.38E-04	1.09E-06	4.77E-06
Cumene	98828	PSD Calcs	1.64E-07	7.17E-07	8.19E-06	3.59E-05	1.64E-07	7.17E-07
Ethyl Benzene	100414	PSD Calcs	2.40E-08	1.05E-07	1.20E-06	5.26E-06	2.40E-08	1.05E-07
Formaldehyde	50000	PSD Calcs	1.00E-05	4.38E-05	5.00E-04	2.19E-03	1.00E-05	4.38E-05
Hexane-n	110543	PSD Calcs	7.94E-07	3.48E-06	3.97E-05	1.74E-04	7.94E-07	3.48E-06
Methanol	67561	PSD Calcs	2.60E-03	1.14E-02	1.30E-01	5.69E-01	2.60E-03	1.14E-02
Methyl Isobutyl Ketone	108101	PSD Calcs	1.71E-05	7.51E-05	8.57E-04	3.75E-03	1.71E-05	7.51E-05
Methylene Chloride	75092	PSD Calcs	7.38E-07	3.23E-06	3.69E-05	1.62E-04	7.38E-07	3.23E-06
Phenol	108952	PSD Calcs	2.02E-05	8.85E-05	1.01E-03	4.42E-03	2.02E-05	8.85E-05
Propionaldehyde	123386	PSD Calcs	4.60E-05	2.01E-04	2.30E-03	1.01E-02	4.60E-05	2.01E-04
Styrene	100425	PSD Calcs	2.80E-06	1.23E-05	1.40E-04	6.13E-04	2.80E-06	1.23E-05
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	5.43E-05	1.24E-05	5.43E-05	1.24E-05	5.43E-05
1,1,2-Trichloroethane	79005	PSD Calcs	5.18E-06	2.27E-05	2.59E-04	1.13E-03	5.18E-06	2.27E-05
1,2,4-Trichlorobenzene	120821	PSD Calcs	7.00E-07	3.07E-06	3.50E-05	1.53E-04	7.00E-07	3.07E-06
Toluene	108883	PSD Calcs	1.86E-05	8.13E-05	9.28E-04	4.06E-03	1.86E-05	8.13E-05
Trichloroethylene	79016	PSD Calcs	6.84E-07	3.00E-06	3.42E-05	1.50E-04	6.84E-07	3.00E-06
Xylenes	1330207	PSD Calcs	2.01E-06	8.80E-06	1.01E-04	4.40E-04	2.01E-06	8.80E-06

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	4.04E-04	9.70E-03	3.54E+00
Acrolein	107028	PSD Calcs	3.58E-07	8.59E-06	3.14E-03
Benzene	71432	PSD Calcs	1.80E-07	4.32E-06	1.58E-03
1,3-Butadiene	106990	PSD Calcs	7.14E-07	1.71E-05	6.25E-03
Carbon Disulfide	75150	PSD Calcs	3.98E-05	9.55E-04	3.49E-01
Chlorobenzene	108907	PSD Calcs	1.40E-08	3.36E-07	1.23E-04
Chloroform	67663	PSD Calcs	1.09E-06	2.61E-05	9.53E-03
Formaldehyde	50000	PSD Calcs	1.00E-05	2.40E-04	8.76E-02
Hexane-n	110543	PSD Calcs	7.94E-07	1.91E-05	6.96E-03
Methyl Ethyl Ketone	78933	PSD Calcs	2.20E-04	5.28E-03	1.93E+00
Methyl Isobutyl Ketone	108101	PSD Calcs	1.71E-05	4.11E-04	1.50E-01
Methylene Chloride	75092	PSD Calcs	7.38E-07	1.77E-05	6.46E-03
Phenol	108952	PSD Calcs	2.02E-05	4.85E-04	1.77E-01
Styrene	100425	PSD Calcs	2.80E-06	6.72E-05	2.45E-02
Tetrachloroethylene	127184	PSD Calcs	1.24E-05	2.98E-04	1.09E-01
Toluene	108883	PSD Calcs	1.86E-05	4.45E-04	1.63E-01
Trichloroethylene	79016	PSD Calcs	6.84E-07	1.64E-05	5.99E-03
Xylenes	1330207	PSD Calcs	2.01E-06	4.82E-05	1.76E-02

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Carbonator - Feed Liquor	EMISSION SOURCE ID NO: ES-09-27.1400
	CONTROL DEVICE ID NO(S): ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-65-25-0310

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Feed Liquor Carbonator routed to HVLC Collection system.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | **B**

EMISSION SOURCE DESCRIPTION: Dilute Process Tanks	EMISSION SOURCE ID NO: ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, ES-09-27.3200
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dilute process tanks routed to two phase packed-bed caustic scrubber.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)	PSD Calcs	8.28E-04	3.63E-03	8.28E-04	3.63E-03	8.28E-04	3.63E-03
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	8.01E-03	3.51E-02	8.01E-03	3.51E-02	8.01E-03	3.51E-02
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRS as Compounds**	PSD Calcs	8.33E+00	3.65E+01	8.33E+00	3.65E+01	8.33E+00	3.65E+01

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
Acetaldehyde	75070	PSD Calcs	2.77E-05	1.21E-04	2.77E-05	1.21E-04	2.77E-05	1.21E-04
Benzene	71432	PSD Calcs	6.79E-06	2.98E-05	6.79E-06	2.98E-05	6.79E-06	2.98E-05
Bromoform	75252	PSD Calcs	4.40E-05	1.93E-04	4.40E-05	1.93E-04	4.40E-05	1.93E-04
Bromomethane	74839	PSD Calcs	1.65E-05	7.23E-05	1.65E-05	7.23E-05	1.65E-05	7.23E-05
Carbon Disulfide	75150	PSD Calcs	2.65E-05	1.16E-04	2.65E-05	1.16E-04	2.65E-05	1.16E-04
Carbon Tetrachloride	56235	PSD Calcs	1.34E-04	5.86E-04	1.34E-04	5.86E-04	1.34E-04	5.86E-04
Chlorobenzene	108907	PSD Calcs	1.96E-05	8.57E-05	1.96E-05	8.57E-05	1.96E-05	8.57E-05
Chloroethane	75003	PSD Calcs	1.12E-05	4.91E-05	1.12E-05	4.91E-05	1.12E-05	4.91E-05
Chloroform	67663	PSD Calcs	2.08E-05	9.09E-05	2.08E-05	9.09E-05	2.08E-05	9.09E-05
1,1-Dichloroethane	75343	PSD Calcs	1.72E-05	7.54E-05	1.72E-05	7.54E-05	1.72E-05	7.54E-05
1,2-Dichloroethane	107062	PSD Calcs	1.72E-05	7.54E-05	1.72E-05	7.54E-05	1.72E-05	7.54E-05
1,2-Dichloropropane	78875	PSD Calcs	1.97E-05	8.61E-05	1.97E-05	8.61E-05	1.97E-05	8.61E-05
Ethyl Benzene	100414	PSD Calcs	1.85E-05	8.09E-05	1.85E-05	8.09E-05	1.85E-05	8.09E-05
Formaldehyde	50000	PSD Calcs	6.37E-06	2.79E-05	6.37E-06	2.79E-05	6.37E-06	2.79E-05
Hydrogen Chloride	7647010	PSD Calcs	9.13E-05	4.00E-04	9.13E-05	4.00E-04	9.13E-05	4.00E-04
Methanol	67561	PSD Calcs	4.73E-03	2.07E-02	4.73E-03	2.07E-02	4.73E-03	2.07E-02
Methyl Chloride	74873	PSD Calcs	8.78E-06	3.85E-05	8.78E-06	3.85E-05	8.78E-06	3.85E-05
Methyl Isobutyl Ketone	108101	PSD Calcs	8.71E-04	3.82E-03	8.71E-04	3.82E-03	8.71E-04	3.82E-03
Methylene Chloride	75092	PSD Calcs	1.48E-05	6.47E-05	1.48E-05	6.47E-05	1.48E-05	6.47E-05
Styrene	100425	PSD Calcs	1.81E-05	7.93E-05	1.81E-05	7.93E-05	1.81E-05	7.93E-05
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	2.92E-05	1.28E-04	2.92E-05	1.28E-04	2.92E-05	1.28E-04
Tetrachloroethylene	127184	PSD Calcs	2.88E-05	1.26E-04	2.88E-05	1.26E-04	2.88E-05	1.26E-04
Toluene	108883	PSD Calcs	8.01E-06	3.51E-05	8.01E-06	3.51E-05	8.01E-06	3.51E-05
1,1,1-Trichloroethane	71556	PSD Calcs	2.32E-05	1.02E-04	2.32E-05	1.02E-04	2.32E-05	1.02E-04
1,1,2-Trichloroethane	79005	PSD Calcs	2.32E-05	1.02E-04	2.32E-05	1.02E-04	2.32E-05	1.02E-04
Trichloroethylene	79016	PSD Calcs	1.14E-04	5.00E-04	1.14E-04	5.00E-04	1.14E-04	5.00E-04
Vinyl Acetate	108054	PSD Calcs	7.49E-05	3.28E-04	7.49E-05	3.28E-04	7.49E-05	3.28E-04
Vinyl Chloride	75014	PSD Calcs	1.09E-05	4.76E-05	1.09E-05	4.76E-05	1.09E-05	4.76E-05
Vinylidene Chloride	75354	PSD Calcs	1.69E-05	7.39E-05	1.69E-05	7.39E-05	1.69E-05	7.39E-05
Xylenes	1330207	PSD Calcs	1.85E-05	8.09E-05	1.85E-05	8.09E-05	1.85E-05	8.09E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	2.77E-05	6.64E-04	2.42E-01
Ammonia	7664417	PSD Calcs	2.33E-04	5.59E-03	2.04E+00
Benzene	71432	PSD Calcs	6.79E-06	1.63E-04	5.95E-02
Carbon Disulfide	75150	PSD Calcs	2.65E-05	6.36E-04	2.32E-01
Carbon Tetrachloride	56235	PSD Calcs	1.34E-04	3.21E-03	1.17E+00
Chlorobenzene	108907	PSD Calcs	1.96E-05	4.70E-04	1.71E-01
Chloroform	67663	PSD Calcs	2.08E-05	4.98E-04	1.82E-01
1,2-Dichloroethane	107062	PSD Calcs	1.72E-05	4.13E-04	1.51E-01
Formaldehyde	50000	PSD Calcs	6.37E-06	1.53E-04	5.58E-02
Hydrogen Chloride	7647010	PSD Calcs	9.13E-05	2.19E-03	8.00E-01
Hydrogen Sulfide**	7783064	PSD Calcs	3.42E+00	1.16E+02	4.25E+04
Methyl Ethyl Ketone	78933	PSD Calcs	6.27E-04	1.51E-02	5.49E+00
Methyl Isobutyl Ketone	108101	PSD Calcs	8.71E-04	2.09E-02	7.63E+00
Methyl Mercaptan**	74931	PSD Calcs	2.50E+00	6.00E+01	2.19E+04
Methylene Chloride	75092	PSD Calcs	1.48E-05	3.55E-04	1.29E-01
Styrene	100425	PSD Calcs	1.81E-05	4.35E-04	1.59E-01
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	2.92E-05	7.01E-04	2.56E-01
Tetrachloroethylene	127184	PSD Calcs	2.88E-05	6.92E-04	2.53E-01
Toluene	108883	PSD Calcs	8.01E-06	1.92E-04	7.02E-02
1,1,1-Trichloroethane	71556	PSD Calcs	2.32E-05	5.57E-04	2.03E-01
Trichloroethylene	79016	PSD Calcs	1.14E-04	2.74E-03	1.00E+00
TRS as H2S**	7783064	PSD Calcs	9.93E+00	2.38E+02	8.70E+04
Vinyl Chloride	75014	PSD Calcs	1.09E-05	2.61E-04	9.52E-02
Vinylidene Chloride	75354	PSD Calcs	1.69E-05	4.05E-04	1.48E-01
Xylenes	1330207	PSD Calcs	1.85E-05	4.43E-04	1.62E-01

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

**All TRS and individual TRS compound emissions include all sources controlled by the scrubber

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION: Dilute Process Tanks	EMISSION SOURCE ID NO: ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, ES-09-27.3200
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Dilute process tanks routed to two phase packed-bed caustic scrubber.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: Acidification Process Tanks

EMISSION SOURCE ID NO: ES-09-27.2700, ES-09-27.2770 and ES-09-27.2800

CONTROL DEVICE ID NO(S):
For ES-09-27.2700 and ES-09-2770 only: ES-09-27.1400;
For all: ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)

OPERATING SCENARIO 1 OF 1

EMISSION POINT (STACK) ID NO(S): ES-65-25-0310

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Acidification process tanks routed to HVLC Collection system.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: 2019

DATE MANUFACTURED: 2012

MANUFACTURER / MODEL NO.: Valmet

EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?): ☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	1.58E-01	6.92E-01	7.90E+00	3.46E+01	1.58E-01	6.92E-01
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRS as Compounds**	PSD Calcs	6.62E-01	2.90E+00	6.62E-01	2.90E+00	6.62E-01	2.90E+00

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
Acetaldehyde	75070	PSD Calcs	3.35E-03	1.47E-02	1.67E-01	7.33E-01	3.35E-03	1.47E-02
Acrolein	107028	PSD Calcs	1.84E-03	8.06E-03	9.20E-02	4.03E-01	1.84E-03	8.06E-03
Benzene	71432	PSD Calcs	1.44E-04	6.33E-04	7.22E-03	3.16E-02	1.44E-04	6.33E-04
Carbon Disulfide	75150	PSD Calcs	4.40E-05	1.93E-04	2.20E-03	9.65E-03	4.40E-05	1.93E-04
Carbon Tetrachloride	56235	PSD Calcs	2.00E-03	8.77E-03	1.00E-01	4.39E-01	2.00E-03	8.77E-03
Chlorobenzene	108907	PSD Calcs	1.53E-04	6.69E-04	7.63E-03	3.34E-02	1.53E-04	6.69E-04
Chloroform	67663	PSD Calcs	4.40E-04	1.93E-03	2.20E-02	9.65E-02	4.40E-04	1.93E-03
Cumene	98828	PSD Calcs	3.44E-04	1.50E-03	1.72E-02	7.52E-02	3.44E-04	1.50E-03
Ethyl Benzene	100414	PSD Calcs	3.61E-04	1.58E-03	1.81E-02	7.91E-02	3.61E-04	1.58E-03
Formaldehyde	50000	PSD Calcs	1.59E-03	6.94E-03	7.93E-02	3.47E-01	1.59E-03	6.94E-03
n-Hexane	110543	PSD Calcs	1.94E-04	8.49E-04	9.69E-03	4.24E-02	1.94E-04	8.49E-04
Methanol	67561	PSD Calcs	2.20E-02	9.65E-02	1.10E+00	4.82E+00	2.20E-02	9.65E-02
Methyl Isobutyl Ketone	108101	PSD Calcs	1.03E-03	4.50E-03	5.14E-02	2.25E-01	1.03E-03	4.50E-03
Phenol	108952	PSD Calcs	1.67E-03	7.33E-03	8.37E-02	3.67E-01	1.67E-03	7.33E-03
Styrene	100425	PSD Calcs	1.47E-03	6.43E-03	7.34E-02	3.22E-01	1.47E-03	6.43E-03
Toluene	108883	PSD Calcs	4.40E-04	1.93E-03	2.20E-02	9.65E-02	4.40E-04	1.93E-03
1,2,4-Trichlorobenzene	120821	PSD Calcs	1.67E-03	7.33E-03	8.37E-02	3.67E-01	1.67E-03	7.33E-03
Xylenes	1330207	PSD Calcs	5.75E-04	2.52E-03	2.87E-02	1.26E-01	5.75E-04	2.52E-03

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	3.35E-03	8.03E-02	29.32
Acrolein	107028	PSD Calcs	1.84E-03	4.42E-02	16.13
Benzene	71432	PSD Calcs	1.44E-04	3.47E-03	1.27
Carbon Disulfide	75150	PSD Calcs	4.40E-05	1.06E-03	0.39
Carbon Tetrachloride	56235	PSD Calcs	2.00E-03	4.81E-02	17.54
Chlorobenzene	108907	PSD Calcs	1.53E-04	3.66E-03	1.34
Chloroform	67663	PSD Calcs	4.40E-04	1.06E-02	3.86
Formaldehyde	50000	PSD Calcs	1.59E-03	3.81E-02	13.89
Hydrogen Sulfide**	7783064	PSD Calcs	3.55E-01	1.21E+01	4.41E+03
n-Hexane	110543	PSD Calcs	1.94E-04	4.65E-03	1.70
Methyl Ethyl Ketone	78933	PSD Calcs	2.94E-03	7.05E-02	25.72
Methyl Isobutyl Ketone	108101	PSD Calcs	1.03E-03	2.47E-02	9.00
Methyl Mercaptan**	74931	PSD Calcs	1.20E-01	2.88E+00	1.05E+03
Phenol	108952	PSD Calcs	1.67E-03	4.02E-02	14.66
Styrene	100425	PSD Calcs	1.47E-03	3.52E-02	12.86
Toluene	108883	PSD Calcs	4.40E-04	1.06E-02	3.86
Xylenes	1330207	PSD Calcs	5.75E-04	1.38E-02	5.03

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

**All TRS and individual TRS compound emissions include all sources controlled in the HVLC System.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **B9**

EMISSION SOURCE DESCRIPTION: Acidification Process Tanks	EMISSION SOURCE ID NO: ES-09-27.2700, ES-09-27.2770 and ES-09-27.2800
	CONTROL DEVICE ID NO(S): For ES-09-27.2700 and ES-09-2770 only: ES-09-27.1400; For all: ES-65-25-0310 or ES-64-25-0290 or ES-10-25-0110 or CD-65-60-TO (as backup)
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-65-25-0310

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Acidification process tanks routed to HVLC Collection system.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **B**

EMISSION SOURCE DESCRIPTION: Tank - 2 Lignin Filter Cloth Wash	EMISSION SOURCE ID NO: ES-09-27.3100
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
No. 2 Lignin filter cloth wash tank routed to two phase packed bed caustic scrubber.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25	JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)	PSD Calcs	1.18E-04	5.18E-04	1.18E-04	5.18E-04	1.18E-04	5.18E-04
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	1.14E-03	5.01E-03	1.14E-03	5.01E-03	1.14E-03	5.01E-03
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	tons/yr
Acetaldehyde	75070	PSD Calcs	3.95E-06	1.73E-05	3.95E-06	1.73E-05	3.95E-06	1.73E-05
Benzene	71432	PSD Calcs	9.70E-07	4.25E-06	9.70E-07	4.25E-06	9.70E-07	4.25E-06
Bromoform	75252	PSD Calcs	6.28E-06	2.75E-05	6.28E-06	2.75E-05	6.28E-06	2.75E-05
Bromomethane	74839	PSD Calcs	2.36E-06	1.03E-05	2.36E-06	1.03E-05	2.36E-06	1.03E-05
Carbon Disulfide	75150	PSD Calcs	3.78E-06	1.66E-05	3.78E-06	1.66E-05	3.78E-06	1.66E-05
Carbon Tetrachloride	56235	PSD Calcs	1.91E-05	8.37E-05	1.91E-05	8.37E-05	1.91E-05	8.37E-05
Chlorobenzene	108907	PSD Calcs	2.80E-06	1.22E-05	2.80E-06	1.22E-05	2.80E-06	1.22E-05
Chloroethane	75003	PSD Calcs	1.60E-06	7.02E-06	1.60E-06	7.02E-06	1.60E-06	7.02E-06
Chloroform	67663	PSD Calcs	2.97E-06	1.30E-05	2.97E-06	1.30E-05	2.97E-06	1.30E-05
1,1-Dichloroethane	75343	PSD Calcs	2.46E-06	1.08E-05	2.46E-06	1.08E-05	2.46E-06	1.08E-05
1,2-Dichloroethane	107062	PSD Calcs	2.46E-06	1.08E-05	2.46E-06	1.08E-05	2.46E-06	1.08E-05
1,2-Dichloropropane	78875	PSD Calcs	2.81E-06	1.23E-05	2.81E-06	1.23E-05	2.81E-06	1.23E-05
Ethyl Benzene	100414	PSD Calcs	2.64E-06	1.16E-05	2.64E-06	1.16E-05	2.64E-06	1.16E-05
Formaldehyde	50000	PSD Calcs	9.10E-07	3.99E-06	9.10E-07	3.99E-06	9.10E-07	3.99E-06
Hydrogen Chloride	7647010	PSD Calcs	1.30E-05	5.71E-05	1.30E-05	5.71E-05	1.30E-05	5.71E-05
Methanol	67561	PSD Calcs	6.75E-04	2.96E-03	6.75E-04	2.96E-03	6.75E-04	2.96E-03
Methyl Chloride	74873	PSD Calcs	1.25E-06	5.49E-06	1.25E-06	5.49E-06	1.25E-06	5.49E-06
Methyl Isobutyl Ketone	108101	PSD Calcs	1.24E-04	5.45E-04	1.24E-04	5.45E-04	1.24E-04	5.45E-04
Methylene Chloride	75092	PSD Calcs	2.11E-06	9.24E-06	2.11E-06	9.24E-06	2.11E-06	9.24E-06
Styrene	100425	PSD Calcs	2.59E-06	1.13E-05	2.59E-06	1.13E-05	2.59E-06	1.13E-05
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	4.17E-06	1.83E-05	4.17E-06	1.83E-05	4.17E-06	1.83E-05
Tetrachloroethylene	127184	PSD Calcs	4.12E-06	1.80E-05	4.12E-06	1.80E-05	4.12E-06	1.80E-05
Toluene	108883	PSD Calcs	1.14E-06	5.01E-06	1.14E-06	5.01E-06	1.14E-06	5.01E-06
1,1,1-Trichloroethane	71556	PSD Calcs	3.31E-06	1.45E-05	3.31E-06	1.45E-05	3.31E-06	1.45E-05
1,1,2-Trichloroethane	79005	PSD Calcs	3.31E-06	1.45E-05	3.31E-06	1.45E-05	3.31E-06	1.45E-05
Trichloroethylene	79016	PSD Calcs	1.63E-05	7.15E-05	1.63E-05	7.15E-05	1.63E-05	7.15E-05
Vinyl Acetate	108054	PSD Calcs	1.07E-05	4.68E-05	1.07E-05	4.68E-05	1.07E-05	4.68E-05
Vinyl Chloride	75014	PSD Calcs	1.55E-06	6.80E-06	1.55E-06	6.80E-06	1.55E-06	6.80E-06
Vinylidene Chloride	75354	PSD Calcs	2.41E-06	1.06E-05	2.41E-06	1.06E-05	2.41E-06	1.06E-05
Xylenes	1330207	PSD Calcs	2.64E-06	1.16E-05	2.64E-06	1.16E-05	2.64E-06	1.16E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	3.95E-06	9.48E-05	3.46E-02
Ammonia	7664417	PSD Calcs	3.33E-05	7.98E-04	2.91E-01
Benzene	71432	PSD Calcs	9.70E-07	2.33E-05	8.50E-03
Carbon Disulfide	75150	PSD Calcs	3.78E-06	9.08E-05	3.31E-02
Carbon Tetrachloride	56235	PSD Calcs	1.91E-05	4.59E-04	1.67E-01
Chlorobenzene	108907	PSD Calcs	2.80E-06	6.71E-05	2.45E-02
Chloroform	67663	PSD Calcs	2.97E-06	7.12E-05	2.60E-02
1,2-Dichloroethane	107062	PSD Calcs	2.46E-06	5.90E-05	2.15E-02
Formaldehyde	50000	PSD Calcs	9.10E-07	2.18E-05	7.97E-03
Hydrogen Chloride	7647010	PSD Calcs	1.30E-05	3.13E-04	1.14E-01
Methyl Ethyl Ketone	78933	PSD Calcs	8.96E-05	2.15E-03	7.85E-01
Methyl Isobutyl Ketone	108101	PSD Calcs	1.24E-04	2.99E-03	1.09E+00
Methylene Chloride	75092	PSD Calcs	2.11E-06	5.06E-05	1.85E-02
Styrene	100425	PSD Calcs	2.59E-06	6.21E-05	2.27E-02
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	4.17E-06	1.00E-04	3.65E-02
Tetrachloroethylene	127184	PSD Calcs	4.12E-06	9.89E-05	3.61E-02
Toluene	108883	PSD Calcs	1.14E-06	2.75E-05	1.00E-02
1,1,1-Trichloroethane	71556	PSD Calcs	3.31E-06	7.96E-05	2.90E-02
Trichloroethylene	79016	PSD Calcs	1.63E-05	3.92E-04	1.43E-01
Vinyl Chloride	75014	PSD Calcs	1.55E-06	3.73E-05	1.36E-02
Vinylidene Chloride	75354	PSD Calcs	2.41E-06	5.78E-05	2.11E-02
Xylenes	1330207	PSD Calcs	2.64E-06	6.33E-05	2.31E-02

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Tank - 2 Lignin Filter Cloth Wash	EMISSION SOURCE ID NO: ES-09-27.3100
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): No. 2 Lignin filter cloth wash tank routed to two phase packed bed caustic scrubber.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Conveyor - #1 Lignin Filter Horizontal and Conveyor - #1 Lignin Filter Incline

EMISSION SOURCE ID NO: ES-09-27.2610 and ES-09-27.2620

CONTROL DEVICE ID NO(S): ES-09-27.3800

OPERATING SCENARIO 1 OF 1

EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Conveyors 1 and 2 routed to two phase packed bed caustic scrubber.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD

DATE MANUFACTURED: 2012

MANUFACTURER / MODEL NO.: Valmet

EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?): ______ ☐ NESHAP (SUBPARTS?): ______

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)	PSD Calcs	2.37E-04	1.04E-03	2.37E-04	1.04E-03	2.37E-04	1.04E-03
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	2.29E-03	1.00E-02	2.29E-03	1.00E-02	2.29E-03	1.00E-02
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
Acetaldehyde	75070	PSD Calcs	7.90E-06	3.46E-05	7.90E-06	3.46E-05	7.90E-06	3.46E-05
Benzene	71432	PSD Calcs	1.94E-06	8.50E-06	1.94E-06	8.50E-06	1.94E-06	8.50E-06
Bromoform	75252	PSD Calcs	1.26E-05	5.50E-05	1.26E-05	5.50E-05	1.26E-05	5.50E-05
Bromomethane	74839	PSD Calcs	4.72E-06	2.07E-05	4.72E-06	2.07E-05	4.72E-06	2.07E-05
Carbon Disulfide	75150	PSD Calcs	7.57E-06	3.31E-05	7.57E-06	3.31E-05	7.57E-06	3.31E-05
Carbon Tetrachloride	56235	PSD Calcs	3.82E-05	1.67E-04	3.82E-05	1.67E-04	3.82E-05	1.67E-04
Chlorobenzene	108907	PSD Calcs	5.59E-06	2.45E-05	5.59E-06	2.45E-05	5.59E-06	2.45E-05
Chloroethane	75003	PSD Calcs	3.21E-06	1.40E-05	3.21E-06	1.40E-05	3.21E-06	1.40E-05
Chloroform	67663	PSD Calcs	5.93E-06	2.60E-05	5.93E-06	2.60E-05	5.93E-06	2.60E-05
1,1-Dichloroethane	75343	PSD Calcs	4.92E-06	2.15E-05	4.92E-06	2.15E-05	4.92E-06	2.15E-05
1,2-Dichloroethane	107062	PSD Calcs	4.92E-06	2.15E-05	4.92E-06	2.15E-05	4.92E-06	2.15E-05
1,2-Dichloropropane	78875	PSD Calcs	5.61E-06	2.46E-05	5.61E-06	2.46E-05	5.61E-06	2.46E-05
Ethyl Benzene	100414	PSD Calcs	5.28E-06	2.31E-05	5.28E-06	2.31E-05	5.28E-06	2.31E-05
Formaldehyde	50000	PSD Calcs	1.82E-06	7.97E-06	1.82E-06	7.97E-06	1.82E-06	7.97E-06
Hydrogen Chloride	7647010	PSD Calcs	2.61E-05	1.14E-04	2.61E-05	1.14E-04	2.61E-05	1.14E-04
Methanol	67561	PSD Calcs	1.35E-03	5.91E-03	1.35E-03	5.91E-03	1.35E-03	5.91E-03
Methyl Chloride	74873	PSD Calcs	2.51E-06	1.10E-05	2.51E-06	1.10E-05	2.51E-06	1.10E-05
Methyl Isobutyl Ketone	108101	PSD Calcs	2.49E-04	1.09E-03	2.49E-04	1.09E-03	2.49E-04	1.09E-03
Methylene Chloride	75092	PSD Calcs	4.22E-06	1.85E-05	4.22E-06	1.85E-05	4.22E-06	1.85E-05
Styrene	100425	PSD Calcs	5.18E-06	2.27E-05	5.18E-06	2.27E-05	5.18E-06	2.27E-05
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	8.34E-06	3.65E-05	8.34E-06	3.65E-05	8.34E-06	3.65E-05
Tetrachloroethylene	127184	PSD Calcs	8.24E-06	3.61E-05	8.24E-06	3.61E-05	8.24E-06	3.61E-05
Toluene	108883	PSD Calcs	2.29E-06	1.00E-05	2.29E-06	1.00E-05	2.29E-06	1.00E-05
1,1,1-Trichloroethane	71556	PSD Calcs	6.63E-06	2.90E-05	6.63E-06	2.90E-05	6.63E-06	2.90E-05
1,1,2-Trichloroethane	79005	PSD Calcs	6.63E-06	2.90E-05	6.63E-06	2.90E-05	6.63E-06	2.90E-05
Trichloroethylene	79016	PSD Calcs	3.26E-05	1.43E-04	3.26E-05	1.43E-04	3.26E-05	1.43E-04
Vinyl Acetate	108054	PSD Calcs	2.14E-05	9.37E-05	2.14E-05	9.37E-05	2.14E-05	9.37E-05
Vinyl Chloride	75014	PSD Calcs	3.11E-06	1.36E-05	3.11E-06	1.36E-05	3.11E-06	1.36E-05
Vinylidene Chloride	75354	PSD Calcs	4.82E-06	2.11E-05	4.82E-06	2.11E-05	4.82E-06	2.11E-05
Xylenes	1330207	PSD Calcs	5.28E-06	2.31E-05	5.28E-06	2.31E-05	5.28E-06	2.31E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	7.90E-06	1.90E-04	6.92E-02
Ammonia	7664417	PSD Calcs	6.65E-05	1.60E-03	5.83E-01
Benzene	71432	PSD Calcs	1.94E-06	4.66E-05	1.70E-02
Carbon Disulfide	75150	PSD Calcs	7.57E-06	1.82E-04	6.63E-02
Carbon Tetrachloride	56235	PSD Calcs	3.82E-05	9.17E-04	3.35E-01
Chlorobenzene	108907	PSD Calcs	5.59E-06	1.34E-04	4.90E-02
Chloroform	67663	PSD Calcs	5.93E-06	1.42E-04	5.20E-02
1,2-Dichloroethane	107062	PSD Calcs	4.92E-06	1.18E-04	4.31E-02
Formaldehyde	50000	PSD Calcs	1.82E-06	4.37E-05	1.59E-02
Hydrogen Chloride	7647010	PSD Calcs	2.61E-05	6.26E-04	2.29E-01
Methyl Ethyl Ketone	78933	PSD Calcs	1.79E-04	4.30E-03	1.57E+00
Methyl Isobutyl Ketone	108101	PSD Calcs	2.49E-04	5.97E-03	2.18E+00
Methylene Chloride	75092	PSD Calcs	4.22E-06	1.01E-04	3.70E-02
Styrene	100425	PSD Calcs	5.18E-06	1.24E-04	4.53E-02
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	8.34E-06	2.00E-04	7.31E-02
Tetrachloroethylene	127184	PSD Calcs	8.24E-06	1.98E-04	7.22E-02
Toluene	108883	PSD Calcs	2.29E-06	5.49E-05	2.01E-02
1,1,1-Trichloroethane	71556	PSD Calcs	6.63E-06	1.59E-04	5.81E-02
Trichloroethylene	79016	PSD Calcs	3.26E-05	7.84E-04	2.86E-01
Vinyl Chloride	75014	PSD Calcs	3.11E-06	7.45E-05	2.72E-02
Vinylidene Chloride	75354	PSD Calcs	4.82E-06	1.16E-04	4.22E-02
Xylenes	1330207	PSD Calcs	5.28E-06	1.27E-04	4.62E-02

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Conveyor - #1 Lignin Filter Horizontal and Conveyor - #1 Lignin Filter Incline	EMISSION SOURCE ID NO: ES-09-27.2610 and ES-09-27.2620
	CONTROL DEVICE ID NO(S): ES-09-27.3800
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Conveyors 1 and 2 routed to two phase packed bed caustic scrubber.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 — **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** — **B**

EMISSION SOURCE DESCRIPTION: Filter - 1 Lignin and Filter - 2 Lignin Filter	EMISSION SOURCE ID NO: ES-09-27.2100 and ES-09-27.3000
	CONTROL DEVICE ID NO(S): ES-09-27.3800 and ES-09-27.3900
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800 & ES-09-27.3900

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Lignin Filter Press 1 routed to two phase packed bed caustic scrubber and Lignin Filter Press 2 equipped with dust collection system.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: Initial: 2012; Future: TBD	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Valmet	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25	JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<10 MICRONS (PM_{10})		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SULFUR DIOXIDE (SO2)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NITROGEN OXIDES (NOx)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CARBON MONOXIDE (CO)	PSD Calcs	2.37E-04	1.04E-03	2.37E-04	1.04E-03	2.37E-04	1.04E-03
VOLATILE ORGANIC COMPOUNDS (VOC)	PSD Calcs	2.29E-03	1.00E-02	2.29E-03	1.00E-02	2.29E-03	1.00E-02
LEAD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL* (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
Acetaldehyde	75070	PSD Calcs	7.90E-06	3.46E-05	7.90E-06	3.46E-05	7.90E-06	3.46E-05
Benzene	71432	PSD Calcs	1.94E-06	8.50E-06	1.94E-06	8.50E-06	1.94E-06	8.50E-06
Bromoform	75252	PSD Calcs	1.26E-05	5.50E-05	1.26E-05	5.50E-05	1.26E-05	5.50E-05
Bromomethane	74839	PSD Calcs	4.72E-06	2.07E-05	4.72E-06	2.07E-05	4.72E-06	2.07E-05
Carbon Disulfide	75150	PSD Calcs	7.57E-06	3.31E-05	7.57E-06	3.31E-05	7.57E-06	3.31E-05
Carbon Tetrachloride	56235	PSD Calcs	3.82E-05	1.67E-04	3.82E-05	1.67E-04	3.82E-05	1.67E-04
Chlorobenzene	108907	PSD Calcs	5.59E-06	2.45E-05	5.59E-06	2.45E-05	5.59E-06	2.45E-05
Chloroethane	75003	PSD Calcs	3.21E-06	1.40E-05	3.21E-06	1.40E-05	3.21E-06	1.40E-05
Chloroform	67663	PSD Calcs	5.93E-06	2.60E-05	5.93E-06	2.60E-05	5.93E-06	2.60E-05
1,1-Dichloroethane	75343	PSD Calcs	4.92E-06	2.15E-05	4.92E-06	2.15E-05	4.92E-06	2.15E-05
1,2-Dichloroethane	107062	PSD Calcs	4.92E-06	2.15E-05	4.92E-06	2.15E-05	4.92E-06	2.15E-05
1,2-Dichloropropane	78875	PSD Calcs	5.61E-06	2.46E-05	5.61E-06	2.46E-05	5.61E-06	2.46E-05
Ethyl Benzene	100414	PSD Calcs	5.28E-06	2.31E-05	5.28E-06	2.31E-05	5.28E-06	2.31E-05
Formaldehyde	50000	PSD Calcs	1.82E-06	7.97E-06	1.82E-06	7.97E-06	1.82E-06	7.97E-06
Hydrogen Chloride	7647010	PSD Calcs	2.61E-05	1.14E-04	2.61E-05	1.14E-04	2.61E-05	1.14E-04
Methanol	67561	PSD Calcs	1.35E-03	5.91E-03	1.35E-03	5.91E-03	1.35E-03	5.91E-03
Methyl Chloride	74873	PSD Calcs	2.51E-06	1.10E-05	2.51E-06	1.10E-05	2.51E-06	1.10E-05
Methyl Isobutyl Ketone	108101	PSD Calcs	2.49E-04	1.09E-03	2.49E-04	1.09E-03	2.49E-04	1.09E-03
Methylene Chloride	75092	PSD Calcs	4.22E-06	1.85E-05	4.22E-06	1.85E-05	4.22E-06	1.85E-05
Styrene	100425	PSD Calcs	5.18E-06	2.27E-05	5.18E-06	2.27E-05	5.18E-06	2.27E-05
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	8.34E-06	3.65E-05	8.34E-06	3.65E-05	8.34E-06	3.65E-05
Tetrachloroethylene	127184	PSD Calcs	8.24E-06	3.61E-05	8.24E-06	3.61E-05	8.24E-06	3.61E-05
Toluene	108883	PSD Calcs	2.29E-06	1.00E-05	2.29E-06	1.00E-05	2.29E-06	1.00E-05
1,1,1-Trichloroethane	71556	PSD Calcs	6.63E-06	2.90E-05	6.63E-06	2.90E-05	6.63E-06	2.90E-05
1,1,2-Trichloroethane	79005	PSD Calcs	6.63E-06	2.90E-05	6.63E-06	2.90E-05	6.63E-06	2.90E-05
Trichloroethylene	79016	PSD Calcs	3.26E-05	1.43E-04	3.26E-05	1.43E-04	3.26E-05	1.43E-04
Vinyl Acetate	108054	PSD Calcs	2.14E-05	9.37E-05	2.14E-05	9.37E-05	2.14E-05	9.37E-05
Vinyl Chloride	75014	PSD Calcs	3.11E-06	1.36E-05	3.11E-06	1.36E-05	3.11E-06	1.36E-05
Vinylidene Chloride	75354	PSD Calcs	4.82E-06	2.11E-05	4.82E-06	2.11E-05	4.82E-06	2.11E-05
Xylenes	1330207	PSD Calcs	5.28E-06	2.31E-05	5.28E-06	2.31E-05	5.28E-06	2.31E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE					
TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Acetaldehyde	75070	PSD Calcs	7.90E-06	1.90E-04	6.92E-02
Ammonia	7664417	PSD Calcs	6.65E-05	1.60E-03	5.83E-01
Benzene	71432	PSD Calcs	1.94E-06	4.66E-05	1.70E-02
Carbon Disulfide	75150	PSD Calcs	7.57E-06	1.82E-04	6.63E-02
Carbon Tetrachloride	56235	PSD Calcs	3.82E-05	9.17E-04	3.35E-01
Chlorobenzene	108907	PSD Calcs	5.59E-06	1.34E-04	4.90E-02
Chloroform	67663	PSD Calcs	5.93E-06	1.42E-04	5.20E-02
1,2-Dichloroethane	107062	PSD Calcs	4.92E-06	1.18E-04	4.31E-02
Formaldehyde	50000	PSD Calcs	1.82E-06	4.37E-05	1.59E-02
Hydrogen Chloride	7647010	PSD Calcs	2.61E-05	6.26E-04	2.29E-01
Methyl Ethyl Ketone	78933	PSD Calcs	1.79E-04	4.30E-03	1.57E+00
Methyl Isobutyl Ketone	108101	PSD Calcs	2.49E-04	5.97E-03	2.18E+00
Methylene Chloride	75092	PSD Calcs	4.22E-06	1.01E-04	3.70E-02
Styrene	100425	PSD Calcs	5.18E-06	1.24E-04	4.53E-02
1,1,2,2- Tetrachloroethane	79345	PSD Calcs	8.34E-06	2.00E-04	7.31E-02
Tetrachloroethylene	127184	PSD Calcs	8.24E-06	1.98E-04	7.22E-02
Toluene	108883	PSD Calcs	2.29E-06	5.49E-05	2.01E-02
1,1,1-Trichloroethane	71556	PSD Calcs	6.63E-06	1.59E-04	5.81E-02
Trichloroethylene	79016	PSD Calcs	3.26E-05	7.84E-04	2.86E-01
Vinyl Chloride	75014	PSD Calcs	3.11E-06	7.45E-05	2.72E-02
Vinylidene Chloride	75354	PSD Calcs	4.82E-06	1.16E-04	4.22E-02
Xylenes	1330207	PSD Calcs	5.28E-06	1.27E-04	4.62E-02

*Expected actual emissions set equivalent to potential emissions after control due to project goal of improving runability.

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: Filter - 1 Lignin and Filter - 2 Lignin Filter	EMISSION SOURCE ID NO: ES-09-27.2100 and ES-09-27.3000
	CONTROL DEVICE ID NO(S): ES-09-27.3800 and ES-09-27.3900
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): ES-09-27.3800

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Lignin Filter Press 1 routed to two phase packed bed caustic scrubber and Lignin Filter Press 2 equipped with dust collection system.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Lignin	ODTL	4.40	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM C6

CONTROL DEVICE (GASEOUS ABSORBER)

C6

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAROLINA.

CONTROL DEVICE ID NO:	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):
EMISSION POINT ID NO(S):	POSITION IN SERIES OF CONTROLS: NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
______ OF ______	

DESCRIBE CONTROL SYSTEM:

A two-stage packed bed scrubber is used to treat the collected DNCG gas.
Solid components and dust are removed from the gas in the lower stage of the scrubber by a spray. TRS compounds are washed in the upper stage by circulating and spraying washing liquid on top of the packed bed. pH of the washing liquid is controlled by feeding sodium hydroxide (NaOH) to the circulation. On top of the scrubber there is a droplet separator to remove the droplets from the gas stream.

POLLUTANT(S) COLLECTED:	Hydrogen sulfide	Methyl merkaptan	DMS	DMDS
BEFORE CONTROL EMISSION RATE (LB/HR):	74.61	18		
CAPTURE EFFICIENCY:	100 %	100 %	0 %	0 %
CONTROL DEVICE EFFICIENCY:	95 %	75 %	%	%
CORRESPONDING EFFICIENCY:	95 %	75 %	%	%
EFFICIENCY DETERMINATION CODE:	2	2		
TOTAL EMISSION RATE (LB/HR):	3.7305	4.5		

PRESSURE DROP (IN. H_2O): 2 MIN 4 MAX	
INLET TEMPERATURE (°F): 111 MIN 131 MAX	OUTLET TEMPERATURE (°F): 100 MIN 131 MAX
INLET AIR FLOW RATE (ACFM): 14100	GAS VELOCITY (FT/SEC): 5.6
TOTAL GAS PRESSURE (PSIG): -0.44 (-3 kPag)	GAS DEW POINT (°F): 131

TYPE OF SYSTEM:			
PACKED COLUMN: X	TYPE OF PACKING: HIFLOW OR EQ.	COLUMN LENGTH (FT): 34.0	COLUMN DIAMETER (FT): 7.2
PLATE COLUMN	PLATE SPACING (INCHES):	COLUMN LENGTH (FT):	COLUMN DIAMETER (FT):

ADDITIVE LIQUID SCRUBBING MEDIUM: NaOH 10wt%	PERCENT RECIRCULATED: 100%	
MINIMUM LIQUID INJECTION RATE (GAL/MIN): 475	MAKE UP RATE (GAL/MIN): 4.2	FOR ADDITIVE (GAL/MIN):
pH RANGE: 10-14	METHOD pH MONITORING: Flow through type continuous DCS measurement	

DESCRIBE MAINTENANCE PROCEDURES:

MEASURES DURING SHUTDOWN

During the shutdown certain protective and inspection measures have to be carried out depending on the situation.

When planning and listing measures to be taken, pay attention to the following:

- Length of the shutdown
- Length of the operational period behind and measures taken during the previous shutdown
- Length of the uninterrupted operational period ahead
- Inspections by authorities required

NOTE! Before maintenance work inside the DNCG cooling scrubber, gas content measurement (H2S) must be done.

Inspections during shutdown

Reserve time particularly for testing of the NCG system safety interlocks. The safety interlocks must be fully tested before start-up.

Testing of the interlocks should be performed at the annual shutdowns. The Operation Manager records the results of the interlock tests performed and testing of the safety valves in a test report book. Alarm lists and trend pages during tests must also be printed out and saved in the same book.

After cleaning the DNCG cooling scrubber thoroughly perform visual inspection of the internal and external parts of the system.

The following lists the most important objects of inspection, which must be done, following the Operation Manager's instructions:

1. Inspection of ducts and fan

- Check the condition of the flow vanes in the ducts.
- Check the condition of the dampers and bellows in the ducts and fans.
- Check and test the operation of the dampers and inlet vanes. (Open-close test drive / make sure they can move freely).
- Test the rotation of the fans; make sure they can rotate freely.

2. Inspection of safety valves

- Check that the safety valves are clean and in good condition.
- Check that the drain pipe of the blow-down pipe is not plugged.

3. Inspection of the DNCG scrubber and auxiliary equipment

- Make sure the scrubber has been taken out of operation and that necessary check-up and safety measures have been carried out before the doors are opened.
- Check that there are no material defects, especially in the inlet duct.
- Check the condition and cleanness of the flow control plates, droplet separator elements, spraying nozzles and packed ped. Remove deposits if necessary.
- Check that the bottom of the scrubber is empty and clean it if necessary.
- Test the rotation of the circulation pumps; make sure they can rotate freely. Check the lubrication of the bearings.
- Check the tightness of all bellows, joints and valves.
- If necessary, clean the scrubber system for example with acid.

4. Lubrication

FORM C6

CONTROL DEVICE (GASEOUS ABSORBER)

DESCRIBE ANY FIRE DETECTION DEVICES AND ANY MEANS OF FIRE SUPPRESSION: No
DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC: Pressure measurements before and after the scrubber. Flow measurements for the scrubber circulations. Temperature measurements. pH measurement. Test ports before and after the scrubber. Pressure gauges at collection point to monitor vacuum.
ATTACH A DIAGRAM OF THE RELATIONSHIP OF CONTROL DEVICE TO ITS EMISSION SOURCE(S): See attached P&ID.
COMMENTS:

Attach Additional Sheets As Necessary

FORM D1 (Continued)

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **D1**

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
1,3-Butadiene	106-99-0	1.03E-01	>25	
Cadmium	7440-43-9	1.04E-02		
Carbon Disulfide	75-15-0	1.26E+00		
Carbon Tetrachloride	56-23-5	2.20E-01		
Chlorine	7782-50-5	8.39E-02		
Chlorobenzene	108-90-7	1.32E-01		
Chloroethane	75-00-3	4.58E-04		
Chloroform	67-66-3	2.75E+00		
Chromium	7440-47-3	4.12E-02		
Chromium VI	NSCR6-Other	7.53E-03		
Cobalt	7440-48-4	1.63E-03		
Cresols	1319-77-3	1.75E+01		
Cumene	98-82-8	1.18E+00		
1,1-Dichloroethane	75-34-3	4.71E-04		
1,2-Dichloroethane	107-06-2	1.33E-01		
Ethyl Benzene	100-41-4	1.86E+01		
Formaldehyde	50-00-0	9.64E+00		
Hexachlorodibenzo-p-dioxin (HCDD)	57653-85-7	7.25E+01		
n-Hexane	110-54-3	4.56E+00		
Hydrogen Chloride	7647-01-0	3.85E+01		
Hydrogen Fluoride	7664-39-3	2.45E-01		
Lead	7439-92-1	5.93E-02		
Manganese	7439-96-5	7.01E-01		
Mercury	7439-97-6	5.49E-03		
Methanol	67-56-1	2.65E+02		

HAPs continued next page

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?		
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No	
Refer to Part 1 application submitted March 27, 2017 for discussion of facility compliance demonstration per 15A NCAC 2Q .0700.							

COMMENTS: Expected actual emissions are based on 2016 AEI/AERO submission.

Attach Additional Sheets As Necessary

FORM D1 (Continued)

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **D1**

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
Bromomethane (Methyl Bromide)	74-83-9	1.26E-02	>25	
Methylene Chloride	75-09-2	1.41E+00		
Methyl Ethyl Ketone	78-93-3	5.12E+00		
Methyl Isobutyl Ketone	108-10-1	3.53E+00		
Naphthalene	91-20-3	4.83E-01		
Nickel	7440-02-0	4.08E-02		
Phenol	108-95-2	1.15E+01		
Phosphorus	7723-14-0	2.27E-01		
Propionaldehyde	123-38-6	6.23E+00		
1,2-Dichloropropane	78-87-5	2.74E-02		
Selenium	7782-49-2	2.58E-03		
Styrene	100-42-5	6.42E+00		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	1.75E-03		
1,1,2,2-Tetrachloroethane	79-34-5	8.66E-04		
Tetrachloroethylene	127-18-4	4.32E-01		
Toluene	108-88-3	5.15E-01		
1,2,4-Trichlorobenzene	120-82-1	7.59E-01		
1,1,1-Trichloroethane	71-55-6	1.46E-01		
1,1,2-Trichloroethane	79-00-5	9.23E-02		
Trichloroethylene	79-01-6	1.44E-01		
Vinyl Acetate	108-05-4	2.05E-03		
Vinyl Chloride	75-01-4	6.23E-02		
Vinylidene Chloride	75-35-4	1.50E-02		
Xylenes	1330-20-7	7.52E+00		

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Modeling Required ? Yes	Modeling Required ? No	
Refer to Part 1 application submitted March 27, 2017 for discussion of facility compliance demonstration per 15A NCAC 2Q .0700.							

COMMENTS: Expected actual emissions are based on 2016 AEI/AERO submission.

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **D4**

ACTIVITIES EXEMPTED PER 2Q .0102 OR INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES

DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. IES-09-27.2900 ~~Wash Water tank~~ Tank-Acid Wash Water	<5TPY Criteria, <1000 lb/yr HAP	SIZE OR PRODUCTION RATE
2. IES-09-27.3700 ~~Acid Sump Pit~~ Sump - Lignin Acid Area	<5TPY Criteria, <1000 lb/yr HAP	SIZE OR PRODUCTION RATE
3. IES-09-27.3400 ~~LRP Lignin Conveyor No. 3~~ Conveyor - #2 Lignin Filter Horizontal	<5TPY Criteria, <1000 lb/yr HAP	SIZE OR PRODUCTION RATE
4. IES-09-27.3600 ~~Alkaline Sump Pit~~ Sump - Lignin Liquor Area	<5TPY Criteria, <1000 lb/yr HAP	SIZE OR PRODUCTION RATE
5.		
6.		
7.		
8.		
9.		
10.		

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

D5

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9)** - SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY)** - PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED INFORMATION TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9)** - PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.

E **PROFESSIONAL ENGINEERING SEAL** - PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, Claire Galie Corta *attest that this application for* The LSRP Reconfiguration Project *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

Received
MAR 05 2019
Air Permits Section

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:	Claire Galie Corta
DATE:	2/26/19
COMPANY:	AECOM
ADDRESS:	1600 Perimeter Park Dr., Suite 400 Morrisville, NC 27560
TELEPHONE:	919-461-1494
SIGNATURE:	Claire Galie Corta
PAGES CERTIFIED:	C6 and C8

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE

NORTH CAROLINA PROFESSIONAL SEAL 043795 ENGINEER CLAIRE GALIE CORTA

Claire Galie Corta

Attach Additional Sheets As Necessary

FORM E1

TITLE V GENERAL INFORMATION

REVISED 06/01/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **E1**

IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL OTHER REQUIRED "E" FORMS (E2 THROUGH E5 AS APPLICABLE)

Indicate here if your facility is subject to Title V by: ☐ EMISSIONS ☑ OTHER

If subject to Title V by "OTHER", specify why: ☐ NSPS ☐ NESHAP (MACT) ☐ TITLE IV ☑ OTHER (specify) Listed Pulp and Paper Facility

If you are or will be subject to any maximum achievable control technology standards (MACT) issued pursuant to section 112(d) of the Clean Air Act, specify below:

EMISSION SOURCE ID	***EMISSION SOURCE DESCRIPTION***	***MACT***
No emission sources related		
to project are subject to 112(d)		other MACT standards apply - see permit.

List any additional regulation which are requested to be included in the shield and provide a detailed explanation as to why the shield should be granted:

REGULATION	***EMISSION SOURCE (Include ID)***	***EXPLANATION***

Comments:
No NC-5 Line sources are subject to MACT.

Attach Additional Sheets As Necessary

FORM E2

EMISSION SOURCE APPLICABLE REGULATION LISTING

EVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **E2**

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	OPERATING SCENARIO INDICATE PRIMARY (P) OR ALTERNATIVE (A)	POLLUTANT	APPLICABLE REGULATION
ES 1	*Coal/Wood Boiler*	*P - Coal*	*PM*	*NCAC 2D .0503*
		A - Wood	*PM*	*NCAC 2D .0504*
Various	Lignin Recovery Process Operations	P	TAP	NCAC 2D .1100 & 2Q .0700
Various	Lignin Recovery Process Operations	P	TRS/H2S	40 CFR Part 51/NCAC 2D .0530
Various	Lignin Recovery Process Operations	P	TRS/H2S	40 CFR Part 64

Attach Additional Sheets As Necessary

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

'EVISED 09/22/16 — **NCDEQ/Division Of Air Quality - Application for Air Permit to Construct/Operate** — **E3**

Emission Source ID NO. Various associated with Lignin Recovery Process Operations Routed to Proposed Scrubber	Regulated Pollutant: TRS/H2S Applicable Regulation: 40 CFR Part 51/NCAC 2D .0530
Alternative Operating Scenario (AOS) NO:	

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? ☑ YES ☐ NO

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? ☐ YES ☑ NO*

*CAM will apply to each lignin source with pre-controlled emissions greater than the major source threshold. A CAM plan will be submitted as part of the renewal application as required under 40 CFR Part 64.5(b) since post control emissions are less than 100 tpy for each PSEU.

Describe Monitoring Device Type: Continuous parameter monitoring system (pH and scrubber flow)

Describe Monitoring Location: Location to obtain representative readings

Other Monitoring Methods (Describe In Detail):

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

Continuous (at least once every 15 min)

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording: pH and Scrubber Liquid Flow rate

Frequency of recordkeeping (How often is data recorded?): 24 hr block average

REPORTING REQUIREMENTS

Generally describe what is being reported:

Instances of deviation from operating parameters including corrective action taken will be reported semi-annually.

*Note that the mill is considering installing dual pH probes to monitor pH to provide a redundant monitoring device in the event of primary pH probe failure or scaling, which could provide erroneous readings. In such an event, information from the malfunctioning meter will be discarded until corrective maintenance is completed.

Frequency: ☐ MONTHLY ☐ QUARTERLY ☑ EVERY 6 MONTHS ☐ OTHER (DESCRIBE):

TESTING

Specify proposed reference test method: As approved via test protocol.

Specify reference test method rule and citation: As approved via test protocol.

Specify testing frequency: One time

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

FORM E4

EMISSION SOURCE COMPLIANCE SCHEDULE

COMPLIANCE STATUS WITH RESPECT TO ALL APPLICABLE REQUIREMENTS

Will each emission source at your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements?

☑ YES ☐ NO **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

Will your facility be in compliance with all applicable requirements taking effect during the term of the permit and meet such requirements on a timely basis?

☑ YES ☐ NO **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

If this application is for a modification of existing emissions source(s), is each emission source currently in compliance with all applicable requirements?

☐ YES ☑ NO **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

A. Emission Source Description (Include ID NO.) Sources associated with the Lignin Solids Removal Process

B. Identify applicable requirement for which compliance is not achieved:

Domtar Paper Company and DAQ have negotiated a Special Order of Consent for a compliance violation associated with the LSRP. Domtar has adhered to the terms of the SOC agreement and anticipates the SOC will be closed by the time of permit issuance.

C. Narrative description of how compliance will be achieved with this applicable requirements:

See response to B above.

D. Detailed Schedule of Compliance:

Step(s)	Date Expected
See response to B above.	

E. Frequency for submittal of progress reports (6 month minimum):

F. Starting date of submittal of progress reports:

Attach Additional Sheets As Necessary

FORM E5

TITLE V COMPLIANCE CERTIFICATION (Required)

In accordance with the provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company official of:

Received
MAR 0 5 2019
Air Permits Section

SITE NAME: Domtar Paper Company

SITE ADDRESS: NC Highway 149 N., P.O. Box 747

CITY, NC : Plymouth, NC

COUNTY: Martin

PERMIT NUMBER : 04291T45

CERTIFIES THAT (Check the appropriate statement(s):

- ☐ The facility is in compliance with all applicable requirements
- ☐ In accordance with the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certifies that the proposed minor modification meets the criteria for using the procedures set out in 2Q .0515 and requests that these procedures be used to process the permit application.
- ☑ The facility is not currently in compliance with all applicable requirements
  If this box is checked, you must also complete Form E4 "Emission Source Compliance Schedule"

The undersigned certifies under the penalty of law, that all information and statements provided in the application, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

[signature]

Signature of responsible company official (REQUIRED, USE BLUE INK)

Date: 02/28/2019

Everick W. Spence, Mill Manager

Name, Title of responsible company official (Type or print)

Attach Additional Sheets As Necessary

Appendix B

Project Emissions Calculations

PSD Calculations

Table 1
Domtar Plymouth Pulp Mill
Lignin Modification Project
PSD Compound Emissions Increase Summary

	PSD Emissions, tpy											
	VOC	**PM**	**PM-10**	**PM-2.5**	**SO_2**	**NOx**	**CO**	**H_2S**	**TRS**	**H_2SO_4**	**Pb**	**CO_2e**
Baseline Actual Emissions (BAE)	118.99	400.16	264.50	207.38	97.35	1,416	5,430	12.65	16.26	7.72	5.68E-02	1,747,854
Could Have Accommodated (CHA) Emissions (for Modified & Affected Units)	122.41	440.83	303.93	236.25	99.56	1,587	5,641	12.65	16.26	7.79	7.67E-02	1,911,816
Potential to Emit (PTE) Emissions (for Modified & Affected Units)	140.26	452.80	317.79	246.04	189.44	1,644	5,644	29.57	43.49	7.72	8.53E-02	1,959,512
Project Emissions Increases	17.85	11.97	13.86	9.79	89.89	56.87	2.91	16.91	27.23	-0.07	0.01	47,696
PSD Significant Emission Rates	40	25	15	10	40	40	100	10	10	7	0.6	75,000
Is PSD review required?	**No**	**No**	**No**	**No**	Yes	Yes	**No**	Yes	Yes	**No**	**No**	**No**

Table 2
Domtar Plymouth Pulp Mill
Lignin Modification Project
Production Summary

Production Parameter	UOM	Baseline Production	Accommodated Production	Potential Production[2]	Notes
Lignin Solids Production	ODT/yr	9,138	9,138	38,581	Potential production is the capacity of the Lignin Plant.
Lignin Hours of Operation	hr/yr	5,317	5,317	8,760	Maximum hours are based on an operating time of 24 hours a day, 7 days a week, and 365 days per year.
Blended Hog Fuel (HFB2)	dry tons/year	219,520	302,807	338,830	Fuel use from January 2017 was annualized to estimate production that could have been accommodated during the baseline. The incremental increase in fuel use required to run the lignin plant at capacity was applied to the accommodated production.
Natural Gas (HFB2)[2]	MMscf/yr	228	228	228	Fuel use from January 2017 was annualized to estimate production that could have been accommodated during the baseline. CHA was less than the baseline so CHA=Baseline. No increase in gas usage projected.
Lignin to Bark Pile (HFB2)	BDT/yr	9,157	9,157	38,581	Lignin is produced as a valuable commodity. However, calculation conservatively assumes 100% of lignin produced is burned.
Black Liquor Solids (RF)	TBLS/yr	1,005,939	1,005,939	987,492	Assumes a reduction of 51 TBLS/day. Accommodated is set equal to baseline.
No. 2 Fuel Oil (RF)	gal/yr	1,134,046	1,134,046	1,134,046	No increase on No. 2 Fuel Oil, accommodated and potential are set equal to baseline.

1. The project involves several tank replacements in the lignin area, therefore the emissions calculations set accommodated production equal to baseline production for the lignin sources as the replacement tanks will be considered new.

2. Note that Projected Actual emissions are described as potential production in table two for the affected sources since the incremental increase in fuel use and decrease in black liquor solids processed is based on the potential incremental increase in lignin solids production.

3. Natural Gas Heat Value: 1057 BTU/scf (based on the average of 2016-2017 fuel data)

Table 3
Domtar Plymouth Pulp Mill
Lignin Modification Project
Baseline Actual Emissions Summary

Lignin Modification Project	PM	PM-10	PM-2.5	VOC	SO_2	NOx	CO	TRS	H_2S	H_2SO_4	Lead	CO_2e
	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
BASELINE ACTUAL EMISSIONS												
No. 2 Hog Fuel Boiler (ES-65-25.0310)	106.64	103.33	81.10	9.24	5.88	479.39	594.48			2.12E-01	5.60E-02	460,357
No. 2 Hog Fuel Conveying (FS-007)	2.20	2.20										
Hogged Fuel Storage Pile at Boilers (FS-011)	1.20E-02	5.66E-03	8.57E-04									
No. 2 HF Ash Transport Steam Exhauster (ES-65-50.0160)	1.02	0.99										
No. 2 HF Ash Silo (ES-65-50.0190)	1.02	0.99										
No. 2 HF Boiler De-Entrainment Vessels (ES-65-60.0150, .0430, .0630)	3.20	3.10										
No. 2 HF Scrubber Ash Silo (ES-65-60.0860)	3.17E-02	3.07E-02										
No. 5 Recovery Boiler (ES-10-25.0110)	264.62	132.79	107.16	58.23	7.16	919	4,834	2.67	1.80	7.51	8.31E-04	1,287,453
Salt Cake Mix Tank (ES-10-08.0010)				7.07E-01			1.48E-02					
No. 5 Precipitator Mix Tank (ES-10-45.0450)				7.84E-01				5.49E-02				
North & South Smelt Tanks (ES-14-05.0050, .0300)	20.95	20.61	18.66	48.68	5.90	18.01	1.18	4.32	2.53			
Lignin Feed Liquor Tank (ES-09-27.1000)				8.99E-01								
Feed Liquor Cooler 1 (ES-09-27.1100)				9.73E-03								
Feed Liquor Carbonator (ES-09-27.1400)				9.73E-03								
Dilute Process Tanks Controlled by White Liquor Scrubber (ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, and ES-09-27.3200)				1.66E-04			8.59E-04					
Acidification Process Tanks (ES-09-27.2700 and ES-09-27.2800)				1.64E-01				9.2	8.3			
Lignin Filter Cloth Wash Tank 2 Controlled by Caustic Scrubber (ES-09-27.3100)				1.19E-03			1.23E-04					
Lignin Filter Conveyor 1 (ES-09-27.2610 and ES-09-27.2620)				4.75E-05			2.45E-04					
Lignin Filters 1 and 2 (ES-09-27.2100 and ES-09-27.3000)				2.37E-03			2.45E-04					
Lignin Handling	4.59E-01	4.58E-01	4.57E-01									
HVLC Combustion				2.48E-01	78							44.1
Fugitives				5.39E-03								
Caustic Scrubber												
Total	**400**	**265**	**207**	**119**	**97**	**1,416**	**5,430**	**16**	**13**	**8**	**5.68E-02**	**1,747,854**

Table 4
Domtar Plymouth Pulp Mill
Lignin Modification Project
Could Have Accommodated Emissions Summary

Lignin Modification Project	PM	PM-10	PM-2.5	VOC	SO_2	NOx	CO	TRS	H_2S	H_2SO_4	Lead	CO_2e
	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
COULD HAVE ACCOMMODATED EMISSIONS												
No. 2 Hog Fuel Boiler (ES-65-25.0310)	144.60	140.11	109.97	12.67	8.09	650.02	806.06			2.83E-01	7.59E-02	624,319
No. 2 Hog Fuel Conveying (FS-007)	3.03	3.03										
Hogged Fuel Storage Pile at Boilers (FS-011)	1.65E-02	7.81E-03	1.18E-03									
No. 2 HF Ash Transport Steam Exhauster (ES-65-50.0160)	1.39	1.35										
No. 2 HF Ash Silo (ES-65-50.0190)	1.39	1.35										
No. 2 HF Boiler De-Entrainment Vessels (ES-65-60.0150, .0430, .0630)	4.34	4.20										
No. 2 HF Scrubber Ash Silo (ES-65-60.0860)	4.29E-02	4.16E-02										
No. 5 Recovery Boiler (ES-10-25.0110)	264.62	132.79	107.16	58.23	7.16	919	4,834	2.67	1.80	7.51	8.31E-04	1,287,453
Salt Cake Mix Tank (ES-10-08.0010)				7.07E-01			1.48E-02					
No. 5 Precipitator Mix Tank (ES-10-45.0450)				7.84E-01				5.49E-02				
North & South Smelt Tanks (ES-14-05.0050, .0300)	20.95	20.61	18.66	48.68	5.90	18.01	1.18	4.32	2.53			
Lignin Feed Liquor Tank (ES-09-27.1000)				0.90								
Feed Liquor Cooler 1 (ES-09-27.1100)				9.73E-03								
Feed Liquor Carbonator (ES-09-27.1400)				9.73E-03								
Dilute Process Tanks Controlled by White Liquor Scrubber (ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, and ES-09-27.3200)				1.66E-04			8.59E-04					
Acidification Process Tanks (ES-09-27.2700 and ES-09-27.2800)				1.64E-01				9.2	8.3			
Lignin Filter Cloth Wash Tank 2 Controlled by Caustic Scrubber (ES-09-27.3100)				1.19E-03			1.23E-04					
Lignin Filter Conveyor 1 (ES-09-27.2610 and ES-09-27.2620)				4.75E-05			2.45E-04					
Lignin Filters 1 and 2 (ES-09-27.2100 and ES-09-27.3000)				2.37E-03			2.45E-04					
Lignin Handling	4.60E-01	4.58E-01	4.57E-01									
HVLC Combustion				2.48E-01	78							44.1
Fugitives				5.39E-03								
Caustic Scrubber												
Total	**441**	**304**	**236**	**122**	**100**	**1,587**	**5,641**	**16**	**13**	**8**	**7.67E-02**	**1,911,816**

Table 5
Domtar Plymouth Pulp Mill
Lignin Modification Project
Potential Emissions Summary

Lignin Modification Project	PM	PM-10	PM-2.5	VOC	SO_2	NOx	CO	TRS	H_2S	H_2SO_4	Lead	CO_2e
	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
POTENTIAL EMISSIONS												
No. 2 Hog Fuel Boiler (ES-65-25.0310)	161.02	156.01	122.46	14.15	9.05	723.82	897.57			3.49E-01	8.45E-02	695,236
No. 2 Hog Fuel Conveying (FS-007)	3.39	3.39										
Hogged Fuel Storage Pile at Boilers (FS-011)	1.85E-02	8.74E-03	1.32E-03									
No. 2 HF Ash Transport Steam Exhauster (ES-65-50.0160)	1.55	1.50										
No. 2 HF Ash Silo (ES-65-50.0190)	1.55	1.50										
No. 2 HF Boiler De-Entrainment Vessels (ES-65-60.0150, .0430, .0630)	4.83	4.68										
No. 2 HF Scrubber Ash Silo (ES-65-60.0860)	4.78E-02	4.63E-02										
No. 5 Recovery Boiler (ES-10-25.0110)	259.77	130.35	105.19	57.17	7.04	902	4,745	2.63	1.77	7.37	8.16E-04	1,264,076
Salt Cake Mix Tank (ES-10-08.0010)				6.94E-01			1.45E-02					
No. 5 Precipitator Mix Tank (ES-10-45.0450)				7.70E-01				5.39E-02				
North & South Smelt Tanks (ES-14-05.0050, .0300)	20.56	20.23	18.32	47.79	5.80	17.68	1.16	4.24	2.49			
Lignin Feed Liquor Tank (ES-09-27.1000)				1.48				6.34E-01	2.14E-01			
Feed Liquor Cooler 1 (ES-09-27.1100)				8.01E-01								
Feed Liquor Carbonator (ES-09-27.1400)				1.60E-02								
Dilute Process Tanks Controlled by White Liquor Scrubber (ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, and ES-09-27.3200)				3.51E-02			3.63E-03					
Acidification Process Tanks (ES-09-27.2700 and ES-09-27.2800)				6.92E-01								
Lignin Filter Cloth Wash Tank 2 Controlled by Caustic Scrubber (ES-09-27.3100)				5.01E-03			5.18E-04					
Lignin Filter Conveyor 1 (ES-09-27.2610 and ES-09-27.2620)				1.00E-02			1.04E-03					
Lignin Filters 1 and 2 (ES-09-27.2100 and ES-09-27.3000)				1.00E-02			1.04E-03					
Lignin Handling	0.08	0.08	0.07									
HVLC Combustion				1.40	168			2.68	2.20			200
Fugitives				8.88E-03				1.67	1.66			
Caustic Scrubber (Includes controlled sources above)				15.2				31.6	21.2			
Total	**453**	**318**	**246**	**140**	**189**	**1,644**	**5,644**	**43.49**	**29.57**	**8**	**8.53E-02**	**1,959,512**

Table 6
Domtar Plymouth Pulp Mill
Lignin Modification Project
Pre-Project HVLC Combustion

Baseline Hours of Operation: 5,317
Accommodated Hours of Operation: 5,317

Compound	VOC?	Molar Weight	Uncontrolled Emission Rate	Uncontrolled Baseline Emissions		Uncontrolled Accommodated Emissions		HFB Control Efficiency	Conversion to CO_2	Controlled Baseline Emissions		Controlled Accommodated Emissions	
		(lb/lb-mole)	lb/hr	(tpy as C)	(tpy)	(tpy as C)	(tpy)	(%)	(%)	(tpy as C)	(tpy)	(tpy as C)	(tpy)
TRS Emissions from HVLC System[1]													
H_2S	No	34.1	22.7	—	60.3	—	60.3	98%	—	—	1.21	—	1.21
MeSH	Yes	48.1	1.64E-01	1.09E-01	4.36E-01	1.09E-01	4.36E-01	98%	—	2.17E-03	8.72E-03	2.17E-03	8.72E-03
DMS	Yes	62.1	8.99E-02	9.23E-02	2.39E-01	9.23E-02	2.39E-01	98%	—	1.85E-03	4.78E-03	1.85E-03	4.78E-03
DMDS	Yes	94.2	0.97	0.65	2.6	0.65	2.6	98%	—	1.31E-02	5.13E-02	1.31E-02	5.13E-02
TRS (as H2S)	—	—	23.6	—	62.6	—	62.6	—	—	—	**1.25**	—	**1.25**
Emissions from TRS Combustion													
VOC from TRS Combustion	—	—	—	—	—	—	—	—	—	1.71E-02	6.48E-02	1.71E-02	6.48E-02
SO2 from TRS Combustion	—	64.0	—	—	—	—	—	32%	—	—	78.4	—	78.4
CO2 from TRS Combustion	—	44.0	—	—	—	—	—	—	98%	0.84	3.07	—	3.07
SO_2 Emissions from HVLC System[2]													
Carbon Disulfide	Yes	76.1	—	2.03E-03	1.29E-02	2.03E-03	1.29E-02	98%	—	4.07E-05	2.58E-04	4.07E-05	2.58E-04
SO_2 from CS2 Combustion	—	64.0	—	—	—	—	—	32%	—	—	1.45E-02	—	1.45E-02
SO_2 from TRS Combustion	—	64.0	—	—	—	—	—	32%	—	—	78.4	—	78.4
Total SO_2	—	—	—	—	—	—	—	—	—	—	**78.4**	—	**78.4**
CO_2 Emissions from HVLC System[2]													
VOC as C	—	—	—	11.4	—	11.4	—	—	—	2.28E-01	—	2.28E-01	—
CO_2 (from VOC combustion)	—	44.0	—	—	—	—	—	—	98%	—	41.0	—	41.0
CO_2 (from TRS combustion)	—	44.0	—	—	—	—	—	—	98%	—	3.07E+00	—	3.07E+00
Total CO_2	—	—	—	—	—	—	—	—	—	—	**44.12**	—	**44.12**
VOC Emissions from HVLC System													
VOC (speciated)	—	44.0	—			—	—	—	—	—	1.84E-01	—	1.84E-01
VOC from TRS Combustion	—	—	—			—	—	—	—	1.71E-02	6.48E-02	1.71E-02	6.48E-02
Total VOC	—	44.0	—			—	—	—	—	—	**2.48E-01**	—	**2.48E-01**

Notes:
1. Uncontrolled emission rates for TRS compounds are from the 2016 test program conducted for the 2016 Lignin Air Permit Application. Note the 50% safety factor was removed from the baseline factors.
2. Carbon Disulfide and VOC as C baseline and accommodated controlled emissions are the sum of emissions from the following sources: Feed Liquor Cooler, Feed Liquor Carbonator, Lignin Slurry Conditioning Tank, Lignin Slurry Buffer Tank, Lignin Filter Cloth Wash Tank, and the Lignin Filter Filtrate Tanks and Conveyors.

Table 7
Domtar Plymouth Pulp Mill
Lignin Modification Project
Post-Project HVLC Combustion

Potential Hours of Operation: 8,760

Compound	VOC?	Molar Weight (lb/lb-mole)	Total Volumetric Flow (dscfm)	Conc. (ppmvd)	Uncontrolled Potential Emissions (tpy as C)	Uncontrolled Potential Emissions (tpy)	HFB Control Efficiency (%)	Conversion to CO_2 (%)	Controlled Potential Emissions (tpy as C)	Controlled Potential Emissions (tpy)
TRS Emissions from HVLC System[1]										
H_2S	No	34.1	735	6,446	---	110	98%	---	---	2.20
MeSH	Yes	48.1	735	1,053	6	25	98%	---	0.13	0.51
DMS	Yes	62.1	735	188	2	6	98%	---	0.05	0.12
DMDS	Yes	94.2	735	75	1	4	98%	---	0.02	0.07
TRS (as H2S)	---	---	---	---	---		---	---	0.19	**2.68**
TRS as Compounds	---	---	---	---	---		---	---	---	**2.90**
Emissions from TRS Combustion										
VOC from TRS Combustion	---	---	---	---	---	---	---	---	0.19	0.70
SO2 from TRS Combustion	---	64.0	---	---	---	---	32%	---	---	167.5
CO2 from TRS Combustion	---	44.0	---	---	---	---	---	98%	---	34.11
SO_2 Emissions from HVLC System[2]										
Carbon Disulfide	Yes	76.1	---	---	2.90E-03	1.84E-02	98%	---	5.79E-05	3.67E-04
SO_2 from CS2 Combustion	---	64.0	---	---	---	---	32%	---	---	2.06E-02
SO_2 from TRS Combustion	---	64.0	---	---	---	---	32%	---	---	167.5
Total SO_2	---	---	---	---	---	---	---	---	---	**167.6**
CO_2 Emissions from HVLC System[2]										
VOC as C	---	---	---	---	46.1	---	---	---	0.92	---
CO_2 (from VOC combustion)	---	44.0	---	---	---	---	---	98%	---	165.83
CO_2 (from TRS combustion)	---	44.0	---	---	---	---	---	98%	---	34.11
Total CO_2	---	---	---	---	---	---	---	---	---	**199.94**
VOC Emissions from HVLC System										
VOC (speciated)	---	44.0	---	---	---	---	---	---	---	0.71
VOC from TRS Combustion	---	---	---	---	---	---	---	---	0.19	0.70
Total VOC	---	44.0	---	---	---	---	---	---	---	**1.40**

Notes:

1. Flow rates and concentrations are provided by the vendor and represent worst case TRS content. Emission rates include a 50% safety margin to account for variability due to process fluctuations and temporal conditions that can impact emission levels.

2. Carbon Disulfide and VOC as C "post-project controlled" emissions are a sum of the potential emissions from the Feed Liquor Carbonator and Acidification Process Tanks.

Table 8
Domtar Plymouth Pulp Mill
Lignin Modification Project
Post-Project Caustic Scrubber Stack Emissions

Potential Hours of Operation: 8,760

Emissions from Caustic Scrubber[1]					
Compound	**VOC?**	**Molar Weight (lb/lb-mole)**	**Total Volumetric Flow (dscfm)**	**Conc. (ppmvd)**	**Controlled Emissions (tpy)**
Total VOC Compounds	---	---	---	---	15.2
TRS (as H2S)	---	---	---	---	31.6
TRS as Compounds					36.5
H_2S from Scrubber	No	34.1	14,853	62	21.2
MeSH from Scrubber	Yes	48.1	14,853	23	11.0
DMS from Scrubber	Yes	62.1	14,853	5	2.8
DMDS from Scrubber	Yes	94.2	14,853	2	1.4

Notes:
1. Flow rates and concentrations are provided by the vendor and represent worst case TRS content and include a 50% safety margin.

Table 9
Domtar Plymouth Pulp Mill
Lignin Modification Project
Pre-Project Fugitive Emissions from Drain Loop and No. 1 Filtrate Sump Enclosure

Pollutant	Drain Loop	Filtrate Sump	Total Emission Factor (lb/hr)	Emissions	
	Emission Factor (lb/hr)[1]			Baseline Actual tpy	Accommodated tpy
VOC[3] (speciated)	1.03E-03	1.68E-03	4.06E-03	5.39E-03	5.39E-03
TRS as H2S	1.78E-02	6.53E-02	1.25E-01	1.66E-01	1.66E-01
Dimethyl Disulfide	1.64E-04	2.65E-04	6.44E-04	8.55E-04	8.55E-04
Dimethyl Sulfide	1.80E-04	2.92E-04	7.08E-04	9.41E-04	9.41E-04
H2S	1.71E-02	6.42E-02	1.22E-01	1.62E-01	1.62E-01
Methyl Mercaptan	6.83E-04	1.12E-03	2.70E-03	3.59E-03	3.59E-03

Basis:[2]

	Baseline Actual	Accommodated
Annual Hours of Operation	2,658	2,658

1. Emission factors are the sum of the Drain Loop and Filtrate Sump emission rates from 2016 test data.
2. Fugitives are assumed to be 50% of lignin run time.
3. VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.

Table 10
Domtar Plymouth Pulp Mill
Lignin Modification Project
Post-Project Fugitive Emissions

Potential Hours of Operation[1]: 4,380
Potential Hours of Operation #2 Lignin Filter Press: 8,760

Emissions from #2 Lignin Filter Press Building Fugitives[2]					
Compound	**VOC?**	**Molar Weight (lb/lb-mole)**	**Total Volumetric Flow (dscfm)**	**Conc. (ppmvd)**	**Uncontrolled Emissions (tpy)**
Total TRS Compounds	---	---	---	---	1.4
H_2S from Building Fugitives	No	34.1	8,000	8	1.4
Emissions from Fugitives: LSRP LVHC Drain Loop and No. 1 Filtrate Sump					
Compound	**VOC?**	**Molar Weight (lb/lb-mole)**	**Uncontrolled Emission Rates[3] (lb/hr)**	**Uncontrolled Emissions (tpy as C)**	**Uncontrolled Emissions (tpy)**
Total VOC Compounds	---	---	---	2.44E-03	8.88E-03
TRS as H2S	---	---	---	2.44E-03	2.73E-01
H_2S	No	34.1	1.22E-01	---	2.67E-01
DMS	Yes	62.1	7.08E-04	5.99E-04	1.55E-03
DMDS	Yes	94.2	6.44E-04	3.59E-04	1.41E-03
MeSH	Yes	48.1	2.70E-03	1.48E-03	5.92E-03

Notes:

1. Fugitives are assumed to be 50% of lignin run time. Fugitives from the LSRP LVHC Drain Loop and No. 1 Filtrate Sump
2. Flow rate and concentration are provided by the vendor and represent worst case TRS content.
3. Emission factors are the sum of the Drain Loop and Filtrate Sump emission rates from 2016 test data.

Table 11
Domtar Plymouth Pulp Mill
Lignin Modification Project
Lignin Solids Reduction Plant PSD Tracking

Historical Facility Wide LSRP Emissions		
Month	TRS (lb/month)	H_2S (lb/month)
April 2016	2,167	2,001
May 2016	1,499	1,380
June 2016	1,528	1,416
July 2016	858	797
August 2016	1,484	1,372
September 2016	1,892	1,742
October 2016	2,085	1,900
November 2016	1,413	1,293
December 2016	1,638	1,482
Januray 2017	1,406	1,284
February 2017	846	769
March 2017	759	697
April 2017	148	139
May 2017	2,116	1,911
June 2017	2,461	2,191
July 2017	815	726
August 2017	1,947	1,752
September 2017	457	408
October 2017	1,762	1,602
November 2017	1,939	1,719
December 2017	2,059	1,746
January 2018	1194	1073
February 2018	2253	1997
March 2018	2117	1877
Baseline (TPY)	**9.21**	**8.32**

Notes: TRS and H2S are calculated on a monthly basis and submitted to NCDAQ on a semi-annual basis using NCDAQ approved emission factors per SOC 2015 - 01.

Table 12
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from the Lignin Feed Liquor Tank (ES-09-27.1000)
Including TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/hr	Pre and Post Project Control by: Uncontrolled	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
VOC[3] (speciated)	---	3.38E-01	0%	8.99E-01	8.99E-01	1.48E+00
VOC (as carbon)	---	1.13E-01	0%	3.00E-01	3.00E-01	1.48E+00
TRS as H_2S[4]	---	1.45E-01	0%	3.85E-01	3.85E-01	6.34E-01
TRS Compound Total	---	2.04E-01	0%	5.43E-01	5.43E-01	8.95E-01
Acetaldehyde	H, T, V	2.02E-02	0%	5.37E-02	5.37E-02	8.85E-02
Acrolein	H, T, V	1.79E-05	0%	4.76E-05	4.76E-05	7.84E-05
Benzene	H, T, V	9.00E-06	0%	2.39E-05	2.39E-05	3.94E-05
1,3-Butadiene	H, T, V	3.57E-05	0%	9.49E-05	9.49E-05	1.56E-04
Carbon Disulfide	H, T, V	1.99E-03	0%	5.29E-03	5.29E-03	8.72E-03
Carbon Tetrachloride	H, T, V	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00
3-Carene	V	1.92E-05	0%	5.10E-05	5.10E-05	8.41E-05
Chlorobenzene	H, T, V	7.00E-07	0%	1.86E-06	1.86E-06	3.07E-06
Chloroform	H, T, V	8.00E-06	0%	2.13E-05	2.13E-05	3.50E-05
Crotonaldehyde	V	2.80E-04	0%	7.44E-04	7.44E-04	1.23E-03
Cumene	H, V	8.19E-06	0%	2.18E-05	2.18E-05	3.59E-05
p-Cymene	Terpene	1.59E-05	0%	4.23E-05	4.23E-05	6.96E-05
1,2-Dichloroethane	H, T, V	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethylene	V	1.10E-06	0%	2.92E-06	2.92E-06	4.82E-06
Dimethyl Disulfide	V	6.08E-02	0%	1.62E-01	1.62E-01	2.66E-01
Dimethyl Sulfide	V	9.45E-02	0%	2.51E-01	2.51E-01	4.14E-01
Ethanol	V	1.30E-02	0%	3.46E-02	3.46E-02	5.69E-02
Ethyl Benzene	H, V	1.20E-06	0%	3.19E-06	3.19E-06	5.26E-06
Formaldehyde	H, T, V	5.00E-04	0%	1.33E-03	1.33E-03	2.19E-03
Hexane-n	H, T, V	3.97E-05	0%	1.06E-04	1.06E-04	1.74E-04
H_2S	T	4.89E-02	0%	1.30E-01	1.30E-01	2.14E-01
Limonene	Terpene	2.35E-05	0%	6.25E-05	6.25E-05	1.03E-04
Methanol	H, V	1.30E-01	0%	3.46E-01	3.46E-01	5.69E-01
Methyl Ethyl Ketone	T, V	1.10E-02	0%	2.92E-02	2.92E-02	4.82E-02
Methyl Isobutyl Ketone	H, T, V	8.57E-04	0%	2.28E-03	2.28E-03	3.75E-03
Methylene Chloride	H, T	3.69E-05	0%	9.81E-05	9.81E-05	1.62E-04
Methyl Mercaptan[5]	T, V	1.00E-04	0%	2.66E-04	2.66E-04	4.38E-04
Phenol	H, T, V	1.01E-03	0%	2.68E-03	2.68E-03	4.42E-03
alpha-Pinene	Terpene	9.72E-05	0%	2.58E-04	2.58E-04	4.26E-04
beta-Pinene	Terpene	2.78E-05	0%	7.39E-05	7.39E-05	1.22E-04
Propionaldehyde	H, V	2.30E-03	0%	6.11E-03	6.11E-03	1.01E-02
Styrene	H, T, V	1.40E-04	0%	3.72E-04	3.72E-04	6.13E-04
Terpenes	V	1.64E-04	0%	4.37E-04	4.37E-04	7.20E-04
Tetrachloroethylene	H, T	1.24E-05	0%	3.30E-05	3.30E-05	5.43E-05
1,1,1-Trichloroethane	H, T	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	H, V	2.59E-04	0%	6.88E-04	6.88E-04	1.13E-03
1,2,4-Trichlorobenzene	H, V	3.50E-05	0%	9.30E-05	9.30E-05	1.53E-04
Toluene	H, T, V	9.28E-04	0%	2.47E-03	2.47E-03	4.06E-03
Trichloroethylene	H, T, V	3.42E-05	0%	9.09E-05	9.09E-05	1.50E-04
Xylenes	H, T, V	1.01E-04	0%	2.67E-04	2.67E-04	4.40E-04
Xylene, m-,p-	Xylenes	3.00E-05	0%	7.97E-05	7.97E-05	1.31E-04
o-Xylene	Xylenes	7.05E-05	0%	1.87E-04	1.87E-04	3.09E-04

Basis:

	Baseline Actual	Accommodated	Potential
Annual Hours of Operation	5,317	5,317	8,760

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
4) Conversions to TRS as H2S:
TRS (as H2S) EF = H2S EF+ MMC EF*(MW H2S/MW MMC) + DMS EF*(MW H2S/MW DMS) + DMDS*(MW H2S/MW DMDS)* (2 mol S in DMDS/1 mol S in H2S)
MW H2S =34; MW MMC= 48; MW DMS =62; DMDS=94
5) MMC from NCASI Technical Bulletin No. 849, August 2002, Table A-11, Unit Code SBLTY1 – Mill Y 50% Black Liq. Storage Tank Vent. The selected factor is most representative of the mill HBL tank emissions based on the site specific test data collected in 1999 on the south weak black liquor storage tank that showed MMC was ND.

Table 13
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from Feed Liquor Cooler 1 (ES-09-27.1100)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/hr	Pre Project Control by: HVLC System	Post Project Control by: Scrubber	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
VOC[3] (speciated)	---	1.83E-01	98%	0%	9.73E-03	9.73E-03	8.01E-01
VOC (as carbon)	---	1.13E-01	98%	0%	6.01E-03	6.01E-03	4.95E-01
Acetaldehyde	H, T, V	2.02E-02	98%	0%	1.07E-03	1.07E-03	8.85E-02
Acrolein	H, T, V	1.79E-05	98%	0%	9.52E-07	9.52E-07	7.84E-05
Benzene	H, T, V	9.00E-06	98%	0%	4.78E-07	4.78E-07	3.94E-05
1,3-Butadiene	H, T, V	3.57E-05	98%	0%	1.90E-06	1.90E-06	1.56E-04
Carbon Disulfide	H, T, V	1.99E-03	98%	0%	1.06E-04	1.06E-04	8.72E-03
Carbon Tetrachloride	H, T, V	0.00E+00	98%	0%	0.00E+00	0.00E+00	0.00E+00
3-Carene	V	1.92E-05	98%	0%	1.02E-06	1.02E-06	8.41E-05
Chlorobenzene	H, T, V	7.00E-07	98%	0%	3.72E-08	3.72E-08	3.07E-06
Chloroform	H, T, V	5.44E-05	98%	0%	2.89E-06	2.89E-06	2.38E-04
Crotonaldehyde	V	2.80E-04	98%	0%	1.49E-05	1.49E-05	1.23E-03
Cumene	H, V	8.19E-06	98%	0%	4.35E-07	4.35E-07	3.59E-05
p-Cymene	Terpene	1.59E-05	98%	0%	8.45E-07	8.45E-07	6.96E-05
1,2-Dichloroethane	H, T, V	0.00E+00	98%	0%	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethylene	V	1.10E-06	98%	0%	5.85E-08	5.85E-08	4.82E-06
Ethanol	V	1.30E-02	98%	0%	6.91E-04	6.91E-04	5.69E-02
Ethyl Benzene	H, V	1.20E-06	98%	0%	6.38E-08	6.38E-08	5.26E-06
Formaldehyde	H, T, V	5.00E-04	98%	0%	2.66E-05	2.66E-05	2.19E-03
Hexane-n	H, T, V	3.97E-05	98%	0%	2.11E-06	2.11E-06	1.74E-04
Limonene	Terpene	2.35E-05	98%	0%	1.25E-06	1.25E-06	1.03E-04
Methanol	H, V	1.30E-01	98%	0%	6.91E-03	6.91E-03	5.69E-01
Methyl Ethyl Ketone	T, V	1.10E-02	98%	0%	5.85E-04	5.85E-04	4.82E-02
Methyl Isobutyl Ketone	H, T, V	8.57E-04	98%	0%	4.56E-05	4.56E-05	3.75E-03
Methylene Chloride	H, T	3.69E-05	98%	0%	1.96E-06	1.96E-06	1.62E-04
Phenol	H, T, V	1.01E-03	98%	0%	5.37E-05	5.37E-05	4.42E-03
alpha-Pinene	Terpene	9.72E-05	98%	0%	5.17E-06	5.17E-06	4.26E-04
beta-Pinene	Terpene	2.78E-05	98%	0%	1.48E-06	1.48E-06	1.22E-04
Propionaldehyde	H, V	2.30E-03	98%	0%	1.22E-04	1.22E-04	1.01E-02
Styrene	H, T, V	1.40E-04	98%	0%	7.44E-06	7.44E-06	6.13E-04
Terpenes	V	1.64E-04	98%	0%	8.74E-06	8.74E-06	7.20E-04
Tetrachloroethylene	H, T	1.24E-05	0%	0%	3.30E-05	3.30E-05	5.43E-05
1,1,1-Trichloroethane	H, T	0.00E+00	0%	0%	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	H, V	2.59E-04	98%	0%	1.38E-05	1.38E-05	1.13E-03
1,2,4-Trichlorobenzene	H, V	3.50E-05	98%	0%	1.86E-06	1.86E-06	1.53E-04
Toluene	H, T, V	9.28E-04	98%	0%	4.93E-05	4.93E-05	4.06E-03
Trichloroethylene	H, T, V	3.42E-05	98%	0%	1.82E-06	1.82E-06	1.50E-04
Xylenes	H, T, V	1.01E-04	98%	0%	5.34E-06	5.34E-06	4.40E-04
Xylene, m-,p-	Xylenes	3.00E-05	98%	0%	1.59E-06	1.59E-06	1.31E-04
o-Xylene	Xylenes	7.05E-05	98%	0%	3.75E-06	3.75E-06	3.09E-04

Basis:

	Baseline Actual	Accommodated	Potential
Annual Hours of Operation	5,317	5,317	8,760

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.

Table 14
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from the Feed Liquor Carbonator (ES-09-27.1400)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/hr	Pre and Post Project Control by: HVLC System	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
VOC[3] (speciated)	---	1.83E-01	98%	9.73E-03	9.73E-03	1.60E-02
VOC[4] (as carbon)	---	1.13E-01	98%	6.01E-03	6.01E-03	9.90E-03
Acetaldehyde	H, T, V	2.02E-02	98%	1.07E-03	1.07E-03	1.77E-03
Acrolein	H, T, V	1.79E-05	98%	9.52E-07	9.52E-07	1.57E-06
Benzene	H, T, V	9.00E-06	98%	4.78E-07	4.78E-07	7.88E-07
1,3-Butadiene	H, T, V	3.57E-05	98%	1.90E-06	1.90E-06	3.13E-06
Carbon Disulfide	H, T, V	1.99E-03	98%	1.06E-04	1.06E-04	1.74E-04
Carbon Tetrachloride	H, T, V	0.00E+00	98%	0.00E+00	0.00E+00	0.00E+00
3-Carene	V	1.92E-05	98%	1.02E-06	1.02E-06	1.68E-06
Chlorobenzene	H, T, V	7.00E-07	98%	3.72E-08	3.72E-08	6.13E-08
Chloroform	H, T, V	5.44E-05	98%	2.89E-06	2.89E-06	4.77E-06
Crotonaldehyde	V	2.80E-04	98%	1.49E-05	1.49E-05	2.45E-05
Cumene	H, V	8.19E-06	98%	4.35E-07	4.35E-07	7.17E-07
p-Cymene	Terpene	1.59E-05	98%	8.45E-07	8.45E-07	1.39E-06
1,2-Dichloroethane	H, T, V	0.00E+00	98%	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethylene	V	1.10E-06	98%	5.85E-08	5.85E-08	9.64E-08
Ethanol	V	1.30E-02	98%	6.91E-04	6.91E-04	1.14E-03
Ethyl Benzene	H, V	1.20E-06	98%	6.38E-08	6.38E-08	1.05E-07
Formaldehyde	H, T, V	5.00E-04	98%	2.66E-05	2.66E-05	4.38E-05
Hexane-n	H, T, V	3.97E-05	98%	2.11E-06	2.11E-06	3.48E-06
Limonene	Terpene	2.35E-05		6.25E-05	6.25E-05	
Methanol	H, V	1.30E-01	98%	6.91E-03	6.91E-03	1.14E-02
Methyl Ethyl Ketone	T, V	1.10E-02	98%	5.85E-04	5.85E-04	9.64E-04
Methyl Isobutyl Ketone	H, T, V	8.57E-04	98%	4.56E-05	4.56E-05	7.51E-05
Methylene Chloride	H, T	3.69E-05	98%	1.96E-06	1.96E-06	3.23E-06
Phenol	H, T, V	1.01E-03	98%	5.37E-05	5.37E-05	8.85E-05
alpha-Pinene	Terpene	9.72E-05	98%	5.17E-06	5.17E-06	8.51E-06
beta-Pinene	Terpene	2.78E-05	98%	1.48E-06	1.48E-06	2.44E-06
Propionaldehyde	H, V	2.30E-03	98%	1.22E-04	1.22E-04	2.01E-04
Styrene	H, T, V	1.40E-04	98%	7.44E-06	7.44E-06	1.23E-05
Terpenes	V	1.64E-04	98%	8.74E-06	8.74E-06	1.44E-05
Tetrachloroethylene	H, T	1.24E-05	0%	3.30E-05	3.30E-05	5.43E-05
1,1,1-Trichloroethane	H, T	0.00E+00	0%	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	H, V	2.59E-04	98%	1.38E-05	1.38E-05	2.27E-05
1,2,4-Trichlorobenzene	H, V	3.50E-05	98%	1.86E-06	1.86E-06	3.07E-06
Toluene	H, T, V	9.28E-04	98%	4.93E-05	4.93E-05	8.13E-05
Trichloroethylene	H, T, V	3.42E-05	98%	1.82E-06	1.82E-06	3.00E-06
Xylenes	H, T, V	1.01E-04	98%	5.34E-06	5.34E-06	8.80E-06
Xylene, m-,p-	Xylenes	3.00E-05	98%	1.59E-06	1.59E-06	2.63E-06
o-Xylene	Xylenes	7.05E-05	98%	3.75E-06	3.75E-06	6.18E-06

Basis:

	Baseline Actual	Accommodated	Potential
Annual Hours of Operation	5,317	5,317	8,760

Notes:

1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
4) VOC annual emissions (as carbon) determined by Method 25A.

Table 15
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from Dilute Process Tanks Sent to Caustic Scrubber for Control
(Tanks ES-09-27.1200, ES-09-27.1800, ES-09-27.2000, ES-09-27.2300, ES-09-27.2400, ES-09-27.2500, ES-09-27 .3200)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2,3] lb/ODTP	Pre Project Control by: HVLC System	Post Project Control by: Scrubber	Emissions[4] BAE ton/yr	Emissions[4] CHA ton/yr	Emissions[4] PTE ton/yr
CO	---	2.69E-05	0%	0%	8.59E-04	8.59E-04	3.63E-03
VOC[5] (speciated)	---	2.60E-04	98%	0%	1.66E-04	1.66E-04	3.51E-02
VOC[6] (as carbon)	---	2.41E-04	98%	0%	1.54E-04	1.54E-04	3.25E-02
Acetaldehyde	H, T, V	8.97E-07	98%	0%	5.74E-07	5.74E-07	1.21E-04
Ammonia	T	7.55E-06	0%	0%	2.42E-04	2.42E-04	1.02E-03
Benzene	H, T, V	2.20E-07	98%	0%	1.41E-07	1.41E-07	2.98E-05
Bromodichloromethane	V	9.24E-07	98%	0%	5.91E-07	5.91E-07	1.25E-04
Bromoform	H, V	1.43E-06	98%	0%	9.12E-07	9.12E-07	1.93E-04
Bromomethane	H, V	5.36E-07	98%	0%	3.43E-07	3.43E-07	7.23E-05
Carbon Disulfide	H, T, V	8.59E-07	98%	0%	5.50E-07	5.50E-07	1.16E-04
Carbon Tetrachloride	H, T, V	4.34E-06	98%	0%	2.78E-06	2.78E-06	5.86E-04
Chlorobenzene	H, T, V	6.35E-07	98%	0%	4.06E-07	4.06E-07	8.57E-05
Chloroethane	H, V	3.64E-07	98%	0%	2.33E-07	2.33E-07	4.91E-05
Chloroform	H, T, V	6.74E-07	98%	0%	4.31E-07	4.31E-07	9.09E-05
Dibromochloromethane	V	1.18E-06	98%	0%	7.52E-07	7.52E-07	1.59E-04
1,1-Dichloroethane	H, V	5.58E-07	98%	0%	3.57E-07	3.57E-07	7.54E-05
1,2-Dichloroethane	H, T, V	5.58E-07	98%	0%	3.57E-07	3.57E-07	7.54E-05
c-1,2-Dichloroethene	V	5.47E-07	98%	0%	3.50E-07	3.50E-07	7.39E-05
1,2-Dichloropropane	H, V	6.37E-07	98%	0%	4.08E-07	4.08E-07	8.61E-05
t-1,2-Dichloropropene	V	6.26E-07	98%	0%	4.00E-07	4.00E-07	8.45E-05
c-1,2-Dichloropropene	V	3.13E-06	98%	0%	2.00E-06	2.00E-06	4.23E-04
Ethyl Benzene	H, V	5.99E-07	98%	0%	3.83E-07	3.83E-07	8.09E-05
Formaldehyde	H, T, V	2.07E-07	98%	0%	1.32E-07	1.32E-07	2.79E-05
Hexaldehyde	V	2.98E-07	98%	0%	1.90E-07	1.90E-07	4.02E-05
2-Hexanone	V	2.83E-05	98%	0%	1.81E-05	1.81E-05	3.82E-03
Hydrogen Chloride	H, T	2.96E-06	0%	0%	9.47E-05	9.47E-05	4.00E-04
Methanol	H, V	1.53E-04	98%	0%	9.80E-05	9.80E-05	2.07E-02
Methyl Chloride	H, V	2.85E-07	98%	0%	1.82E-07	1.82E-07	3.85E-05
Methyl Ethyl Ketone	T, V	2.03E-05	98%	0%	1.30E-05	1.30E-05	2.75E-03
Methyl Isobutyl Ketone	H, T, V	2.83E-05	98%	0%	1.81E-05	1.81E-05	3.82E-03
Methylene Chloride	H, T	4.79E-07	0%	0%	1.53E-05	1.53E-05	6.47E-05
Styrene	H, T, V	5.88E-07	98%	0%	3.76E-07	3.76E-07	7.93E-05
1,1,2,2- Tetrachloroethane	H, T, V	9.47E-07	98%	0%	6.06E-07	6.06E-07	1.28E-04
Tetrachloroethylene	H, T	9.36E-07	0%	0%	2.99E-05	2.99E-05	1.26E-04
Toluene	H, T, V	2.60E-07	98%	0%	1.66E-07	1.66E-07	3.51E-05
1,1,1-Trichloroethane	H, T	7.53E-07	0%	0%	2.41E-05	2.41E-05	1.02E-04
1,1,2-Trichloroethane	H, V	7.53E-07	98%	0%	4.81E-07	4.81E-07	1.02E-04
Trichloroethylene	H, T, V	3.71E-06	98%	0%	2.37E-06	2.37E-06	5.00E-04
Vinyl Acetate	H, V	2.43E-06	98%	0%	1.55E-06	1.55E-06	3.28E-04
Vinyl Chloride	H, T, V	3.53E-07	98%	0%	2.26E-07	2.26E-07	4.76E-05
Vinylidene Chloride	H, T, V	5.47E-07	98%	0%	3.50E-07	3.50E-07	7.39E-05
Xylenes	H, T, V	5.99E-07	98%	0%	3.83E-07	3.83E-07	8.09E-05

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581

Notes:

1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 1 tank and there are 7 tanks total.
3) Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based on actual venting periods of only 15% of the time.
4) Emission are for 7 tanks total:
   Lignin Filter Filtrate Storage Tank 1 (ES-09-27.1200), Lignin Slurry Conditioning Tank (ES-09-27.1800), Lignin Slurry Buffer Tank (ES-09-27-2000), Lignin Filter Cloth Wash Tank 1 (ES-09-27.2300), Lignin Filter Filtrate Tank 1 (ES-09-27 .2400), Lignin Filter Filtrate Buffer Tank 1 (ES-09-27-2500), Lignin Filter Acidic Filtrate Tank 2 (ES-09-27 .3200)
5) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
6) VOC (as carbon) annual emissions determined by Method 25A.

Table 16
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from Acidification Process Tanks (PL09-27.2700, ES-09.2770, & PL09-27.2800)
PL09-27.2700, ES-09.2770 Vented through PL09-27.1400 and all vented to HVLC System for Control
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/ADTP	Emission Factor[2] lb/ODTP	Pre and Post Project Control by: HVLC System	Emissions[4] BAE ton/yr	CHA ton/yr	PTE ton/yr
VOC[3] (speciated)	---	5.38E-01	5.98E-01	98%	1.64E-01	1.64E-01	6.92E-01
VOC (as carbon)	---	7.10E-01	7.89E-01	98%	2.16E-01	2.16E-01	9.13E-01
Acetaldehyde	H, T, V	1.14E-02	1.27E-02	98%	3.47E-03	3.47E-03	1.47E-02
Acrolein	H, T, V	6.27E-03	6.97E-03	98%	1.91E-03	1.91E-03	8.06E-03
Benzene	H, T, V	4.92E-04	5.47E-04	98%	1.50E-04	1.50E-04	6.33E-04
Camphene	V	1.10E-02	1.22E-02	98%	3.35E-03	3.35E-03	1.41E-02
Camphor	V	1.90E-02	2.11E-02	98%	5.79E-03	5.79E-03	2.44E-02
Carbon Disulfide	H, T, V	1.50E-04	1.67E-04	98%	4.57E-05	4.57E-05	1.93E-04
Carbon Tetrachloride	H, T, V	6.82E-03	7.58E-03	98%	2.08E-03	2.08E-03	8.77E-03
3-Carene	V	1.20E-03	1.33E-03	98%	3.66E-04	3.66E-04	1.54E-03
Chlorobenzene	H, T, V	5.20E-04	5.78E-04	98%	1.58E-04	1.58E-04	6.69E-04
Chloroform	H, T, V	1.50E-03	1.67E-03	98%	4.57E-04	4.57E-04	1.93E-03
Cumene	H, V	1.17E-03	1.30E-03	98%	3.56E-04	3.56E-04	1.50E-03
p-Cymene	Terpene	3.76E-03	4.18E-03	0%	5.73E-02	5.73E-02	2.42E-01
Ethanol	V	8.60E-03	9.56E-03	98%	2.62E-03	2.62E-03	1.11E-02
Ethyl Benzene	H, V	1.23E-03	1.37E-03	98%	3.75E-04	3.75E-04	1.58E-03
Formaldehyde	H, T, V	5.40E-03	6.00E-03	98%	1.64E-03	1.64E-03	6.94E-03
n-Hexane	H, T, V	6.60E-04	7.33E-04	98%	2.01E-04	2.01E-04	8.49E-04
Isopropanol	V	1.53E-02	1.70E-02	98%	4.66E-03	4.66E-03	1.97E-02
Limonene	Terpene	6.00E-02	6.67E-02	0%	9.14E-01	9.14E-01	3.86E+00
Methanol	H, V	7.50E-02	8.33E-02	98%	2.28E-02	2.28E-02	9.65E-02
Methyl Ethyl Ketone	T, V	1.00E-02	1.11E-02	98%	3.05E-03	3.05E-03	1.29E-02
Methyl Isobutyl Ketone	H, T, V	3.50E-03	3.89E-03	98%	1.07E-03	1.07E-03	4.50E-03
alpha-Pinene	Terpene	1.30E-01	1.44E-01	0%	1.98E+00	1.98E+00	8.36E+00
beta-Pinene	Terpene	5.60E-02	6.22E-02	0%	8.53E-01	8.53E-01	3.60E+00
Phenol	H, T, V	5.70E-03	6.33E-03	98%	1.74E-03	1.74E-03	7.33E-03
Styrene	H, T, V	5.00E-03	5.56E-03	98%	1.52E-03	1.52E-03	6.43E-03
Terpenes	V	3.39E-01	3.77E-01	98%	1.03E-01	1.03E-01	4.36E-01
alpha-Terpeneol	Terpene	8.80E-02	9.78E-02	0%	1.34E+00	1.34E+00	5.66E+00
gamma-Terpenene	Terpene	1.60E-03	1.78E-03	0%	2.44E-02	2.44E-02	1.03E-01
Toluene	H, T, V	1.50E-03	1.67E-03	98%	4.57E-04	4.57E-04	1.93E-03
1,2,4-Trichlorobenzene	H, V	5.70E-03	6.33E-03	98%	1.74E-03	1.74E-03	7.33E-03
Xylene, m-,p-	Xylenes	1.50E-03	1.67E-03	0%	2.28E-02	2.28E-02	9.65E-02
o-Xylene	Xylenes	4.57E-04	5.08E-04	0%	6.96E-03	6.96E-03	2.94E-02
Xylenes	H, T, V	1.96E-03	2.17E-03	98%	5.96E-04	5.96E-04	2.52E-03

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources.
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
4) Emissions are for 3 Total Tanks.

Table 17
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from the No. 2 Lignin Filter Cloth Wash Tank Sent to Caustic Scrubber for Control
(PL09-27.3100)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/ODTP	Pre Project Control by: Uncontrolled	Post Project Control by: Scrubber	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
CO	---	2.69E-05	0%	0%	1.23E-04	1.23E-04	5.18E-04
VOC[3] (speciated)	---	2.60E-04	0%	0%	1.19E-03	1.19E-03	5.01E-03
VOC (as carbon)	---	2.41E-04	0%	0%	1.10E-03	1.10E-03	4.65E-03
Acetaldehyde	H, T, V	8.97E-07	0%	0%	4.10E-06	4.10E-06	1.73E-05
Ammonia	T	7.55E-06	0%	0%	3.45E-05	3.45E-05	1.46E-04
Benzene	H, T, V	2.20E-07	0%	0%	1.01E-06	1.01E-06	4.25E-06
Bromodichloromethane	V	9.24E-07	0%	0%	4.22E-06	4.22E-06	1.78E-05
Bromoform	H, V	1.43E-06	0%	0%	6.51E-06	6.51E-06	2.75E-05
Bromomethane	H, V	5.36E-07	0%	0%	2.45E-06	2.45E-06	1.03E-05
Carbon Disulfide	H, T, V	8.59E-07	0%	0%	3.93E-06	3.93E-06	1.66E-05
Carbon Tetrachloride	H, T, V	4.34E-06	0%	0%	1.98E-05	1.98E-05	8.37E-05
Chlorobenzene	H, T, V	6.35E-07	0%	0%	2.90E-06	2.90E-06	1.22E-05
Chloroethane	H, V	3.64E-07	0%	0%	1.66E-06	1.66E-06	7.02E-06
Chloroform	H, T, V	6.74E-07	0%	0%	3.08E-06	3.08E-06	1.30E-05
Dibromochloromethane	V	1.18E-06	0%	0%	5.37E-06	5.37E-06	2.27E-05
1,1-Dichloroethane	H, V	5.58E-07	0%	0%	2.55E-06	2.55E-06	1.08E-05
1,2-Dichloroethane	H, T, V	5.58E-07	0%	0%	2.55E-06	2.55E-06	1.08E-05
c-1,2-Dichloroethene	V	5.47E-07	0%	0%	2.50E-06	2.50E-06	1.06E-05
1,2-Dichloropropane	H, V	6.37E-07	0%	0%	2.91E-06	2.91E-06	1.23E-05
t-1,2-Dichloropropene	V	6.26E-07	0%	0%	2.86E-06	2.86E-06	1.21E-05
c-1,2-Dichloropropene	V	3.13E-06	0%	0%	1.43E-05	1.43E-05	6.04E-05
Ethyl Benzene	H, V	5.99E-07	0%	0%	2.74E-06	2.74E-06	1.16E-05
Formaldehyde	H, T, V	2.07E-07	0%	0%	9.44E-07	9.44E-07	3.99E-06
Hexaldehyde	V	2.98E-07	0%	0%	1.36E-06	1.36E-06	5.74E-06
2-Hexanone	V	2.83E-05	0%	0%	1.29E-04	1.29E-04	5.45E-04
Hydrogen Chloride	H, T	2.96E-06	0%	0%	1.35E-05	1.35E-05	5.71E-05
Methanol	H, V	1.53E-04	0%	0%	7.00E-04	7.00E-04	2.96E-03
Methyl Chloride	H, V	2.85E-07	0%	0%	1.30E-06	1.30E-06	5.49E-06
Methyl Ethyl Ketone	T, V	2.03E-05	0%	0%	9.29E-05	9.29E-05	3.92E-04
Methyl Isobutyl Ketone	H, T, V	2.83E-05	0%	0%	1.29E-04	1.29E-04	5.45E-04
Methylene Chloride	H, T	4.79E-07	0%	0%	2.19E-06	2.19E-06	9.24E-06
Styrene	H, T, V	5.88E-07	0%	0%	2.68E-06	2.68E-06	1.13E-05
1,1,2,2- Tetrachloroethane	H, T, V	9.47E-07	0%	0%	4.33E-06	4.33E-06	1.83E-05
Tetrachloroethylene	H, T	9.36E-07	0%	0%	4.27E-06	4.27E-06	1.80E-05
Toluene	H, T, V	2.60E-07	0%	0%	1.19E-06	1.19E-06	5.01E-06
1,1,1-Trichloroethane	H, T	7.53E-07	0%	0%	3.44E-06	3.44E-06	1.45E-05
1,1,2-Trichloroethane	H, V	7.53E-07	0%	0%	3.44E-06	3.44E-06	1.45E-05
Trichloroethylene	H, T, V	3.71E-06	0%	0%	1.69E-05	1.69E-05	7.15E-05
Vinyl Acetate	H, V	2.43E-06	0%	0%	1.11E-05	1.11E-05	4.68E-05
Vinyl Chloride	H, T, V	3.53E-07	0%	0%	1.61E-06	1.61E-06	6.80E-06
Vinylidene Chloride	H, T, V	5.47E-07	0%	0%	2.50E-06	2.50E-06	1.06E-05
Xylenes	H, T, V	5.99E-07	0%	0%	2.74E-06	2.74E-06	1.16E-05

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.

Table 18
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from Conveyors 1 and 2 (PL09-27.2610 and PL09-27.2620)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2] lb/ODTP	Pre Project Control by: HVLC System	Post Project Control by: Scrubber	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
CO	---	2.69E-05	0%	0%	2.45E-04	2.45E-04	1.04E-03
VOC[3] (speciated)	---	2.60E-04	98%	0%	4.75E-05	4.75E-05	1.00E-02
VOC[4] (as carbon)	---	2.41E-04	98%	0%	4.40E-05	4.40E-05	9.30E-03
Acetaldehyde	H, T, V	8.97E-07	98%	0%	1.64E-07	1.64E-07	3.46E-05
Ammonia	T	7.55E-06	0%	0%	6.90E-05	6.90E-05	2.91E-04
Benzene	H, T, V	2.20E-07	98%	0%	4.03E-08	4.03E-08	8.50E-06
Bromodichloromethane	V	9.24E-07	98%	0%	1.69E-07	1.69E-07	3.57E-05
Bromoform	H, V	1.43E-06	98%	0%	2.61E-07	2.61E-07	5.50E-05
Bromomethane	H, V	5.36E-07	98%	0%	9.79E-08	9.79E-08	2.07E-05
Carbon Disulfide	H, T, V	8.59E-07	98%	0%	1.57E-07	1.57E-07	3.31E-05
Carbon Tetrachloride	H, T, V	4.34E-06	98%	0%	7.93E-07	7.93E-07	1.67E-04
Chlorobenzene	H, T, V	6.35E-07	98%	0%	1.16E-07	1.16E-07	2.45E-05
Chloroethane	H, V	3.64E-07	98%	0%	6.65E-08	6.65E-08	1.40E-05
Chloroform	H, T, V	6.74E-07	98%	0%	1.23E-07	1.23E-07	2.60E-05
Dibromochloromethane	V	1.18E-06	98%	0%	2.15E-07	2.15E-07	4.53E-05
1,1-Dichloroethane	H, V	5.58E-07	98%	0%	1.02E-07	1.02E-07	2.15E-05
1,2-Dichloroethane	H, T, V	5.58E-07	98%	0%	1.02E-07	1.02E-07	2.15E-05
c-1,2-Dichloroethene	V	5.47E-07	98%	0%	1.00E-07	1.00E-07	2.11E-05
1,2-Dichloropropane	H, V	6.37E-07	98%	0%	1.17E-07	1.17E-07	2.46E-05
t-1,2-Dichloropropene	V	6.26E-07	98%	0%	1.14E-07	1.14E-07	2.42E-05
c-1,2-Dichloropropene	V	3.13E-06	98%	0%	5.72E-07	5.72E-07	1.21E-04
Ethyl Benzene	H, V	5.99E-07	98%	0%	1.09E-07	1.09E-07	2.31E-05
Formaldehyde	H, T, V	2.07E-07	98%	0%	3.78E-08	3.78E-08	7.97E-06
Hexaldehyde	V	2.98E-07	98%	0%	5.44E-08	5.44E-08	1.15E-05
2-Hexanone	V	2.83E-05	98%	0%	5.16E-06	5.16E-06	1.09E-03
Hydrogen Chloride	H, T	2.96E-06	0%	0%	2.71E-05	2.71E-05	1.14E-04
Methanol	H, V	1.53E-04	98%	0%	2.80E-05	2.80E-05	5.91E-03
Methyl Chloride	H, V	2.85E-07	98%	0%	5.21E-08	5.21E-08	1.10E-05
Methyl Ethyl Ketone	T, V	2.03E-05	98%	0%	3.72E-06	3.72E-06	7.85E-04
Methyl Isobutyl Ketone	H, T, V	2.83E-05	98%	0%	5.16E-06	5.16E-06	1.09E-03
Methylene Chloride	H, T	4.79E-07	0%	0%	4.38E-06	4.38E-06	1.85E-05
Styrene	H, T, V	5.88E-07	98%	0%	1.07E-07	1.07E-07	2.27E-05
1,1,2,2- Tetrachloroethane	H, T, V	9.47E-07	98%	0%	1.73E-07	1.73E-07	3.65E-05
Tetrachloroethylene	H, T	9.36E-07	0%	0%	8.55E-06	8.55E-06	3.61E-05
Toluene	H, T, V	2.60E-07	98%	0%	4.75E-08	4.75E-08	1.00E-05
1,1,1-Trichloroethane	H, T	7.53E-07	0%	0%	6.88E-06	6.88E-06	2.90E-05
1,1,2-Trichloroethane	H, V	7.53E-07	98%	0%	1.38E-07	1.38E-07	2.90E-05
Trichloroethylene	H, T, V	3.71E-06	98%	0%	6.77E-07	6.77E-07	1.43E-04
Vinyl Acetate	H, V	2.43E-06	98%	0%	4.44E-07	4.44E-07	9.37E-05
Vinyl Chloride	H, T, V	3.53E-07	98%	0%	6.44E-08	6.44E-08	1.36E-05
Vinylidene Chloride	H, T, V	5.47E-07	98%	0%	1.00E-07	1.00E-07	2.11E-05
Xylenes	H, T, V	5.99E-07	98%	0%	1.09E-07	1.09E-07	2.31E-05

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two tanks. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
4) VOC annual emissions (as carbon) determined by Method 25A.

Table 19
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from LRP Filter Presses (PL09-27.2100 and PL09-27.3000)
Excluding TRS

Pollutant	Pollutant Category[1]	Emission Factor[2,5] lb/ODTP	Pre Project Control by: Uncontrolled	Post Project Control by: Scrubber	Emissions BAE ton/yr	Emissions CHA ton/yr	Emissions PTE ton/yr
CO	---	2.69E-05	0%	0%	2.45E-04	2.45E-04	1.04E-03
VOC[3] (speciated)	---	2.60E-04	0%	0%	2.37E-03	2.37E-03	1.00E-02
VOC[4] (as carbon)	---	2.41E-04	0%	0%	2.20E-03	2.20E-03	9.30E-03
Acetaldehyde	H, T, V	8.97E-07	0%	0%	8.20E-06	8.20E-06	3.46E-05
Ammonia	T	7.55E-06	0%	0%	6.90E-05	6.90E-05	2.91E-04
Benzene	H, T, V	2.20E-07	0%	0%	2.01E-06	2.01E-06	8.50E-06
Bromodichloromethane	V	9.24E-07	0%	0%	8.45E-06	8.45E-06	3.57E-05
Bromoform	H, V	1.43E-06	0%	0%	1.30E-05	1.30E-05	5.50E-05
Bromomethane	H, V	5.36E-07	0%	0%	4.89E-06	4.89E-06	2.07E-05
Carbon Disulfide	H, T, V	8.59E-07	0%	0%	7.85E-06	7.85E-06	3.31E-05
Carbon Tetrachloride	H, T, V	4.34E-06	0%	0%	3.96E-05	3.96E-05	1.67E-04
Chlorobenzene	H, T, V	6.35E-07	0%	0%	5.80E-06	5.80E-06	2.45E-05
Chloroethane	H, V	3.64E-07	0%	0%	3.33E-06	3.33E-06	1.40E-05
Chloroform	H, T, V	6.74E-07	0%	0%	6.15E-06	6.15E-06	2.60E-05
Dibromochloromethane	V	1.18E-06	0%	0%	1.07E-05	1.07E-05	4.53E-05
1,1-Dichloroethane	H, V	5.58E-07	0%	0%	5.10E-06	5.10E-06	2.15E-05
1,2-Dichloroethane	H, T, V	5.58E-07	0%	0%	5.10E-06	5.10E-06	2.15E-05
c-1,2-Dichloroethene	V	5.47E-07	0%	0%	5.00E-06	5.00E-06	2.11E-05
1,2-Dichloropropane	H, V	6.37E-07	0%	0%	5.83E-06	5.83E-06	2.46E-05
t-1,2-Dichloropropene	V	6.26E-07	0%	0%	5.72E-06	5.72E-06	2.42E-05
c-1,2-Dichloropropene	V	3.13E-06	0%	0%	2.86E-05	2.86E-05	1.21E-04
Ethyl Benzene	H, V	5.99E-07	0%	0%	5.47E-06	5.47E-06	2.31E-05
Formaldehyde	H, T, V	2.07E-07	0%	0%	1.89E-06	1.89E-06	7.97E-06
Hexaldehyde	V	2.98E-07	0%	0%	2.72E-06	2.72E-06	1.15E-05
2-Hexanone	V	2.83E-05	0%	0%	2.58E-04	2.58E-04	1.09E-03
Hydrogen Chloride	H, T	2.96E-06	0%	0%	2.71E-05	2.71E-05	1.14E-04
Methanol	H, V	1.53E-04	0%	0%	1.40E-03	1.40E-03	5.91E-03
Methyl Chloride	H, V	2.85E-07	0%	0%	2.60E-06	2.60E-06	1.10E-05
Methyl Ethyl Ketone	T, V	2.03E-05	0%	0%	1.86E-04	1.86E-04	7.85E-04
Methyl Isobutyl Ketone	H, T, V	2.83E-05	0%	0%	2.58E-04	2.58E-04	1.09E-03
Methylene Chloride	H, T	4.79E-07	0%	0%	4.38E-06	4.38E-06	1.85E-05
Styrene	H, T, V	5.88E-07	0%	0%	5.37E-06	5.37E-06	2.27E-05
1,1,2,2- Tetrachloroethane	H, T, V	9.47E-07	0%	0%	8.65E-06	8.65E-06	3.65E-05
Tetrachloroethylene	H, T	9.36E-07	0%	0%	8.55E-06	8.55E-06	3.61E-05
Toluene	H, T, V	2.60E-07	0%	0%	2.38E-06	2.38E-06	1.00E-05
1,1,1-Trichloroethane	H, T	7.53E-07	0%	0%	6.88E-06	6.88E-06	2.90E-05
1,1,2-Trichloroethane	H, V	7.53E-07	0%	0%	6.88E-06	6.88E-06	2.90E-05
Trichloroethylene	H, T, V	3.71E-06	0%	0%	3.39E-05	3.39E-05	1.43E-04
Vinyl Acetate	H, V	2.43E-06	0%	0%	2.22E-05	2.22E-05	9.37E-05
Vinyl Chloride	H, T, V	3.53E-07	0%	0%	3.22E-06	3.22E-06	1.36E-05
Vinylidene Chloride	H, T, V	5.47E-07	0%	0%	5.00E-06	5.00E-06	2.11E-05
Xylenes	H, T, V	5.99E-07	0%	0%	5.47E-06	5.47E-06	2.31E-05

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581

Notes:
1) H=Clean Air Act Hazardous Air Pollutant, V=Volatile Organic Compound, T=Toxic Air Pollutant
2) Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two tanks.
ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.
3) VOC annual emissions are estimated as the sum of all the speciated volatile organic compounds.
4) VOC annual emissions (as carbon) determined by Method 25A.
5) Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.

Table 20
Domtar Plymouth Pulp Mill
Lignin Modification Project
Estimated Emissions from Handling Lignin

Lignin Handling:

Pre Project: A factor of 1.0 lb/ton dry wood for particulate emissions from sawdust handling was found in AP-42, Table 10.3-1, 1994 Edition. AP-42 Section 13.2.4.4 indicates that watering can reduce emissions of particulate matter handling by up to 90%. Conveyors 1 and 2 will be enclosed with exhaust collected by the HVLC system resulting in no emissions of PM associated with those conveyors. Conveyor - #2 Lignin Filter Horizontal (IES-09-27.3400) is not enclosed pre-project, however, the moisture content of the product will be 30-40% on the conveyor making a 90% reduction in the product handling factor for dry sawdust appropriate.

Post Project: The dust and gas will be collected from Conveyor - #2 Lignin Filter Horizontal (IES-09-27.3400) and truck loading area and will be sent to a dust collection scrubber.

Pollutant	Emission Factor[1]	Pre Project Control by:	Emissions		
			BAE	CHA	PTE
	lb/ODTP	Water[2]	ton/yr	ton/yr	ton/yr
Pre Project PM/PM10/PM2.5	1.0	90%	0.5	0.5	0.0

Pollutant	Uncontrolled Emission Factor[4]	Post Project Control by[4]	Emissions		
			BAE	CHA	PTE
	lb/hr	dust collection scrubber	ton/yr	ton/yr	ton/yr
Post Project PM/PM10/PM2.5	1.66	99%	0	0	0.07

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	9,138	38,581
Hours of Operation:	5,317	5,317	8,760

Notes:

1) AP-42, Table 10.3-1, 1994 Edition.
2) AP-42 Section 13.2.4.4 indicates that watering can reduce emissions of particulate matter handling by up to 90%.
3) Assuming handled after dewatering, and assuming conservatively that PM=PM10=PM2.5.
4) Uncontrolled emission factor and control efficiency was provided by the vendor.

Transfer Point Emissions Associated with Lignin Handling:

Currently, there are no factors for particulate emissions from a biomass handling or storage piles. However, factors do exist for aggregate handling and storage piles. For this estimation, the aggregate handling and storage pile (AP-42, Section 13.2.4, 11/06) numbers will be used to represent particulate emissions from lignin handling. The equation below will be used to determine the most applicable factor. The equation is based on silt content, moisture content, particle size, and wind speed. Clay is the most representative material with a typical silt content of 6%. However, the moisture content of the lignin will be closer to 35%. The largest particle size listed of 30 ug (which dictates the particle size multiplier) was used along with a wind speed of 6.7 m/s. There are a total of two drop points associated with transfer of the lignin to the hog fuel pile (dropping from Conveyor No. 3 into an open topped truck and dumping of the truck contents onto the hog fuel pile.)

Pollutant	Emission Factor[1]	Emissions		
		BAE	CHA	PTE
	lb/ODT	ton/yr	ton/yr	ton/yr
PM	1.80E-04	1.64E-03	2.94E-03	6.50E-03
PM10	8.50E-05	7.76E-04	1.39E-03	3.08E-03
PM2.5	1.29E-05	1.18E-04	2.11E-04	4.66E-04

Basis:

	Baseline Actual	Accommodated	Potential
Annual ODT of lignin	9,138	16,392	36,211

Notes:

1) Aggregate handling and storage pile calculations (AP-42, Section 13.2.4, 11/06) are used to estimate particulate emissions from lignin handling. The emission factor, E equals: E = k(0.0032)*({U/5}1.3 / {M/2}1.4), where:

k = particle size multiplier PM, 0.74
k = particle size multiplier PM10, 0.35
k = particle size multiplier PM2.5, 0.053
U = mean wind speed, 15 mph
M = material moisture content, 35%

Table 21
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler - Tested Pollutants

Pollutant	Emission Factor		Total Emissions		
			BAE	CHA	PTE
	lb/MMBtu	Ref.	ton/yr	ton/yr	ton/yr
NOx	2.46E-01	4	479.39	650.02	723.82
CO	3.05E-01	6	594.48	806.06	897.57
Filterable PM	5.47E-02	2	106.64	144.60	161.02
Condensable PM	3.20E-02	2	62.39	84.59	94.20
Total PM (Filterable + Condensable)	8.67E-02	2	169.03	229.19	255.22
PM10	5.30E-02	3,7	103.33	140.11	156.01
PM2.5	4.16E-02	3,7	81.10	109.97	122.46
Lead	2.87E-05	8	5.60E-02	7.59E-02	8.45E-02
Sulfuric Acid	1.03E-04	9	2.01E-01	2.72E-01	3.03E-01

Basis:

	Baseline Actual	Accommodated	Potential
Blended hog fuel combustion (dry ton/yr)	219,520	302,807	338,830
HFB2 Natural Gas Combustion (MMscf/yr)	228	228	228
Total firing rate (MMBtu/yr)[1]	3,899,259	5,287,069	5,887,323

Notes:

1) Fuel Heating Values:

Blended Hog Fuel	16,663,000	BTU/dry ton
Natural Gas	1,057	BTU/scf

Heat value is based upon the average of 8391 BTU/dry lb from 2016 fuel data and 8272 BTU/dry lb from 2017 fuel data.
Blended hog fuel includes lignin.

2) Filterable Particulate refers to the Method 5 catch, and is the average tested emission factor utilized in the 2017 inventory. Condensable Particulate refers to the Method 202 catch. The total particulate emission factor is the sum of the average condensable PM emission factor and the average filterable PM emission factor.

3) PM-10 factor is from Aug 2009 ICR Testing. The PM-2.5 factor (based on one test) is larger than the average PM-10 factor based on multiple tests. Therefore, the PM-2.5 factor is calculated as the ratio of PM-2.5 to PM-10 during the 2000 test times the average PM-10 emission factor.

4) Derived emission factors from the average of 2016-2017 CEMS data and 2016-2017 production of blended hog fuel (dry tons/yr).

5) Stack test on 7/17/2013, Biomass/HVLC/LSRP in operation.

6) HAP metals and PM testing on 3/8/2016.

7) HAP metals and PM testing on 3/2/2015.

8) Stack test on 7/10/2012, Hog Fuel.

9) October 2010 stack test (Condition 3: Hog Fuel, Sludge, Used Oil, No. 6 F.O., & HVLC).

Table 22
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler - Published Emission Factors

Pollutant	Hog Fuel					Natural Gas					Lignin					Total		
	Emission Factor		Emissions			Emission Factor		Emissions			Emission Factor		Emissions			Emissions		
			BAE	CHA	PTE			BAE	CHA	PTE			BAE	CHA	PTE	BAE	CHA	PTE
	lb/MMBtu	Ref	ton/yr	ton/yr	ton/yr	lb/MMscf	Ref	ton/yr	ton/yr	ton/yr	lb/MMBtu	Ref	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
CO2e	--	8	460,343	624,305	695,222	--	8	15	15	15						460,357	624,319	695,236
CO2	2.34E+02	8	455,302	617,352	687,441	CEMS	8									455,302	617,352	687,441
CH4	1.58E-02	8	28.97	39.96	44.72	2.33E+00	8	0.27	0.27	0.27						29.24	40	44.98
N2O	7.92E-03	8	14.49	19.98	22.36	2.33E-01	8	0.03	0.03	0.03						14.51	20	22.38
SO2	3.18E-03	2	5.82E+00	8.02E+00	8.98E+00	6.00E-01	5	6.85E-02	6.85E-02	6.85E-02						5.88	8.09	9.05
VOC (speciated)	4.94E-03	3,4	9.03E+00	1.25E+01	1.39E+01	1.88E+00	3,6	2.15E-01	2.15E-01	2.15E-01						9.24	12.67	14.15
Hydrogen Fluoride	7.47E-05	4	1.37E-01	1.88E-01	2.11E-01											1.37E-01	1.88E-01	2.11E-01
Sulfuric Acid Mist											1.02E-04	7	1.09E-02	1.09E-02	4.58E-02	1.09E-02	1.09E-02	4.58E-02

Basis:

	Baseline Actual	Accommodated	Potential
HFB2 Blended Hog Fuel (dry tons/yr)	219,520	302,807	338,830
HFB2 Blended Hog Fuel (MMBtu/yr)[1]	3,657,861	5,045,671	5,645,925
HFB2 Natural Gas Combustion (MMscf/yr)	228	228	228
HFB2 Lignin (dry tons/yr)	9,157	9,157	38,581
HFB2 Lignin (MMBtu/yr)[1]	213,249	213,249	898,471
Total firing rate (MMBtu/yr)[1]	3,899,259	5,287,069	5,887,323

Notes:

1) Fuel Heating Values:

Blended Hog Fuel	16,663,000	BTU/dry ton
Natural Gas	1,057	BTU/scf
Lignin	11,644	BTU/dry lb

Heat value is based upon the average of 8391 BTU/dry lb from 2016 fuel data and 8272 BTU/dry lb from 2017 fuel data.

Heat value for Lignin based on (12.63 Btu/dscf) x (17,081 max dscf/min) x (60 min/hr) x (24 hr/d) / (2050 max ODTP/d).

2) Emission factor for sulfur dioxide is from Table 10.4 of NCASI TB 1020, median value.

3) Sum of VOC compounds.

4) Emission factors for VOC compounds and Hydrogen Fluoride are from Tables 4.1 and 4.5 of NCASI TB 1013

5) AP-42, Chapter 1.4, Table 1.4-2: Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion.

6) AP-42, Chapter 1.4, Table 1.4-3: Emission Factors for Speciated Organic Compounds from Natural Gas Combustion.

7) Major NSR Permit Application for Lignin Solids Removal Process and Other Energy Improvements Application, Table C-78, October 2016

8) GHG factors are from site specific CEMS data. CO2e = CO2+ CH4*25 + N2O*298

Table 23
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler - Sum of VOC Compounds

Fuel	Pollutant	Emission Factor	UOM
Hog Fuel	Acetaldehyde	1.57E-04	lb/MMBtu
Hog Fuel	Acrolein	1.27E-04	lb/MMBtu
Hog Fuel	Acenaphthene	1.03E-07	lb/MMBtu
Hog Fuel	Acetophenone	1.84E-06	lb/MMBtu
Hog Fuel	Acenaphthylene	5.81E-07	lb/MMBtu
Hog Fuel	Anthracene	1.76E-07	lb/MMBtu
Hog Fuel	Benzaldehyde	5.40E-05	lb/MMBtu
Hog Fuel	Benzene	2.35E-04	lb/MMBtu
Hog Fuel	Benzo(a)anthracene	1.26E-08	lb/MMBtu
Hog Fuel	Benzo(a)pyrene	1.52E-08	lb/MMBtu
Hog Fuel	Benzo(b)fluoranthene	1.26E-08	lb/MMBtu
Hog Fuel	Benzo(k)fluoranthene	1.83E-08	lb/MMBtu
Hog Fuel	Benzo(g,h,i)perylene	9.91E-09	lb/MMBtu
Hog Fuel	Bis(2-Ethylhexyl)phthalate	4.65E-08	lb/MMBtu
Hog Fuel	Bromomethane (Methyl Bromide)	3.67E-06	lb/MMBtu
Hog Fuel	n-Butyraldehyde	6.88E-05	lb/MMBtu
Hog Fuel	Carbon Disulfide	1.25E-04	lb/MMBtu
Hog Fuel	Carbon tetrachloride	1.16E-05	lb/MMBtu
Hog Fuel	Chlorobenzene	1.66E-05	lb/MMBtu
Hog Fuel	Chloroform	2.55E-06	lb/MMBtu
Hog Fuel	Chloromethane	2.66E-05	lb/MMBtu
Hog Fuel	2-Chlorophenol	1.85E-08	lb/MMBtu
Hog Fuel	Crotonaldehyde	4.49E-05	lb/MMBtu
Hog Fuel	Cumene	1.77E-05	lb/MMBtu
Hog Fuel	Dibenzo(a,h)anthracene	8.88E-09	lb/MMBtu
Hog Fuel	Dibutylphthalate	3.33E-05	lb/MMBtu
Hog Fuel	Dichlorobiphenyl	9.00E-10	lb/MMBtu
Hog Fuel	1,2-Dichloroethane	2.92E-05	lb/MMBtu
Hog Fuel	2,5-Dimethyl Benzaldehyde	7.68E-05	lb/MMBtu
Hog Fuel	2,4-Dinitrophenol	1.30E-07	lb/MMBtu
Hog Fuel	1,4-Dichlorobenzene	2.79E-04	lb/MMBtu
Hog Fuel	2,4-Dinitrotoluene	9.42E-07	lb/MMBtu
Hog Fuel	Ethanol	4.80E-04	lb/MMBtu
Hog Fuel	Ethyl Benezene	3.13E-05	lb/MMBtu
Hog Fuel	Fluoranthene	4.57E-07	lb/MMBtu
Hog Fuel	Fluorene	1.89E-07	lb/MMBtu
Hog Fuel	Formaldehyde	3.77E-04	lb/MMBtu
Hog Fuel	Hexachlorobenzene	1.03E-06	lb/MMBtu

Table 23
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler - Sum of VOC Compounds

Hog Fuel	Hexaldehyde	4.16E-05	lb/MMBtu
Hog Fuel	Indeno(1,2,3,c,d)pyrene	9.13E-09	lb/MMBtu
Hog Fuel	Isovaleraldehyde	6.32E-05	lb/MMBtu
Hog Fuel	Methanol	4.82E-04	lb/MMBtu
Hog Fuel	Methyl Ethyl Ketone	5.39E-06	lb/MMBtu
Hog Fuel	Methyl Isobutyl Ketone	4.45E-04	lb/MMBtu
Hog Fuel	n-Hexane	2.88E-04	lb/MMBtu
Hog Fuel	Naphthlene	8.13E-06	lb/MMBtu
Hog Fuel	2-Nitrophenol	2.71E-07	lb/MMBtu
Hog Fuel	4-Nitrophenol	9.32E-08	lb/MMBtu
Hog Fuel	Perylene	6.58E-09	lb/MMBtu
Hog Fuel	Phenanthrene	2.64E-06	lb/MMBtu
Hog Fuel	Phenol	1.53E-05	lb/MMBtu
Hog Fuel	Propionaldehyde	2.14E-05	lb/MMBtu
Hog Fuel	Pyrene	9.88E-07	lb/MMBtu
Hog Fuel	Styrene	1.54E-05	lb/MMBtu
Hog Fuel	Terpenes	1.12E-03	lb/MMBtu
Hog Fuel	Tetrachloroethylene	2.46E-05	lb/MMBtu
Hog Fuel	m,p-Tolualdehyde	9.19E-06	lb/MMBtu
Hog Fuel	o-Tolualdehyde	1.29E-04	lb/MMBtu
Hog Fuel	Toluene	3.67E-06	lb/MMBtu
Hog Fuel	Trichlorobiphenyl	1.78E-09	lb/MMBtu
Hog Fuel	Trichloroethylene	3.88E-05	lb/MMBtu
Hog Fuel	2,4,6-Trichlorophenol	2.76E-07	lb/MMBtu
Hog Fuel	Vinyl Chloride	1.84E-05	lb/MMBtu
Hog Fuel	Xylenes (mixed isomers)	5.58E-06	lb/MMBtu
Hog Fuel	**Sum of VOCs**	**4.94E-03**	**lb/MMBtu**
Natural Gas	Benzene	2.10E-03	lb/MMScf
Natural Gas	Dichlorobenzene	1.20E-03	lb/MMScf
Natural Gas	Fluoranthene	3.00E-06	lb/MMScf
Natural Gas	Fluorene	2.80E-06	lb/MMScf
Natural Gas	Formaldehyde	7.50E-02	lb/MMScf
Natural Gas	2-Methylnaphthalene	2.40E-05	lb/MMScf
Natural Gas	Naphthalene	6.10E-04	lb/MMScf
Natural Gas	n-Hexane	1.80E+00	lb/MMScf
Natural Gas	Phenanthrene	1.70E-05	lb/MMScf
Natural Gas	Pyrene	5.00E-06	lb/MMScf
Natural Gas	Toluene	3.40E-03	lb/MMScf
Natural Gas	**Sum of VOCs**	1.88E+00	**lb/MMScf**

Table 24
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler De-Entrainment Vessels

Source	Pollutant	BAE Emissions to Electroscrubbers[1] (tpy)	CHA Emissions to Electroscrubbers[1] (tpy)	PTE Emissions to Electroscrubbers[1] (tpy)	BAE Emissions Removed by Electroscrubbers[2,3] (tpy)	CHA Emissions Removed by Electroscrubbers[2,3] (tpy)	PTE Emissions Removed by Electroscrubbers[2,3] (tpy)	BAE Emissions from De-Entrainment Vessel[4,5] (tpy)	CHA Emissions from De-Entrainment Vessel[4,5] (tpy)	PTE Emissions from De-Entrainment Vessel[4,5] (tpy)
No. 2 Hog Fuel Boiler De-Entrainment Vessels (total of 3)	Filterable PM	427	578	644	319.93	433.80	483.05	3.20	4.34	4.83
	PM10	413	560	624	309.99	420.32	468.04	3.10	4.20	4.68

Notes:
1) The hog fuel boiler control system has a total efficiency of 99% for the control of particulate emissions. The mechanical cyclones have a 96% efficiency for the control of particulates.
2) The electroscrubbers use pea gravel to remove the particulates from the air stream. The particulates which are deposited on the pea gravel is removed in the de-entrainment vessels. The de-entrainment vessels are assumed to have a 100% efficiency for the removal of particulates from the pea gravel.
3) The emissions removed by the electroscrubbers are calculated using a particulate mass balance for the electroscrubbers.
4) The particulates that are removed from the pea gravel in the de-entrainment vessels are sent to a baghouse.
The baghouses are assumed to have a 99% efficiency for the control of particulates.
5) Each boiler has three electroscrubbers and de-entrainment vessels, however they operate in parallel.

Table 25
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler Scrubber Ash Silos

Source	Pollutant	BAE	CHA	PTE	BAE	CHA	PTE
		Total Ash Sent to Silos[1] ton/yr	Total Ash Sent to Silos[1] ton/yr	Total Ash Sent to Silos[1] ton/yr	Total Emissions[2,3] ton/yr	Total Emissions[2,3] ton/yr	Total Emissions[2,3] ton/yr
No. 2 Hog Fuel Boiler Scrubber Ash Silo	Filterable PM	316.73	429.47	478.22	0.032	0.043	0.048
	PM10	306.89	416.12	463.36	0.031	0.042	0.046

Notes:

1) The amount of ash sent to the scrubber ash silo was calculated by subtracting the amount of ash emitted by the de-entrainment vessel baghouse from the amount of ash sent to the de-entrainment vessel baghouse (the ash controlled by the de-entrainment vessel baghouse is sent to the scrubber ash silo).
2) It is assumed that 1% of the total ash that enters the silos can be emitted as particulate.
3) All ash silos have a bag filter with 99% particulate control efficiency.

Table 26
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler Ash Transport System

Source	Pollutant	BAE	CHA	PTE	BAE	CHA	PTE
		Total Ash to Silo[1] ton/yr	Total Ash to Silo[1] ton/yr	Total Ash to Silo[1] ton/yr	Total Emissions[2,3] ton/yr	Total Emissions[2,3] ton/yr	Total Emissions[2,3] ton/yr
No. 2 Hog Fuel Boiler Ash Transport System	Filterable PM	10,238	13,882	15,458	1.02	1.39	1.55
	PM10	9,920	13,450	14,977	0.99	1.35	1.50

Notes:
1) The ash transport systems carry the ash generated in the boilers from the control devices to the ash silos. Steam is released through a venturi to create a vacuum used for ash transport.
2) It is assumed that 0.1% of the total ash that is transported is emitted to the air scrubber.
3) The air washer scrubs the air and steam stream before discharge to the atmosphere. This air scrubber is assumed to have a 90% particulate control efficiency.

Table 27
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 2 Hog Fuel Boiler Ash Silos and Baghouses

Source	Pollutant	BAE	CHA	PTE	BAE	CHA	PTE	BAE	CHA	PTE
		Total Emissions from HFB2 (Post Control)[1] ton/yr	Total Emissions from HFB2 (Post Control)[1] ton/yr	Total Emissions from HFB2 (Post Control)[1] ton/yr	Total Ash Emitted from Silo Uncontrolled[2,3,4] ton/yr	Total Ash Emitted from Silo Uncontrolled[2,3,4] ton/yr	Total Ash Emitted from Silo Uncontrolled[2,3,4] ton/yr	Total Silo Emissions[5] ton/yr	Total Silo Emissions[5] ton/yr	Total Silo Emissions[5] ton/yr
No. 2 Hog Fuel Boiler Ash Silo East & West Bag Filters	Filterable PM	107	145	161	102	139	155	1.02	1.39	1.55
	PM10	103	140	156	99	135	150	0.99	1.35	1.50

Notes:
1) Total particulate and PM10 emissions are based upon calculations performed for each boiler based upon the different fuels used. These emissions are presented on the forms for each boiler and are located earlier in this section.
2) The combined control efficiency of the multicyclones and the electroscrubbers on the Hog Fuel boilers is 99%.
3) The ash controlled by the Hog Fuel boiler multiclones alone is assumed to be 96% of the total particulate. This ash is transferred to the Hog Fuel Boilers' individual ash silos.
4) It is assumed that 1% of the ash entering each ash silo is capable of producing particulate emissions.
5) The baghouses on each ash silo are assumed to be 99% efficient at controlling particulate emissions from the silo.

Table 28
Domtar Plymouth Pulp Mill
Lignin Modification Project
Hog Fuel Conveying

Source	Pollutant	Emissions (TPY)[1,2]		
		BAE	CHA	PTE
Nos. 1 and No. 2 Hog Fuel Conveying Systems	PM	2.20	3.03	3.39
	PM10	2.20	3.03	3.39

Basis:	Baseline Actual	Accommodated	Potential
Blended hog fuel combustion (dry ton/yr)	219,520	302,807	338,830

Notes:
1) The hog fuel conveying system is assumed to allow only 0.001% emission and is not controlled.
2) PM10 emissions are based on 100% of the total particulate.

Table 29
Domtar Plymouth Pulp Mill
Lignin Modification Project
Hog Fuel Storage Pile

Source	Particle Size Multiplier	Mean Wind Speed, mph	Moisture Content, %	Particulate (lb/ton)	BAE (tpy)	CHA (tpy)	PTE (tpy)
TSP							
Hog Fuel Storage Pile at Boilers	0.74	15	50%	1.09E-04	1.20E-02	1.65E-02	1.85E-02
PM10							
Hog Fuel Storage Pile at Boilers	0.35	15	50%	5.16E-05	5.66E-03	7.81E-03	8.74E-03
PM2.5							
Hog Fuel Storage Pile at Boilers	0.053	15	50%	7.81E-06	8.57E-04	1.18E-03	1.32E-03

Basis:	Baseline Actual	Accommodated	Potential
Blended hog fuel combustion (dry ton/yr)	219,520	302,807	338,830

Notes:
1) EPA's AP-42 gives an equation for the calculation of particulate emissions from open air storage piles (AP-42 13.2.4-4, November 2006 Edition). The equation is based on wind speed, the particle size and the moisture content of the species.

E=k(0.0032)*({U/5}1.3 / {M/2}1.4) lb/ton

k = particle size multiplier
U = mean wind speed
M = moisture content

Table 30
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 5 Recovery Boiler

Pollutant	Black Liquor Solids					No. 2 Fuel Oil							Total		
	Emission Factor		Emissions			Emission Factor		Control Efficiency		Emissions			Emissions		
			BAE	CHA	PTE					BAE	CHA	PTE	BAE	CHA	PTE
	lb/TBLS	Ref	ton/yr	ton/yr	ton/yr	lb/1000 gal	Ref	%	Ref	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
SO2	1.26E-02	2	6.35	6.35	6.23	1.42E+00	9			8.05E-01	8.05E-01	8.05E-01	7.16	7.16	7.04
NOx	1.80E+00	2	905.35	905.35	888.74	2.40E+01	9			1.36E+01	1.36E+01	1.36E+01	918.95	918.95	902.35
CO	9.61E+00	3	4,831	4,831.02	4,742	5.00E+00	9			2.84E+00	2.84E+00	2.84E+00	4,833.86	4,833.86	4,745.27
CO2e	--	10	1,274,770	1,274,770	1,251,393	--	10			12,683	12,683	12,683	1,287,453	1,287,452.77	1,264,076
Filterable PM	5.26E-01	4	264.61	264.61	259.76	2.00E+00	12	9.92E-01	11	9.07E-03	9.07E-03	9.07E-03	264.62	264.62	259.77
Condensable PM	4.64E-02	4	23.35	23.35	22.92	1.30E+00	12			7.37E-01	7.37E-01	7.37E-01	24.09	24.09	23.66
Total PM	5.73E-01	4	288.0	287.96	282.7	3.30E+00	12			7.46E-01	7.46E-01	7.46E-01	288.71	288.71	283.43
PM10	2.64E-01	4	132.8	132.78	130.3	1.00E+00	13	9.92E-01	11	4.54E-03	4.54E-03	4.54E-03	132.79	132.79	130.35
PM2.5	2.13E-01	5	107.2	107.16	105.2	2.50E-01	14	9.92E-01	11	1.13E-03	1.13E-03	1.13E-03	107.16	107.16	105.19
Lead	1.65E-06	6	8.31E-04	8.31E-04	8.16E-04	--							8.31E-04	8.31E-04	8.16E-04
VOC (speciated)	1.16E-01	7	58.21	58.21	57.14	4.28E-02	7,9			2.43E-02	2.43E-02	2.43E-02	58.23	58.23	57.17
Sulfuric Acid	1.49E-02	2	7.49	7.49	7.36	2.45E-02	15			1.39E-02	1.39E-02	1.39E-02	7.51	7.51	7.37
TRS (as H2S)	5.32E-03	8	2.67	2.67	2.63	--							2.67	2.67	2.63
H2S	3.58E-03	8	1.80	1.80	1.77	--							1.80	1.80	1.77
Methyl Mercaptan	1.14E-03	8	0.57	0.57	0.56	--							5.72E-01	5.72E-01	5.62E-01
Dimethyl Disulfide	4.39E-04	8	0.22	0.22	0.22	--							2.21E-01	2.21E-01	2.17E-01
Dimethyl Sulfide	1.11E-03	8	0.56	0.56	0.55	--							5.61E-01	5.61E-01	5.50E-01

Basis:

	Baseline Actual	Accommodated	Potential
Tons of BLS Burned in the Recovery Boiler[1]	1,005,939	1,005,939	987,492
Gallons of No. 2 Fuel Oil Used[1]	1,134,046	1,134,046	1,134,046

1) Fuel Heating Values:

Black Liquor	6,078	BTU/dry lb
No. 2 Fuel Oil	136,713	BTU/gallon

2) During each test, only black liquor solids were fired. The factor reported is the average of three test runs and the emission factor may be an average based on multiple tests.
3) The emission factor for CO is the average of 2016-2017 CEMS data.
4) Filterable Particulate refers to the Method 5 catch. Condensable Particulate refers to the Method 202 catch. The total particulate emission factor is the sum of the average Condensable PM emission factor and the average filterable PM emission factor.
5) PM2.5 estimated to be 80.7% of PM-10 based on particle size distribution testing conducted in November 1996 and May 1998 (test results were averaged).
6) All 2008 stack test runs result in values below the detection limit for this compound. Therefore, Domtar Plymouth calculated these emissions using one half of the detection limit.
7) VOC (speciated) annual emissions are estimated as the sum of all the speciated volatile organic compounds. Terpenes are the sum of alpha- and beta-pinenes, p-cymene and limonene
National Council of the Paper Industry for Air and Stream Improvement (NCASI) Technical Bulletin No. 650, June 1993, Compilation of 'Air Toxic' Emissions data for Boilers, Pulp Mills, and Bleach Plants, pg.78. The emission factor reported is the numerical average of all mills with NDC evaporators and dry bottom ESP's. Conversion from ADTP to TBLS is based upon 3000 lb BLS/ton pulp as provided on page 4 of the technical bulletin. Emissions rates of particulate-type pollutants are post-control. POMs start on page 86 (81 on paper) table 11C
National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mill Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.
8) NCASI TB973 Table 4.23, ratioed from the average of 2016-2017 CEMS TRS data.
9) No. 2 Fuel Oil emission factors are from AP-42 Section 1.3.
10) GHGs for Tons of BLS burned in the recovery boiler are from Table AA-1 to Subpart AA of Part 98 - Kraft Pulping Liquor Emissions Factors for Biomass-based CO2, CH4, and N2O.
GHGs for No. 2 Fuel Oil are from Tables C-1 and C-2 to Subpart C of Part 98.
11) Control efficiencies applied are consistent with AP-42 efficiencies for particulate control systems using ESPs.
12) Particulate emissions are determined by summing the filterable PM emissions and the Condensable PM emissions (the Condensable PM emission factor is the same for controlled and uncontrolled sources).
13) PM10 emissions are based on AP-42 5th Edition Supplement E, November 1998, Table 1.3-5. For No. 2 Fuel Oil the factor is from Table 1.3-6. Both factors listed are for pre-control.
14) PM2.5 emissions are based on AP-42 5th Edition Supplement E, November 1998, Table 1.3-5. The factor is 4.67*A where
A = 1.12*(S) +0.37 lb/10^3 gal
15) Sulfuric acid emissions are calculated using emission factors from NCASI's SARA 313 Handbook. The factors are based upon the sulfur content of the fuels used. The document is based on an assumption that all the sulfur in the oil is oxidized and states that 0.00245 times the sulfur contained in oil would be converted to sulfuric acid. The emission factor developed from the sulfur content has a basis of lb/1000 gallons of fuel.

Table 31
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 5 Recovery Boiler - Sum of VOC Compounds

Fuel	Pollutant	Emission Factor	UOM
Black Liquor Solids	1,1,2-Trichloroethane	2.40E-05	lb/TBLS
Black Liquor Solids	1,2,4-Trichlorobenzene	1.50E-04	lb/TBLS
Black Liquor Solids	1,2-Dichloroethane	3.10E-07	lb/TBLS
Black Liquor Solids	1,2-Dichloroethylene	6.39E-06	lb/TBLS
Black Liquor Solids	1,2-Dimethoxyethane	1.49E-04	lb/TBLS
Black Liquor Solids	Acenaphthene	3.33E-06	lb/TBLS
Black Liquor Solids	Acetaldehyde	3.70E-03	lb/TBLS
Black Liquor Solids	Acetone	5.00E-03	lb/TBLS
Black Liquor Solids	Benzaldehyde	7.00E-03	lb/TBLS
Black Liquor Solids	Benzo(a)anthracene	8.00E-06	lb/TBLS
Black Liquor Solids	Benzo(b)fluoranthene	4.27E-06	lb/TBLS
Black Liquor Solids	Benzo(g,h,i)perylene	5.27E-06	lb/TBLS
Black Liquor Solids	Benzene	7.28E-04	lb/TBLS
Black Liquor Solids	1,3-Butadiene	1.59E-04	lb/TBLS
Black Liquor Solids	Carbon Disulfide	6.60E-04	lb/TBLS
Black Liquor Solids	Carbon Tetrachloride	1.21E-05	lb/TBLS
Black Liquor Solids	3-Carene	1.84E-03	lb/TBLS
Black Liquor Solids	Chlorobenzene	1.46E-05	lb/TBLS
Black Liquor Solids	Methyl Chloride	5.37E-05	lb/TBLS
Black Liquor Solids	Chloroform	1.42E-05	lb/TBLS
Black Liquor Solids	Chrysene	3.67E-05	lb/TBLS
Black Liquor Solids	Cumene	1.63E-03	lb/TBLS
Black Liquor Solids	Ethyl benzene	4.62E-05	lb/TBLS
Black Liquor Solids	Formaldehyde	7.79E-03	lb/TBLS
Black Liquor Solids	p-Cymene	1.22E-03	lb/TBLS
Black Liquor Solids	Dibenzo(a,h)anthracene	4.00E-06	lb/TBLS
Black Liquor Solids	Ethanol	1.20E-02	lb/TBLS
Black Liquor Solids	Hexachlorobenzene	1.41E-11	lb/TBLS
Black Liquor Solids	n-Hexane	1.67E-04	lb/TBLS
Black Liquor Solids	Indeno(1,2,3-c,d)pyrene	4.00E-06	lb/TBLS
Black Liquor Solids	Methanol	1.80E-02	lb/TBLS
Black Liquor Solids	Methyl Ethyl Ketone	3.80E-03	lb/TBLS
Black Liquor Solids	Methyl Isobutyl Ketone	4.70E-04	lb/TBLS
Black Liquor Solids	Naphthalene	1.64E-04	lb/TBLS
Black Liquor Solids	Phenol	1.37E-02	lb/TBLS
Black Liquor Solids	Polycyclic Aromatic Hydrocarbons	1.07E-04	lb/TBLS
Black Liquor Solids	2-Propanol	1.47E-02	lb/TBLS
Black Liquor Solids	Propionaldehyde	6.52E-03	lb/TBLS

Table 31
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 5 Recovery Boiler - Sum of VOC Compounds

Black Liquor Solids	Pyrene	6.67E-05	lb/TBLS
Black Liquor Solids	Styrene	9.07E-05	lb/TBLS
Black Liquor Solids	Terpenes	1.20E-02	lb/TBLS
Black Liquor Solids	Toluene	2.96E-04	lb/TBLS
Black Liquor Solids	Trichloroethylene	1.78E-05	lb/TBLS
Black Liquor Solids	Vinyl Chloride	3.07E-06	lb/TBLS
Black Liquor Solids	Xylenes (mixed isomers)	9.40E-04	lb/TBLS
Black Liquor Solids	Methyl Mercaptan	1.03E-03	lb/TBLS
Black Liquor Solids	Dimethyl Disulfide	3.98E-04	lb/TBLS
Black Liquor Solids	Dimethyl Sulfide	1.01E-03	lb/TBLS
Black Liquor Solids	**Sum of VOCs**	**1.16E-01**	**lb/TBLS**
No. 2 Fuel Oil	Acenaphthene	2.11E-05	lb/1000 gal
No. 2 Fuel Oil	Acenaphthylene	2.53E-07	lb/1000 gal
No. 2 Fuel Oil	Anthracene	1.22E-06	lb/1000 gal
No. 2 Fuel Oil	Benzene	2.14E-04	lb/1000 gal
No. 2 Fuel Oil	Benzo(a)anthracene	4.01E-06	lb/1000 gal
No. 2 Fuel Oil	Benzo(b,k)fluoranthene	1.48E-06	lb/1000 gal
No. 2 Fuel Oil	Benzo(g,h,i)anthracene	2.26E-06	lb/1000 gal
No. 2 Fuel Oil	Chrysene	2.38E-06	lb/1000 gal
No. 2 Fuel Oil	Dibenzo(a,h)anthracene	1.67E-06	lb/1000 gal
No. 2 Fuel Oil	Ethyl benzene	6.36E-05	lb/1000 gal
No. 2 Fuel Oil	Fluoranthene	4.84E-06	lb/1000 gal
No. 2 Fuel Oil	Fluorene	4.47E-06	lb/1000 gal
No. 2 Fuel Oil	Formaldehyde	3.50E-02	lb/1000 gal
No. 2 Fuel Oil	Indeno(1,2,3-cd)pyrene	2.14E-06	lb/1000 gal
No. 2 Fuel Oil	Naphthalene	1.13E-03	lb/1000 gal
No. 2 Fuel Oil	Phenanthrene	1.05E-05	lb/1000 gal
No. 2 Fuel Oil	Pyrene	4.25E-06	lb/1000 gal
No. 2 Fuel Oil	Toluene	6.20E-03	lb/1000 gal
No. 2 Fuel Oil	Xylenes (mixed isomers)	1.09E-04	lb/1000 gal
No. 2 Fuel Oil	**Sum of VOCs**	**4.28E-02**	**lb/1000 gal**

Table 32
Domtar Plymouth Pulp Mill
Lignin Modification Project
North and South Smelt Tank Scrubbers

Pollutant	Emission Factor			Emissions		
	North Smelt Tank	South Smelt Tank		BAE	CHA	PTE
	lb/TBLS	lb/TBLS	Ref	ton/yr	ton/yr	ton/yr
NOX	4.61E-02	2.55E-02	2	18.01	18.01	17.68
SO2	7.58E-03	1.59E-02	2	5.90	5.90	5.80
CO	2.35E-03	2.35E-03	3	1.18	1.18	1.16
Filterable PM	3.63E-02	4.70E-02	4	20.95	20.95	20.56
Condensable PM	5.85E-03	7.89E-03	4	3.46	3.46	3.39
Total PM	4.21E-02	5.49E-02	4	24.40	24.40	23.95
PM10	3.56E-02	4.64E-02	5	20.61	20.61	20.23
PM2.5	3.22E-02	4.20E-02	5	18.66	18.66	18.32
VOC (speciated)	9.68E-02	9.68E-02	6,9,10	48.68	48.68	47.79
TRS (sum of compounds)	1.21E-02	8.35E-03	7,8	5.15	5.15	5.06
TRS (as H2S)	1.02E-02	7.00E-03	7,8	4.32	4.32	4.24
H2S	5.97E-03	4.11E-03	7,8	2.53	2.53	2.49

Basis:

	Baseline Actual	Accommodated	Potential
Tons of BLS Burned in the Recovery Boiler[1]	1,005,939	1,005,939	987,492

1) Fuel Heating Values:

Black Liquor 6,078 BTU/dry lb

2) Test results from ETG Stationary Source Sampling Report No. 0783 (December 1999 - January 2000). The Saltcake mix tank is vented to the South Smelt Tank scrubber. Only the most recent test data was used to calculate the emission factor for this compound.
3) Only the North Smelt Tank was tested for CO emissions; however, the emission factor has been applied to both tanks.
4) The average of 2004 and 2017 stack test data was used to estimate emissions for the south smelt tank and 2004 test data was used to estimate emissions for the north smelt tank. Note 2004 test data was utilized in AEI's until 2017 when the south smelt tank was retested. The north tank has not been retested.
Filterable Particulate refers to the Method 5 catch. Condensable Particulate refers to the Method 202 catch.
The total particulate emission factor is the sum of the average Condensable PM emission factor and the average filterable PM emission factor.
5) PM10 and PM2.5 estimated from NCASI Particulate Emissions Data for Pulp and Paper Industry-Specific Sources, October 27, 2006, Table 1: PM10 is 81.9% and PM2.5 is 72.6% of filterable PM + 100% of Condensable.
6) VOC (speciated) annual emissions are estimated as the sum of all the speciated volatile organic compounds. Terpenes is the sum of alpha-and beta-pinene, 3-carene and p-cymene. NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks. NCASI TB 858 indicates the median emission factor from Table 17A. NCASI SARA313 indicates NCASI's Handbook for SARA Section 313 Form R Reporting. Factors reported as non-detect are not presented.
7) TRS as H2S for the North Smelt Tank are calculated based on the NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks
8) South smelt tank tested for TRS in October 2017. H2S, MMC, DMS, and DMDS is ratioed from test data.
9) NCASI TB 973 Table 8.1; Median
10) NCASI TB 973, Figure 13.2; Y = 0.0057 • X + 0.0163, where Y = methanol emissions in lb/t BLS; and X = weak wash methanol concentration, ppm; value shown is for assumed X of 10 ppm

Table 33
Domtar Plymouth Pulp Mill
Lignin Modification Project
North and South Smelt Tank Scrubbers - Sum of VOC Compounds

Fuel	Pollutant	Emission Factor	UOM
Black Liquor Solids	Acenaphthene	7.67E-07	lb/TBLS
Black Liquor Solids	Acenaphthylene	1.36E-04	lb/TBLS
Black Liquor Solids	Acetaldehyde	1.11E-03	lb/TBLS
Black Liquor Solids	Acrolein	2.26E-04	lb/TBLS
Black Liquor Solids	Anthracene	4.14E-05	lb/TBLS
Black Liquor Solids	Benzene	3.10E-06	lb/TBLS
Black Liquor Solids	Benzo(a)anthracene	4.52E-06	lb/TBLS
Black Liquor Solids	Benzo(a)phenanthrene	1.06E-05	lb/TBLS
Black Liquor Solids	Benzo(a)pyrene	3.59E-07	lb/TBLS
Black Liquor Solids	Benzo(b)fluoranthene	9.18E-07	lb/TBLS
Black Liquor Solids	Benzo(g,h,i)perylene	5.76E-08	lb/TBLS
Black Liquor Solids	Benzo(k)fluoranthene	8.03E-07	lb/TBLS
Black Liquor Solids	Benzaldehyde	8.90E-05	lb/TBLS
Black Liquor Solids	Benzyl Alcohol	3.00E-03	lb/TBLS
Black Liquor Solids	Benzo(e)pyrene	4.74E-07	lb/TBLS
Black Liquor Solids	Biphenyl	3.61E-05	lb/TBLS
Black Liquor Solids	Bis(2-ethylhexyl)phthalate (DEHP)	1.00E-05	lb/TBLS
Black Liquor Solids	Bromodichloromethane	8.30E-05	lb/TBLS
Black Liquor Solids	Bromomethane (Methyl Bromide)	1.30E-05	lb/TBLS
Black Liquor Solids	n-Butyraldehyde	4.60E-04	lb/TBLS
Black Liquor Solids	Carbon Disulfide	3.35E-05	lb/TBLS
Black Liquor Solids	Carbon Tetrachloride	3.90E-06	lb/TBLS
Black Liquor Solids	Chlorobenzene	4.50E-06	lb/TBLS
Black Liquor Solids	2-Chloro-1,3-Butadiene	1.80E-05	lb/TBLS
Black Liquor Solids	Chloroform	7.10E-06	lb/TBLS
Black Liquor Solids	Crotonaldehyde	1.30E-04	lb/TBLS
Black Liquor Solids	Cumene	1.43E-04	lb/TBLS
Black Liquor Solids	Dibenzo(a,h)anthracene	3.56E-08	lb/TBLS
Black Liquor Solids	Dibutylphthalate	2.45E-04	lb/TBLS
Black Liquor Solids	Dimethyl Disulfide	3.25E-03	lb/TBLS
Black Liquor Solids	Dimethyl Sulfide	1.35E-03	lb/TBLS
Black Liquor Solids	Di-n-Butyl Phthalate	2.45E-04	lb/TBLS
Black Liquor Solids	Ethanol	7.63E-04	lb/TBLS
Black Liquor Solids	Ethyl Benzene	8.69E-06	lb/TBLS
Black Liquor Solids	1,2-Dichloroethane	6.88E-06	lb/TBLS
Black Liquor Solids	1,2-Dichloroethylene	1.03E-05	lb/TBLS
Black Liquor Solids	7,12-Dimethylbenz(a)anthracene	8.77E-08	lb/TBLS

Table 33
Domtar Plymouth Pulp Mill
Lignin Modification Project
North and South Smelt Tank Scrubbers - Sum of VOC Compounds

Black Liquor Solids	2,5-Dimethyl Benzaldehyde	1.50E-05	lb/TBLS
Black Liquor Solids	Fluoranthene	8.93E-05	lb/TBLS
Black Liquor Solids	Fluorene	9.13E-06	lb/TBLS
Black Liquor Solids	Formaldehyde	3.15E-04	lb/TBLS
Black Liquor Solids	Hexaldehyde	2.00E-04	lb/TBLS
Black Liquor Solids	n-Hexane	4.66E-05	lb/TBLS
Black Liquor Solids	Indeno(1,2,3-c,d)pyrene	8.77E-08	lb/TBLS
Black Liquor Solids	Isooctane	4.22E-06	lb/TBLS
Black Liquor Solids	Isovaleraldehyde	2.10E-04	lb/TBLS
Black Liquor Solids	Methanol	7.33E-02	lb/TBLS
Black Liquor Solids	Methyl Chloride	1.12E-04	lb/TBLS
Black Liquor Solids	Methyl Ethyl Ketone	2.06E-04	lb/TBLS
Black Liquor Solids	Methyl Isobutyl Ketone	1.92E-04	lb/TBLS
Black Liquor Solids	Methyl Mercaptan	1.56E-03	lb/TBLS
Black Liquor Solids	3-Methylcholanthrene	1.77E-06	lb/TBLS
Black Liquor Solids	1-Methylnaphthalene	7.56E-06	lb/TBLS
Black Liquor Solids	2-Methylnaphthalene	3.00E-03	lb/TBLS
Black Liquor Solids	Naphthalene	7.86E-05	lb/TBLS
Black Liquor Solids	Perylene	8.50E-08	lb/TBLS
Black Liquor Solids	Phenanthrene	2.86E-04	lb/TBLS
Black Liquor Solids	Phenol	6.13E-04	lb/TBLS
Black Liquor Solids	Propionaldehyde	6.38E-04	lb/TBLS
Black Liquor Solids	Pyrene	4.55E-05	lb/TBLS
Black Liquor Solids	Styrene	5.59E-06	lb/TBLS
Black Liquor Solids	Terpenes	3.42E-03	lb/TBLS
Black Liquor Solids	Toluene	3.79E-05	lb/TBLS
Black Liquor Solids	m,p-Tolualdehyde	4.60E-05	lb/TBLS
Black Liquor Solids	o-Tolualdehyde	4.00E-05	lb/TBLS
Black Liquor Solids	1,2,4-Trichlorobenzene	2.79E-05	lb/TBLS
Black Liquor Solids	1,1,2-Trichloroethane	1.03E-05	lb/TBLS
Black Liquor Solids	Trichloroethylene	2.76E-05	lb/TBLS
Black Liquor Solids	Valeraldehyde	5.80E-04	lb/TBLS
Black Liquor Solids	Vinyl Acetate	4.40E-05	lb/TBLS
Black Liquor Solids	Xylenes	1.70E-04	lb/TBLS
Black Liquor Solids	**Sum of VOCs**	**9.68E-02**	**lb/TBLS**

Table 34
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 5 Precipitator Mix Tank

Pollutant	Emission Factor		Emissions		
			BAE	CHA	PTE
	lb/TBLS	Ref.	ton/yr	ton/yr	ton/yr
VOC (speciated)	1.56E-03	1	7.84E-01	7.84E-01	7.70E-01
TRS (sum of compounds)	1.65E-04	2,3	8.30E-02	8.30E-02	8.15E-02
TRS (as H2S)	1.09E-04	2,3	5.49E-02	5.49E-02	5.39E-02

Basis:

	Baseline Actual	Accommodated	Potential
Tons of BLS produced in Recovery Boiler	1,005,939	1,005,939	987,492

Notes:

1) VOC (as speciated) annual emissions are estimated as the sum of all the speciated volatile organic compounds. Terpenes are the sum of alpha- and beta-pinenes. National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mill Sources - A Second Update, Table 4.35 Salt Cake Mix Tanks. Data points reported as non-detect treated as zero.

2) Reduced sulfur compound emission factors are from National Council For Air and Stream Improvement (NCASI) Technical Bulletin No. 849, August 2002, Table A-6 TRS Data Summary - Kraft Recovery Furnaces - Salt Cake Mix Tank Results Table A-6 p. 166

3) TRS as H2S emissions are based upon the sum of Dimethyl Sulfide, Dimethyl Disulfide, H2S (if available), and Methyl Mercaptan converted to an "as H2S" basis using the individual molecular weights.

Table 35
Domtar Plymouth Pulp Mill
Lignin Modification Project
No. 5 Precipitator Mix Tank - Sum of VOC Compounds

Fuel	Pollutant	Emission Factor	UOM
Black Liquor Solids	Acetaldehyde	1.07E-04	lb/TBLS
Black Liquor Solids	Acrolein	6.04E-06	lb/TBLS
Black Liquor Solids	Benzene	2.30E-07	lb/TBLS
Black Liquor Solids	Biphenyl	5.80E-07	lb/TBLS
Black Liquor Solids	Chlorobenzene	4.60E-07	lb/TBLS
Black Liquor Solids	1,2-Dichloroethylene	3.00E-07	lb/TBLS
Black Liquor Solids	Dimethyl Disulfide	4.10E-05	lb/TBLS
Black Liquor Solids	Dimethyl Sulfide	5.20E-05	lb/TBLS
Black Liquor Solids	Ethanol	7.79E-05	lb/TBLS
Black Liquor Solids	Formaldehyde	6.40E-06	lb/TBLS
Black Liquor Solids	n-Hexane	2.89E-07	lb/TBLS
Black Liquor Solids	Isopropanol	3.89E-05	lb/TBLS
Black Liquor Solids	Methanol	9.80E-04	lb/TBLS
Black Liquor Solids	Methyl Ethyl Ketone	1.20E-05	lb/TBLS
Black Liquor Solids	Methyl Isobutyl Ketone	1.40E-06	lb/TBLS
Black Liquor Solids	Methyl Mercaptan	7.20E-05	lb/TBLS
Black Liquor Solids	Phenol	3.60E-05	lb/TBLS
Black Liquor Solids	Propionaldehyde	3.80E-05	lb/TBLS
Black Liquor Solids	Styrene	1.15E-06	lb/TBLS
Black Liquor Solids	Terpenes	7.00E-05	lb/TBLS
Black Liquor Solids	1,2,4-Trichlorobenzene	1.10E-05	lb/TBLS
Black Liquor Solids	Toluene	4.77E-06	lb/TBLS
Black Liquor Solids	Trichloroethylene	4.08E-07	lb/TBLS
Black Liquor Solids	Xylenes	7.00E-07	lb/TBLS
Black Liquor Solids	**Sum of VOCs**	**1.56E-03**	**lb/TBLS**

Table 36
Domtar Plymouth Pulp Mill
Lignin Modification Project
Salt Cake Mix Tank

Pollutant	Emission Factor		Emissions		
			BAE	CHA	PTE
	lb/TBLS	Ref.	ton/yr	ton/yr	ton/yr
CO	2.94E-05	1,2	1.48E-02	1.48E-02	1.45E-02
VOC (speciated)	1.41E-03	3,4	7.07E-01	7.07E-01	6.94E-01

Basis:

	Baseline Actual	Accommodated	Potential
Tons of BLS burned in Recovery Boiler	1,005,939	1,005,939	987,492

Notes:

1) Only the North Smelt Tank was tested for CO emissions; however, the emission factor has been applied to both tanks.
2) Test results from ETG Stationary Source Sampling Report No. 0783 (December 1999 - January 2000). The Saltcake mix tank is vented to the South Smelt Tank scrubber. All 1999 stack test data runs resulted in values below the detection limit. Therefore, Domtar Plymouth calculated these using emissions one half of the detection limit.
3) VOC (speciated) annual emissions are estimated as the sum of all the speciated volatile organic compounds. Terpenes is the sum of alpha- and beta-terpenes.
4) NCASI TB 973 Table 4.35 - Summary of Air Toxic Emissions from Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents.

Table 37
Domtar Plymouth Pulp Mill
Lignin Modification Project
Salt Cake Mix Tank - Sum of VOC Compounds

Fuel	Pollutant	Emission Factor	UOM
Black Liquor Solids	Acetaldehyde	1.07E-04	lb/TBLS
Black Liquor Solids	Acrolein	6.04E-06	lb/TBLS
Black Liquor Solids	Benzene	2.30E-07	lb/TBLS
Black Liquor Solids	Biphenyl	5.80E-07	lb/TBLS
Black Liquor Solids	Bromoform	1.15E-06	lb/TBLS
Black Liquor Solids	Bromomethane (Methyl Bromide)	4.33E-07	lb/TBLS
Black Liquor Solids	Carbon Disulfide	5.60E-06	lb/TBLS
Black Liquor Solids	Chlorobenzene	4.60E-07	lb/TBLS
Black Liquor Solids	Chloroethane	2.94E-07	lb/TBLS
Black Liquor Solids	1,2-Dichloroethylene	4.52E-07	lb/TBLS
Black Liquor Solids	Ethanol	7.79E-05	lb/TBLS
Black Liquor Solids	Ethyl Benzene	4.84E-07	lb/TBLS
Black Liquor Solids	Formaldehyde	6.40E-06	lb/TBLS
Black Liquor Solids	n-Hexane	2.89E-07	lb/TBLS
Black Liquor Solids	Isopropanol	3.89E-05	lb/TBLS
Black Liquor Solids	Methanol	9.80E-04	lb/TBLS
Black Liquor Solids	Methyl Chloride	2.30E-07	lb/TBLS
Black Liquor Solids	Methyl Ethyl Ketone	1.20E-05	lb/TBLS
Black Liquor Solids	Methyl Isobutyl Ketone	1.40E-06	lb/TBLS
Black Liquor Solids	Phenol	3.60E-05	lb/TBLS
Black Liquor Solids	Propionaldehyde	3.80E-05	lb/TBLS
Black Liquor Solids	Styrene	1.15E-06	lb/TBLS
Black Liquor Solids	Terpenes	7.00E-05	lb/TBLS
Black Liquor Solids	Toluene	4.77E-06	lb/TBLS
Black Liquor Solids	1,2,4-Trichlorobenzene	1.10E-05	lb/TBLS
Black Liquor Solids	1,1,2-Trichloroethane	6.09E-07	lb/TBLS
Black Liquor Solids	Trichloroethylene	3.00E-06	lb/TBLS
Black Liquor Solids	Vinyl Chloride	2.85E-07	lb/TBLS
Black Liquor Solids	Vinylidene Chloride	4.42E-07	lb/TBLS
Black Liquor Solids	Xylenes	7.00E-07	lb/TBLS
Black Liquor Solids	**Sum of VOCs**	**1.41E-03**	**lb/TBLS**

Potential Emissions Calculations for Toxics

TABLE 1
PARAMETERS FOR CALCULATING TAP POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Description	Peak Hourly		Peak Daily		Maximum Annual		Comments
Fiberlines							
No. 6 Fiberline and Bleach Plant	35.50	ODTUBP/hr	852.00	ODTUBP/day	310,980.00	ODTUBP/yr	
	34.08	ODTBP/hr	817.92	ODTBP/day	298,540.80	ODTBP/yr	
	37.87	ADTBP/hr	908.80	ADTBP/day	331,712.00	ADTBP/yr	Converted ODTBP TO ADTBP by dividing by 0.9
	39.44	ADTUBP/hr	946.67	ADTUBP/day	345,533.33	ADTUBP/yr	Converted ODTUBP to ADTUBP by dividing by 0.9
No. 6 Fiberline and Bleach Plant - Peroxide Stages	22.82	ODTUBP/hr	547.63	ODTUBP/day	199,884.34	ODTUBP/yr	
No. 7 Fiberline and Bleach Plant	55.47	ODTUBP/hr	1,331.25	ODTUBP/day	485,906.25	ODTUBP/yr	
	53.25	ODTBP/hr	1,278.00	ODTBP/day	466,470.00	ODTBP/yr	
	59.17	ADTBP/hr	1,420.00	ADTBP/day	518,300.00	ADTBP/yr	Converted ODTBP TO ADTBP by dividing by 0.9
	61.63	ADTUBP/hr	1,479.17	ADTUBP/day	539,895.83	ADTUBP/yr	Converted ODTUBP to ADTUBP by dividing by 0.9
Total Pulp Production	101.08	ADTUBP/hr	2,425.83	ADTUBP/day	885,429.17	ADTUBP/yr	
	90.97	ODTUBP/hr	2,183.25	ODTUBP/day	796,886.25	ODTUBP/yr	
Storage Tanks	8,760.00	hrs/yr					
Power and Recovery Area							
No. 1 Hog Fuel Boiler	1,087.37	MMBtu/hr	26,096.76	MMBtu/day	9,525,317.40	MMBtu/yr	
No. 1 Hog Fuel Boiler	7.77	Mgal/hr	186.41	Mgal/day	68,037.98	Mgal/yr	140000 Btu/gal No. 2 Fuel Oil
No. 1 Hog Fuel Boiler	4,329.23	Gal/hr	103,901.40	Gal/day	37,924,011.00	Gal/yr	No. 6 fuel Oil, 151792 BTU/Gal
No. 2 Hog Fuel Boiler	946.79	MMBtu/hr	22,722.84	MMBtu/day	8,293,836.60	MMBtu/yr	Need to determine why max input 889 is multiplied by 1.065
No. 2 Hog Fuel Boiler	5,612.55	Gal/hr	134,701.20	Gal/day	689,839.00	Gal/yr	No. 6 fuel Oil, 151792 BTU/Gal
No. 5 Recovery Boiler	140.00	TBLS/hr	3,360.00	TBLS/day	1,226,400.00	TBLS/yr	
	9,159.00	gal/hr	219,816.00	gal/day	3,280,704.00	gal/yr	No. 2 Fuel Oil, 138000 BTU/Gal
No. 5 Recovery Boiler Oil & Gas Burner	1,263.94	MMBtu/hr	30,334.61	MMBtu/day	11,072,131.92	MMBtu/yr	Assumed the same burner capacity for gas and fuel oil
North and South Smelt Tanks	138.45	TBLS/hr	3,322.80	TBLS/day	1,212,822.00	TBLS/yr	Total for two tanks
Thermal Oxidizer	45	MMBtu/hr	1,080.00	MMBtu/day	394,200.00	MMBtu/yr	
Causticizing Area							
Lime Kiln	22.19	T CaO/hr	532.50	T CaO/day	194,362.50	T CaO/yr	
No. 5 Lime Kiln - No. 6 Fuel Oil	1,278.00	Gal/hr	15,383.73	Gal/day	5,615,063.00	Gal/yr	No. 6 fuel Oil
No. 5 Lime Kiln - Natural Gas	197.03	MMBtu/hr	4,728.60	MMBtu/day	1,725,939.00	MMBtu/yr	Assumed the same burner capacity for gas and fuel oil
Lime Kiln maximum oil usage	197.03	MMBtu/hr	4,728.60	MMBtu/day	1,725,939.00	MMBtu/yr	
Paper Machine							
NC-2	25.00	ADTFP/hr	665	ADTFP/day	242,725	ADTFP/yr	
	24.94	ODTUBP/hr	599	ODTUBP/day	218,453	ODTUBP/yr	
NC-5	69	ADTFP/hr	1,664	ADTFP/day	563,281	ADTFP/yr	1510 ADMT/D for Short Term and 1400 ADMT/D for Long Term(7.5% Moisture as documented in the 2009 NC 5 Project)
	64.15	ODTUBP/hr	1,540	ODTUBP/day	521,035	ODTUBP/yr	
Total	94.35	ADTFP/hr	2,329	ADTFP/day	806,006	ADTFP/yr	
	89.09	ODTUBP/hr	2,138	ODTUBP/day	739,487	ODTUBP/yr	

TABLE 1
PARAMETERS FOR CALCULATING TAP POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Description	Peak Hourly		Peak Daily		Maximum Annual		Comments
Bleaching Area							
ClO2 Plant	2.29	T ClO_2/hr	55.00	T ClO_2/day	20,075.00	T ClO_2/yr	
#6 Bleach Plant Building Fugitives	1.00	hr	24.00	hr/day	8,760.00	hr/yr	
#7 Bleach Plant Building Fugitives	1.00	hr	24.00	hr/day	8,760.00	hr/yr	
Combustion Sources							
Fine Paper Diesel Engine	2.1	MMBtu/hr	50.40	MMBtu/day	1,050.00	MMBtu/yr	500 hr per year
Lime Kiln Diesel Backup Engine	5.1	MMBtu/hr	121.80	MMBtu/day	2,537.50	MMBtu/yr	500 hr per year
W.N. Cr., East Diesel Fire Pump Engine	2.1	MMBtu/hr	50.40	MMBtu/day	1,050.00	MMBtu/yr	500 hr per year
W.N. Cr., West Diesel Fire Pump Engine	2.7	MMBtu/hr	65.52	MMBtu/day	1,365.00	MMBtu/yr	500 hr per year
Runoff Coll Sewer Lift Station Diesel Backup Engine	1.4	MMBtu/hr	33.60	MMBtu/day	700.00	MMBtu/yr	500 hr per year
Fiber Line Sewer Lift Station Diesel Backup Engine	1.4	MMBtu/hr	33.60	MMBtu/day	700.00	MMBtu/yr	500 hr per year
Wastewater Dredge Engine			0.00				
LSRP Sources							
Lignin Production	4.40	ODTL/hr	105.70	ODTL/day	38,581	ODTL/yr	Max 35,000 MTPY converted to short tons.
Lignin Hours	1.0	hr/hr	24.0	hr/day	8,760	hr/yr	
WWTP							
WWTP flow rate	3125000	gallons/hr	75,000,000	gallons/day	27,375,000,000	gallons/yr	
Primary Sludge	2.3	ton/hr	56.24	ton/day	20,528.00	ton/yr	
C3 Stream Sewering hours	1	hr/hr	24	hr/day	5,500	hr/yr	
No. 6 Evaporators 5th effect Sewering hours	1	hr/hr	24	hr/day	8,760	hr/yr	
Crude Tall Oil Plant							
Tall Oil Production	2.56E+00	TTO/hr	61.51	TTO/day	22,452	TTO/yr	
Other							
Pulp Production Total	90.97	ODTP/hr	2,183.25	ODTP/day	796,886.25	ODTP/yr	
	101.08	ADTFP/hr	2,425.83	ADTP/day	885,429.17	ADTP/yr	

18% Liquor Tanks (Scenario 3)	10	Total Tank Liquor Capacity Multiplier for Tank Movements
48% Liquor Tanks (Scenario 3)	9.0	Total Tank Liquor Capacity Multiplier for Tank Movements
65% Liquor Tanks (Scenario 3)	2	Total Tank Liquor Capacity Multiplier for Tank Movements
No. 5 Soap Storage Tank	1	Total Tank Liquor Capacity Multiplier for Tank Movements
New Liquor Separator Tank	1	Total Tank Liquor Capacity Multiplier for Tank Movements

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	5.37E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	74	hp-hr/hr	3.97E-04	5.01E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.28E-04	lb/ODTUBP	1995 Stack Test	35.5	ODTUBP/hr	4.54E-03	5.73E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	1.64E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber)	37.9	ADTBP/hr	6.21E-02	7.82E-03
06-P1	6FEEDTNK	No. 6 Bleach Plant 6th Stage Feed Tank	6.84E-04	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	35.5	ODTUBP/hr	2.43E-02	3.06E-03
06-P2	6BLOWTBE	No. 6 Bleach Plant 6th Stage Blow Tube (standpipe)	3.20E-03	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	35.5	ODTUBP/hr	1.14E-01	1.43E-02
06-P3	6EXHAUST	No. 6 BP 6th Stage Washer And Filtrate Tank	1.13E-02	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	35.5	ODTUBP/hr	4.02E-01	5.07E-02
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	4.57E-04	lb/ODTUBP	1995 Stack Test	55.5	ODTUBP/hr	2.53E-02	3.19E-03
07-31-1180	F30	No. 7 Bleach Plant Scrubber	1.64E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber)	59.2	ADTBP/hr	9.70E-02	1.22E-02
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	9.40E-04	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	5.21E-02	6.57E-03
08-40-1000	F35	No. 32 High Density Pulp Tank	5.20E-03	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1.0	tank	5.20E-03	6.55E-04
05-30-1300	F60	Hot Water Tank	2.92E-02	lb/hr	Sep 1998 Stack Testing	1.0	hr/hr	2.92E-02	3.68E-03
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.67E-04	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91	ODTUBP/hr	1.52E-02	1.91E-03
09-05-0210	SWBLTANK	South WBL Storage Tank	8.97E-07	lb/ODTUBP	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	91.0	ODTUBP/hr	8.16E-05	1.03E-05

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-12-0250	5SOAP	No. 5 Soap Storage Tank	4.74E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	4.74E-04	5.97E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	4.74E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	4.74E-04	5.97E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	4.74E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids. 10.0 multiplier for tank movements	10	tank	4.74E-03	5.97E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	2.02E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9	tank	1.82E-01	2.29E-02
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	2.02E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2	tank	4.04E-02	5.09E-03
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	2.02E-02	lb/hr/tank	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	tank	2.02E-02	2.55E-03
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	8.97E-07	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.95E-06	4.98E-07
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	3.70E-03	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.23 - Summary of Non-metal Air Toxic Emissions from NDCE Kraft Recovery Furnace p. 100	140	TBLS/hr	5.18E-01	6.53E-02
10-45-0450	R05	No. 5 Precipitator Mix Tank	1.07E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	140.0	TBLS/hr	1.50E-02	1.89E-03
14-05-0050	R03	North Smelt Tank	1.11E-03	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010 - Table 4.28 Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	7.68E-02	9.68E-03
14-05-0300	R04-1	South Smelt Tank	1.11E-03	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010 - Table 4.28 Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	7.68E-02	9.68E-03
10-08-0010	R04-2	Salt Cake Mix Tank	1.07E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	138	TBLS/hr	1.48E-02	1.87E-03
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						9.17E-02	1.15E-02

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-10-05	R14	No. 5 Green Liquor Clarifier	1.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources Table 4.32 - Green Liquor Clarifier Mill D.	22.2	T CaO/hr	2.22E-03	2.80E-04
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	1.80E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources Table 4.32 - White Liquor and Weak Wash Pressure Filter Vent Mill J. A 2.0 factor is applied.	22.2	T CaO/hr	7.99E-02	1.01E-02
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	22.2	T CaO/hr	6.66E-04	8.39E-05
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.16E-02	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Sources p. 128, Causticizer/Slaker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	3.86E-01	4.86E-02
14-30-0310	R46	Lime Mud Mix Tank	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent.	22.2	T CaO/hr	4.44E-03	5.59E-04
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.54E-03	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	3.42E-02	4.31E-03
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	7.60E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied to account for Lime Mud Filter Vacuum System, East and West Lime Filter Vacuum Pump Silencers, and the Lime Mud Filtrate Tank.	22.2	T CaO/hr	5.06E-01	6.37E-02
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.42E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	1.42E-01	1.79E-02
09-20-0250	R71	Combined Condensate Tank	5.12E-03	lb/hr	Stack Testing 1998, 1.7% increase due to sewering of condensates from C3 and No. 6 Evaps 5th effect (2013 Project)	1.0	hr/hr	5.12E-03	6.45E-04
		Cooler -1 Feed Liquor	2.02E-02	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.0	hr/hr	2.02E-02	2.55E-03
		Filter - 1 Lignin	8.97E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.95E-06	4.98E-07

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		Tank - 2 Lignin Filter Cloth Wash	8.97E-07	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000 . Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.95E-06	4.98E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.79E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.40	ODTL/hr	7.90E-06	9.96E-07
		LRP Dilute Tanks	6.28E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.40	ODTL/hr	2.77E-05	3.48E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						2.02E-02	2.55E-03
64-25-0290	PO01A	No. 1 HFB - Hog Fuel	1.57E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1087.4	MMBtu/hr	1.71E-01	2.15E-02
	PO13A	No. 2 HFB - Hog Fuel	1.57E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013; adds the LVHC and HVLC combustion gases	946.8	MMBtu/hr	1.49E-01	1.87E-02
	PO13A	LVHC Combustion	3.01E-04	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101.1	ADTUBP/hr	3.04E-02	3.83E-03
	PO13A	HVLC Combustion	5.71E-06	lb/hr	Data generated by the 1996 compliance testing was run at 68% of the total fiberline capacity, 2050 BDTP per day. The tested lb/hr loadings were adjusted by a ratio of actual production to testing production. HVLC gases are burned through the No. 2 HFB and the White Liquor Scrubber is used as backup	1.0	hr/hr	5.71E-06	7.20E-07
	PO13A	Carbonator - Feed Liquor	4.04E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank. Controlled by HVLC System	1.00	hr/hr	4.04E-04	5.09E-05
	PO13A	LRP Acidification Tanks	7.60E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.40	ODTL/hr	3.35E-03	4.22E-04
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.83E-01	2.30E-02
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							3.76E-03	4.73E-04

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
32-40-1560	NC1&2	NC-2 Paper Machine	4.05E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010 Table 4.34 pg. 140, Summary of Air Toxic Emissions form Bleached Kraft Pulp and Paper Machines	25	ADTFP/hr	1.01E-01	1.28E-02
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	3.50E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994. VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	1.31E-02	1.65E-03
45-93-0100	NC5	NC-5 Paper Machine	4.05E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010 Table 4.34 pg. 140, Summary of Air Toxic Emissions form Bleached Kraft Pulp and Paper Machines	69	ADTFP/hr	2.81E-01	3.54E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	3.50E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	3.37E-02	4.24E-03
53-40-0130	FPDE	Fine Paper Diesel Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	1.61E-03	2.03E-04
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.1	MMBtu/hr	3.89E-03	4.90E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	1.61E-03	2.03E-04
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.7	MMBtu/hr	2.09E-03	2.64E-04
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.07E-03	1.35E-04
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.07E-03	1.35E-04
71-95-0500	COMMEA	Communications Back up Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.8	MMBtu/hr	4.42E-03	5.57E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.4	MMBtu/hr	1.81E-03	2.28E-04
TEMPGEN	TEMPGEN	Temporary Generator	7.67E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.006	MMBtu/hr	4.59E-06	5.78E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	1.76E-07	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	1000	hp-hr/hr	1.76E-04	2.22E-05
73-10-2000	SETPOND2	Primary Clarifier	4.00E-03	lb/ADTP	NCASI TRI Guidance	101	ADTP/hr	4.04E-01	5.09E-02
73-10-1000	SETPOND1	Secondary Clarifier	1.41E-02	lb/ADTP	NCASI TRI Guidance	101	ADTP/hr	1.42E+00	1.79E-01

TABLE 2
ACETALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
73-05-2000-A		C3 Stream Sewering	3.19E+00	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1	hr/hr	3.19E+00	4.02E-01
73-05-2000-B		5th eff 6 evap Sewering	2.25E+00	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1	hr/hr	2.25E+00	2.83E-01

TABLE 3
ACROLEIN POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	2.82E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	39.4	ADTUBP/hr	1.11E-03	1.40E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	6.23E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	2.36E-03	2.97E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, **F42**	No. 7 O2 Delig	2.82E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	61.6	ADTUBP/hr	1.74E-03	2.19E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	6.23E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	3.69E-03	4.64E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	2.40E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	1.33E-03	1.68E-04
05-30-1300	F60	Hot Water Tank	9.24E-06	lb/hr	Sep 1998 Stack Testing	1.0	hr/hr	9.24E-06	1.16E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.79E-05	lb/hr/tank	NCASI Pulp and Paper Database 2013 - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	hr/hr	1.79E-05	2.26E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.36E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	1.36E-04	1.71E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.36E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	1.36E-04	1.71E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.36E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tank	1.36E-03	1.71E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.79E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	tank	1.61E-04	2.03E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.79E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	tank	3.58E-05	4.51E-06

TABLE 3
ACROLEIN POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
10-45-0450	R05	No. 5 Precipitator Mix Tank	6.04E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	140.0	TBLS/hr	8.46E-04	1.07E-04
14-05-0050	R03	North Smelt Tank	2.26E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	1.56E-02	1.97E-03
14-05-0300	R04-1	South Smelt Tank	2.26E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	1.56E-02	1.97E-03
10-08-0010	R04-2	Salt Cake Mix Tank	6.04E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	138	TBLS/hr	8.36E-04	1.05E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.65E-02	2.08E-03
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	5.33E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	1.18E-03	1.49E-04
		Cooler -1 Feed Liquor	1.79E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.0	hr/hr	1.79E-05	2.26E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.79E-05	2.26E-06
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	5.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources p. 136, White Liquor and Weak Wash Pressure Filter Vent Mill J. A 2.0 Factor is applied.	22.2	T CaO/hr	2.62E-03	3.30E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	5.06E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Sources p. 128, Causticizer/Slaker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	1.68E-03	2.12E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.27E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1087.4	MMBtu/hr	1.38E-01	1.74E-02
	PO13A	Carbonator - Feed Liquor	3.58E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1.0	hr/hr	3.58E-07	4.51E-08
	PO13A	LRP Acidification Tanks	4.18E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	1.84E-03	2.32E-04
	PO13A	No. 2 HFB - Hog Fuel	1.27E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	946.8	MMBtu/hr	1.20E-01	1.52E-02
65-25-0310		Total from No. 2 Hog Fuel Boiler						1.22E-01	1.54E-02
CD-65-60-1010		Total from Thermal Oxidizer and HVLC						1.84E-03	2.32E-04

TABLE 3
ACROLEIN POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	1.94E-04	2.45E-05
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.1	MMBtu/hr	4.69E-04	5.91E-05
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	5.50E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	1.22E-02	1.54E-03
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	1.94E-04	2.45E-05
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.7	MMBtu/hr	2.53E-04	3.18E-05
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.30E-04	1.63E-05
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.30E-04	1.63E-05
71-95-0500	COMMEA	Communications Back up Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.8	MMBtu/hr	5.34E-04	6.72E-05
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.4	MMBtu/hr	2.18E-04	2.75E-05
TEMPGEN	TEMPGEN	Temporary Generator	9.25E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.006	MMBtu/hr	5.54E-07	6.97E-08
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	5.52E-08	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	1000	hp-hr/hr	5.52E-05	6.96E-06
73-05-2000-A		C3 Stream Sewering	1.00E-03	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1	hr/hr	1.00E-03	1.26E-04
73-05-2000-B		5th eff 6 evap Sewering	1.00E-03	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1	hr/hr	1.00E-03	1.26E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.80E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010 Table 4.34 pg. 140, Summary of Air Toxic Emissions form Bleached Kraft Pulp and Paper Machines	25	ADTFP/hr	4.50E-02	5.67E-03
45-93-0100	NC5	NC-5 Paper Machine	1.80E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010 Table 4.34 pg. 140, Summary of Air Toxic Emissions form Bleached Kraft Pulp and Paper Machines	69	ADTFP/hr	1.25E-01	1.57E-02

TABLE 4
AMMONIA POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	4.19E-04	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000	91.0	ODTUBP/hr	3.81E-02	4.80E-03
09-05-0210	SWBLTANK	South WBL Storage Tank	7.55E-06	lb/ODTUBP	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	91.0	ODTUBP/hr	6.87E-04	8.65E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	7.55E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks . Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.33E-05	4.19E-06
		LRP Dilute Tanks	5.29E-05	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	2.33E-04	2.93E-05
		Tank - 2 Lignin Filter Cloth Wash	7.55E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks . Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.33E-05	4.19E-06
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.51E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. (2 Conveyors)	4.4	ODTL/hr	6.65E-05	8.38E-06
		Filter - 1 Lignin	7.55E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.33E-05	4.19E-06
09-27-3800	LSRPSCRUB				Total from Caustic Scrubber			3.66E-04	4.61E-05
14-05-0050	R03	North Smelt Tank	8.40E-02	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	5.81E+00	7.33E-01
14-05-0300	R04-1	South Smelt Tank	8.40E-02	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks p. 118	69.2	TBLS/hr	5.81E+00	7.33E-01
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						5.81E+00	7.33E-01
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.14E-01	lb/T CaO	NCASI Technical Bulletin No. 789, Ammonia Emissions from Kraft Smelt Dissolving Tanks, Slaker Vents, and Causticizer Vents. Table 6, page 31, Mill C.	22.2	T CaO/hr	2.53E+00	3.19E-01
73-05-2000-A		5th eff No. 6 evaps sewering	4.34E+00	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1	hr/hr	4.34E+00	5.47E-01

TABLE 4
AMMONIA POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
73-05-2000-B		C3 Stream Sewering	5.63E+00	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1	hr/hr	5.63E+00	7.09E-01
73-05-2000-C		WWTP Operations	5.71E-02	lb/hr	NCASI TRI Guidance	1	hr/hr	5.71E-02	7.19E-03

TABLE 5
ARSENIC POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.80E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	216,080	hp-hr/yr	6.05E-03	8.70E-08
	PO01C	No. 5 Recovery Boiler BLS	1.88E-06	lb/TBLS	Stack Testing 2008	1,226,400	TBLS/yr	2.31E+00	3.32E-05
	PO01C	No. 5 Recovery Boiler - No. 2	4.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	11,072,132	MMBtu/yr	4.43E+01	6.37E-04
10-25-0110	Total from No. 5 Recovery Boiler							**4.66E+01**	**6.70E-04**
14-05-0050	R03	North Smelt Tank	9.41E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	606,411	TBLS/yr	5.71E-01	8.21E-06
14-05-0300	R04-1	South Smelt Tank	9.41E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	606,411	TBLS/yr	5.71E-01	8.21E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						**5.71E-01**	**8.21E-06**
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.66E-06	lb/T CaO	2008 Stack Testing (1/2 Detection Limit)	194,363	T CaO/yr	3.23E-01	4.64E-06
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.54E-06	lb/MMBtu	2016 Stack Testing	9,525,317	MMBtu/yr	1.47E+01	2.11E-04
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	5.29E-07	lb/MMBtu	2016 Stack Testing	8,293,837	MMBtu/yr	4.39E+00	6.31E-05

TABLE 5
ARSENIC POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
CD-65-60-1010	THERMALOX	Thermal Oxidizer	1.90E-07	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	394,200	MMBtu/yr	7.51E-02	1.08E-06
53-40-0130	FPDE	Fine Paper Diesel Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	4.20E-03	6.04E-08
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,538	MMBtu/yr	1.02E-02	1.46E-07
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	4.20E-03	6.04E-08
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,365	MMBtu/yr	5.46E-03	7.85E-08
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.80E-03	4.03E-08
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.80E-03	4.03E-08
71-95-0500	COMMEA	Communications Back up Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,884	MMBtu/yr	1.15E-02	1.66E-07
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	20,677	MMBtu/yr	8.27E-02	1.19E-06
TEMPGEN	TEMPGEN	Temporary Generator	4.00E-06	lb/MMBtu	AP-42 Table 1.3-10	52	MMBtu/yr	2.10E-04	3.02E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	2.80E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10	910,000.00	hp-hr/yr	2.55E-02	3.66E-07

TABLE 6
BENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	6.53E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	216,080	hp-hr/yr	1.41E+00	2.03E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.24E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	4.28E+00	6.16E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	5.74E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	331,712	ADTBP/yr	1.90E+01	2.74E-04
06-P1	6FEEDTNK	No. 6 Bleach Plant 6th Stage Feed Tank	6.11E-06	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	1.90E+00	2.73E-05
06-P2	6BLOWTBE	No. 6 Bleach Plant 6th Stage Blow Tube (standpipe)	2.86E-05	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	8.91E+00	1.28E-04
06-P3	6EXHAUST	No. 6 BP 6th Stage Washer And Filtrate Tank	1.01E-04	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	3.15E+01	4.53E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.24E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	6.69E+00	9.63E-05
07-31-1180	F30	No. 7 Bleach Plant Scrubber	5.74E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	2.98E+01	4.28E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	8.40E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	485,906	ODTUBP/yr	4.08E+00	5.87E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	1.75E-05	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	8,760	tank*hr/yr	1.53E-01	2.20E-06
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	8.13E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	6.48E-01	9.32E-06
09-05-0210	SWBLTANK	South WBL Storage Tank	2.20E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.75E-01	2.52E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	3.99E-05	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	8,760	tanks*hr/yr	3.50E-01	5.03E-06
09-12-0050	LIQSEP	New Liquor Separator Tank	3.99E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tanks*hr/yr	3.50E-01	5.03E-06

TABLE 6
BENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	3.99E-05	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	3.50E+00	5.03E-05
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	9.00E-06	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	78,840	tank*hr/yr	7.10E-01	1.02E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	9.00E-06	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	17,520	tank*hr/yr	1.58E-01	2.27E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	9.00E-06	lb/hr/tank	NCASI Pulp and Paper Database 2013 - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	8,760	hr/yr	7.88E-02	1.13E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.20E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time	38,581	ODTL/yr	8.49E-03	1.22E-07
10-45-0450	R05	No. 5 Precipitator Mix Tank	2.30E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank p. 143	1,226,400	TBLS/yr	2.82E-01	4.06E-06
14-05-0050	R03	North Smelt Tank	3.10E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	1.88E+00	2.70E-05
14-05-0300	R04-1	South Smelt Tank	3.10E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	1.88E+00	2.70E-05
10-08-0010	R04-2	Salt Cake Mix Tank	2.30E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank p. 143	1,212,822	TBLS/yr	2.79E-01	4.01E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.16E+00	3.11E-05
14-10-05	R14	No. 5 Green Liquor Clarifier	2.80E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	194,363	T CaO/yr	1.03E+01	1.49E-04
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	6.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	194,363	T CaO/yr	2.37E+01	3.41E-04
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.80E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	194,363	T CaO/yr	1.63E+00	2.35E-05
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.24E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied to account for all emissions.	194,363	T CaO/yr	3.62E+00	5.20E-05

TABLE 6
BENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	2.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied.	194,363	T CaO/yr	1.41E+01	2.03E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	9.20E-04	lb/TCaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	194,363	T CaO/yr	1.79E+02	2.57E-03
	PO01C	No. 5 Recovery Boiler - BLS	7.28E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mill Sources - A Second Update, Table 4.23.	1,226,400	TBLS/yr	8.93E+02	1.28E-02
	PO01C	No. 5 Recovery Boiler - No. 2	1.96E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	11,072,132	MMBtu/yr	2.17E+02	3.13E-03
10-25-0110	Total from No. 5 Recovery Boiler							1.11E+03	1.60E-02
14-30-0310	R46	Lime Mud Mix Tank	4.70E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	194,363	T CaO/yr	9.14E-01	1.31E-05
14-30-1450	R15	Lime Mud Storage Tank	4.70E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	194,363	T CaO/yr	9.14E-01	1.31E-05
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	2.80E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	194,363	T CaO/yr	5.44E+00	7.83E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.20E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	2.33E+00	3.35E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	3.95E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied to account for Lime Mud Filter Vacuum System, East and West Lime Filter Vacuum Pump Silencers, and the Lime Mud Filtrate Tank.	194,363	T CaO/yr	2.30E+00	3.31E-05
		Cooler -1 Feed Liquor	9.00E-06	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8,760	hr/yr	7.88E-02	1.13E-06
		Filter - 1 Lignin	2.20E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	8.49E-03	1.22E-07
		Tank - 2 Lignin Filter Cloth Wash	2.20E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time	38,581	ODTL/yr	8.49E-03	1.22E-07

TABLE 6
BENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	4.40E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	1.70E-02	2.44E-07
		LRP Dilute Tanks	1.54E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	5.94E-02	8.55E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.72E-01	2.48E-06
09-20-0250	R71	Combined Condensate Tank	2.76E+00	lb/yr	Pollutants loading test results from Radian Corp "Wastewater Characteriziation and Emissions" study for Weyerhaeuser Company, Dec. 1991. Two scenarios were evaluated and the SIMS model was used to give estimated air emissions for both.	1	tank	2.76E+00	3.97E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.35E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	2.24E+03	3.22E-02
	PO13A	No. 2 HFB - Hog Fuel	2.35E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	1.95E+03	2.80E-02
	PO13A	LVHC Combustion	1.55E-04	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	885,429	ADTUBP/yr	1.37E+02	1.97E-03
	PO13A	HVLC Combustion	1.33E-02	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	8,760	hr/yr	1.17E+02	1.68E-03
	PO13A	Carbonator - Feed Liquor	1.80E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	1.58E-03	2.27E-08
	PO13A	LRP Acidification Tanks	3.28E-05	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	38,581	ODTL/yr	1.27E+00	1.82E-05
65-25-0310	Total from No. 2 Hog Fuel Boiler							2.20E+03	3.17E-02
CD-65-60-1010	THERMALOX	Thermal Oxidizer	2.00E-06	lb/MMBTU	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	394,200	MMBtu/yr	7.88E-01	1.13E-05
	Total from Thermal Oxidizer and HVLC combustion							1.19E+02	1.71E-03

TABLE 6
BENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,050	MMBtu/yr	9.80E-01	1.41E-05
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2,538	MMBtu/yr	2.37E+00	3.41E-05
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,050	MMBtu/yr	9.80E-01	1.41E-05
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,365	MMBtu/yr	1.27E+00	1.83E-05
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	700	MMBtu/yr	6.53E-01	9.39E-06
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	700	MMBtu/yr	6.53E-01	9.39E-06
71-95-0500	COMMEA	Communications Back up Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2,884	MMBtu/yr	2.69E+00	3.87E-05
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	20,677	MMBtu/yr	1.93E+01	2.77E-04
TEMPGEN	TEMPGEN	Temporary Generator	9.33E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	52	MMBtu/yr	4.89E-02	7.04E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	5.43E-06	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	910,000	hp-hr/yr	4.94E+00	7.11E-05
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	1.70E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	5.57E+00	8.01E-05
32-40-1560	NC1&2	NC-2 Paper Machine	2.25E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	242,725	ADTFP/yr	5.46E+01	7.86E-04
45-93-0100	NC5	NC-5 Paper Machine	2.25E-04	lb/ADTFP	NCASI TB 884 Database 2013 - PM Pulp Dryers Non-Tissue	563,281	ADTFP/yr	1.27E+02	1.82E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	1.70E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	1.33E+01	1.91E-04

TABLE 7
BERYLLIUM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	216,080	hp-hr/yr	4.54E-03	6.53E-08
	PO01C	No. 5 Recovery Boiler BLS	1.71E-07	lb/TBLS	Stack Testing 2008	1,226,400	TBLS/yr	2.10E-01	3.02E-06
	PO01C	No. 5 Recovery Boiler - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	11,072,132	MMBtu/yr	3.32E+01	4.78E-04
10-25-0110	Total from No. 5 Recovery Boiler							3.34E+01	4.81E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.81E-08	lb/T CaO	2008 Stack Testing (1/2 Detection Limit)	194,363	T CaO/yr	5.46E-03	7.86E-08
14-05-0050	R03	North Smelt Tank	1.11E-07	lb/TBLS	NCASI Technical Bulletin No. 973, Table 4.29 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	6.73E-02	9.68E-07
14-05-0300	R04-1	South Smelt Tank	1.11E-07	lb/TBLS	NCASI Technical Bulletin No. 973, Table 4.29 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	6.73E-02	9.68E-07
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						6.73E-02	9.68E-07
64-25-0290	PO01A-1	No. 1 HFB - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	9,525,317	MMBtu/yr	2.86E+01	4.11E-04
65-25-0310	PO13A-1	No. 2 HFB - Testing	2.28E-09	lb/MMBtu	2012 Stack Testing; Only the most recent test data was used ot determine the emission factor for this compound, AEI 2016 Appendix C	8,293,837	MMBtu/yr	1.89E-02	2.72E-07
CD-65-60-1010	THERMALOX	Thermal Oxidizer	1.14E-08	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	394,200	MMBtu/yr	4.51E-03	6.48E-08
53-40-0130	FPDE	Fine Paper Diesel Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	3.15E-03	4.53E-08
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,538	MMBtu/yr	7.61E-03	1.09E-07

TABLE 7
BERYLLIUM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	3.15E-03	4.53E-08
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,365	MMBtu/yr	4.10E-03	5.89E-08
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.10E-03	3.02E-08
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.10E-03	3.02E-08
71-95-0500	COMMEA	Communications Back up Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,884	MMBtu/yr	8.65E-03	1.24E-07
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	20,677	MMBtu/yr	6.20E-02	8.92E-07
TEMPGEN	TEMPGEN	Temporary Generator	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	52	MMBtu/yr	1.57E-04	2.26E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10	910,000	hp-hr/yr	1.91E-02	2.75E-07

TABLE 8
1,3-BUTADIENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-12-0250	5SOAP	No. 5 Soap Storage Tank	4.97E-05	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	8760	tank*hr/yr	4.35E-01	6.26E-06
09-12-0050	LIQSEP	New Liquor Separator Tank	4.97E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8760	tank*hr/yr	4.35E-01	6.26E-06
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	4.97E-05	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	4.35E+00	6.26E-05
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	3.57E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	78,840	tank*hr/yr	2.81E+00	4.05E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	3.57E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	17,520	tank*hr/yr	6.25E-01	9.00E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	3.57E-05	lb/hr	NCASI Pulp and Paper Database 2013 - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	8,760	hr/yr	3.13E-01	4.50E-06
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.86E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	1.33E+00	1.92E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	4.94E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	331,712	ADTBP/yr	1.64E+01	2.36E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	3.86E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	2.08E+00	3.00E-05
07-31-1180	F30	No. 7 Bleach Plant Scrubber	4.94E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	2.56E+01	3.68E-04
53-40-0130	FPDE	Fine Paper Diesel Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,050	MMBtu/yr	4.11E-02	5.91E-07
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2,538	MMBtu/yr	9.92E-02	1.43E-06
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,050	MMBtu/yr	4.11E-02	5.91E-07

TABLE 8
1,3-BUTADIENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1,365	MMBtu/yr	5.34E-02	7.68E-07
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	700	MMBtu/yr	2.74E-02	3.94E-07
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	700	MMBtu/yr	2.74E-02	3.94E-07
71-95-0500	COMMEA	Communications Back up Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2,884	MMBtu/yr	1.13E-01	1.62E-06
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	20,677	MMBtu/yr	8.08E-01	1.16E-05
TEMPGEN	TEMPGEN	Temporary Generator	3.91E-05	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	52	MMBtu/yr	2.05E-03	2.95E-08
		Cooler -1 Feed Liquor	3.57E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8760	hr/yr	3.13E-01	4.50E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						3.13E-01	4.50E-06
	PO13A	Carbonator - Feed Liquor	7.14E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	6.25E-03	9.00E-08
65-25-0310	Total from No. 2 Hog Fuel Boiler							6.25E-03	9.00E-08
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							6.25E-03	9.00E-08
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	1.59E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mill Sources - A Second Update, Table 4.23.	1,226,400	TBLS/yr	1.95E+02	2.80E-03
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.94E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	194,363	T CaO/yr	1.35E+01	1.94E-04

TABLE 9
CADMIUM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	216,080	hp-hr/yr	4.54E-03	6.53E-08
	PO01C	No. 5 Recovery Boiler BLS	1.16E-05	lb/TBLS	Stack Testing 2008	1,226,400	TBLS/yr	1.42E+01	2.05E-04
	PO01C	No. 5 Recovery Boiler - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	11,072,132	MMBtu/yr	3.32E+01	4.78E-04
10-25-0110					Total from No. 5 Recovery Boiler			4.74E+01	6.82E-04
14-05-0050	R03	North Smelt Tank	5.20E-07	lb/TBLS	NCASI Technical Bulletin No. 973, Table 4.29 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	3.15E-01	4.54E-06
14-05-0300	R04-1	South Smelt Tank	5.20E-07	lb/TBLS	NCASI Technical Bulletin No. 973, Table 4.29 - Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	3.15E-01	4.54E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.15E-01	4.54E-06
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.24E-06	lb/T CaO	2008 Stack Testing (1/2 Detection Limit)	194,363	T CaO/yr	2.41E-01	3.47E-06
64-25-0290	PO01A-1	No. 1 HFB - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	9,525,317	MMBtu/yr	2.86E+01	4.11E-04
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	1.78E-06	lb/MMBtu	2012 Stack Testing; Only the most recent test data was used ot determine the emission factor for this compound, AEI 2016 Appendix C	8,293,837	MMBtu/yr	1.48E+01	2.12E-04
CD-65-60-1010	THERMALOX	Thermal Oxidizer	1.05E-06	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	394,200	MMBtu/yr	4.13E-01	5.94E-06
53-40-0130	FPDE	Fine Paper Diesel Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	3.15E-03	4.53E-08
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,538	MMBtu/yr	7.61E-03	1.09E-07

TABLE 9
CADMIUM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,050	MMBtu/yr	3.15E-03	4.53E-08
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	1,365	MMBtu/yr	4.10E-03	5.89E-08
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.10E-03	3.02E-08
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	700	MMBtu/yr	2.10E-03	3.02E-08
71-95-0500	COMMEA	Communications Back up Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	2,884	MMBtu/yr	8.65E-03	1.24E-07
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	20,677	MMBtu/yr	6.20E-02	8.92E-07
TEMPGEN	TEMPGEN	Temporary Generator	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	52	MMBtu/yr	1.57E-04	2.26E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	2.10E-08	lb/hp-hr	AP-42 Section 1.3 Table 1.3-10	910,000	hp-hr/yr	1.91E-02	2.75E-07

TABLE 10
CARBON DISULFIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.90E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	947	ADTUBP/day	1.80E-02	9.44E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	1.11E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	1.01E-01	5.30E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.90E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	1,479	ADTUBP/day	2.81E-02	1.48E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	1.11E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	1.58E-01	8.27E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	3.14E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	533	T CaO/day	1.67E-01	8.78E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	3.17E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	6.92E-03	3.63E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	8.59E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000 Stack Testing	2,183	ODTUBP/day	1.88E-03	9.85E-06
14-05-0050	R03	North Smelt Tank	3.35E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010 - Table 4.28 Kraft Smelt Dissolving Tanks p. 118	606,411	TBLS/day	2.03E+01	1.07E-01
14-05-0300	R04-1	South Smelt Tank	3.35E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010 - Table 4.28 Kraft Smelt Dissolving Tanks p. 118	606,411	TBLS/day	2.03E+01	1.07E-01
10-08-0010	R04-2	Salt Cake Mix Tank	5.60E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010 - Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank p. 143	1,212,822	TBLS/day	6.79E+00	3.57E-02
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.71E+01	1.42E-01
32-40-1560	NC1&2	NC-2 Paper Machine	7.37E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	665	ADTFP/day	4.90E-01	2.57E-03

TABLE 10
CARBON DISULFIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
45-93-0100	NC5	NC-5 Paper Machine	7.37E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	1664	ADTFP/day	1.23E+00	6.44E-03
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	3.80E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied to account for Lime Mud Filter Vacuum System, East and West Lime Filter Vacuum Pump Silencers, and the Lime Mud Filtrate Tank.	532.5	T CaO/day	6.07E-02	3.19E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	2.40E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Sources p. 128, Causticizer/Slaker Combination Emissions. A 1.5 factor is applied.	532.5	T CaO/day	1.92E-03	1.01E-05
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	6.60E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	3360	TBLS/day	2.22E+00	1.16E-02
10-45-0450	R05	No. 5 Precipitator Mix Tank	5.60E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	3360	TBLS/day	1.88E-02	9.88E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.25E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	26096.8	MMBtu/day	4.89E+00	2.57E-02
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.99E-03	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank > 20% Solids - Median	24.0	hr/day	4.78E-02	2.51E-04
		Cooler -1 Feed Liquor	1.99E-03	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24.0	hr/day	4.78E-02	2.51E-04
		Filter - 1 Lignin	8.59E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	9.08E-05	4.77E-07

TABLE 10
CARBON DISULFIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
		Tank - 2 Lignin Filter Cloth Wash	8.59E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time	105.7	ODTL/day	9.08E-05	4.77E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.72E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	105.7	ODTL/day	1.82E-04	9.53E-07
		LRP Dilute Tanks	6.01E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	105.7	ODTL/day	6.36E-04	3.34E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						4.88E-02	2.56E-04
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	8.59E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time	105.7	ODTL/day	9.08E-05	4.77E-07
	PO13A	Carbonator - Feed Liquor	3.98E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	24.0	hr/day	9.55E-04	5.01E-06
	PO13A	LRP Acidification Tanks	1.00E-05	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	1.06E-03	5.55E-06
	PO13A	No. 2 HFB - Hog Fuel	1.25E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22722.8	MMBtu/day	4.26E+00	2.24E-02

TABLE 10
CARBON DISULFIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
65-25-0310	Total from No. 2 Hog Fuel Boiler							4.26E+00	2.24E-02
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							2.01E-03	1.06E-05
09-12-0250	5SOAP	No. 5 Soap Storage Tank	9.99E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	2.40E-01	1.26E-03
09-12-0050	LIQSEP	New Liquor Separator Tank	9.99E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	2.40E-01	1.26E-03
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	9.99E-03	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	tank*hr/day	2.40E+00	1.26E-02
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.99E-03	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216	tank*hr/day	4.30E-01	2.26E-03
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.99E-03	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48.0	tank*hr/day	9.55E-02	5.01E-04
SETPOND2	SETPOND2	Primary Clarifier	1.46E-09	lb/ADTUBP	NCASI TRI Guidance	2425.8	ADTUBP/day	3.54E-06	1.86E-08
SETPOND1	SETPOND1	Secondary Clarifier	9.50E-09	lb/ADTUBP	NCASI TRI Guidance	2425.8	ADTUBP/day	2.30E-05	1.21E-07

TABLE 11
CARBON TETRACHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	4.80E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	1.66E+00	2.39E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	5.06E-06	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	331,712	ADTBP/yr	1.68E+00	2.41E-05
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	4.80E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	2.59E+00	3.73E-05
07-31-1180	F30	No. 7 Bleach Plant Scrubber	5.06E-06	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	2.62E+00	3.77E-05
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	1.26E-04	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	485,906	ODTUBP/yr	6.12E+01	8.81E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.60E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000	796,886	ODTUBP/yr	1.28E+01	1.83E-04
09-05-0210	SWBLTANK	South WBL Storage Tank	4.34E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000	2,183	ODTUBP/yr	9.48E-03	1.36E-07
09-12-0250	5SOAP	No. 5 Soap Storage Tank	6.80E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tanks*hr/yr	5.96E-02	8.57E-07
09-12-0050	LIQSEP	New Liquor Separator Tank	6.80E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tanks*hr/yr	5.96E-02	8.57E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	6.80E-06	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tanks*hr/yr	5.96E-01	8.57E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	4.34E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.67E-01	2.41E-06
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	1.21E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	1,226,400	TBLS/yr	1.48E+01	2.13E-04
14-05-0050	R03	North Smelt Tank	3.90E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	606,411	TBLS/yr	2.37E+00	3.40E-05
14-05-0300	R04-1	South Smelt Tank	3.90E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	606,411	TBLS/yr	2.37E+00	3.40E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.37E+00	3.40E-05

TABLE 11
CARBON TETRACHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.16E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	3.31E+02	4.77E-03
		LRP Dilute Tanks	3.04E-05	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	1.17E+00	1.69E-05
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	8.68E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	3.35E-01	4.82E-06
		Tank - 2 Lignin Filter Cloth Wash	4.34E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.67E-01	2.41E-06
		Filter - 1 Lignin	4.34E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.67E-01	2.41E-06
09-27-3800	LSRPSCRUB				Total from Caustic Scrubber			1.84E+00	2.65E-05
	PO13A	No. 2 HFB - Hog Fuel	1.16E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	9.62E+01	1.38E-03
	PO13A	LVHC Combustion	5.30E-05	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	885,429	ADTUBP/yr	4.69E+01	6.75E-04
	PO13A	HVLC Combustion	2.16E-05	lb/hr	Data generated by the 1996 compliance testing was run at 68% of the total fiberline capacity, 2050 BDTP per day. The tested lb/hr loadings were adjusted by a ratio of actual production to testing production.	8,760	hr/yr	1.89E-01	2.72E-06
	PO13A	LRP Dilute Tanks	5.21E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks (6 Tanks) assuming 98% control by HVLC combustion system	38,581	ODTL/yr	2.01E-02	2.89E-07
	PO13A	LRP Acidification Tanks	4.55E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	38,581	ODTL/yr	1.75E+01	2.52E-04
65-25-0310					Total from No. 2 Hog Fuel Boiler			1.61E+02	2.31E-03
CD-65-60-1010					Total from Thermal Oxidizer and HVLC			1.78E+01	2.55E-04
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	3.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	1.18E+02	1.70E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	3.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	2.81E+02	4.05E-03

TABLE 12
CHLOROBENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.26E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	947	ADTUBP/day	1.19E-02	6.26E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	1.07E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	9.72E-03	5.11E-05
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.26E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update"February 2014, Table 4.4, Oxygen Delignification System Vents.(Emission Factor given in lb/ADTUBP - converted to lb/ODTP by dividing by 0.9)	1,479	ADTUBP/day	1.86E-02	9.78E-05
07-31-1180	F30	No. 7 Bleach Plant Scrubber	1.07E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	1.52E-02	7.98E-05
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	3.32E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	533	T CaO/day	1.77E-02	9.28E-05
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	7.80E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	1.04E-02	5.45E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	1.53E-05	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	3.67E-04	1.93E-06
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.34E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	5.11E-03	2.68E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	6.35E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000 Stack Testing	2,183	ODTUBP/day	1.39E-03	7.28E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	3.75E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	9.00E-05	4.72E-07
09-12-0050	LIQSEP	New Liquor Separator Tank	3.75E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	9.00E-05	4.72E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	3.75E-06	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	tank*hr/day	9.00E-04	4.72E-06

TABLE 12
CHLOROBENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	7.00E-07	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216	tank*hr/day	1.51E-04	7.94E-07
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	7.00E-07	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48	tank*hr/day	3.36E-05	1.76E-07
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	7.00E-07	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank > 20% Solids - Median	24.0	hr/day	1.68E-05	8.82E-08
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	6.35E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	6.71E-05	3.52E-07
10-45-0450	R05	No. 5 Precipitator Mix Tank	4.60E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents, p. 143	3,360	TBLS/day	1.55E-03	8.11E-06
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	1.46E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	3,360	TBLS/day	4.91E-02	2.58E-04
14-05-0050	R03	North Smelt Tank	4.50E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	1,661	TBLS/day	7.48E-03	3.92E-05
14-05-0300	R04-1	South Smelt Tank	4.50E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	1,661	TBLS/day	7.48E-03	3.92E-05
10-08-0010	R04-2	Salt Cake Mix Tank	4.60E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents, p. 143	3,323	TBLS/day	1.53E-03	8.02E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						9.00E-03	4.73E-05
14-30-0310	R46	Lime Mud Mix Tank	5.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	533	T CaO/day	3.14E-02	1.65E-04
		Cooler -1 Feed Liquor	7.00E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24.0	hr/day	1.68E-05	8.82E-08

TABLE 12
CHLOROBENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
		Filter - 1 Lignin	6.35E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	6.71E-05	3.52E-07
		Tank - 2 Lignin Filter Cloth Wash	6.35E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	6.71E-05	3.52E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.27E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	106	ODTL/day	1.34E-04	7.05E-07
		LRP Dilute Tanks	4.45E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	106	ODTL/day	4.70E-04	2.47E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						7.55E-04	3.96E-06
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.50E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	7.99E-02	4.19E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.66E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	26,096.76	MMBtu/day	4.33E-01	2.27E-03
	PO13A	LVHC Combustion	5.00E-07	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	2,426	ADTUBP/day	1.21E-03	6.37E-06
	PO13A	No. 2 HFB - Hog Fuel	1.66E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22,723	MMBtu/day	3.77E-01	1.98E-03
	PO13A	Carbonator - Feed Liquor	1.40E-08	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	24.0	hr/day	3.36E-07	1.76E-09
	PO13A	LRP Acidification Tanks	3.47E-05	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	3.66E-03	1.92E-05
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.82E-01	2.01E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							3.66E-03	1.92E-05

TABLE 12
CHLOROBENZENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	599	ODTUBP/day	1.98E-02	1.04E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.16E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	665	ADTFP/day	7.71E-02	4.05E-04
45-93-0100	NC5	NC-5 Paper Machine	1.16E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	1,664	ADTFP/day	1.93E-01	1.01E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	1,540	ODTUBP/day	5.08E-02	2.67E-04

TABLE 13
CHLOROFORM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	5.12E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	1.77E+01	2.54E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	2.83E-03	lb/ODTUBP	Emissions are based on the results of testing conducted in July 1995. Testing results are based upon Fiberline production.	310,980	ODTUBP/yr	8.80E+02	1.27E-02
06-P1	6FEEDTNK	No. 6 Bleach Plant 6th Stage Feed Tank	4.07E-04	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	1.27E+02	1.82E-03
06-P2	6BLOWTBE	No. 6 Bleach Plant 6th Stage Blow Tube (standpipe)	1.91E-03	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	5.94E+02	8.54E-03
06-P3	6EXHAUST	No. 6 BP 6th Stage Washer And Filtrate Tank	6.75E-03	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources. TB No. 679 doesn't specify bleached or unbleached so we assume unbleached.	310,980	ODTUBP/yr	2.10E+03	3.02E-02
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	5.12E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	2.76E+01	3.98E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	5.00E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	2.59E+03	3.73E-02
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	9.98E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	194,363	T CaO/yr	1.94E+01	2.79E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	5.60E-04	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	485,906	ODTUBP/yr	2.72E+02	3.91E-03
08-40-1000	F35	No. 32 High Density Pulp Tank	4.83E-03	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	8,760	tank*hr/yr	4.23E+01	6.09E-04
08-52-1060	F34	ClO2 Scrubber	2.61E-04	lb/Ton ClO2	ETG, Sep 1998, Stack Testing	20,075	Ton ClO2/yr	5.24E+00	7.54E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.49E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.98E+00	2.85E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	6.74E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	5.37E-01	7.73E-06

TABLE 13
CHLOROFORM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-12-0250	5SOAP	No. 5 Soap Storage Tank	8.34E-07	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tank*hr/yr	7.31E-03	1.05E-07
09-12-0050	LIQSEP	New Liquor Separator Tank	8.34E-07	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tank*hr/yr	7.31E-03	1.05E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	8.34E-07	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87600.0	tank*hr/yr	7.31E-02	1.05E-06
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	8.00E-06	lb/hr/tank	Chloroform is the median value from NCASI Table A8a. Summary of 'Air Toxic' Emissions from Kraft Liquor and Unbleached Pulp Storage Tanks, Contd. as referenced in TB973 Section 4.2.8 for Kraft Liquor Storage Tanks. NCASI discusses rejection of specific test data in TB 973 Section 4.2.8.2 and provides test detail in Table A8a. 9.0 multiplier for tank movements	78840	tank*hr/yr	6.31E-01	9.07E-06
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	8.00E-06	lb/hr/tank	Chloroform is the median value from NCASI Table A8a. Summary of 'Air Toxic' Emissions from Kraft Liquor and Unbleached Pulp Storage Tanks, Contd. as referenced in TB973 Section 4.2.8 for Kraft Liquor Storage Tanks. NCASI discusses rejection of specific test data in TB 973 Section 4.2.8.2 and provides test detail in Table A8a. 2.0 multiplier for tank movements	17520.0	tank*hr/yr	1.40E-01	2.02E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	8.00E-06	lb/hr	Chloroform is the median value from NCASI Table A8a. Summary of 'Air Toxic' Emissions from Kraft Liquor and Unbleached Pulp Storage Tanks, Contd. as referenced in TB973 Section 4.2.8 for Kraft Liquor Storage Tanks. NCASI discusses rejection of specific test data in TB 973 Section 4.2.8.2 and provides test detail in Table A8a.	8,760	hr/yr	7.01E-02	1.01E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	6.74E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.60E-02	3.74E-07
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	1.42E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	1,226,400	TBLS/yr	1.74E+01	2.50E-04
14-05-0050	R03	North Smelt Tank	7.10E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	606,411	TBLS/yr	4.31E+00	6.19E-05
14-05-0300	R04-1	South Smelt Tank	7.10E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	606,411	TBLS/yr	4.31E+00	6.19E-05

TABLE 13
CHLOROFORM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						4.31E+00	6.19E-05
		Cooler -1 Feed Liquor	5.44E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8,760	hr/yr	4.77E-01	6.85E-06
		Filter - 1 Lignin	6.74E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.60E-02	3.74E-07
		Tank - 2 Lignin Filter Cloth Wash	6.74E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.60E-02	3.74E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.35E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	5.20E-02	7.48E-07
		LRP Dilute Tanks	4.72E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	1.82E-01	2.62E-06
09-27-3800	**LSRPSCRUB**	Total from Caustic Scrubber						7.63E-01	1.10E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.40E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	2.72E+00	3.91E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	5.06E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	194,363	T CaO/yr	2.95E+01	4.24E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.55E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	2.43E+01	3.49E-04
	PO13A	No. 2 HFB - Hog Fuel	2.55E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	2.11E+01	3.04E-04
	PO13A	LVHC Combustion	1.00E-07	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	885,429	ADTUBP/yr	8.85E-02	1.27E-06
	PO13A	Carbonator - Feed Liquor	1.09E-06	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4 19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	9.53E-03	1.37E-07

TABLE 13
CHLOROFORM POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
	PO13A	LRP Acidification Tanks	1.00E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	38,581	ODTL/yr	3.86E+00	5.55E-05
65-25-0310	Total from No. 2 Hog Fuel Boiler							2.51E+01	3.61E-04
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							3.87E+00	5.56E-05
32-40-1560	NC1&2	NC-2 Paper Machine	1.59E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	242,725	ADTFP/yr	3.86E+01	5.55E-04
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	3.10E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	1.02E+02	1.46E-03
45-93-0100	NC5	NC-5 Paper Machine	1.59E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	563,281	ADTFP/yr	8.96E+01	1.29E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	3.10E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	2.42E+02	3.48E-03
SETPOND2	SETPOND2	Primary Clarifier	2.35E-04	lb/ODTUBP	NCASI TRI Guidance	796,886	ODTUBP/yr	1.87E+02	2.70E-03
SETPOND1	SETPOND1	Secondary Clarifier	1.16E-03	lb/ODTUBP	NCASI TRI Guidance	796,886	ODTUBP/yr	9.21E+02	1.32E-02
73-05-2000-A		C3 Stream	1.35E-21	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	5,500	hr/yr	7.43E-18	1.07E-22

TABLE 14
CHROMIUM (VI) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-05-0050	R03	North Smelt Tank	3.40E-06	lb/TBLS	NCASI TB 973 Table 4.29 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	5.65E-03	2.97E-05
14-05-0300	R04-1	South Smelt Tank	3.40E-06	lb/TBLS	NCASI TB 973 Table 4.29 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	5.65E-03	2.97E-05
14-05-0300, 10-08-001(	R04	Total South Smelt Tank and Salt Cake Mix Tank						5.65E-03	2.97E-05
	PO01C	No. 5 Recovery Boiler - BLS	8.30E-06	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	3,360.00	TBLS/day	2.79E-02	1.46E-04
	PO01C	No. 5 Recovery Boiler - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30,334.61	MMBtu/day	9.10E-02	4.78E-04
10-25-0110	Total from No. 5 Recovery Boiler							1.19E-01	6.24E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	4.25E-05	lb/T CaO	NCASI TB 973 Table 4.27	533	T CaO/day	2.26E-02	1.19E-04
CD-65-60-1010	THERMALOX	Thermal Oxidizer	1.33E-06	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	1.44E-03	7.56E-06
53-40-0130	FPDE	Fine Paper Diesel Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	50	MMBtu/day	1.51E-04	7.94E-07
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	122	MMBtu/day	3.65E-04	1.92E-06
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	50	MMBtu/day	1.51E-04	7.94E-07

TABLE 14
CHROMIUM (VI) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	66	MMBtu/day	1.97E-04	1.03E-06
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	34	MMBtu/day	1.01E-04	5.29E-07
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	34	MMBtu/day	1.01E-04	5.29E-07
71-95-0500	COMMEA	Communications Back up Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	138	MMBtu/day	4.15E-04	2.18E-06
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	57	MMBtu/day	1.70E-04	8.92E-07
TEMPGEN	TEMPGEN	Temporary Generator	3.00E-06	lb/MMBtu	AP-42 Table 1.3-10	0.14	MMBtu/day	4.31E-07	2.26E-09
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	5.16E-06	lb/MMBtu	Test data; Appendix C in AEI, only most recent test data used in determining emission factor	26,097	MMBtu/day	1.35E-01	7.07E-04
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	4.38E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22,723	MMBtu/day	9.95E-02	5.23E-04

TABLE 15
1,2-DICHLOROETHANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.10E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	1.07E+00	1.54E-05
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	3.10E-06	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	1.67E+00	2.41E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.06E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.64E+00	2.36E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	5.58E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	4.45E-01	6.40E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.51E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	1.32E+00	1.90E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.51E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	1.32E+00	1.90E-05
14-05-0050	R03	North Smelt Tank	6.88E-06	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	4.17E+00	6.00E-05
14-05-0300	R04-1	South Smelt Tank	6.88E-06	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	4.17E+00	6.00E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						4.17E+00	6.00E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.51E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	1.32E+01	1.90E-04
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	5.58E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.15E-02	3.10E-07
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.27E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	2.47E+00	3.55E-05

TABLE 15
1,2-DICHLOROETHANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
10-25-0110	PO01C	No. 5 Recovery Furnace - BLS	3.10E-07	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	1226400	TBLS/yr	3.80E-01	5.47E-06
		LRP Dilute Tanks	3.91E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	1.51E-01	2.17E-06
		Tank - 2 Lignin Filter Cloth Wash	5.58E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.15E-02	3.10E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.12E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	4.31E-02	6.19E-07
		Filter - 1 Lignin	5.58E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	2.15E-02	3.10E-07
09-27-3800	LSRPSCRUB				Total from Caustic Scrubber			2.37E-01	3.41E-06
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.92E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	2.78E+02	4.00E-03
	PO13A	No. 2 HFB - Hog Fuel	2.92E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	2.42E+02	3.48E-03
65-25-0310					Total from No. 2 Hog Fuel Boiler			2.42E+02	3.48E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	7.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	2.49E+01	3.58E-04
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	7.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	5.94E+01	8.54E-04

TABLE 16
FLUORIDE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	4,729	MMbtu/day	1.26E+00	6.61E-03
10-25-0110	PO01C	No. 5 Recovery Boiler - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30,335	MMbtu/day	8.08E+00	4.24E-02
64-25-0290	PO01A-1	No. 1 HFB - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	26,097	MMbtu/day	6.95E+00	3.65E-02
65-25-0310	PO13A-1	No. 2 HFB - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	22,723	MMbtu/day	6.05E+00	3.18E-02

TABLE 17
FLUORIDE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	197	MMbtu/hr	5.25E-02	6.61E-03
10-25-0110	PO01C	No. 5 Recovery Boiler - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1264	MMbtu/hr	3.37E-01	4.24E-02
64-25-0290	PO01A-1	No. 1 HFB - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1087	MMbtu/hr	2.90E-01	3.65E-02
65-25-0310	PO13A-1	No. 2 HFB - No. 2	2.66E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	947	MMbtu/hr	2.52E-01	3.18E-02

TABLE 18
FORMALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	8.26E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	74	hp-hr/hr	6.11E-04	7.70E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.57E-06	lb/ODTUBP	1995 test data	35.5	ODTUBP/hr	1.27E-04	1.60E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	6.21E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	2.35E-02	2.96E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.32E-05	lb/ODTUBP	1995 test data	55.5	ODTUBP/hr	7.32E-04	9.23E-05
07-31-1180	F30	No. 7 Bleach Plant Scrubber	6.21E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	3.67E-02	4.63E-03
05-30-1300	F60	Hot Water Tank	1.77E-04	lb/hr	Sep 1998 Stack Testing	1.0	hr/hr	1.77E-04	2.23E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	2.07E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	1.88E-05	2.37E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.00E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.00E-04	2.52E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	2.00E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.00E-04	2.52E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.00E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tank	2.00E-03	2.52E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	5.00E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	tank	4.50E-03	5.67E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	5.00E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	tank	1.00E-03	1.26E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	5.00E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank > 20% Solids - Median	1.0	hr/hr	5.00E-04	6.30E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.07E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	9.12E-07	1.15E-07
	PO01C	No. 5 Recovery Boiler BLS	7.79E-03	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.23 - Summary of Non-metal Air Toxic Emissions from NDCE Kraft Recovery Furnace p. 100	140.0	TBLS/hr	1.09E+00	1.37E-01

TABLE 18
FORMALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
	PO01C	No. 5 Recovery Boiler - No. 2	3.43E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1263.9	MMBtu/hr	4.33E-01	5.46E-02
10-25-0110	Total from No. 5 Recovery Boiler							1.52E+00	1.92E-01
10-45-0450	R05	No. 5 Precipitator Mix Tank	6.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents, p. 143	140	TBLS/hr	8.96E-04	1.13E-04
14-05-0050	R03	North Smelt Tank	3.15E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	69.2	TBLS/hr	2.18E-02	2.75E-03
14-05-0300	R04-1	South Smelt Tank	3.15E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	69.2	TBLS/hr	2.18E-02	2.75E-03
10-08-0010	R04-2	Salt Cake Mix Tank	6.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents, p. 143	138	TBLS/hr	8.86E-04	1.12E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.27E-02	2.86E-03
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	2.94E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	9.78E-04	1.23E-04
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	2.20E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied.	22.2	T CaO/hr	1.22E-01	1.54E-02
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	4.99E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	1.11E-01	1.39E-02
09-20-0250	R71	Combined Condensate Tank	2.78E-05	lb/hr	Stack Testing 1998; 12.58% increase due to sewering of condensates from C3 and No. 6 Evaps 5th effect (2013 Project)	1.0	hr/hr	2.78E-05	3.50E-06
		Cooler -1 Feed Liquor	5.00E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.0	hr/hr	5.00E-04	6.30E-05
		Filter - 1 Lignin	2.07E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	9.12E-07	1.15E-07
		Tank - 2 Lignin Filter Cloth Wash	2.07E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	9.12E-07	1.15E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	4.14E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	1.82E-06	2.30E-07

TABLE 18
FORMALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		LRP Dilute Tanks	1.45E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	6.38E-06	8.04E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						5.10E-04	6.43E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	3.77E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1087.4	MMBtu/hr	4.10E-01	5.17E-02
	PO13A	No. 2 HFB - Hog Fuel	3.77E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	946.8	MMBtu/hr	3.57E-01	4.50E-02
	PO13A	LVHC Combustion	1.46E-04	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101.1	ADTUBP/hr	1.48E-02	1.86E-03
	PO13A	Carbonator - Feed Liquor	1.00E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1.0	hr/hr	1.00E-05	1.26E-06
	PO13A	LRP Acidification Tanks	3.60E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	1.59E-03	2.00E-04
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.73E-01	4.70E-02
CD-65-60-1010	THERMALOX	Thermal Oxidizer	7.14E-05	lb/MMBTU	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	45	MMBtu/hr	3.21E-03	4.05E-04
	Total from Thermal Oxidizer and HVLC combustion							4.81E-03	6.06E-04

TABLE 18
FORMALDEHYDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
32-40-1560	NC1&2	NC-2 Paper Machine	2.30E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 pg. 140, Summary of Air Toxic Emission from Bleached Kraft Pulp and Paper Machines	25	ADTFP/hr	5.75E-02	7.24E-03
45-93-0100	NC5	NC-5 Paper Machine	2.30E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 pg. 140, Summary of Air Toxic Emission from Bleached Kraft Pulp and Paper Machines	69	ADTFP/hr	1.60E-01	2.01E-02
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.75E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22	T CaO/hr	3.88E-03	4.89E-04
53-40-0130	FPDE	Fine Paper Diesel Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	2.48E-03	3.12E-04
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.1	MMBtu/hr	5.99E-03	7.55E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2	2.1	MMBtu/hr	2.48E-03	3.12E-04
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.7	MMBtu/hr	3.22E-03	4.06E-04
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.65E-03	2.08E-04
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	1.65E-03	2.08E-04
71-95-0500	COMMEA	Communications Back up Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.8	MMBtu/hr	6.81E-03	8.58E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.4	MMBtu/hr	2.79E-03	3.51E-04
TEMPGEN	TEMPGEN	Temporary Generator	1.18E-03	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.006	MMBtu/hr	7.06E-06	8.90E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	5.52E-07	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	1000	hp-hr/hr	5.52E-04	6.96E-05
73-10-2000	SETPOND2	Primary Clarifier	1.50E-09	lb/gallon	NCASI TRI Guidance	3125000	gal/hr	4.69E-03	5.91E-04
73-10-1000	SETPOND1	Secondary Clarifier	3.00E-09	lb/gallon	NCASI TRI Guidance	3125000	gal/hr	9.37E-03	1.18E-03
73-05-2000-A		C3 Stream Sewering	3.24E-02	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1.0	hr/hr	3.24E-02	4.08E-03
73-05-2000-B		5th eff 6 evap Sewering	2.50E-02	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1.0	hr/hr	2.50E-02	3.15E-03

TABLE 19
HYDROGEN CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	1.81E-05	lb/hp-hr	AP-42 Section 1.3, Table 1.3-11. Converted to lb/hp-hr	74	hp-hr/hr	1.34E-03	1.68E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	2.30E-02	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	8.71E-01	1.10E-01
07-31-1180	F30	No. 7 Bleach Plant Scrubber	2.30E-02	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	1.36E+00	1.71E-01
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.90E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	4.22E-02	5.31E-03
08-52-1060	F34	ClO2 Scrubber	3.66E-03	lb/Ton ClO2	ETG, Sep 1998, Stack Testing	2.3	Ton ClO2/hr	8.39E-03	1.06E-03
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.10E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91	ODTUBP/hr	1.00E-03	1.26E-04
09-05-0210	SWBLTANK	South WBL Storage Tank	2.96E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91	ODTUBP/hr	2.69E-04	3.39E-05
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	6.00E-02	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	140	TBLS/hr	8.40E+00	1.06E+00
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	3.46E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	3.76E-01	4.74E-02
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.96E-06	lb/ODTP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTP/hr	1.30E-05	1.64E-06

TABLE 19
HYDROGEN CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		LRP Dilute Tanks	2.07E-05	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTP/hr	9.13E-05	1.15E-05
		Tank - 2 Lignin Filter Cloth Wash	2.96E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTP/hr	1.30E-05	1.64E-06
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	5.92E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. (2 Conveyors)	4.4	ODTL/hr	2.61E-05	3.29E-06
		Filter - 1 Lignin	2.96E-06	lb/ODTP	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTP/hr	1.30E-05	1.64E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.43E-04	1.81E-05
	PO13A	No. 2 HFB - Hog Fuel	3.46E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	946.8	MMBtu/hr	3.28E-01	4.13E-02

TABLE 19
HYDROGEN CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.28E-01	4.13E-02
53-40-0130	FPDE	Fine Paper Diesel Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	2.1	MMBtu/hr	5.42E-03	6.83E-04
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	5.1	MMBtu/hr	1.31E-02	1.65E-03
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	2.1	MMBtu/hr	5.42E-03	6.83E-04
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	2.7	MMBtu/hr	7.04E-03	8.87E-04
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	1.4	MMBtu/hr	3.61E-03	4.55E-04
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	1.4	MMBtu/hr	3.61E-03	4.55E-04
71-95-0500	COMMEA	Communications Back up Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	5.8	MMBtu/hr	1.49E-02	1.88E-03
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	2.4	MMBtu/hr	6.09E-03	7.67E-04
TEMPGEN	TEMPGEN	Temporary Generator	2.58E-03	lb/MMBtu	AP-42 Table 1.3-11 converted to lb/MMBtu	0.01	MMBtu/hr	1.54E-05	1.95E-06

TABLE 20
HYDROGEN SULFIDE POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate (lb/day)	Potential Emission Rate (g/s)
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	3.61E-02	lb/ODTP	July 1995 Stack Testing (Increased by 7.58% due to additional condensate sewering March 2013)	818	ODTP/day	2.96E+01	1.55E-01
07-31-1180	F30	No. 7 Bleach Plant Scrubber	2.15E-02	lb/ODTP	Sep 1995 Stack Testing (Increased by 7.58% due to additional condensate sewering March 2013)	1,278	ODTP/day	2.75E+01	1.44E-01
05-30-1300	F60	No. 5 Hot Water Tank	2.05E-03	lb/hr	Sep 1998 Stack Testing (Same as Combined Condensate Tank)	24	hr/day	4.93E-02	2.59E-04
08-40-1000	F35	No. 32 High Density Pulp Tank	2.35E-03	lb/hr	NCASI SR 14-01 Table 3-6- Addendum to TB 973	24	hr/day	5.64E-02	2.96E-04
14-05-0050	R03	North Smelt Tank	5.97E-03	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	9.92E+00	5.21E-02
14-05-0300	R04-1	South Smelt Tank	5.97E-03	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	9.92E+00	5.21E-02
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						9.92E+00	5.21E-02
14-10-05	R14	No. 5 Green Liquor Clarifier	1.93E-05	lb/T CaO	1991 Stack Testing. A factor of 1.9 is applied.	533	T CaO/day	1.95E-02	1.03E-04
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.58E-04	lb/T CaO	1991 Stack Testing.	533	T CaO/day	1.37E-01	7.21E-04
14-30-0310	R46	Lime Mud Mix Tank	2.37E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 Causticizing Area Sources - Causticizer/Slaker Combination Emissions. A multiplier of 2 is applied. Based on 1991 test data, an H2S to MMC ratio of 0.32 was applied to the NCASI MMC factor. Data points reported as non-detect treated as zero.	533	T CaO/day	1.26E-01	6.63E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	4.80E-05	lb/T CaO	NCASI Technical Bulletin No. 858, February 2003, Table A-17 Precoat Filter Vacuum Pump Exhausts Based on 1991 test data, an H2S to MMC ratio of 0.32 was applied to the NCASI MMC factor.	533	T CaO/day	2.56E-02	1.34E-04
10-25-0110	PO01C	No. 5 Recovery Boiler	7.72E+00	lb/hr	Emission Rate estimated using permit limit of 5 TRS as H2S ppm @ 8%O2 and 2014 test flow scaled up to max production. Ratio applied from NCASI TB 973 Table 4.23 to speciate TRS compounds. See supporting file: "Limits ppm calcs 2016.xlsx"	24	hr/day	1.85E+02	9.73E-01

TABLE 20
HYDROGEN SULFIDE POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate (lb/day)	Potential Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln	2.83E+00	lb/hr	Emission Rate estimated using permit limit of 8 TRS as H2S ppm @ 10%O2 and 2014 test flow scaled up to max production. Ratio applied from NCASI TB 973 Table 4.25 to speciate TRS compounds. See supporting file: "Limits ppm calcs 2016.xlsx"	24	hr/day	6.79E+01	3.57E-01
	PO13A	LVHC Combustion	5.13E+00	lb/hr	Energy Savings and Sustainability Project Report, February, 2006.	24	hr/day	1.23E+02	6.46E-01
	PO13A	LSRP Contribution to Main HVLC Header	5.03E-01	lb/hr	Emisson rate is derived from projected exhaust concentration and flow rate data from a preliminary design of the future LSRP emissions routed to the HVLC header. Includes a 50% Safety Factor.	24	hr/day	1.21E+01	6.34E-02
	PO01A	Main HVLC Combined Header (No LSRP Contribution)	6.54E-02	lb/hr	Emissions are estimated based on pollutant loading in the HVLC gases from December 2008 testing and 98% destruction efficiency	24	hr/day	1.57E+00	8.24E-03
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.37E+02	7.18E-01
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							1.36E+01	7.16E-02
09-12-0250	5SOAP	No. 5 Soap Storage Tank	3.87E-03	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	24	tank*hr/day	9.29E-02	4.88E-04
09-12-0050	LIQSEP	New Liquor Separator Tank	3.87E-03	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	24	tank*hr/day	9.29E-02	4.88E-04
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	3.87E-03	lb/hr/tank	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240.0	tank*hr/day	9.29E-01	4.88E-03
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, **R72**	**48%** Liquor Storage Tanks, Soap Tanks	4.89E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216.0	tank*hr/day	1.06E+01	5.55E-02
09-40-0010, 09-40-0020	R29, **R30**	**65%** Liquor Storage Tanks	4.89E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48.0	tank*hr/day	2.35E+00	1.23E-02

TABLE 20
HYDROGEN SULFIDE POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate (lb/day)	Potential Emission Rate (g/s)
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	4.89E-02	lb/hr/tank	NCASI Technical Bulletin No. 973, February 2010, Table 4.19 - Strong or Heavy Black Liquor Storage Tanks p. 81.	24	hr/day	1.17E+00	6.16E-03
09-27-3800	LSRPSCRUB	LSRP Emissions Post Control By Scrubber	4.85E+00	lb/hr	Emisson rate is derived from projected exhaust concentration and flow rate data from a preliminary design of LSRP emissions routed to the scrubber. Includes a 50% Safety Factor.	24	hr/day	1.16E+02	6.11E-01
09-27-3000	LRPPRS2	LRP Press Building Fugitives	3.19E-01	lb/hr	Emissions rate is derived from projected exhaust concentration and flow rate data from a filter press 2 fugitive emissions vented to atmosphere.	24	hr/day	7.65E+00	4.01E-02
FIBLIFT	FIBLIFT	Open Sewer	7.26E+00	lb/day	NCASI 2006 H2S Study - Converted to lb/day	1	unity	7.26E+00	3.81E-02
SETPOND1	SETPOND1	No. 1 Settling Pond	1.32E+04	lb/yr	2012 NCASI Emission Estimation Model and NCASI 2006 H2S study. Total Settling Pond emissions ratioed by the total flow to each pond.	365	days/yr	3.60E+01	1.89E-01
SETPOND2	SETPOND2	No. 2 Settling Pond	3.90E+03	lb/yr	2012 NCASI Emission Estimation Model and NCASI 2006 H2S study. Total Settling Pond emissions ratioed by the total flow to each pond.	365	days/yr	1.07E+01	5.61E-02
AIRBASIN	AIRBASIN	Aerated Stabilization Basin	1.82E+04	lb/yr	2012 NCASI Emission Estimation Model and NCASI 2006 H2S study.	365	days/yr	4.98E+01	2.61E-01
09-20-0250	R71	Combined Condensate Tank	2.05E-03	lb/hr	1998 Stack Testing; 3.76% increase due to sewering of condensates from C3 and No. 6 Evaps 5th effect (2013 Project)	24	hr/day	4.93E-02	2.59E-04
LRPSSUMP	LRPSSUMP	LSRP Fugitives (LVHC Drain Loop and No. 1 Filtrate Sump)	1.22E-01	lb/hr	Emission factors from test data 2016 are the sum of the Drain Loop and Filtrate Sump	24	hr/day	2.93E+00	1.54E-02

TABLE 21
METHYL MERCAPTAN POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate	
								(lb/hr)	(g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	8.10E-07	lb/ODTUBP	July 1995 Stack Test	35.5	ODTUBP/hr	2.88E-05	3.62E-06
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	1.64E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	6.21E-02	7.82E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	2.92E-05	lb/ODTUBP	1995 Stack Test	55.5	ODTUBP/hr	1.62E-03	2.04E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	1.64E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	9.70E-02	1.22E-02
10-25-0110	PO01C	No. 5 Recovery Boiler	1.74E+00	lb/hr	Emission Rate estimated using permit limit of 5 ppm TRS as H2S @ 8%O2 and 2014 test flow scaled up to max production. Ratio applied from NCASI TB 973 Table 4.23 to speciate TRS compounds. See supporting file: "Limits ppm calcs 2016.xlsx"	1.0	hr/hr	1.74E+00	2.19E-01
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	1.66E-04	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994, emission factor multiplied by 2	55	ODTUBP/hr	9.21E-03	1.16E-03
05-30-1300	F60	No. 5 Hot Water Tank	2.52E-02	lb/hr	Condensate sampling results from 2013 using NCASI Methodology for 24% emitted as MeSH	1	hr/hr	2.52E-02	3.18E-03
08-40-1000	F35	No. 32 High Density Pulp Tank	3.14E-03	lb/hr/tank	DMDS, H2S, MMC, DMS from NCASI SR 14-01 Table 3-6-Addendum to TB 973	1	tanks	3.14E-03	3.96E-04
09-12-0250	5SOAP	No. 5 Soap Storage Tank	4.10E-03	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	1	tank	4.10E-03	5.17E-04
09-12-0050	LIQSEP	New Liquor Separator Tank	4.10E-03	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	1	tank	4.10E-03	5.17E-04
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	4.10E-03	lb/hr/tank	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tanks	4.10E-02	5.17E-03
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks	1.00E-04	lb/hr/tank	NCASI Technical Bulletin No. 849, August 2002, Table A-11, Unit Code SBLTY1 -- Mill Y 50% Black Liq. Storage Tank Vent. The selected factor is most representative of the mill HBL tank emissions based on the site specific test data performed in 1999 on the south weak black liquor storage tank that showed MMC was ND. 9.0 multiplier for tank movements.	9.0	tanks	9.00E-04	1.13E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.00E-04	lb/hr/tank	MMC from NCASI Technical Bulletin No. 849, August 2002, Table A-11, Unit Code SBLTY1 -- Mill Y 50% Black Liq. Storage Tank Vent. The selected factor is most representative of the mill HBL tank emissions based on the site specific test data performed in 1999 on the south weak black liquor storage tank that showed MMC was ND. 2.0 multiplier for tank movements.	2	tanks	2.00E-04	2.52E-05

TABLE 21
METHYL MERCAPTAN POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (g/s)
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.00E-04	lb/hr/tank	NCASI Technical Bulletin No. 849, August 2002, Table A-11, Unit Code SBLTY1 – Mill Y 50% Black Liq. Storage Tank Vent. The selected factor is most representative of the mill HBL tank emissions based on the site specific test data performed in 1999 on the south weak black liquor storage tank that showed MMC was ND.	1.0	tanks	1.00E-04	1.26E-05
09-27-3800	LSRPSCRUB	LSRP Emissions Post Control By Scrubber	2.50E+00	lb/hr	Emisson rate is derived from projected exhaust concentration and flow rate data from a preliminary design of LSRP emissions routed to the scrubber. Includes a 50% Safety Factor.	1.0	hr/hr	2.50E+00	3.15E-01
09-27-3000	LRPPRS2	LRP Press Building Fugitives	0.00E+00	lb/hr	Testing Conducted in May 2016. 42% through stacks, 58% as fugitives. Emissions increased 50% for compliance margin. (consistent with 2016 LSRP PSD Calcs)	1.0	hr/hr	0.00E+00	0.00E+00
10-45-0450	R05	No. 5 Precipitator Mix Tank	7.20E-05	lb/TBLS	NCASI Technical Bulletin No. 849, August 2002, Table A-6 TRS Data Summary - Kraft Recovery Furnaces - Salt Cake Mix Tank Results Table A-6 p. 178	140	TBLS/hr	1.01E-02	1.27E-03
14-05-0050	R03	North Smelt Tank	1.56E-03	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	1.08E-01	1.36E-02
14-05-0300	R04-1	South Smelt Tank	1.56E-03	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	1.08E-01	1.36E-02
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.08E-01	1.36E-02
14-10-05	R14	No. 5 Green Liquor Clarifier	4.20E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136 + 2 * Green Liquor Storage Tank Factor located in NCASI TB 973 Table 4.19 Green Liquor Storage Tanks(This is added in the Lb/hr Calculation)	22.2	T CaO/hr	4.13E-02	5.21E-03
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	4.20E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.4 factor is applied.	22.2	T CaO/hr	3.73E-03	4.70E-04
14-30-0310	R46	Lime Mud Mix Tank	7.40E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	22.2	T CaO/hr	1.64E-02	2.07E-03
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	2.80E-04	lb/T CaO	(NCASI) Technical Bulletin No. 858, February 2003, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Sources at Kraft, Sulfated and Non-Chemical Pulp Mills - An Update, Table A-17 Lime Mud Precoat Filter Vents	22.2	T CaO/hr	6.21E-03	7.83E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	1.50E-04	lb/T CaO	(NCASI) Technical Bulletin No. 858, February 2003, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Sources at Kraft, Sulfated and Non-Chemical Pulp Mills - An Update, Table A-17 Precoat Filter Vacuum Pump Exhausts. A factor of 3 is applied.	22.2	T CaO/hr	9.98E-03	1.26E-03

TABLE 21
METHYL MERCAPTAN POTENTIAL EMISSION RATES (50% Safety Factor on Lignin Sources)
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor	Units	Reference	Activity Factor	Units	Potential Emission Rate (lb/hr)	Potential Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln	4.00E-02	lb/hr	Emission Rate estimated using permit limit of 8 TRS as H2S ppm @ 10%O2 and 2014 test flow scaled up to max production. Ratio applied from NCASI TB 973 Table 4.25 to speciate TRS compounds. See supporting file: "Limits ppm calcs 2016.xlsx"	1	hr/hr	4.00E-02	5.04E-03
	PO013A	No. 2 HFB LVHC Combustion	2.58E-04	lb/ADTUBP	NCASI Technical Bulletin No. 973, February 2010, Table 4.18 - Kraft NCG Thermal Oxidizers p. 77	101	ADTUBP/hr	2.61E-02	3.29E-03
	PO13A	LSRP Contribution to Main HVLC Header	1.16E-01	lb/hr	Emisson rate is derived from projected exhaust concentration and flow rate data from a preliminary design of the future LSRP emissions routed to the HVLC header.	1	hr/hr	1.16E-01	1.46E-02
	PO01A	Main HVLC Combined Header (No LSRP Contribution)	1.15E+00	lb/hr	Emissions are estimated based on pollutant loading in the HVLC gases from December 2008 testing and 98% destruction efficiency	1	hr/hr	1.15E+00	1.45E-01
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.30E+00	1.63E-01
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							1.27E+00	1.60E-01
09-20-0250	R71	Combined Condensate Tank	2.52E-02	lb/hr	Condensate sampling results from 2013 using NCASI Methodology for 24% emitted as MeSH	1	hr/hr	2.52E-02	3.18E-03
LRPSSUMP	LRPSSUMP	LSRP Fugitives (LVHC Drain Loop and No. 1 Filtrate Sump)	2.70E-03	lb/hr	Emission factors from test data 2016 are the sum of the Drain Loop and Filtrate Sump	1	hr/hr	2.70E-03	3.41E-04
32-40-1560	NC1&2	NC-2 Paper Machine	9.90E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	25	ADTFP/hr	2.48E-01	3.12E-02
45-93-0100	NC5	NC-5 Paper Machine	9.90E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	69	ADTFP/hr	6.87E-01	8.65E-02

TABLE 22
MANGANESE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	4.20E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	1776	hp-hr/day	7.46E-05	3.92E-07
	PO01C	No. 5 Recovery Boiler BLS	4.12E-05	lb/TBLS	Stack Testing 2008	3,360	TBLS/day	1.38E-01	7.27E-04
	PO01C	No. 5 Recovery Boiler - No. 2	6.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30335	MMBtu/day	1.82E-01	9.56E-04
10-25-0110	Total from No. 5 Recovery Boiler							3.20E-01	1.68E-03
14-05-0050	R03	North Smelt Tank	1.53E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1,661	TBLS/day	2.54E-02	1.33E-04
14-05-0300	R04-1	South Smelt Tank	1.53E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1,661	TBLS/day	2.54E-02	1.33E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.54E-02	1.33E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.16E-05	lb/T CaO	Stack Testing 2008	532.5	T CaO/day	3.28E-02	1.72E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.46E-04	lb/MMBtu	2014,2015 and 2016 Stack Testing	26,097	MMBtu/day	6.42E+00	3.37E-02
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	1.54E-04	lb/MMBtu	2015 and 2016 Stack Testing	22,723	MMBtu/day	3.50E+00	1.84E-02
CD-65-60-1010	THERMALOX	Thermal Oxidizer	3.62E-07	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	3.91E-04	2.05E-06

TABLE 22
MANGANESE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	50	MMBtu/day	3.02E-04	1.59E-06
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	122	MMBtu/day	7.31E-04	3.84E-06
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	50	MMBtu/day	3.02E-04	1.59E-06
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	66	MMBtu/day	3.93E-04	2.06E-06
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	34	MMBtu/day	2.02E-04	1.06E-06
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	34	MMBtu/day	2.02E-04	1.06E-06
71-95-0500	COMMEA	Communications Back up Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	138	MMBtu/day	8.31E-04	4.36E-06
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	57	MMBtu/day	3.40E-04	1.78E-06
TEMPGEN	TEMPGEN	Temporary Generator	6.00E-06	lb/MMBtu	AP-42 Table 1.3-10	0.14	MMBtu/day	8.62E-07	4.52E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	4.20E-08	lb/hp-hr	AP-42 Section 1.3 Table 1.3-10	24,000	hp-hr/day	1.01E-03	5.29E-06

TABLE 23
MERCURY, ARYL AND INORGANIC COMPOUNDS POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	1776	hp-hr/day	3.73E-05	1.96E-07
	PO01C	No. 5 Recovery Boiler BLS	6.76E-06	lb/TBLS	2008 Stack Testing	3360	TBLS/day	2.27E-02	1.19E-04
	PO01C	No. 5 Recovery Boiler - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30335	MMBtu/day	9.10E-02	4.78E-04
10-25-0110	Total from No. 5 Recovery Boiler							1.14E-01	5.97E-04
64-25-0290	PO01A-1	No. 1 HFB - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	26,097	MMBtu/day	7.83E-02	4.11E-04
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	4.32E-07	lb/MMBtu	2010 Stack Testing; At the request of DAQ, where metals emission factors are derived from test data having analytical results below the detection limit, one half of the detection limit was used to calculate the emissions for that compound.	22,723	MMBtu/day	9.82E-03	5.15E-05
CD-65-60-1010	THERMALOX	Thermal Oxidizer	2.48E-07	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	2.67E-04	1.40E-06
14-05-0050	R03	North Smelt Tank	1.52E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1661.4	TBLS/day	2.53E-04	1.33E-06
14-05-0300	R04-1	South Smelt Tank	1.52E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1661.4	TBLS/day	2.53E-04	1.33E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.53E-04	1.33E-06
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.38E-06	lb/T CaO	Stack Testing 1998 (1/2 Detection Limit)	532.5	T CaO/day	7.35E-04	3.86E-06

TABLE 23
MERCURY, ARYL AND INORGANIC COMPOUNDS POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	50.4	MMBtu/day	1.51E-04	7.94E-07
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	121.8	MMBtu/day	3.65E-04	1.92E-06
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	50.4	MMBtu/day	1.51E-04	7.94E-07
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	65.5	MMBtu/day	1.97E-04	1.03E-06
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	33.6	MMBtu/day	1.01E-04	5.29E-07
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	33.6	MMBtu/day	1.01E-04	5.29E-07
71-95-0500	COMMEA	Communications Back up Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	138.4	MMBtu/day	4.15E-04	2.18E-06
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	56.6	MMBtu/day	1.70E-04	8.92E-07
TEMPGEN	TEMPGEN	Temporary Generator	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	0.1	MMBtu/day	4.31E-07	2.26E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10	24000	hp-hr/day	5.04E-04	2.65E-06

TABLE 24
METHYL ETHYL KETONE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.79E-05	lb/ODTUBP	1995 Stack Test	852	ODTUBP/day	1.53E-02	8.01E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	6.90E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	6.27E-01	3.29E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	4.04E-05	lb/ODTUBP	1995 Stack Test	1,331	ODTUBP/day	5.38E-02	2.82E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	6.90E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	9.80E-01	5.14E-03
14-05-0050	R03	North Smelt Tank	2.06E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1661	TBLS/day	3.42E-01	1.80E-03
14-05-0300	R04-1	South Smelt Tank	2.06E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1661	TBLS/day	3.42E-01	1.80E-03
10-08-0010	R04-2	Salt Cake Mix Tank	1.20E-05	lb/TBLS	NCASI TB 973, Table 4.35, February 2010, Summary of Air Toxic Emissions from Miscellaneous Kraft Mill Sources	3,323	TBLS/day	3.99E-02	2.09E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.82E-01	2.01E-03
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	2.93E-02	1.54E-04
08-40-1000	F35	No. 32 High Density Pulp Tank	5.90E-03	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	1.42E-01	7.43E-04
05-30-1300	F60	Hot Water Tank	4.38E-03	lb/hr	Sep 1998 Stack Testing	24	hr/day	1.05E-01	5.52E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	7.20E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	1.57E-01	8.25E-04
09-05-0210	SWBLTANK	South WBL Storage Tank	2.03E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	4.43E-02	2.33E-04
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.13E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	5.11E-02	2.68E-04
09-12-0050	LIQSEP	New Liquor Separator Tank	2.13E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	tank*hr/day	5.11E-02	2.68E-04
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.13E-03	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240.0	hr*tank/day	5.11E-01	2.68E-03

TABLE 24
METHYL ETHYL KETONE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.10E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216.0	hr*tank/day	2.38E+00	1.25E-02
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.10E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48.0	hr*tank/day	5.28E-01	2.77E-03
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.10E-02	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	24.0	hr/day	2.64E-01	1.39E-03
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.03E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.15E-03	1.13E-05
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	3.80E-03	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	3,360	TBLS/day	1.28E+01	6.70E-02
10-45-0450	R05	No. 5 Precipitator Mix Tank	1.20E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	3,360	TBLS/day	4.03E-02	2.12E-04
14-10-05	R14	No. 5 Green Liquor Clarifier	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	533	T CaO/day	2.02E-01	1.06E-03
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	1.90E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	533	T CaO/day	2.02E-01	1.06E-03
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	533	T CaO/day	3.20E-02	1.68E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.30E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	533	T CaO/day	1.04E+00	5.45E-03
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	1.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied.	533	T CaO/day	2.13E-01	1.12E-03
14-30-0310	R46	Lime Mud Mix Tank	2.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	533	T CaO/day	1.38E-01	7.27E-04
14-30-1450	R15	Lime Mud Storage Tank	1.70E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D. p. 136.	533	T CaO/day	9.05E-04	4.75E-06

TABLE 24
METHYL ETHYL KETONE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	6.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	533	T CaO/day	3.25E-02	1.71E-04
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.50E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	7.99E-02	4.19E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	9.80E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	533	T CaO/day	1.57E+00	8.22E-03
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.24E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	533	T CaO/day	1.19E+00	6.26E-03
09-20-0250	R71	Combined Condensate Tank	2.04E-03	lb/hr	Stack Testing 1998; 1.47% increase due to sewering of condensates from C3 and No. 6 Evaps 5th effect (2013 Project)	24	hr/day	4.89E-02	2.57E-04
		Cooler -1 Feed Liquor	1.10E-02	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24	hr/day	2.64E-01	1.39E-03
		Filter - 1 Lignin	2.03E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.15E-03	1.13E-05
		Tank - 2 Lignin Filter Cloth Wash	2.03E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.15E-03	1.13E-05
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	4.06E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	105.7	ODTL/day	4.29E-03	2.25E-05
		LRP Dilute Tanks	1.42E-04	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	105.7	ODTL/day	1.50E-02	7.89E-05
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						2.88E-01	1.51E-03
64-25-0290	PO01A-I	No. 1 HFB - Hog Fuel	5.39E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	26,097	MMBtu/day	1.41E-01	7.38E-04
	PO13A	No. 2 HFB - Hog Fuel	5.39E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22,723	MMBtu/day	1.22E-01	6.43E-04
	PO13A	No. 2 HFB LVHC Combustion	7.73E-05	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	2425.8	ADTUBP/day	1.88E-01	9.84E-04

TABLE 24
METHYL ETHYL KETONE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
	PO13A	No. 2 HFB HVLC Combustion	1.42E-02	lb/hr	Data generated by the 1996 compliance testing was run at 68% of the total fiberline capacity, 2050 BDTP per day. The tested lb/hr loadings were adjusted by a ratio of actual production to testing production.	24	hr/day	3.41E-01	1.79E-03
	PO13A	Carbonator - Feed Liquor	2.20E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	24	hr/day	5.28E-03	2.77E-05
	PO13A	LRP Acidification Tanks	6.67E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	7.05E-02	3.70E-04
65-25-0310	Total from No. 2 Hog Fuel Boiler							7.27E-01	3.81E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							4.17E-01	2.19E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	6.30E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	599	ODTUBP/day	5.66E-02	2.97E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.80E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	665	ADTFP/day	1.20E+00	6.28E-03
45-93-0100	NC5	NC-5 Paper Machine	1.80E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	1,664	ADTFP/day	3.00E+00	1.57E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	6.30E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	1,540	ODTUBP/day	1.45E-01	7.64E-04
73-10-2000	SETPOND2	Primary Clarifier	1.06E-03	lb/ADTUBP	NCASI TRI Guidance	2,426	ADTUBP/day	2.58E+00	1.36E-02
73-10-1000	SETPOND1	Secondary Clarifier	3.55E-03	lb/ADTUBP	NCASI TRI Guidance	2,426	ADTUBP/day	8.61E+00	4.52E-02
73-05-2000-A		C3 Stream Sewering	1.78E-01	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream-No Setpond	24	hr/day	4.27E+00	2.24E-02
73-05-2000-B		5th eff 6 evap Sewering	1.70E-02	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap- No Setpond	24	hr/day	4.08E-01	2.14E-03

TABLE 25
METHYL ETHYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.79E-05	lb/ODTUBP	1995 Stack Test	35.5	ODTUBP/hr	6.35E-04	8.01E-05
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	6.90E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	2.61E-02	3.29E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	4.04E-05	lb/ODTUBP	1995 Stack Test	55.5	ODTUBP/hr	2.24E-03	2.82E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	6.90E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	4.08E-02	5.14E-03
14-05-0050	R03	North Smelt Tank	2.06E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	1.43E-02	1.80E-03
14-05-0300	R04-1	South Smelt Tank	2.06E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	1.43E-02	1.80E-03
10-08-0010	R04-2	Salt Cake Mix Tank	1.20E-05	lb/TBLS	NCASI TB 973, Table 4.35, February 2010, Summary of Air Toxic Emissions from Miscellaneous Kraft Mill Sources	138	TBLS/hr	1.66E-03	2.09E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.59E-02	2.01E-03
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	1.22E-03	1.54E-04
08-40-1000	F35	No. 32 High Density Pulp Tank	5.90E-03	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1.0	tank	5.90E-03	7.43E-04
05-30-1300	F60	Hot Water Tank	4.38E-03	lb/hr	Sep 1998 Stack Testing	1.0	hr/hr	4.38E-03	5.52E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	7.20E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	6.55E-03	8.25E-04
09-05-0210	SWBLTANK	South WBL Storage Tank	2.03E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	1.85E-03	2.33E-04
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.13E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.13E-03	2.68E-04
09-12-0050	LIQSEP	New Liquor Separator Tank	2.13E-03	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.13E-03	2.68E-04
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.13E-03	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	hr*tank/hr	2.13E-02	2.68E-03

TABLE 25
METHYL ETHYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.10E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	hr*tank/hr	9.90E-02	1.25E-02
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.10E-02	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	hr*tank/hr	2.20E-02	2.77E-03
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.10E-02	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1.0	hr/hr	1.10E-02	1.39E-03
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.03E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000. Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	8.94E-05	1.13E-05
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	3.80E-03	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	140	TBLS/hr	5.32E-01	6.70E-02
10-45-0450	R05	No. 5 Precipitator Mix Tank	1.20E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	140	TBLS/hr	1.68E-03	2.12E-04
14-10-05	R14	No. 5 Green Liquor Clarifier	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	22.2	T CaO/hr	8.43E-03	1.06E-03
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	1.90E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	22.2	T CaO/hr	8.43E-03	1.06E-03
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	22.2	T CaO/hr	1.33E-03	1.68E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.30E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	4.33E-02	5.45E-03
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	1.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied.	22.2	T CaO/hr	8.88E-03	1.12E-03
14-30-0310	R46	Lime Mud Mix Tank	2.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	22.2	T CaO/hr	5.77E-03	7.27E-04
14-30-1450	R15	Lime Mud Storage Tank	1.70E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	22.2	T CaO/hr	3.77E-05	4.75E-06

TABLE 25
METHYL ETHYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	6.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	22.2	T CaO/hr	1.35E-03	1.71E-04
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.50E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	3.33E-03	4.19E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	9.80E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	22.2	T CaO/hr	6.52E-02	8.22E-03
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.24E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	4.97E-02	6.26E-03
09-20-0250	R71	Combined Condensate Tank	2.04E-03	lb/hr	Stack Testing 1998; 1.47% increase due to sewering of condensates from C3 and No. 6 Evaps 5th effect (2013 Project)	1	hr/hr	2.04E-03	2.57E-04
		Cooler -1 Feed Liquor	1.10E-02	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.0	hr/hr	1.10E-02	1.39E-03
		Filter - 1 Lignin	2.03E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	8.94E-05	1.13E-05
		Tank - 2 Lignin Filter Cloth Wash	2.03E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	8.94E-05	1.13E-05
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	4.06E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	1.79E-04	2.25E-05
		LRP Dilute Tanks	1.42E-04	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	6.26E-04	7.89E-05
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.20E-02	1.51E-03
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	5.39E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	5.86E-03	7.38E-04
	PO13A	No. 2 HFB - Hog Fuel	5.39E-06	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	947	MMBtu/hr	5.10E-03	6.43E-04
	PO13A	No. 2 HFB LVHC Combustion	7.73E-05	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101	ADTUBP/hr	7.81E-03	9.84E-04

TABLE 25
METHYL ETHYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
	PO13A	No. 2 HFB HVLC Combustion	1.42E-02	lb/hr	Data generated by the 1996 compliance testing was run at 68% of the total fiberline capacity, 2050 BDTP per day. The tested lb/hr loadings were adjusted by a ratio of actual production to testing production.	1.0	hr/hr	1.42E-02	1.79E-03
	PO13A	Carbonator - Feed Liquor	2.20E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1.0	hr/hr	2.20E-04	2.77E-05
	PO13A	LRP Acidification Tanks	6.67E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	2.94E-03	3.70E-04
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.03E-02	3.81E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							1.74E-02	2.19E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	6.30E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	2.36E-03	2.97E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.80E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	4.50E-02	5.67E-03
45-93-0100	NC5	NC-5 Paper Machine	1.80E-03	lb/ADFTP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	1.25E-01	1.57E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	6.30E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	6.06E-03	7.64E-04
73-10-2000	SETPOND2	Primary Clarifier	1.06E-03	lb/ADTUBP	NCASI TRI Guidance	101.1	ADTUBP/hr	1.08E-01	1.36E-02
73-10-1000	SETPOND1	Secondary Clarifier	3.55E-03	lb/ADTUBP	NCASI TRI Guidance	101.1	ADTUBP/hr	3.59E-01	4.52E-02
73-05-2000-A		C3 Stream Sewering	1.78E-01	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1.0	hr/hr	1.78E-01	2.24E-02
73-05-2000-B		5th eff 6 evap Sewering	1.70E-02	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1.0	hr/hr	1.70E-02	2.14E-03

TABLE 26
POTENTIAL EMISSIONS RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.71E-05	lb/ODTUBP	1995 Stack Test	852	ODTUBP/day	5.72E-02	3.00E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	2.10E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	1.91E-01	1.00E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	2.44E-04	lb/ODTUBP	1995 Stack Test	1,331	ODTUBP/day	3.25E-01	1.71E-03
07-31-1180	F30	No. 7 Bleach Plant Scrubber	2.10E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	2.98E-01	1.57E-03
14-05-0050	R03	North Smelt Tank	1.92E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1661	TBLS/day	3.19E-01	1.67E-03
14-05-0300	R04-1	South Smelt Tank	1.92E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1661	TBLS/day	3.19E-01	1.67E-03
10-08-0010	R04-2	Salt Cake Mix Tank	1.40E-06	lb/TBLS	NCASI TB 973, Table 4.35, February 2010, Summary of Air Toxic Emissions from Miscellaneous Kraft Mill Sources	3,323	TBLS/day	4.65E-03	2.44E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.24E-01	1.70E-03
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	533	T CaO/day	1.38E-01	7.27E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	4.45E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	26,097	MMBtu/day	1.16E+01	6.10E-02
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	7.80E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	1.04E-02	5.45E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	6.19E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	1.49E-02	7.80E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.04E-04	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	2.27E-01	1.19E-03
09-05-0210	SWBLTANK	South WBL Storage Tank	2.83E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	6.18E-02	3.24E-04
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.90E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr*tank/day	6.96E-03	3.65E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	2.90E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr*tank/day	6.96E-03	3.65E-05

TABLE 26
POTENTIAL EMISSIONS RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	**Activity Factor**	**Units**	**Emission Rate (lb/day)**	**Emission Rate (g/s)**
09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.90E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	hr*tank/day	6.96E-02	3.65E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	8.57E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216	hr*tank/day	1.85E-01	9.72E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	8.57E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48	hr*tank/day	4.11E-02	2.16E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	8.57E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	24.0	hr/day	2.06E-02	1.08E-04
		Cooler -1 Feed Liquor	8.57E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24.0	hr/day	2.06E-02	1.08E-04
		Filter - 1 Lignin	2.83E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.99E-03	1.57E-05
		Tank - 2 Lignin Filter Cloth Wash	2.83E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.99E-03	1.57E-05
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	5.66E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	105.7	ODTL/day	5.98E-03	3.14E-05
		LRP Dilute Tanks	1.98E-04	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	105.7	ODTL/day	2.09E-02	1.10E-04
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						5.35E-02	2.81E-04

TABLE 26
POTENTIAL EMISSIONS RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.83E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	105.7	ODTL/day	2.99E-03	1.57E-05
	PO13A	Carbonator - Feed Liquor	1.71E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median. 98% control, 1 tank.	24.0	hr/day	4.11E-04	2.16E-06
	PO13A	LRP Acidification Tanks	2.33E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	2.47E-02	1.29E-04
	PO13A	No. 2 HFB - Hog Fuel	4.45E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22,723	MMBtu/day	1.01E+01	5.31E-02
	PO13A	No. 2 HFB HVLC Combustion	3.53E-01	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	24.0	hr/day	8.47E+00	4.44E-02
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.86E+01	9.77E-02
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							8.49E+00	4.46E-02
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	4.70E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	3360	TBLs/day	1.58E+00	8.29E-03
10-45-0450	R05	No. 5 Precipitator Mix Tanks	1.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	3,360	TBLS/day	4.70E-03	2.47E-05
14-10-05	R14	No. 5 Green Liquor Clarifier	1.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	533	T CaO/day	1.11E-02	5.84E-05
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	3.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	533	T CaO/day	4.15E-02	2.18E-04
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	533	T CaO/day	1.76E-03	9.23E-06
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.32E-04	lb/T CaO	NCASI Technical Bulletin No. 973, October 2014, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	533	T CaO/day	1.05E-01	5.54E-04

TABLE 26
POTENTIAL EMISSIONS RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-30-0310	R46	Lime Mud Mix Tank	1.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	533	T CaO/day	6.39E-03	3.35E-05
14-30-1450	R15	Lime Mud Storage Tank	4.80E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	533	T CaO/day	2.56E-04	1.34E-06
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	5.70E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	3.04E-02	1.59E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	1.40E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	533	T CaO/day	2.24E-01	1.17E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	599	ODTUBP/day	1.98E-02	1.04E-04
32-40-1560	NC1&2	NC-2 Paper Machine	3.60E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	665	ADTFP/day	2.39E-01	1.26E-03
45-93-0100	NC5	NC-5 Paper Machine	3.60E-04	lb/ADFTP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	1,664	ADTFP/day	5.99E-01	3.15E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	1,540	ODTUBP/day	5.08E-02	2.67E-04

TABLE 27
METHYL ISOBUTYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.71E-05	lb/ODTUBP	1995 Stack Test	35.5	ODTUBP/hr	2.38E-03	3.00E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	2.10E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	7.95E-03	1.00E-03
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	2.44E-04	lb/ODTUBP	1995 Stack Test	55.5	ODTUBP/hr	1.35E-02	1.71E-03
07-31-1180	F30	No. 7 Bleach Plant Scrubber	2.10E-04	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	1.24E-02	1.57E-03
14-05-0050	R03	North Smelt Tank	1.92E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	1.33E-02	1.67E-03
14-05-0300	R04-1	South Smelt Tank	1.92E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	1.33E-02	1.67E-03
10-08-0010	R04-2	Salt Cake Mix Tank	1.40E-06	lb/TBLS	NCASI TB 973, Table 4.35, February 2010, Summary of Air Toxic Emissions from Miscellaneous Kraft Mill Sources	138.5	TBLS/hr	1.94E-04	2.44E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.35E-02	1.70E-03
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.60E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22	T CaO/hr	5.77E-03	7.27E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	4.45E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1087	MMBtu/hr	4.84E-01	6.10E-02
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	7.80E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55	ODTUBP/hr	4.33E-04	5.45E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	6.19E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1.0	tank	6.19E-04	7.80E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.04E-04	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	9.46E-03	1.19E-03
09-05-0210	SWBLTANK	South WBL Storage Tank	2.83E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	2.57E-03	3.24E-04
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.90E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.90E-04	3.65E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	2.90E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	2.90E-04	3.65E-05

TABLE 27
METHYL ISOBUTYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.90E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	hr*tank/hr	2.90E-03	3.65E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	8.57E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	hr*tank/hr	7.71E-03	9.72E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	8.57E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	hr*tank/hr	1.71E-03	2.16E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	8.57E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1.0	hr/hr	8.57E-04	1.08E-04
		Cooler -1 Feed Liquor	8.57E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.0	hr/hr	8.57E-04	1.08E-04
		Filter - 1 Lignin	2.83E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.25E-04	1.57E-05
		Tank - 2 Lignin Filter Cloth Wash	2.83E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.25E-04	1.57E-05
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	5.66E-05	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	2.49E-04	3.14E-05
		LRP Dilute Tanks	1.98E-04	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	8.72E-04	1.10E-04
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						2.23E-03	2.81E-04

TABLE 27
METHYL ISOBUTYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.83E-05	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.25E-04	1.57E-05
	PO13A	Carbonator - Feed Liquor	1.71E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1.0	hr/hr	1.71E-05	2.16E-06
	PO13A	LRP Acidification Tanks	2.33E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	1.03E-03	1.29E-04
	PO13A	No. 2 HFB - Hog Fuel	4.45E-04	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	947	MMBtu/hr	4.21E-01	5.31E-02
	PO13A	No. 2 HFB HVLC Combustion	3.53E-01	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	1.0	hr/hr	3.53E-01	4.44E-02
65-25-0310	Total from No. 2 Hog Fuel Boiler							7.75E-01	9.77E-02
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							3.54E-01	4.46E-02
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	4.70E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	140	TBLS/hr	6.58E-02	8.29E-03
10-45-0450	R05	No. 5 Precipitator Mix Tanks	1.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	140	TBLS/hr	1.96E-04	2.47E-05
14-10-05	R14	No. 5 Green Liquor Clarifier	1.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	22.2	T CaO/hr	4.64E-04	5.84E-05
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	3.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	22.2	T CaO/hr	1.73E-03	2.18E-04
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.10E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	22.2	T CaO/hr	7.32E-05	9.23E-06

TABLE 27
METHYL ISOBUTYL KETONE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.32E-04	lb/T CaO	NCASI Technical Bulletin No. 973, October 2014, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	4.39E-03	5.54E-04
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	0.00E+00	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied. Data points reported as non-detect treated as zero.	22.2	T CaO/hr	0.00E+00	0.00E+00
14-30-0310	R46	Lime Mud Mix Tank	1.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	22.2	T CaO/hr	2.66E-04	3.35E-05
14-30-1450	R15	Lime Mud Storage Tank	4.80E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	22.2	T CaO/hr	1.07E-05	1.34E-06
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	5.70E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	1.26E-03	1.59E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum	1.40E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	22.2	T CaO/hr	9.32E-03	1.17E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	8.23E-04	1.04E-04
32-40-1560	NC1&2	NC-2 Paper Machine	3.60E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	9.00E-03	1.13E-03
45-93-0100	NC5	NC-5 Paper Machine	3.60E-04	lb/ADFTP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	2.50E-02	3.15E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.20E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	2.12E-03	2.67E-04

TABLE 28
METHYL CHLOROFORM (1,1,1 TRICHLOROETHANE) 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.18E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	947	ADTUBP/day	3.01E-02	1.58E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	3.18E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	1,479	ADTUBP/day	4.70E-02	2.47E-04
14-05-0050	R03	North Smelt Tank	5.52E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	1,661	TBLS/day	9.17E-03	4.81E-05
14-05-0300	R04-1	South Smelt Tank	5.52E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	1,661	TBLS/day	9.17E-03	4.81E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						9.17E-03	4.81E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.78E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	6.07E-03	3.19E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	7.53E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	1.64E-03	8.63E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.90E-06	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	24	tank*hr/day	6.96E-05	3.65E-07
09-12-0050	LIQSEP	New Liquor Separator Tank	2.90E-06	lb/hr	NCASI 973 Database 2013 - Recovery Black Liquor Tank Weak </=20% Soilds	24	tank*hr/day	6.96E-05	3.65E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.90E-06	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	tank*hr/day	6.96E-04	3.65E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	7.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	7.96E-05	4.18E-07
	PO01C	No. 5 Recovery Boiler - BLS	5.76E-06	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	3360	TBLS/day	1.94E-02	1.02E-04
	PO01C	No. 5 Recovery Boiler - No. 2	1.69E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal; converted to lb/mmbtu	30,335	MMBtu/day	5.11E-02	2.68E-04
10-25-0110	Total from No. 5 Recovery Boiler							7.05E-02	3.70E-04

TABLE 28
METHYL CHLOROFORM (1,1,1 TRICHLOROETHANE) 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	1.69E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal; converted to lb/mmbtu	4,729	MMBtu/day	7.97E-03	4.18E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	5.93E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	3.16E-02	1.66E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	3.93E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	26,097	MMBtu/day	1.03E+00	5.38E-03
		LRP Dilute Tanks	5.27E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	106	ODTL/day	5.57E-04	2.92E-06
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.51E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	106	ODTL/day	1.59E-04	8.36E-07
		Tank - 2 Lignin Filter Cloth Wash	7.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	7.96E-05	4.18E-07
		Filter - 1 Lignin	7.53E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	7.96E-05	4.18E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						8.76E-04	4.60E-06
	PO13A	No. 2 HFB - Hog Fuel	3.93E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	22,723	MMBtu/day	8.93E-01	4.69E-03
65-25-0310		Total from No. 2 Hog Fuel Boiler						8.93E-01	4.69E-03

TABLE 29
METHYL CHLOROFORM (1,1,1 TRICHLOROETHANE) 1-HOUR POTENTIAL EMISSION RATES
DOMTAR COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.18E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	39.4	ADTUBP/hr	1.25E-03	1.58E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	3.18E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	61.6	ADTUBP/hr	1.96E-03	2.47E-04
14-05-0050	R03	North Smelt Tank	5.52E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	69.2	TBLS/hr	3.82E-04	4.81E-05
14-05-0300	R04-1	South Smelt Tank	5.52E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	69.2	TBLS/hr	3.82E-04	4.81E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.82E-04	4.81E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.78E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	2.53E-04	3.19E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	7.53E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	6.85E-05	8.63E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.90E-06	lb/hr	NCASI Technical Bulletin No. 973, February 2010, Table 4.19 - Weak Black Liquor Storage Tanks pg. 78.	1	tank	2.90E-06	3.65E-07
09-12-0050	LIQSEP	New Liquor Separator Tank	2.90E-06	lb/hr	NCASI Technical Bulletin No. 973, February 2010, Table 4.19 - Weak Black Liquor Storage Tanks pg. 78.	1	tank	2.90E-06	3.65E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.90E-06	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tank	2.90E-05	3.65E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	7.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.32E-06	4.18E-07
	PO01C	No. 5 Recovery Boiler - BLS	5.76E-06	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	140	TBLS/hr	8.06E-04	1.02E-04
	PO01C	No. 5 Recovery Boiler - No. 2	1.69E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1263.9	MMBtu/hr	2.13E-03	2.68E-04

TABLE 29
METHYL CHLOROFORM (1,1,1 TRICHLOROETHANE) 1-HOUR POTENTIAL EMISSION RATES
DOMTAR COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
10-25-0110	Total from No. 5 Recovery Boiler							2.94E-03	3.70E-04
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	1.69E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal; converted to lb/mmbtu	197	MMBtu/hr	3.32E-04	4.18E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	5.93E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	1.32E-03	1.66E-04
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	3.93E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1087.4	MMBtu/hr	4.27E-02	5.38E-03
		LRP Dilute Tanks	5.27E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	2.32E-05	2.92E-06
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.51E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	6.63E-06	8.36E-07
		Tank - 2 Lignin Filter Cloth Wash	7.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.32E-06	4.18E-07
		Filter - 1 Lignin	7.53E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	3.32E-06	4.18E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						3.65E-05	4.60E-06
	PO13A	No. 2 HFB - Hog Fuel	3.93E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	946.8	MMBtu/hr	3.72E-02	4.69E-03
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.72E-02	4.69E-03

TABLE 30
METHYLENE CHLORIDE ANNUAL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.00E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	3.46E+01	4.97E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	3.89E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	331,712	ADTBP/yr	1.29E+01	1.86E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.00E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	5.40E+01	7.77E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	3.89E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	2.02E+01	2.90E-04
14-05-0050	R03	North Smelt Tank	3.90E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	2.37E+01	3.40E-04
14-05-0300	R04-1	South Smelt Tank	3.90E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	606,411	TBLS/yr	2.37E+01	3.40E-04
10-08-0010	R04-2	Salt Cake Mix Tank	2.26E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	1,212,822	TBLS/yr	2.74E+01	3.94E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						5.11E+01	7.34E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.30E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	194,363	T CaO/yr	2.53E+01	3.63E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	5.80E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	485,906	ODTUBP/yr	2.82E+01	4.05E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.77E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.41E+00	2.03E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	4.79E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	3.82E-01	5.49E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.94E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tank*hr/yr	1.70E+00	2.44E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.94E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	tank*hr/yr	1.70E+00	2.44E-05

TABLE 30
METHYLENE CHLORIDE ANNUAL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.94E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	1.70E+01	2.44E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	3.69E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	78,840	tank*hr/yr	2.91E+00	4.18E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	3.69E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	17,520	tank*hr/yr	6.46E-01	9.30E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	3.69E-05	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	8,760	hr/yr	3.23E-01	4.65E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	4.79E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.85E-02	2.66E-07
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	1.79E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	1,226,400	TBLS/yr	2.20E+02	3.16E-03
10-45-0450	R05	No. 5 Precipitator Mix Tank	2.26E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	1,226,400	TBLS/yr	2.77E+01	3.99E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	5.09E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	194,363	T CaO/yr	1.48E+03	2.13E-02
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	2.98E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	5.79E+00	8.33E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	2.48E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	194,363	T CaO/yr	1.45E+01	2.08E-04
		Cooler -1 Feed Liquor	3.69E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8,760	hr/yr	3.23E-01	4.65E-06

TABLE 30
METHYLENE CHLORIDE ANNUAL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
		Filter - 1 Lignin	4.79E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.85E-02	2.66E-07
		Tank - 2 Lignin Filter Cloth Wash	4.79E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.85E-02	2.66E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	9.58E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	3.70E-02	5.32E-07
		LRP Dilute Tanks	3.35E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	1.29E-01	1.86E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						5.27E-01	7.57E-06
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.82E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	2.69E+02	3.86E-03
	PO13A	Carbonator - Feed Liquor	7.38E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	6.46E-03	9.30E-08
	PO13A	No. 2 HFB - Hog Fuel	2.82E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	2.34E+02	3.36E-03
65-25-0310	Total from No. 2 Hog Fuel Boiler							2.34E+02	3.36E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							6.46E-03	9.30E-08
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	1.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	5.24E+01	7.54E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.81E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	242,725	ADTFP/yr	4.39E+02	6.32E-03

TABLE 30
METHYLENE CHLORIDE ANNUAL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
45-93-0100	NC5	NC-5 Paper Machine	1.81E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	563,281	ADTFP/yr	1.02E+03	1.47E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	1.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants. pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	1.25E+02	1.80E-03
SETPOND1	SETPOND1	Secondary Clarifier	5.97E-11	lb/ADTUBP	NCASI TRI Guidance	885,429	ADTUBP/yr	5.29E-05	7.60E-10

TABLE 31
METHYLENE CHLORIDE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	1.00E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	39.4	ADTUBP/hr	3.94E-03	4.97E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	3.89E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	1.47E-03	1.86E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	1.00E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	61.6	ADTUBP/hr	6.16E-03	7.77E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	3.89E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59	ADTBP/hr	2.30E-03	2.90E-04
14-05-0050	R03	North Smelt Tank	3.90E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	2.70E-03	3.40E-04
14-05-0300	R04-1	South Smelt Tank	3.90E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69	TBLS/hr	2.70E-03	3.40E-04
10-08-0010	R04-2	Salt Cake Mix Tank	2.26E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	138	TBLS/hr	3.13E-03	3.94E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						5.83E-03	7.34E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.30E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22	T CaO/hr	2.88E-03	3.63E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	5.80E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55	ODTUBP/hr	3.22E-03	4.05E-04
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.77E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91	ODTUBP/hr	1.61E-04	2.03E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	4.79E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	4.36E-05	5.49E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.94E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	hr/hr	1.94E-04	2.44E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.94E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	hr/hr	1.94E-04	2.44E-05

TABLE 31
METHYLENE CHLORIDE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.94E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	hr*tank/hr	1.94E-03	2.44E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	3.69E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	hr*tank/hr	3.32E-04	4.18E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	3.69E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	hr*tank/hr	7.38E-05	9.30E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	3.69E-05	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	hr/hr	3.69E-05	4.65E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	4.79E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.11E-06	2.66E-07
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	1.79E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23.	140	TBLS/hr	2.51E-02	3.16E-03
10-45-0450	R05	No. 5 Precipitator Mix Tank	2.26E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	140	TBLS/hr	3.16E-03	3.99E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	5.09E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	1.69E-01	2.13E-02
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	2.98E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	6.61E-04	8.33E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	2.48E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	22.2	T CaO/hr	1.65E-03	2.08E-04

TABLE 31
METHYLENE CHLORIDE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		Cooler -1 Feed Liquor	3.69E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1	hr/hr	3.69E-05	4.65E-06
		Filter - 1 Lignin	4.79E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.11E-06	2.66E-07
		Tank - 2 Lignin Filter Cloth Wash	4.79E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.11E-06	2.66E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	9.58E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	4.22E-06	5.32E-07
		LRP Dilute Tanks	3.35E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	1.48E-05	1.86E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						6.01E-05	7.57E-06
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	2.82E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	3.07E-02	3.86E-03
	PO13A	Carbonator - Feed Liquor	7.38E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1	hr/hr	7.38E-07	9.30E-08
	PO13A	No. 2 HFB - Hog Fuel	2.82E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	946.8	MMBtu/hr	2.67E-02	3.36E-03
65-25-0310	Total from No. 2 Hog Fuel Boiler							2.67E-02	3.36E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							7.38E-07	9.30E-08

TABLE 31
METHYLENE CHLORIDE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	1.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	5.99E-03	7.54E-04
32-40-1560	NC1&2	NC-2 Paper Machine	1.81E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	4.53E-02	5.70E-03
45-93-0100	NC5	NC-5 Paper Machine	1.81E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	1.26E-01	1.58E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	1.60E-04	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	1.54E-02	1.94E-03
SETPOND1	SETPOND1	Secondary Clarifier	5.97E-11	lb/ADTUBP	NCASI TRI Guidance	101	ADTUBP/hr	6.03E-09	7.60E-10

TABLE 32
n-HEXANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	2.60E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	947	ADTUBP/day	2.46E-02	1.29E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	2.80E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	2.54E-02	1.34E-04
06-P1	6FEEDTNK	No. 6 Bleach Plant 6th Stage Feed Tank	6.25E-06	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	852	ODTUBP/day	5.33E-03	2.80E-05
06-P2	6BLOWTBE	No. 6 Bleach Plant 6th Stage Blow Tube (standpipe)	2.93E-05	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	852	ODTUBP/day	2.50E-02	1.31E-04
06-P3	6EXHAUST	No. 6 BP 6th Stage Washer And Filtrate Tank	1.04E-04	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	852	ODTUBP/day	8.83E-02	4.64E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	2.60E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	1,479	ADTUBP/day	3.85E-02	2.02E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	2.80E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	3.98E-02	2.09E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	8.60E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	1.14E-02	6.01E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	1.69E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	4.06E-03	2.13E-05
09-12-0250	5SOAP	No. 5 Soap Storage Tank	3.80E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	9.12E-05	4.79E-07
64-25-0290	PO01A-1	No. 1 HFB - Natural Gas	1.71E-03	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database.	26,097	MMBtu/day	4.47E+01	2.35E-01
09-12-0050	LIQSEP	New Liquor Separator Tank	3.80E-06	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	9.12E-05	4.79E-07
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	3.80E-06	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240.0	tank*hr/day	9.12E-04	4.79E-06
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	3.97E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216.0	tank*hr/day	8.58E-03	4.50E-05

TABLE 32
n-HEXANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	3.97E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48.0	tank*hr/day	1.91E-03	1.00E-05
		Cooler -1 Feed Liquor	3.97E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24	hr/day	9.53E-04	5.00E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						9.53E-04	5.00E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	3.97E-05	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	24	hr/day	9.53E-04	5.00E-06
	PO13A	Carbonator - Feed Liquor	7.94E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	24	hr/day	1.91E-05	1.00E-07
	PO13A	LRP Acidification Tanks	4.40E-05	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	4.65E-03	2.44E-05
	PO13A	LVHC Combustion	2.50E-06	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	2425.8	ADTUBP/day	6.06E-03	3.18E-05
	PO13A	No. 2 HFB - Natural Gas	1.71E-03	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database.	22,723	MMBtu/day	3.90E+01	2.05E-01
65-25-0310	Total from No. 2 Hog Fuel Boiler							3.90E+01	2.05E-01
CD-65-60-1010	THERMALOX	Thermal Oxidizer	1.71E-03	lb/MMBTU	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	1.85E+00	9.72E-03
	Total from Thermal Oxidizer and HVLC combustion							1.86E+00	9.74E-03
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.46E-05	lb/TCaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	532.5	TCaO/day	7.77E-03	4.08E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	6.70E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	532.5	T CaO/day	1.07E-01	5.62E-04
	PO01C	No. 5 Recovery Boiler - Natural Gas	1.71E-03	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database.	30335	MMBtu/day	5.20E+01	2.73E-01
	PO01C	No. 5 Recovery Boiler - BLS	1.67E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23	3360	TBLS/day	5.61E-01	2.95E-03
10-25-0110	Total from No. 5 Recovery Boiler							5.26E+01	2.76E-01

TABLE 32
n-HEXANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

10-45-0450	R05	No. 5 Precipitator Mix Tanks	2.89E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,360	TBLS/day	9.71E-04	5.10E-06
14-05-0050	R03	North Smelt Tank	4.66E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	1,661	TBLS/day	7.74E-02	4.06E-04
14-05-0300	R04-1	South Smelt Tank	4.66E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	1,661	TBLS/day	7.74E-02	4.06E-04
10-08-0010	R04-2	Salt Cake Mix Tank	2.89E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,323	TBLS/day	9.60E-04	5.04E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						7.84E-02	4.11E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	2.28E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	533	T CaO/day	1.82E-03	9.56E-06
14-60-3000	R01A	No. 5 Lime Kiln - Natural Gas	1.71E-03	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database.	4,729	MMBtu/day	8.11E+00	4.26E-02
32-40-1560	NC1&2	NC-2 Paper Machine	2.23E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	665	ADTFP/day	1.48E-01	7.79E-04
45-93-0100	NC5	NC-5 Paper Machine	2.23E-04	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	1,664	ADTFP/day	3.71E-01	1.95E-03

TABLE 33
NICKEL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.10E-08	lb/hp-hr	AP-42 Section 1.3, Table 1.3-10. Converted to lb/hp-hr	1776	hp-hr/day	3.73E-05	1.96E-07
	PO01C	No. 5 Recovery Boiler BLS	4.41E-05	lb/TBLS	2008 Stack Test	3,360	TBLS/day	1.48E-01	7.78E-04
	PO01C	No. 5 Recovery Boiler - No. 2	3.00E-06	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1,264	MMBtu/day	3.79E-03	1.99E-05
10-25-0110	Total from No. 5 Recovery Boiler							1.52E-01	7.98E-04
14-05-0050	R03	North Smelt Tank	1.67E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1,661	TBLS/day	2.77E-03	1.46E-05
14-05-0300	R04-1	South Smelt Tank	1.67E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.29 - Summary of Trace Metal Emissions from Smelt Dissolving Tanks p. 121	1,661	TBLS/day	2.77E-03	1.46E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.77E-03	1.46E-05
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.26E-05	lb/T CaO	Stack Testing 2008	533	T CaO/day	6.71E-03	3.52E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	4.43E-06	lb/MMBtu	2014, 2015 and 2016 Stack Testing	26,097	MMBtu/day	1.16E-01	6.07E-04
65-25-0310	PO13A-1	No. 2 HFB - Hog Fuel	5.33E-06	lb/MMBtu	2012 Stack Test	22,723	MMBtu/day	1.21E-01	6.36E-04
CD-65-60-1010	THERMALOX	Thermal Oxidizer	2.00E-06	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	2.16E-03	1.13E-05
53-40-0130	FPDE	Fine Paper Diesel Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	50	MMBtu/day	1.51E-04	7.94E-07
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	122	MMBtu/day	3.65E-04	1.92E-06

TABLE 33
NICKEL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	50	MMBtu/day	1.51E-04	7.94E-07
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	66	MMBtu/day	1.97E-04	1.03E-06
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	34	MMBtu/day	1.01E-04	5.29E-07
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	34	MMBtu/day	1.01E-04	5.29E-07
71-95-0500	COMMEA	Communications Back up Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	138	MMBtu/day	4.15E-04	2.18E-06
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	57	MMBtu/day	1.70E-04	8.92E-07
TEMPGEN	TEMPGEN	Temporary Generator	3.00E-06	lb/MMBtu	AP-42 Table 1.3-11	0.1	MMBtu/day	4.31E-07	2.26E-09
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	2.10E-08	lb/hp-hr	AP-42 Section 1.3 Table 1.3-10	24,000	hp-hr/day	5.04E-04	2.65E-06

TABLE 34
PHENOL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.61E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	39.4	ADTUBP/hr	2.61E-02	3.29E-03
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	3.87E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	1.47E-01	1.85E-02
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	6.61E-04	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	61.6	ADTUBP/hr	4.07E-02	5.13E-03
07-31-1180	F30	No. 7 Bleach Plant Scrubber	3.87E-03	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	2.29E-01	2.89E-02
08-40-1000	F35	No. 32 High Density Pulp Tank	6.39E-02	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1	tank	6.39E-02	8.05E-03
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	1.37E-02	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	140	TBLS/hr	1.92E+00	2.42E-01
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	8.90E-03	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22	T CaO/hr	1.97E-01	2.49E-02
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.53E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	1.66E-02	2.10E-03
		Cooler -1 Feed Liquor	1.01E-03	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1	hr/hr	1.01E-03	1.27E-04
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.01E-03	1.27E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.01E-03	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	hr/hr	1.01E-03	1.27E-04
	PO13A	Carbonator - Feed Liquor	2.02E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median. 98% control, 1 tank.	1	hr/hr	2.02E-05	2.55E-06
	PO13A	No. 2 HFB - Hog Fuel	1.53E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	1.66E-02	2.10E-03

TABLE 34
PHENOL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
	PO13A	LRP Acidification Tanks	3.80E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	1.67E-03	2.11E-04
65-25-0310	Total from No.2 Hog Fuel Boiler							1.83E-02	2.31E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							1.69E-03	2.13E-04
32-40-1560	NC1&2	NC-2 Paper Machine	7.35E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	25	ADTFP/hr	1.84E-01	2.32E-02
45-93-0100	NC5	NC-5 Paper Machine	7.35E-03	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines p. 140	69	ADTFP/hr	5.10E-01	6.42E-02
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	9.90E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	3.29E-02	4.15E-03
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.01E-03	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	tank	9.09E-03	1.15E-03
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.01E-03	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	tank	2.02E-03	2.55E-04
10-45-0450	R05	No. 5 Precipitator Mix Tank	3.60E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 143	140	TBLS/hr	5.04E-03	6.35E-04
14-05-0050	R03	North Smelt Tank	6.13E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	69	TBLS/hr	4.24E-02	5.35E-03
14-05-0300	R04-1	South Smelt Tank	6.13E-04	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28 - Kraft Smelt Dissolving Tanks, p. 118	69	TBLS/hr	4.24E-02	5.35E-03
10-08-0010	R04-2	Salt Cake Mix Tank	3.60E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	138.5	TBLS/hr	4.98E-03	6.28E-04
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						4.74E-02	5.97E-03
73-10-2000	SETPOND2	Primary Clarifier	3.82E-10	lb/gallon	NCASI TRI Guidance	3,125,000	gallons/hr	1.19E-03	1.50E-04
73-10-1000	SETPOND1	Secondary Clarifier	3.82E-10	lb/gallon	NCASI TRI Guidance	3,125,000	gallons/hr	1.19E-03	1.50E-04

TABLE 34
PHENOL POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
73-05-2000-A		C3	8.94E-03	lb/hr	Water 9 Results for Base Case with Addition of C3 Stream	1.0	hr/hr	8.94E-03	1.13E-03
73-05-2000-B		5th eff 6 evap	8.00E-03	lb/hr	Water 9 Results for Base Case with Addition of 5th eff 6 evap	1.0	hr/hr	8.00E-03	1.01E-03

TABLE 35
STYRENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.64E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0. Terpenes is the sum of alpha-pinenes, beta-pinenes, 3-carene, p-cymene and limonene	39.4	ADTUBP/hr	2.62E-03	3.30E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	7.50E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	2.84E-03	3.58E-04
06-P1	6FEEDTNK	No. 6 Bleach Plant 6th Stage Feed Tank	5.82E-06	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	35.5	ODTUBP/hr	2.07E-04	2.60E-05
06-P2	6BLOWTBE	No. 6 Bleach Plant 6th Stage Blow Tube (standpipe)	2.73E-05	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	35.5	ODTUBP/hr	9.68E-04	1.22E-04
06-P3	6EXHAUST	No. 6 BP 6th Stage Washer And Filtrate Tank	9.64E-05	lb/ODTUBP	Estimation using compound to methanol ratio of NCASI TB No. 679, Table V.O.1, Mill N, October 1994 and 1995/2004 methanol testing on similar existing bleach plant sources.	35.5	ODTUBP/hr	3.42E-03	4.31E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	6.64E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0. Terpenes is the sum of alpha-pinenes, beta-pinenes, 3-carene, p-cymene and limonene	61.6	ADTUBP/hr	4.09E-03	5.16E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	7.50E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	4.44E-03	5.59E-04
14-05-0050	R03	North Smelt Tank	5.59E-06	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	3.87E-04	4.88E-05
14-05-0300	R04-1	South Smelt Tank	5.59E-06	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	3.87E-04	4.88E-05
10-08-0010	R04-2	Salt Cake Mix Tank	1.15E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	138	TBLS/hr	1.59E-04	2.01E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						5.46E-04	6.88E-05
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	8.00E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	4.44E-04	5.59E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	2.67E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1	tank	2.67E-04	3.36E-05

TABLE 35
STYRENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.17E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	1.97E-04	2.49E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	5.88E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	5.35E-05	6.74E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	7.89E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	7.89E-05	9.94E-06
09-12-0050	LIQSEP	New Liquor Separator Tank	7.89E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	7.89E-05	9.94E-06
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	7.89E-05	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	hr*tank/hr	7.89E-04	9.94E-05
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.40E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	hr*tank/hr	1.26E-03	1.59E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.40E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	hr*tank/hr	2.80E-04	3.53E-05
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.40E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	hr/hr	1.40E-04	1.76E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	5.88E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.59E-06	3.26E-07
10-25-0110	PO01C	No. 5 Recovery Boiler BLS	9.07E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	140	TBLS/hr	1.27E-02	1.60E-03
10-45-0450	R05	No. 5 Precipitator Mix Tank	1.15E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	140	TBLS/hr	1.61E-04	2.03E-05
14-10-05	R14	No. 5 Green Liquor Clarifier	1.10E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	22.2	T CaO/hr	4.64E-03	5.84E-04

TABLE 35
STYRENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	4.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	22.2	T CaO/hr	1.86E-03	2.35E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.03E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 1.5 factor is applied.	22.2	T CaO/hr	3.43E-04	4.32E-05
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.10E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 0.3 factor is applied.	22.2	T CaO/hr	7.32E-04	9.23E-05
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	4.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied.	22.2	T CaO/hr	2.72E-03	3.42E-04
14-30-0310	R46	Lime Mud Mix Tank	9.90E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	22.2	T CaO/hr	2.20E-03	2.77E-04
14-30-1450	R15	Lime Mud Storage Tank	4.60E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	22.2	T CaO/hr	1.02E-05	1.29E-06
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	2.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	22.2	T CaO/hr	5.55E-04	6.99E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	8.20E-06	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	1.82E-04	2.29E-05
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	1.38E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 133. A 3.0 factor is applied.	22.2	T CaO/hr	9.19E-04	1.16E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.34E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	1.41E-03	1.77E-04
		Cooler -1 Feed Liquor	1.40E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1	hr/hr	1.40E-04	1.76E-05
		Filter - 1 Lignin	5.88E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.59E-06	3.26E-07

TABLE 35
STYRENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		Tank - 2 Lignin Filter Cloth Wash	5.88E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	2.59E-06	3.26E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.18E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	5.18E-06	6.53E-07
		LRP Dilute Tanks	4.12E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	1.81E-05	2.28E-06
09-27-3800	LSRPSCRUB				Total from Caustic Scrubber			1.68E-04	2.12E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.54E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	1,087	MMBtu/hr	1.67E-02	2.11E-03
	PO13A	Carbonator - Feed Liquor	2.80E-06	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1	hr/hr	2.80E-06	3.53E-07
	PO13A	LRP Acidification Tanks	3.33E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	1.47E-03	1.85E-04
	PO13A	No. 2 HFB - Hog Fuel	1.54E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	947	MMBtu/hr	1.46E-02	1.84E-03
	PO13A	No. 2 HFB LVHC Combustion	2.20E-05	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101	ADTUBP/hr	2.22E-03	2.80E-04
	PO13A	No. 2 HFB HVLC Combustion	1.45E+00	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	1	hr/hr	1.45E+00	1.83E-01
65-25-0310					Total from No. 2 Hog Fuel Boiler			1.47E+00	1.85E-01
CD-65-60-1010					Total from Thermal Oxidizer and HVLC			1.45E+00	1.83E-01

TABLE 35
STYRENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	7.48E-04	9.43E-05
32-40-1560	NC1&2	NC-2 Paper Machine	3.28E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	8.20E-03	1.03E-03
45-93-0100	NC5	NC-5 Paper Machine	3.28E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	2.27E-02	2.87E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	1.92E-03	2.42E-04

TABLE 36
SULFURIC ACID 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
	PO01C	No. 5 Recovery Boiler BLS	1.49E-02	lb/TBLS	Stack Testing 2001, 02, 03, 04, 05, 10	3,360	TBLS/day	5.01E+01	2.63E-01
	PO01C	No. 5 Recovery Boiler Fuel Oil	1.77E-03	lb/Mgal	Sulfuric acid emissions are calculated using emission factors from NCASI's SARA 313 Handbook. The factors are based upon the sulfur content of the fuels used. The document is based on an assumption that all the sulfur in the oil is oxidized and states that 0.00245 times the sulfur contained in oil would be converted to sulfuric acid. The emission factor developed from the sulfur content has a basis of lb/1000 gallons of fuel.	219.8	Mgal/day	3.89E-01	2.04E-03
10-25-0110	Total from No. 5 Recovery Boiler							5.05E+01	2.65E-01
64-25-0290	PO01A	No. 1 HFB - Lignin	1.02E-04	lb/MMbtu	Updated per Responses to Domar 2013 Inventory Questions; Major NSR Permit Application for Lignin Solids Removal Process and Other Energy Improvements Application, Table C-74, October 2016	26,097	MMBtu/day	2.66E+00	1.40E-02
	PO13A	No. 2 HFB - Tested	1.03E-04	lb/MMBtu	Oct 2010 Stack Test (Hog Fuel, Sludge, Used Oil, No. 6 Fuel Oil, HVLC)	22,723	MMBtu/day	2.34E+00	1.23E-02
	PO13A	LVHC Combustion	4.90E-03	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	2425.8	ADTUBP/day	1.19E+01	6.24E-02
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.42E+01	7.47E-02
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.80E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	532.5	T CaO/day	3.62E-04	1.90E-06

TABLE 37
SULFURIC ACID 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
	PO01C	No. 5 Recovery Boiler BLS	1.49E-02	lb/TBLS	Stack Testing 2001, 02, 03, 04, 05, 10	140	TBLS/hr	2.09E+00	2.63E-01
	PO01C	No. 5 Recovery Boiler Fuel Oil	1.77E-03	lb/Mgal	Sulfuric acid emissions are calculated using emission factors from NCASI's SARA 313 Handbook. The factors are based upon the sulfur content of the fuels used. The document is based on an assumption that all the sulfur in the oil is oxidized and states that 0.00245 times the sulfur contained in oil would be converted to sulfuric acid. The emission factor developed from the sulfur content has a basis of lb/1000 gallons of fuel.	9.2	MGal/hr	1.62E-02	2.04E-03
10-25-0110	Total from No. 5 Recovery Boiler							2.10E+00	2.65E-01
64-25-0290	PO01A	No. 1 HFB - Lignin	1.02E-04	lb/MMbtu	Major NSR Permit Application for Lignin Solids Removal Process and Other Energy Improvements Application, Table C-74, October 2016	1,087.37	MMBtu/hr	1.11E-01	1.40E-02
	PO13A	LVHC Combustion	4.90E-03	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101.1	ADTUBP/hr	4.95E-01	6.24E-02
	PO13A	No. 2 HFB - Tested	1.03E-04	lb/MMbtu	Oct 2010 (Condition 3: Hog Fuel, Sludge, Used Oil, No. 6 F.O., & HVLC	947	MMBtu/hr	9.75E-02	1.23E-02
65-25-0310	Total from No. 2 Hog Fuel Boiler							5.93E-01	7.47E-02
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	6.80E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.25 - Summary of Non-metal Air Toxic Emissions from Kraft Lime Kilns p. 110	22.2	T CaO/hr	1.51E-05	1.90E-06

TABLE 38
1,1,2,2-TETRACHLOROETHANE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-05-0210	SWBLTANK	South WBL Storage Tank	9.47E-07	lb/ODTUBP	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	796,886	ODTUBP/yr	7.55E-01	1.09E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	9.47E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.65E-02	5.26E-07
		LRP Dilute Tanks	6.63E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	2.56E-01	3.68E-06
		Tank - 2 Lignin Filter Cloth Wash	9.47E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.65E-02	5.26E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.89E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,580.9	ODTL/yr	7.31E-02	1.05E-06
		Filter - 1 Lignin	9.47E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.65E-02	5.26E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						4.02E-01	5.78E-06
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	3.49E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	2.78E+00	4.00E-05

TABLE 39
TETRACHLOROETHYLENE (PERCHLOROETHYLENE) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	8.82E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	3.05E+01	4.38E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	8.82E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	4.76E+01	6.85E-04
08-40-1000	F35	No. 32 High Density Pulp Tank	6.33E-05	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	8,760	tank*hr/yr	5.55E-01	7.98E-06
14-05-0050	R03	North Smelt Tank	1.71E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	606,411	TBLS/yr	1.04E+01	1.49E-04
14-05-0300	R04-1	South Smelt Tank	1.71E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	606,411	TBLS/yr	1.04E+01	1.49E-04
10-08-0010	R04-2	Salt Cake Mix Tank	1.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	1,212,822	TBLS/yr	1.70E+00	2.44E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.21E+01	1.74E-04
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	2.24E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	1,226,400	TBLS/yr	2.75E+01	3.95E-04
10-45-0450	R05	No. 5 Precipitator Mix Tank	1.40E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	1,226,400	TBLS/yr	1.72E+00	2.47E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	3.45E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	2.75E+00	3.95E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	9.36E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	7.46E-01	1.07E-05
09-12-0250	5SOAP	No. 5 Soap Storage Tank	5.10E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	4.47E-01	6.43E-06
09-12-0050	LIQSEP	New Liquor Separator Tank	5.10E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	4.47E-01	6.43E-06

TABLE 39
TETRACHLOROETHYLENE (PERCHLOROETHYLENE) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	5.10E-05	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	4.47E+00	6.43E-05
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.24E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	78,840	tank*hr/yr	9.78E-01	1.41E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.24E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	17,520	tank*hr/yr	2.17E-01	3.12E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.24E-05	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	8,760	hr/yr	1.09E-01	1.56E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	9.36E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.61E-02	5.19E-07
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	194,363	T CaO/yr	7.77E+01	1.12E-03
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	7.44E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	194,363	T CaO/yr	2.17E+01	3.12E-04
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	1.12E-03	lb/TCaO	NCASI TB 973 Table 4.25 or Table 9.9 - Emissions from Kraft Lime Kilns, p. 110	194,363	TCaO/yr	2.18E+02	3.13E-03
14-30-0310	R46	Lime Mud Mix Tank	3.30E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	194,363	T CaO/yr	6.41E+00	9.23E-05
14-30-1450	R15	Lime Mud Storage Tank	2.90E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	194,363	T CaO/yr	5.64E-01	8.11E-06
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	2.60E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	194,363	T CaO/yr	5.05E+00	7.27E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	2.37E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	4.61E+00	6.63E-05

TABLE 39
TETRACHLOROETHYLENE (PERCHLOROETHYLENE) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
32-40-1560	NC1&2	NC-2 Paper Machine	5.10E-04	lb/ADTFP	Table 4.34 of NCASI TB 973: PM Bleached Kraft	242,725	ADTFP/yr	1.24E+02	1.78E-03
45-93-0100	NC5	NC-5 Paper Machine	5.10E-04	lb/ADTFP	Table 4.34 of NCASI TB 973: PM Bleached Kraft	563,281	ADTFP/yr	2.87E+02	4.13E-03
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	9.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	3.15E+01	4.52E-04
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	9.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	7.50E+01	1.08E-03
		Cooler -1 Feed Liquor	1.24E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8,760	hr/yr	1.09E-01	1.56E-06
		Filter - 1 Lignin	9.36E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.61E-02	5.19E-07
		Tank - 2 Lignin Filter Cloth Wash	9.36E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	3.61E-02	5.19E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.87E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,580.9	ODTL/yr	7.22E-02	1.04E-06
		LRP Dilute Tanks	6.55E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,580.9	ODTL/yr	2.53E-01	3.64E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						5.06E-01	7.28E-06

TABLE 39
TETRACHLOROETHYLENE (PERCHLOROETHYLENE) POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-40-0020	PO01A	No. 1 HFB - Hog Fuel	2.46E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	2.34E+02	3.37E-03
	PO13A	Carbonator - Feed Liquor	2.48E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	2.17E-03	3.12E-08
	PO13A	No. 2 HFB HVLC Combustion	7.99E-04	lb/hr	Data generated by the 1996 compliance testing was run at 68% of the total fiberline capacity, 2050 BDTP per day. The tested lb/hr loadings were adjusted by a ratio of actual production to testing production.	8760.0	hr/yr	7.00E+00	1.01E-04
	PO13A	No. 2 HFB - Hog Fuel	2.46E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	2.04E+02	2.93E-03
65-25-0310	Total from No. 2 Hog Fuel Boiler							2.11E+02	3.04E-03
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							7.00E+00	1.01E-04

TABLE 40
TOLUENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.86E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	1776	hp-hr/day	5.08E-03	2.67E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.09E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	947	ADTUBP/day	5.77E-02	3.03E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	9.60E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	8.72E-02	4.58E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	6.09E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	1,479	ADTUBP/day	9.01E-02	4.73E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	9.60E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	1.36E-01	7.16E-04
14-05-0050	R03	North Smelt Tank	3.79E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	6.30E-02	3.31E-04
14-05-0300	R04-1	South Smelt Tank	3.79E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	1,661	TBLS/day	6.30E-02	3.31E-04
10-08-0010	R04-2	Salt Cake Mix Tank	4.77E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,323	TBLS/day	1.58E-02	8.32E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						7.88E-02	4.14E-04
10-45-0450	R05	No. 5 Precipitator Mix Tank	4.77E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,360	TBLS/day	1.60E-02	8.41E-05
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	6.40E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	8.52E-03	4.47E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	2.04E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	4.90E-03	2.57E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	9.59E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	2.09E-03	1.10E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	2.60E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	5.68E-04	2.98E-06

TABLE 40
TOLUENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.60E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	3.84E-03	2.02E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.60E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	3.84E-03	2.02E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.60E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	tank*hr/day	3.84E-02	2.02E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	9.28E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216	tank*hr/day	2.00E-01	1.05E-03
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	9.28E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48	tank*hr/day	4.45E-02	2.34E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	9.28E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	24	hr/day	2.23E-02	1.17E-04
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.60E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	2.75E-05	1.44E-07
	PO01C	No. 5 Recovery Boiler - BLS	2.96E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	3,360	TLBS/day	9.95E-01	5.22E-03
	PO01C	No. 5 Recovery Boiler - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30,335	MMBtu/day	1.73E+01	9.07E-02
10-25-0110	Total from No. 5 Recovery Boiler							1.83E+01	9.59E-02
14-10-05	R14	No. 5 Green Liquor Clarifier	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	533	T CaO/day	1.01E-02	5.31E-05

TABLE 40
TOLUENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	1.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	533	T CaO/day	1.60E-02	8.39E-05
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	533	T CaO/day	1.60E-03	8.39E-06
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.80E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	533	T CaO/day	1.44E-01	7.55E-04
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	5.69E-04	lb/MMBtu	AP-42 Section 1.3, 5th Edition Supplement E, September 1998.	4,729	MMBtu/day	2.69E+00	1.41E-02
14-30-0310	R46	Lime Mud Mix Tank	3.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136.	533	T CaO/day	1.86E-02	9.78E-05
14-30-1450	R15	Lime Mud Storage Tank	5.70E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	533	T CaO/day	3.04E-04	1.59E-06
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	3.60E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	533	T CaO/day	1.92E-03	1.01E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.30E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	6.92E-02	3.63E-04
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	533	T CaO/day	1.60E-02	8.39E-05
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	1.80E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	599	ODTUBP/day	1.62E-02	8.48E-05
32-40-1560	NC1&2	NC-2 Paper Machine	1.59E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	665	ADTFP/day	1.06E-01	5.55E-04
45-93-0100	NC5	NC-5 Paper Machine	1.59E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	1,664	ADTFP/day	2.65E-01	1.39E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	1.80E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	1,540	ODTUBP/day	4.16E-02	2.18E-04

TABLE 40
TOLUENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	50.4	MMBtu/day	2.06E-02	1.08E-04
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	121.8	MMBtu/day	4.98E-02	2.62E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	50.4	MMBtu/day	2.06E-02	1.08E-04
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	65.5	MMBtu/day	2.68E-02	1.41E-04
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	33.6	MMBtu/day	1.37E-02	7.21E-05
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	33.6	MMBtu/day	1.37E-02	7.21E-05
71-95-0500	COMMEA	Communications Back up Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	138.4	MMBtu/day	5.66E-02	2.97E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	56.6	MMBtu/day	2.32E-02	1.22E-04
TEMPGEN	TEMPGEN	Temporary Generator	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.144	MMBtu/day	5.87E-05	3.08E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	1.97E-06	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	24000	hp-hr/day	4.73E-02	2.48E-04
		Cooler -1 Feed Liquor	9.28E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24	hr/day	2.23E-02	1.17E-04
		Filter - 1 Lignin	2.60E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	2.75E-05	1.44E-07
		Tank - 2 Lignin Filter Cloth Wash	2.60E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	2.75E-05	1.44E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	5.20E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	105.7	ODTL/day	5.50E-05	2.89E-07

TABLE 40
TOLUENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
		LRP Dilute Tanks	1.82E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	105.7	ODTL/day	1.92E-04	1.01E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						2.26E-02	1.19E-04
64-25-0290	PO01A-1	No. 1 HFB - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	26097	MMBtu/day	1.49E+01	7.80E-02
	PO13A	Carbonator - Feed Liquor	1.86E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	24	hr/day	4.45E-04	2.34E-06
	PO13A	LVHC Combustion	1.52E-06	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	2426	ADTUBP/day	3.69E-03	1.94E-05
	PO13A	No. 2 HFB - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	22,723	MMBtu/day	1.29E+01	6.79E-02
	PO13A	LRP Acidification Tanks	1.00E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.7	ODTL/day	1.06E-02	5.55E-05
65-25-0310		Total from No. 2 Hog Fuel Boiler						1.30E+01	6.80E-02
CD-65-60-1010	THERMALOX	Thermal Oxidizer	3.24E-06	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	1,080	MMBtu/day	3.50E-03	1.84E-05
		Total from Thermal Oxidizer and HVLC combustion						1.45E-02	7.62E-05

TABLE 41
TOLUENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.86E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	74	hp-hr/hr	2.12E-04	2.67E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	6.09E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	39.4	ADTUBP/hr	2.40E-03	3.03E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	9.60E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	37.9	ADTBP/hr	3.64E-03	4.58E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	6.09E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	61.6	ADTUBP/hr	3.75E-03	4.73E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	9.60E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	5.68E-03	7.16E-04
14-05-0050	R03	North Smelt Tank	3.79E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	2.62E-03	3.31E-04
14-05-0300	R04-1	South Smelt Tank	3.79E-05	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks	69.2	TBLS/hr	2.62E-03	3.31E-04
10-08-0010	R04-2	Salt Cake Mix Tank	4.77E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	138.5	TBLS/hr	6.60E-04	8.32E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.28E-03	4.14E-04
10-45-0450	R05	No. 5 Precipitator Mix Tank	4.77E-06	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	140	TBLS/hr	6.68E-04	8.41E-05
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	6.40E-06	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	3.55E-04	4.47E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	2.04E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1.0	tank*hr/hr	2.04E-04	2.57E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	9.59E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	8.72E-05	1.10E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	2.60E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	2.37E-05	2.98E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	1.60E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	hr/hr	1.60E-04	2.02E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	1.60E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	hr/hr	1.60E-04	2.02E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	1.60E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tank	1.60E-03	2.02E-04

TABLE 41
TOLUENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	9.28E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	tank	8.35E-03	1.05E-03
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	9.28E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	tank	1.86E-03	2.34E-04
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	9.28E-04	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	1	hr/hr	9.28E-04	1.17E-04
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	2.60E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.15E-06	1.44E-07
	PO01C	No. 5 Recovery Boiler - BLS	2.96E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	140	TBLS/hr	4.14E-02	5.22E-03
	PO01C	No. 5 Recovery Boiler - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1,263.9	MMBtu/hr	7.20E-01	9.07E-02
10-25-0110	Total from No. 5 Recovery Boiler							7.61E-01	9.59E-02
14-10-05	R14	No. 5 Green Liquor Clarifier	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources.	22.2	T CaO/hr	4.22E-04	5.31E-05
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	1.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied.	22.2	T CaO/hr	6.66E-04	8.39E-05
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. A 0.3 factor is applied.	22.2	T CaO/hr	6.66E-05	8.39E-06
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	1.80E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied.	22.2	T CaO/hr	5.99E-03	7.55E-04
14-60-3000	R01A	No. 5 Lime Kiln - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	197.0	MMBtu/hr	1.12E-01	1.41E-02
14-30-0310	R46	Lime Mud Mix Tank	3.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136	22.2	T CaO/hr	7.77E-04	9.78E-05
14-30-1450	R15	Lime Mud Storage Tank	5.70E-07	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136.	22.2	T CaO/hr	1.26E-05	1.59E-06
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	3.60E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	22.2	T CaO/hr	7.99E-05	1.01E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	1.30E-04	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	2.88E-03	3.63E-04

TABLE 41
TOLUENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	1.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	22.2	T CaO/hr	6.66E-04	8.39E-05
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	1.80E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	6.73E-04	8.48E-05
32-40-1560	NC1&2	NC-2 Paper Machine	1.59E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	3.98E-03	5.01E-04
45-93-0100	NC5	NC-5 Paper Machine	1.59E-04	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	1.10E-02	1.39E-03
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	1.80E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	1.73E-03	2.18E-04
53-40-0130	FPDE	Fine Paper Diesel Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	8.59E-04	1.08E-04
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.1	MMBtu/hr	2.08E-03	2.62E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	8.59E-04	1.08E-04
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.7	MMBtu/hr	1.12E-03	1.41E-04
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	5.73E-04	7.21E-05
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3 3-2.	1.4	MMBtu/hr	5.73E-04	7.21E-05
71-95-0500	COMMEA	Communications Back up Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.8	MMBtu/hr	2.36E-03	2.97E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.4	MMBtu/hr	9.65E-04	1.22E-04
TEMPGEN	TEMPGEN	Temporary Generator	4.09E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.006	MMBtu/hr	2.45E-06	3.08E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	1.97E-06	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	1000	hp-hr/hr	1.97E-03	2.48E-04
		Cooler -1 Feed Liquor	9.28E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1	hr/hr	9.28E-04	1.17E-04
		Filter - 1 Lignin	2.60E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.15E-06	1.44E-07
		Tank - 2 Lignin Filter Cloth Wash	2.60E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.4	ODTL/hr	1.15E-06	1.44E-07

TABLE 41
TOLUENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	5.20E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.4	ODTL/hr	2.29E-06	2.89E-07
		LRP Dilute Tanks	1.82E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.4	ODTL/hr	8.02E-06	1.01E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						9.41E-04	1.19E-04
64-25-0290	PO01A-1	No. 1 HFB - No. 2	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1087	MMBtu/hr	6.19E-01	7.80E-02
	PO13A	Carbonator - Feed Liquor	1.86E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	1	hr/hr	1.86E-05	2.34E-06
	PO13A	LVHC Combustion	1.52E-06	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	101	ADTUBP/hr	1.54E-04	1.94E-05
	PO13A	No. 2 HFB - Hog Fuel	5.69E-04	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	947	MMBtu/hr	5.39E-01	6.79E-02
	PO13A	LRP Acidification Tanks	1.00E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.4	ODTL/hr	4.40E-04	5.55E-05
65-25-0310	Total from No. 2 Hog Fuel Boiler							5.40E-01	6.80E-02
CD-65-60-1010	THERMALOX	Thermal Oxidizer	3.24E-06	lb/MMBtu	Emission Factors are based on AP-42, Chapter 1.4 (revised 7/98) except acetaldehyde, acrolein and ammonia. Acetaldehyde, acrolein, and ammonia factors are from WebFIRE database. , converted from MMSCF to MMBTU; this is the backup for HVLC comustion behind the No. 2 Hog Fuel Boiler	45	MMBtu/hr	1.46E-04	1.84E-05
	Total from Thermal Oxidizer and HVLC combustion							6.05E-04	7.62E-05

TABLE 42
TRICHLOROETHYLENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	3.34E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0.	345,533	ADTUBP/yr	1.15E+01	1.66E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	1.20E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	331,712	ADTBP/yr	3.98E+00	5.73E-05
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	3.34E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0.	539,896	ADTUBP/yr	1.80E+01	2.59E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	1.20E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	518,300	ADTBP/yr	6.22E+00	8.95E-05
14-05-0050	R03	North Smelt Tank	2.76E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	606,411	TBLS/yr	1.67E+01	2.41E-04
14-05-0300	R04-1	South Smelt Tank	2.76E-05	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.28	606,411	TBLS/yr	1.67E+01	2.41E-04
10-08-0010	R04-2	Salt Cake Mix Tank	3.00E-06	lb/TBLS	Test Results from ETG Stationary Source Sampling Report No. 0783 (Dec 1999- Jan 2000).	1,212,822	TBLS/yr	3.64E+00	5.23E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.04E+01	2.93E-04
10-45-0450	R05	No. 5 Precipitator Mix Tank	4.08E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	1,226,400	TBLS/yr	5.00E-01	7.20E-06
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	2.80E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994.	485,906	ODTUBP/yr	1.36E+01	1.96E-04
08-40-1000	F35	No. 32 High Density Pulp Tank	6.08E-05	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	8,760	tank*hr/yr	5.33E-01	7.66E-06
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.37E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.09E+01	1.57E-04
09-05-0210	SWBLTANK	South WBL Storage Tank	3.71E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	2.96E+00	4.25E-05
09-12-0250	5SOAP	No. 5 Soap Storage Tank	2.31E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	2.02E-01	2.91E-06

TABLE 42
TRICHLOROETHYLENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-12-0050	LIQSEP	New Liquor Separator Tank	2.31E-05	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	8,760	hr/yr	2.02E-01	2.91E-06
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	2.31E-05	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	87,600	tank*hr/yr	2.02E+00	2.91E-05
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	3.42E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	78,840	tank*hr/yr	2.70E+00	3.88E-05
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	3.42E-05	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	17,520	tank*hr/yr	5.99E-01	8.62E-06
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	3.42E-05	lb/hr	NCASI Pulp and Paper Database - March 2013 - Recovery Black Liquor Tank >20% Solids - Median	8,760	hr/yr	3.00E-01	4.31E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	3.71E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.43E-01	2.06E-06
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	4.22E-05	lb/T CaO	NCASI TB 973 Table 4.25 - Emissions from Kraft Lime Kilns, p. 110	194,363	T CaO/yr	8.20E+00	1.18E-04
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	1.78E-05	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	1,226,400	TBLS/yr	2.18E+01	3.14E-04
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	6.20E-06	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	194,363	T CaO/yr	1.21E+00	1.73E-05
		Cooler -1 Feed Liquor	3.42E-05	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	8,760	hr/yr	3.00E-01	4.31E-06

TABLE 42
TRICHLOROETHYLENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
		Filter - 1 Lignin	3.71E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.43E-01	2.06E-06
		Tank - 2 Lignin Filter Cloth Wash	3.71E-06	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.43E-01	2.06E-06
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	7.42E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	2.86E-01	4.12E-06
		LRP Dilute Tanks	2.60E-05	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	1.00E+00	1.44E-05
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.87E+00	2.70E-05
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	3.88E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	1.11E+03	1.59E-02
	PO13A	Carbonator - Feed Liquor	6.84E-07	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank.	8,760	hr/yr	5.99E-03	8.62E-08
	PO13A	No. 2 HFB LVHC Combustion	7.60E-07	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups	885,429	ADTUBP/day	6.73E-01	9.68E-06
	PO13A	No. 2 HFB - Hog Fuel	3.88E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	3.22E+02	4.63E-03
65-25-0310		Total from No. 2 Hog Fuel Boiler						3.22E+02	4.64E-03
CD-65-60-1010		Total from Thermal Oxidizer and HVLC						5.99E-03	8.62E-08

TABLE 42
TRICHLOROETHYLENE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
32-40-1560	NC1&2	NC-2 Paper Machine	2.97E-07	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines	242,725	ADTFP/yr	7.21E-02	1.04E-06
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	7.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	218,453	ODTUBP/yr	2.49E+01	3.58E-04
45-93-0100	NC5	NC-5 Paper Machine	2.97E-07	lb/ADTFP	NCASI Technical Bulletin No. 973, February 2010, Table 4.34 - Bleached Kraft Pulp and Paper Machines	563,281	ADTFP/yr	1.67E-01	2.41E-06
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	7.60E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	521,035	ODTUBP/yr	5.94E+01	8.54E-04

TABLE 43
VINYL CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
09-05-0210	SWBLTANK	South WBL Storage Tank	3.53E-07	lb/ODTUBP	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	796,886	ODTUBP/yr	2.81E-01	4.05E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	3.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.36E-02	1.96E-07
		LRP Dilute Tanks	2.47E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	38,581	ODTL/yr	9.53E-02	1.37E-06
		Tank - 2 Lignin Filter Cloth Wash	3.53E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.36E-02	1.96E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	7.06E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	38,581	ODTL/yr	2.72E-02	3.92E-07
		Filter - 1 Lignin	3.53E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	38,581	ODTL/yr	1.36E-02	1.96E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						1.50E-01	2.15E-06
	PO13A	No. 2 HFB - Hog Fuel	1.84E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	8,293,837	MMBtu/yr	1.53E+02	2.19E-03
65-25-0310		Total from No. 2 Hog Fuel Boiler						1.53E+02	2.19E-03

TABLE 43
VINYL CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/yr)	Emission Rate (g/s)
64-25-0290	PO01A-1	No. 1 HFB - Hog Fuel	1.84E-05	lb/MMBtu	Table 4.1, 4.5 and 4.6 of NCASI TB 1013	9,525,317	MMBtu/yr	1.75E+02	2.52E-03
10-25-0110	PO01C	No. 5 Recovery Boiler - BLS	3.07E-06	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23	1,226,400	TBLS/yr	3.77E+00	5.42E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	1.30E-06	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	796,886	ODTUBP/yr	1.04E+00	1.49E-05
10-08-0010	R04-2	Salt Cake Mix Tank	2.85E-07	lb/TBLS	Test Results from ETG Stationary Source Sampling Report No. 0783 (Dec 1999- Jan 2000).	1,212,822	TBLS/yr	3.46E-01	4.97E-06
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						3.46E-01	4.97E-06

TABLE 44
VINYLIDENE CHLORIDE POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-05-0210	SWBLTANK	South WBL Storage Tank	5.47E-07	lb/ODTUBP	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	2,183	ODTUBP/day	1.19E-03	6.27E-06
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	5.47E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	5.78E-05	3.04E-07
		LRP Dilute Tanks	3.83E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	106	ODTL/day	4.05E-04	2.12E-06
		Tank - 2 Lignin Filter Cloth Wash	5.47E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	5.78E-05	3.04E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.09E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	106	ODTL/day	1.16E-04	6.07E-07
		Filter - 1 Lignin	5.47E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	5.78E-05	3.04E-07
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						6.36E-04	3.34E-06
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	9.40E-05	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	2.05E-01	1.08E-03
10-08-0010	R04-2	Salt Cake Mix Tank	4.42E-07	lb/TBLS	Test Results from ETG Stationary Source Sampling Report No. 0783 (Dec 1999- Jan 2000).	3,323	TBLS/day	1.47E-03	7.71E-06
14-05-0300, 10	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.47E-03	7.71E-06

TABLE 45
XYLENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.00E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	1776	hp-hr/day	3.54E-03	1.86E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	7.61E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0. Xylenes are sum of o,m & p-xylenes	947	ADTUBP/day	7.20E-02	3.78E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	4.98E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	909	ADTBP/day	4.53E-02	2.38E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	7.61E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0. Xylenes are sum of o,m & p-xylenes	1,479	ADTUBP/day	1.13E-01	5.91E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	4.98E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	1,420	ADTBP/day	7.07E-02	3.71E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	1.32E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	1,331	ODTUBP/day	1.76E-02	9.23E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	2.38E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	24	tank*hr/day	5.71E-03	3.00E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.21E-06	lb/ODTUBP	Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	4.82E-03	2.53E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	5.99E-07	lb/ODTUBP	Dec 1999-Jan 2000, Stack Testing	2,183	ODTUBP/day	1.31E-03	6.87E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	6.80E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	1.63E-02	8.57E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	6.80E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	24	hr/day	1.63E-02	8.57E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	6.80E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	240	tank*hr/day	1.63E-01	8.57E-04
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.01E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	216	tank*hr/day	2.18E-02	1.15E-04

TABLE 45
XYLENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.01E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	48	tank*hr/day	4.85E-03	2.55E-05
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.01E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	24	hr/day	2.41E-03	1.27E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	5.99E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	6.33E-05	3.32E-07
	PO01C	No. 5 Recovery Boiler - BLS	9.40E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	3,360.0	TBLS/day	3.16E+00	1.66E-02
	PO01C	No. 5 Recovery Boiler - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	30,334.61	MMBtu/day	3.03E-01	1.59E-03
10-25-0110					Total from No. 5 Recovery Boiler			3.46E+00	1.82E-02
10-45-0450	R05	No. 5 Precipitator Mix Tank	7.00E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,360	TBLS/day	2.35E-03	1.23E-05
14-05-0050	R03	North Smelt Tank	1.70E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks, Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	1,661	TBLS/day	2.82E-01	1.48E-03
14-05-0300	R04-1	South Smelt Tank	1.70E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks, Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	1,661	TBLS/day	2.82E-01	1.48E-03
10-08-0010	R04-2	Salt Cake Mix Tank	7.00E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	3,323	TBLS/day	2.33E-03	1.22E-05
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						2.84E-01	1.49E-03
14-10-05	R14	No. 5 Green Liquor Clarifier	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	2.02E-01	1.06E-03
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	8.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors	533	T CaO/day	9.05E-02	4.75E-04

TABLE 45
XYLENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors. A 0.3 factor is applied.	533	T CaO/day	3.20E-02	1.68E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	6.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	4.95E-02	2.60E-04
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	6.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	8.25E-02	4.33E-04
14-30-0310	R46	Lime Mud Mix Tank	3.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	1.60E-02	8.39E-05
14-30-1450	R15	Lime Mud Storage Tank	7.10E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	3.78E-03	1.98E-05
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	2.94E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	533	T CaO/day	1.57E-02	8.22E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	3.40E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	533	T CaO/day	1.81E-02	9.50E-05
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.14E-03	lb/T CaO	NCASI TB 973 Table 4.25, Table 8.1, or Table 9.9 - Emissions from Kraft Lime Kilns, p. 110. AP-42 used where NCASI factors are not available. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	533	T CaO/day	1.14E+00	5.98E-03
		Cooler -1 Feed Liquor	1.01E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	24	hr/day	2.41E-03	1.27E-05
		Filter - 1 Lignin	5.99E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	6.33E-05	3.32E-07
		Tank - 2 Lignin Filter Cloth Wash	5.99E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	106	ODTL/day	6.33E-05	3.32E-07

TABLE 45
XYLENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.20E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	106	ODTL/day	1.27E-04	6.65E-07
		LRP Dilute Tanks	4.19E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	106	ODTL/day	4.43E-04	2.33E-06
09-27-3800	LSRPSCRUB	Total from Caustic Scrubber						3.11E-03	1.63E-05
64-25-0290	PO01A-1	No. 1 HFB - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	26,097	MMBtu/day	2.61E-01	1.37E-03
	PO13A	Carbonator - Feed Liquor	2.01E-06	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	24.00	hr/day	4.82E-05	2.53E-07
	PO13A	LRP Acidification Tanks	1.31E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	105.70	ODTL/day	1.38E-02	7.25E-05
	PO13A	LVHC Combustion	6.20E-06	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups. This is the sum of o-xylene and m,p-xylenes.	2426	ADTUBP/day	1.50E-02	7.90E-05
	PO13A	HVLC Combustion	1.45E+00	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	24.0	hr/day	3.49E+01	1.83E-01
	PO13A	No. 2 HFB - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	22,723	MMBtu/day	2.27E-01	1.19E-03
65-25-0310		Total from No. 2 Hog Fuel Boiler						3.51E+01	1.84E-01
CD-65-60-1010		Total from Thermal Oxidizer and HVLC						3.49E+01	1.83E-01
14-30-5040, 14-30-6040	R65, **R66**	East and West Lime Mud Vacuum System	2.48E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	533	T CaO/day	3.96E-02	2.08E-04

TABLE 45
XYLENE 24-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/day)	Emission Rate (g/s)
53-40-0130	FPDE	Fine Paper Diesel Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	50.4	MMBtu/day	1.44E-02	7.54E-05
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	121.8	MMBtu/day	3.47E-02	1.82E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	50.4	MMBtu/day	1.44E-02	7.54E-05
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	65.5	MMBtu/day	1.87E-02	9.80E-05
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	33.6	MMBtu/day	9.58E-03	5.03E-05
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	33.6	MMBtu/day	9.58E-03	5.03E-05
71-95-0500	COMMEA	Communications Back up Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	138.4	MMBtu/day	3.95E-02	2.07E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	56.6	MMBtu/day	1.61E-02	8.48E-05
TEMPGEN	TEMPGEN	Temporary Generator	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.144	MMBtu/day	4.09E-05	2.15E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	1.35E-06	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	24000	hp-hr/day	3.24E-02	1.70E-04
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	599	ODTUBP/day	1.80E-02	9.43E-05
32-40-1560	NC1&2	NC-2 Paper Machine	2.29E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	665	ADTFP/day	1.52E+00	7.99E-03
45-93-0100	NC5	NC-5 Paper Machine	2.29E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	1,664	ADTFP/day	3.81E+00	2.00E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	1,540	ODTUBP/day	4.62E-02	2.42E-04

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XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
TROMSCR	TROMSCR	Trommel Screen	2.00E-06	lb/hp-hr	AP-42 Section 3.3, Table 3.3-2. Converted to lb/hp-hr	74	hp-hr/hr	1.48E-04	1.86E-05
06-31-0180, 06-31-1000, 06-32-2060, 06-32-2120, 06-32-2100, 06-32-2300, 06-32-2340, 06-32-2380	F09, F12, F13, F14, F17, F18, F19, F41	No. 6 O2 Delig	7.61E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2010, Table 4.4, Median emission factors using ND=0. Xylenes are sum of o,m & p-xylenes	39	ADTUBP/hr	3.00E-03	3.78E-04
06-40-8000	F15, F16	No. 6 Bleach Plant Scrubber	4.98E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	38	ADTBP/hr	1.89E-03	2.38E-04
07-31-1000, 07-31-1100, 07-33-3000, 07-31-1140, 07-31-1200, 07-31-1180	F23-27, F42	No. 7 O2 Delig	7.61E-05	lb/ADTUBP	NCASI Technical Bulletin 973, "Compilation of Air Toxic and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update" February 2014, Table 4.4, Median emission factors using ND=0. Xylenes are sum of o,m & p-xylenes	61.6	ADTUBP/hr	4.69E-03	5.91E-04
07-31-1180	F30	No. 7 Bleach Plant Scrubber	4.98E-05	lb/ADTBP	NCASI 2013 Pulp & Paper Database (Median Values for ECF Bleach Plant Scrubber).	59.2	ADTBP/hr	2.95E-03	3.71E-04
07-34-4080, 07-34-4100, 07-36-6040, 07-36-6060	EOP, PEROX	EOP and Peroxide Stage	1.32E-05	lb/ODTUBP	NCASI Technical Bulletin 679, Table V.O.1, Mill N, October 1994	55.5	ODTUBP/hr	7.32E-04	9.23E-05
08-40-1000	F35	No. 32 High Density Pulp Tank	2.38E-04	lb/hr/tank	NCASI Technical Bulletin No. 973, October 2014, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update. Table 4.19 HD Unbleached Pulp Storage Tanks	1.0	tank	2.38E-04	3.00E-05
08-65-1060	6N7SPLTK	No. 6 and 7 spill collection tank	2.21E-06	lb/ODTUBP	Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	2.01E-04	2.53E-05
09-05-0210	SWBLTANK	South WBL Storage Tank	5.99E-07	lb/ODTUBP	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing	91.0	ODTUBP/hr	5.45E-05	6.87E-06
09-12-0250	5SOAP	No. 5 Soap Storage Tank	6.80E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	6.80E-04	8.57E-05
09-12-0050	LIQSEP	New Liquor Separator Tank	6.80E-04	lb/hr	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids	1	tank	6.80E-04	8.57E-05
09-05-0200, 09-05-0150, 09-05-0100, 09-95-0015, 09-19-0020, 09-19-0030, 09-30-0030, 09-10-0150, 09-10-0300, 09-10-0350, 09-10-0400	R24-26, R32, R36, R39-R43	18% Liquor Mix Tanks	6.80E-04	lb/hr/tank	NCASI 973 Database 2014 - Recovery Black Liquor Tank Weak </=20% Solids, 10.0 multiplier for tank movements	10.0	tank	6.80E-03	8.57E-04

TABLE 46
XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
09-30-0010, 09-30-0020, 09-95-0010, 09-95-0009, 09-20-0070, 09-25-0140, 09-25-0540, 09-25-0340, 09-20-0310	R27-R28, R31, R33, R34, R37, R38, R44, R72	48% Liquor Storage Tanks, Soap Tanks	1.01E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 9.0 multiplier for tank movements	9.0	tank	9.09E-04	1.15E-04
09-40-0010, 09-40-0020	R29, R30	65% Liquor Storage Tanks	1.01E-04	lb/hr/tank	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. 2.0 multiplier for tank movements	2.0	tank	2.02E-04	2.55E-05
09-27-1000	LRP 40%	Tank - Lignin Feed Liquor	1.01E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	1	hr/hr	1.01E-04	1.27E-05
09-27-3000	LRPPRS2	Filter - 2 Lignin Filter	5.99E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.40	ODTL/hr	2.64E-06	3.32E-07
10-45-0450	R05	No. 5 Precipitator Mix Tank	7.00E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	140	TBLS/hr	9.80E-05	1.23E-05
	PO01C	No. 5 Recovery Boiler - BLS	9.40E-04	lb/TBLS	National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 973, February 2010, Compilation of 'Air Toxic' and Total Emissions Data for Pulp and Paper Mil Sources - A Second Update, Table 4.23. Data points reported as non-detect treated as zero.	140	TBLS/hr	1.32E-01	1.66E-02
	PO01C	No. 5 Recovery Boiler - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1263.9	MMBtu/hr	1.26E-02	1.59E-03
10-25-0110	Total from No. 5 Recovery Boiler							1.44E-01	1.82E-02
14-05-0050	R03	North Smelt Tank	1.70E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks, Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factor.	69.2	TBLS/hr	1.17E-02	1.48E-03
14-05-0300	R04-1	South Smelt Tank	1.70E-04	lb/TBLS	NCASI TB 973 Table 4.28 - Emissions from Kraft Smelt Dissolving Tanks, Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factor.	69.2	TBLS/hr	1.17E-02	1.48E-03
10-08-0010	R04-2	Salt Cake Mix Tank	7.00E-07	lb/TBLS	NCASI Technical Bulletin No. 973, February 2010, Table 4.35 - Miscellaneous Kraft Mill Sources - Salt Cake Mix Tank Vents p. 144	138.5	TBLS/hr	9.69E-05	1.22E-05

TABLE 46
XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-05-0300, 10-08-0010	R04	Total South Smelt Tank and Salt Cake Mix Tank						1.18E-02	1.49E-03
14-10-05	R14	No. 5 Green Liquor Clarifier	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Green Liquor Clarifier Mill D. P. 136. A factor of 1.9 is applied to account for all sources. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	8.43E-03	1.06E-03
14-15-0450, 14-70-2045, 14-70-2020	R45,R70,R76	Scrubber Water Standpipe, Scrubber Water Clarifier	8.50E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - White Liquor and Weak Wash Pressure Filters Vent Mill J. A 2.0 factor is applied. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors	22.2	T CaO/hr	3.77E-03	4.75E-04
14-15-0600, 14-15-0800, 14-15-0900, 14-15-DREGS	R09,R13,R10, R12	Dregs Sources	2.00E-04	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources -Green Liquor Clarifier Vent Mill D. Emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors. A 0.3 factor is applied.	22.2	T CaO/hr	1.33E-03	1.68E-04
14-20-2020, 14-20-2085	R53, R58	East/West Slaker Area	6.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 Causticizing Area Sources - Causticizer/Salker Combination Emissions. A 1.5 factor is applied. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	2.06E-03	2.60E-04
08-70-0900, 14-25-0450, 14-25-0800, 14-25-0050, 14-25-0150	R16, R17, R07, R22, F11	No. 3 and 4 WL Clarifiers and Tanks	6.20E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - White Liquor Pressure Filter Vent Mill F (ND=0). A 2.5 factor is applied. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	3.44E-03	4.33E-04
14-30-0310	R46	Lime Mud Mix Tank	3.00E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Additional Causticizing Area Sources, Table 4.32 p.136, Lime Mud Dilution Tank Vent Mill D p. 136. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	6.66E-04	8.39E-05
14-30-1450	R15	Lime Mud Storage Tank	7.10E-06	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Sources - Lime Mud Mix Tank Vent Mill D, p. 136. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	1.58E-04	1.98E-05
14-30-350	R47, R49	No. 2 and 3 Lime Mud Wash Tank	2.94E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.32 - Additional Causticizing Area Sources - Lime Mud Pressure Filter Vent Mill D p. 136.	22.2	T CaO/hr	6.52E-04	8.22E-05
14-30-5000, 14-30-6000	R50	East and West Lime Mud Filters	3.40E-05	lb/T CaO	NCASI Pulp and Paper Database TB 973 Table 4.31 - Lime Mud Precoat Filters	22.2	T CaO/hr	7.54E-04	9.50E-05

TABLE 46
XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
14-60-3000	R01A	No. 5 Lime Kiln - TCaO	2.14E-03	lb/T CaO	NCASI TB 973 Table 4.25, Table 8.1, or Table 9.9 - Emissions from Kraft Lime Kilns, p. 110. AP-42 used where NCASI factors are not available. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	22.2	T CaO/hr	4.75E-02	5.98E-03
		Cooler -1 Feed Liquor	1.01E-04	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor	1.00	hr/hr	1.01E-04	1.27E-05
		Filter - 1 Lignin	5.99E-07	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factors are production based and thus are conservatively not time weighted based on actual venting only 15% of the time.	4.40	ODTL/hr	2.64E-06	3.32E-07
		Tank - 2 Lignin Filter Cloth Wash	5.99E-07	lb/ODTL	ETG No. 0783, Dec 1999-Jan 2000, Stack Testing on WBL Tanks. Because emissions factors are production based, they are conservatively not time weighted based on actual venting only 15% of the time.	4.40	ODTL/hr	2.64E-06	3.32E-07
		Conveyors - #1 Lignin Filter & #1 Lignin Filter Incline	1.20E-06	lb/ODTL	Conservatively assume emissions from filters equate to weak black liquor tank. Multiply emissions by 2 for two conveyors. ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000.	4.40	ODTL/hr	5.28E-06	6.65E-07
		LRP Dilute Tanks	4.19E-06	lb/ODTL	ETG Stationary Source Sampling Report No. 0783, December 1999-January 2000. Emission factor displayed is for 7 tanks total. Emission factors used for the primary cloth wash and filtrate tanks are production based and thus are conservatively not time weighted based onactual venting periods of only 15% of the time.	4.40	ODTL/hr	1.85E-05	2.33E-06
09-27-3800	LSRPSCRUB				Total from Caustic Scrubber			1.30E-04	1.63E-05
64-25-0290	PO01A-1	No. 1 HFB - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	1087.4	MMBtu/hr	1.09E-02	1.37E-03
	PO13A	Carbonator - Feed Liquor	2.01E-06	lb/hr	NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor Median, 98% control, 1 tank. Xylenes (mixed isomers) emission factor is the sum of o-Xylenes plus m,p-Xylenes emission factors.	1.00	hr/hr	2.01E-06	2.53E-07
	PO13A	No. 2 HFB - No. 2	1.00E-05	lb/MMBtu	AP-42, Fifth edition, Chapter 1, Section 3, Supplement E. Factor units are lb/10^3 gal	947	MMBtu/hr	9.47E-03	1.19E-03

TABLE 46
XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
	PO13A	LRP Acidification Tanks	1.31E-04	lb/ODTL	NCASI TB973 Table 4.15 Median Values for Pulp Mill LVHC Sources. Assumes ODT=ADT/0.9, 98% control, 3 tanks. Controlled by HVLC System	4.40	ODTL/hr	5.75E-04	7.25E-05
	PO13A	No. 2 HFB LVHC Combustion	6.20E-06	lb/ADTUBP	NCASI TB 973 Table 4.18 - Kraft Mill NCG Thermal Oxidizer. LVHC gases are burned through No. 2 HFB. The White Liquor Scrubber then No. 5 Lime Kiln are used as backups. This is the sum of o-xylene and m,p-xylenes.	101	ADTUBP/hr	6.27E-04	7.90E-05
	PO13A	No. 2 HFB HVLC Combustion	1.45E+00	lb/hr	NCASI TRI Guidance 2013 converted to lb/hr basis using annual production and hours of operation with 98% control.	1.0	hr/hr	1.45E+00	1.83E-01
65-25-0310	Total from No. 2 Hog Fuel Boiler							1.46E+00	1.84E-01
CD-65-60-1010	Total from Thermal Oxidizer and HVLC							1.45E+00	1.83E-01
14-30-5040, 14-30-6040	R65, R66	East and West Lime Mud Vacuum System	2.48E-05	lb/T CaO	NCASI Technical Bulletin No. 973, February 2010, Table 4.31 - Causticizing Area Sources - Precoat Filter Vacuum Pump Exhaust p. 134. A 3.0 factor is applied.	22.2	T CaO/hr	1.65E-03	2.08E-04
53-40-0130	FPDE	Fine Paper Diesel Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	5.99E-04	7.54E-05
14-60-3000-1	LKDE	Lime Kiln Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.1	MMBtu/hr	1.45E-03	1.82E-04
53-40-0140	WNCEE	W.N. Cr., East Diesel Fire Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.1	MMBtu/hr	5.99E-04	7.54E-05
53-40-0145	WNCWE	W.N. Cr., West Diesel Fire Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.7	MMBtu/hr	7.78E-04	9.80E-05
73-05-4570	RUNEA	Runoff Coll Sewer Lift Station Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	3.99E-04	5.03E-05
73-05-4580	SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	1.4	MMBtu/hr	3.99E-04	5.03E-05
71-95-0500	COMMEA	Communications Back up Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	5.8	MMBtu/hr	1.64E-03	2.07E-04
TEMPSEW	TEMPSEW	Temporary Sewer Pump Engine	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	2.4	MMBtu/hr	6.73E-04	8.48E-05
TEMPGEN	TEMPGEN	Temporary Generator	2.85E-04	lb/MMBtu	AP-42 Section 3.3, Table 3.3-2.	0.006	MMBtu/hr	1.71E-06	2.15E-07
TEMP-CHIP	TEMPCHIP	Temporary Log Chipper	1.35E-06	lb/hp-hr	AP-42 Section 3.4, Table 3.4-3	1000	hp-hr/hr	1.35E-03	1.70E-04

TABLE 46
XYLENE 1-HOUR POTENTIAL EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

Emission Source ID	Model ID	Source Description	Emission Factor (lb/unit)	Units	EF Basis	Activity Factor	Units	Emission Rate (lb/hr)	Emission Rate (g/s)
32-10-0140	P09A-F	NC-2 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	24.9	ODTUBP/hr	7.48E-04	9.43E-05
32-40-1560	NC1&2	NC-2 Paper Machine	2.29E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	25	ADTFP/hr	5.73E-02	7.21E-03
45-93-0100	NC5	NC-5 Paper Machine	2.29E-03	lb/ADTFP	Table 4.34 of NCASI TB 973; PM Bleached Kraft	69	ADTFP/hr	1.59E-01	2.00E-02
45-10-0005	P27A-H	NC-5 HD and LD Stock Tanks	2.00E-05	lb/ODTUBP	NCASI Technical Bulletin No. 679, October 1994, VOC Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants, pg. 104 Table V.B.1, Mill A, D Washer Vent. A 1.5 factor is applied.	64.2	ODTUBP/hr	1.92E-03	2.42E-04

TABLE 60
POTENTIAL FACILITY-WIDE TOXIC AIR POLLUTANT EMISSION RATES
DOMTAR PAPER COMPANY, PLYMOUTH, NC

TAP	Averaging Period	Total Potential Emissions (lb/averaging period)	TPER (lb/averaging period)	Modeling Required (Y/N)?
Acetaldehyde	1-Hour	11.02	6.8	Y
Acrolein	1-Hour	0.50	0.02	Y
Ammonia	1-Hour	24.23	0.68	Y
Arsenic (& Cmpds)	Annual	67.35	0.053	Y
Benzene	Annual	6153	8.1	Y
Benzo(a)pyrene	Annual	0.73	2.2	N
Beryllium	Annual	62.28	0.28	Y
Butadiene, 1,3-	Annual	264.40	11	Y
Cadmium	Annual	92.18	0.37	Y
Carbon disulfide	24-Hour	64.57	3.90	Y
Carbon tetrachloride	Annual	997	460	Y
Chlorine	1-Hour	0.05	0.23	N
	24-Hour	1	0.79	Y
Chlorobenzene	24-Hour	1.43	46	N
Chloroform	Annual	8,367	290	Y
Chromium VI (soluble chromate compounds)	24-Hour	0.39	0.013	Y
Cresol	1-Hour	6.254	0.56	Y
Di(2-ethylhexyl)phthalate	24-Hour	0.04	0.63	N
1,2 Dichloroethane (Ethylene Dichloride)	Annual	637	260	Y
1,4 Dichlorobenzene	1-Hour	0.004	16.8	N
Fluoride	24-Hour	22.3	0.34	Y
	1-Hour	0.93	0.064	Y
Formaldehyde	1-Hour	2.98	0.04	Y
n-Hexane	24-Hour	147.29	23	Y
Hexachlorodebenzo-p-dioxin	Annual	1.94E-05	5.10E-03	N
Hydrogen Chloride	1-Hour	11.45	0.18	Y
Hydrogen Fluoride	24-Hour	3.65	0.63	Y
	1-Hour	0.15	0.064	Y
Hydrogen Sulfide	24-Hour	713.2	1.7	Y
Manganese (& Cmpds)	24-Hour	10.33	0.63	Y
Mercury	24-Hour	0.21	0.013	Y
Methyl Ethyl Ketone	24-Hour	46	78	N
	1-Hour	1.9	22.4	N
Methyl Isobutyl Ketone	24-Hour	35.48	52.00	N
	1-Hour	1.48	7.6	N
Methyl Chloroform	24-Hour	2.13	250.0	N
	1-Hour	0.09	64.0	N
Methyl Mercaptan	1-Hour	7.09	0.013	Y
Methylene Chloride	Annual	4,167	1600	Y
	1-Hour	0.48	0.39	Y
Nickel (metal)	24-Hour	0.41	0.13	Y
Nitric Acid	1-Hour	0.25	0.256	N
Phenol	1-Hour	3.51	0.24	Y
Styrene	1-Hour	1.57	2.7	N
Sulfuric Acid	24-Hour	67	0.25	Y
	1-Hour	2.81	0.025	Y
1,1,2,2-Tetrachloroethane	Annual	3.97	430	N
Tetrachloroethylene (Perchloroethylene)	Annual	1437.64	13000	N
Toluene	24-Hour	50.61	98.0	N
	1-Hour	2.11	14.4	N
Trichloroethylene	Annual	1,660	4000	N
Trichlorofluoromethane	1-Hour	3.86E-02	140	N
Vinyl Chloride	Annual	333.46	26	Y
Vinylidene Chloride	24-Hour	2.09E-01	2.5	N
Xylene	24-Hour	47.25	57	N
	1-Hour	1.96	16.4	N

NOTE:
TPER = TAP Permitting Emission Rate
*These compounds have not had changes to emissions that exceed requested optimized permit limits from prior modeling analyses, therefore will not require modeling.

Appendix C

Proof of Publication of Notice

Received

MAR 0 5 2019

Air Permits Section

NORTH CAROLINA
WASHINGTON COUNTY.

AFFIDAVIT OF PUBLICATION

Before the undersigned, a Notary Public of said County and State, duly commissioned, qualified, and authorized by law to administer oaths, personally appeared

Mary R. Wayt,

who being first duly sworn, deposes and says: that he (she) is Publisher (Publisher, or other officer or employee authorized to make affidavit) of The Roanoke Beacon engaged in the publication of a newspaper known as The Roanoke Beacon, published, issued, and entered as periodical mail in the Town of Plymouth, in said County and State; that he (she) is authorized to make this affidavit and sworn statement; that the notice or other legal advertisement, a true copy of which is attached hereto, was published in The Roanoke Beacon on the following dates:

May 30, 2018

;

and that said newspaper in which such notice, paper, document, or legal advertisement was published was, at the time of each and every such publication, a newspaper meeting all of the requirements and qualifications of Section 1-597 of the General Statutes of North Carolina and was a qualified newspaper within the meaning of Section 1-597 of the General Statutes of North Carolina.

This 31 day of May, 2018

Mary R. Wayt

(Signature of person making affidavit)

Sworn to and subscribed before me, this 31

day of May, 2018

Kimberly F. Myers

Notary Public

My Commission expires: May 17, 2021

KIMBERLY F. MYERS
NOTARY PUBLIC
BERTIE COUNTY, N.C.

LEGAL PUBLIC NOTICE

Domtar Paper Company, LLC is applying to the NC Division of Air Quality for an air permit to conduct projects in the Lignin Solids Removal Process (LSRP) area of the Plymouth facility, which involve: installing a new caustic scrubber for air quality control of certain LSRP sources, replacing or modifying various LSRP tanks, and installing a new dust collection system at the #2 lignin filter conveyor and truck bay.

Permit applicant mailing address and physical location:

Domtar Paper Company, LLC
NC Highway 149 North
P.O. Box 747
Plymouth, NC 27962

Questions and comments may be directed to Diane R. Hardison of the Environmental Department at the above address or by phone at 252-793-8611.

Cooke
COMMUNICATIONS

NORTH CAROLINA LLC
The Daily Reflector - The Daily Advance - The Rocky Mount Telegram
Bertie Ledger - Chowan Herald - Duplin Times - Farmville Enterprise - Perquimans Weekly - Standard Laconic
Tarboro Weekly - Times Leader - Williamston Enterprise
PO Box 1967
Greenville NC 27835

Check # CC
Date Paid 1/18/19
A/R Rep SLJ

DOMTAR PULP & PAPER, INC.
ENVIRONMENTAL DEPT.
PO BOX 747
PLYMOUTH NC 27962

Copy Line: Domtary
Lines: 24
Total Price: $42.00

Account: 104462 Ticket: 235326

PUBLISHER'S AFFIDAVIT

NORTH CAROLINA
Martin County

Tylanda Randolph affirms that he/she is clerk of Williamston Enterprise, a newspaper published bi-weekly at Williamston, Martin County, North Carolina, and that the advertisement, a true copy of which is hereto attached, entitled Domtary was published in said Williamston Enterprise on the following dates:

Friday, May 25, 2018

and that the said newspaper in which such notice, paper, document or legal advertisement was published, was at the time of each and every publication, a newspaper meeting all of the requirements and qualifications of Chapter 1, Section 597 of the General Statutes of North Carolina and was a qualified newspaper within the meaning of Chapter 1, Section 597 of the General Statutes of North Carolina.

Tylanda Randolph

Affirmed and subscribed before me this 25th day of May 2018

Kealey Stortz (Notary Public Signature)

Kealey Stortz (Notary Public Printed Name)

My commission expires August 24, 2022

KEALEY STORTZ
NOTARY PUBLIC
PITT COUNTY, NC

LEGAL PUBLIC NOTICE
Domtar Paper Company, LLC is applying to the NC Division of Air Quality for an air permit to conduct projects in the Lignin Solids Removal Process (LSRP) area of the Plymouth facility, which involve: installing a new caustic scrubber for air quality control of certain LSRP sources, replacing or modifying various LSRP tanks, and installing a new dust collection system at the #2 lignin filter conveyor and truck bay.
Permit applicant mailing address and physical location:
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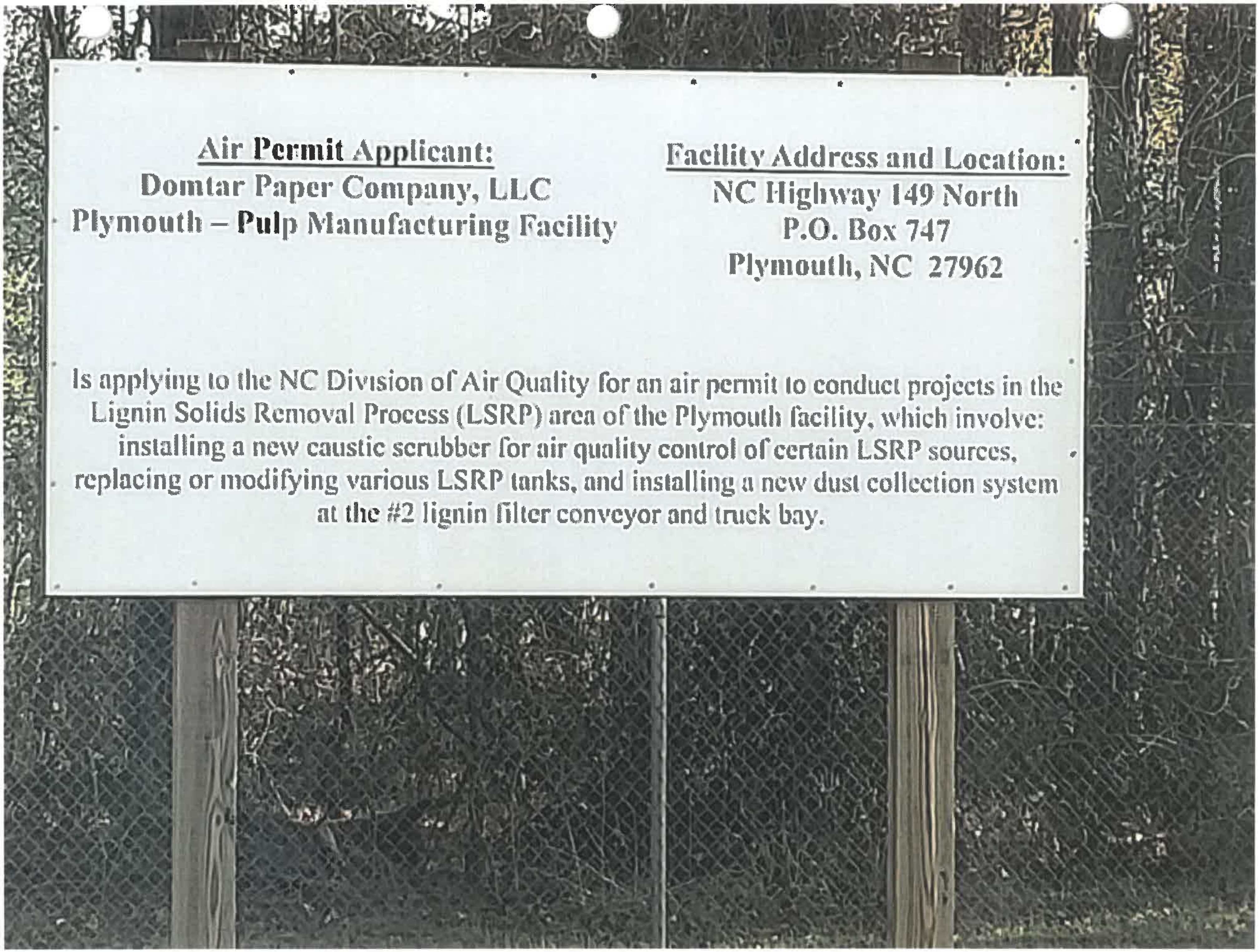
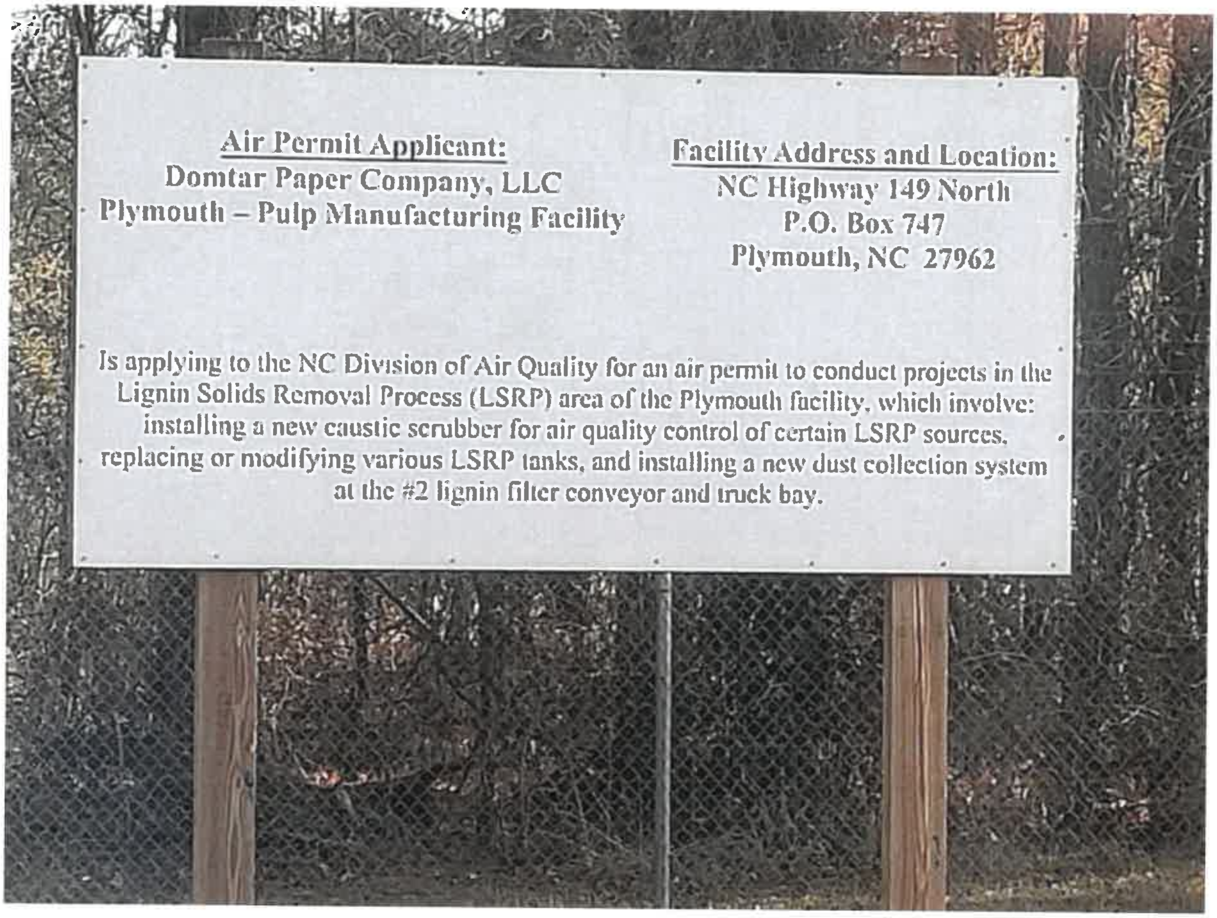
NC Highway 149 North
P.O. Box 747
Plymouth, NC 27962
Questions and comments may be directed to Diane R. Hardison of the Environmental Department at the above address or by phone at 252-793-8611.
104462
5/25

Received
MAR 05 2019
Air Permits Section


Air Permit Applicant:
Domtar Paper Company, LLC
Plymouth – Pulp Manufacturing Facility
Facility Address and Location:
NC Highway 149 North
P.O. Box 747
Plymouth, NC 27962
Is applying to the NC Division of Air Quality for an air permit to conduct projects in the Lignin Solids Removal Process (LSRP) area of the Plymouth facility, which involve: installing a new caustic scrubber for air quality control of certain LSRP sources, replacing or modifying various LSRP tanks, and installing a new dust collection system at the #2 lignin filter conveyor and truck bay.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Facility Address and Location:
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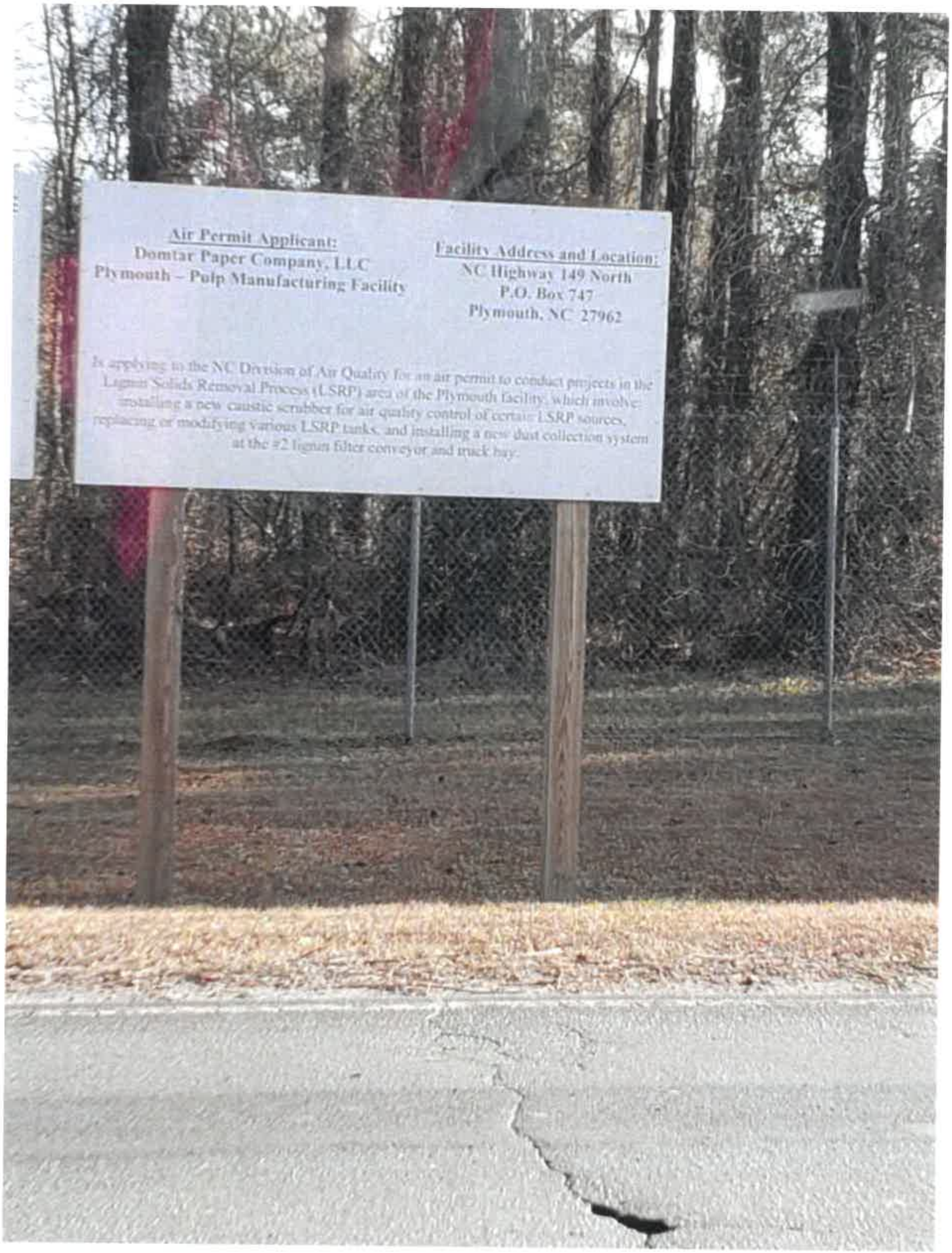
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Appendix D

BACT Analysis and Supporting Documentation

Table 1
Domtar Plymouth Pulp Mill
Lignin Modification Project
TRS Emissions Summary

Potential Hours of Operation: 8,760

Uncontrolled LSRP Gasses Routed to Proposed Scrubber[1]						Controlled Emission Rate if Incinerated	
Compound	**VOC?**	**Molar Weight (lb/lb-mole)**	**Total Volumetric Flow (dscfm)**	**Uncontrolled Concentration (ppmvd)**	**Uncontrolled Potential Emissions (tpy)**	**Incineration Control Efficiency (%)**	**Controlled Potential Emissions Incineration (tpy)**
H_2S	No	34.1	12003	1,470	410.2	98%	8.20
MeSH	Yes	48.1	12003	110	43.1	98%	0.86
DMS	Yes	62.1	12003	6.0	3.1	98%	0.06
DMDS	Yes	94.2	12003	3.0	2.3	98%	0.05
Total TRS Compounds					458.6	98%	9.17
SO2 from TRS Combustion		64.0			0.00	0%	**817.2**

1. Flow rates and concentrations are provided by the vendor and represent worst case TRS content.

Emissions from #2 Lignin Filter Press Building Fugitives[2]					
Compound	**VOC?**	**Molar Weight (lb/lb-mole)**	**Total Volumetric Flow (dscfm)**	**Uncontrolled Concentration (ppmvd)**	**Uncontrolled Potential Emissions (tpy)**
Total TRS Compounds	---	---	---	---	1.9
H_2S from Building Fugitives	No	34.1	8,000	8	1.4
H_2S to Scrubber Stack	No	34.1	2850	8	0.5
Emissions from Fugitives: LSRP LVHC Drain Loop and No. 1 Filtrate Sump					
	VOC?	**Molar Weight**	**Uncontrolled Emission Rates[3] (lb/hr)**	**Potential Hours of Operation[1]:**	**Uncontrolled Emissions**
Total TRS Compounds	---	---	1.26E-01	4,380	0.28
H_2S	No	34.1	1.22E-01	4,380	0.27
Emissions from the Lignin Feed Liquor Tank (ES-09-27.1000)[4,5]					
Total TRS Compounds	---	---	2.04E-01	8,760	0.89
H_2S	No	34.1	4.89E-02	8,760	0.21
Total Uncontrolled H_2S					2.4
Total Uncontrolled TRS Compounds					3.1

1. Fugitives are assumed to be 50% of lignin run time. Fugitives from the LSRP LVHC Drain Loop and No. 1 Filtrate Sump
2. Flow rate and concentration are provided by the vendor and represent worst case TRS content.
3. Emission factors are the sum of the Drain Loop and Filtrate Sump emission rates from 2016 test data.
4. NCASI TB 973 "A Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data For Pulp and Paper Mill Sources - A Second Update" 2/2010. Table 4.19 - Strong or Heavy Black Liquor

5. MMC from NCASI Technical Bulletin No. 849, August 2002, Table A-11, Unit Code SBLTY1 – Mill Y 50% Black Liq. Storage Tank Vent. The selected factor is most representative of the mill HBL tank emissions based on the site specific test data collected in 1999 on the south weak black liquor storage tank that showed MMC was ND.

TABLE 2
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of a Caustic Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

	Cost Factor / Equation	Component Cost	Cost Reference
Installation Cost of Caustic Scrubber		$4,068,491	[1]
TOTAL CAPITAL INVESTMENT		$4,068,491	Sum

Annual Cost	Cost Factor/ Equation	Unit Cost in 2018 dollars	Component Cost	
Direct Annual Costs, DC				
Operating Labor				
Operator	1/2 hr / shift	31.14 $/hr	$17,049	[2, 3, 4]
Supervisor	15% of operator		$2,557	[2]
Maintenance				
Labor	1/2 hr / shift	34.92 $/hr	$19,119	[2, 3, 4]
Material	100% of Lbr		$19,119	[2]
Utilities				
Electricity (Fan and Pumps)	78 hp	.1000 $/kW-hr	$50,626	[1, 4]
Cost for Caustic Use			$0	[1, 4]
Total DC			$108,469	
Indirect Annual Costs, IC				
Overhead	60% of Labor and Materials		$34,706	[2]
Administrative charges	2% TCI		$81,370	[2]
Property Taxes	1% TCI		$40,685	[2]
Insurance	1% TCI		$40,685	[2]
Capital Recovery Costs = CRF*TCI				
Capital Recovery (CR) = capital recovery factor (CRF)* total capital investment (TCI)				
Capital Recovery Factor = i (1+ i) ^ n / ((1+i)^ n-1) ; i= interest rate , n= years				
Capital Recovery Factor =	0.1095			
Capital Recovery = (CR) is 0.1095 *TCI (assuming a 20 yr life @ 9% interest)			$445,689	[5]
Total IC			$643,135	[2]
Total Annual Cost			**$751,604**	[2]

TABLE 2
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of a Caustic Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

Max TRS reduction is calculated as follows based on a control efficiency of		95%	Hydrogen sulfide	[6]
		75%	Methyl mercaptan	[6]
TRS Emission Sources to Control:				
	H2S	**MeSH**	**DMS and DMDS**	
Total Uncontrolled Emissions	410	43	5	[6]
Pollutant Reduction (tpy) =	390	32	0	[6]
			422	
			TOTAL TRS Reduction	

Cost Effectiveness is calculated using the Annual Cost.
Cost Effectiveness ($/ton TRS/H2S removed) = Annual Cost ($/yr) / TRS reduction(tons/yr)

Cost Effectiveness: $/ton TRS removed =	**$1,781**
Cost Effectiveness: $/ton H2S removed =	**$1,929**

References:

[1] Scrubber quote provided from Valmet and NCG piping from NHWL Estimate. The cost includes equipment, installation, engineering, and NCG Piping cost. Scrubber fan is 50 hp and pumps are 7.5 and 20 HP. Cost for caustic is expected to be negligible cost when accounting for sulfur recovery to Mill.
[2] OAQPS Control Cost Manual, sixth edition, EPA 452-02-001, chapter 1, January 2002 (for Gas Absorber Systems).
[3] Assumed 8760 hours per year of operation
[4] Plymouth, DOMTAR Mill Cost and Shift Data (3 shifts/day)
[5] Interest rate (9%) from previous Domtar Projects and life expectancy (20 years) provided by Tony Criscitiello, DOMTAR (9-28-15 email)
[6] Vendor H2S and methyl mercaptan removal efficiencies. Uncontrolled emission rate provided by Valmet includes a 50% safety factor..

TABLE 3
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of Thermal Oxidizer followed by a Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

	Cost Factor / Equation	Component Cost	Cost Reference
Capital Cost of Thermal Oxidizer		$3,347,471	[1]
Capital Cost of Scrubber		$2,840,228	[8]
TOTAL CAPITAL INVESTMENT		$6,187,699	Sum

Annual Cost	Cost Factor/ Equation	Unit Cost in 2018 dollars	Component Cost	
Direct Annual Costs, DC				
Operating Labor				
Operator	1/2 hr / shift	31.14 $/hr	$34,098	[2, 3, 4]
Supervisor	15% of operator		$5,115	[2]
Maintenance				
Labor	1/2 hr / shift	34.92 $/hr	$38,237	[2, 3, 4]
Material	100% of Lbr		$38,237	[2]
Utilities				
Electricity (Fan)	56 hp	.1000 $/kW-hr	$36,646	[1, 4]
Natural Gas Cost (Fuel Usage)	23 MMBtu/hr	4.45 $/MMBtu	$896,613	[1, 4]
Electricity (Fan and Pumps)	78 hp	.1000 $/kW-hr	$50,626	[4, 8]
Cost for Caustic Use			$0	[4, 8]
Total DC			$1,099,573	
Indirect Annual Costs, IC				
Overhead	60% of Labor and Materials		$69,413	[2]
Administrative charges	2% TCI		$123,754	[2]
Property Taxes	1% TCI		$61,877	[2]
Insurance	1% TCI		$61,877	[2]
Capital Recovery Costs = CRF*TCI				
Capital Recovery (CR) = capital recovery factor (CRF)* total capital investment (TCI)				
Capital Recovery Factor = i (1+ i) ^ n / ((1+i)^ n-1) ; i= interest rate , n= years				
Capital Recovery Factor =	0.1095			
Capital Recovery = (CR) is 0.1095 *TCI (assuming a 20 yr life @ 9% interest)			$677,841	[2, 5]
Total IC			$994,761	[2]
Total Annual Cost			**$2,094,334**	[2]

TABLE 3
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of Thermal Oxidizer followed by a Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

Max TRS reduction from incineration is calculated as follows based on a control efficiency of	98%	Hydrogen sulfide and TRS	[6]
Max TRS reduction is calculated as follows based on a control efficiency of	95%	Hydrogen sulfide	[7]
	75%	Methyl mercaptan	[7]

TRS Emission Sources to Control:

	H2S	MeSH	DMS and DMDS	
Total Uncontrolled Emissions (tpy)	410	43	5	[7]
(1) Pollutant Reduction Incineration (tpy) =	402	42	5	
(2) Pollutant Reduction Scrubber (tpy) =	8	1	0.1	
(3) Total Pollutant Reduction (tpy) =	410	43	5	
			458	
			TOTAL TRS Reduction	

Cost Effectiveness is calculated using the Annual Cost.
Cost Effectiveness ($/ton TRS/H2S removed) = Annual Cost ($/yr) / TRS reduction(tons/yr)

Cost Effectiveness: $/ton TRS removed =	**$4,573**
Cost Effectiveness: $/ton H2S removed =	**$5,111**

References:

[1] TO quote provided from Lundberg for the optimization thermal oxidizer and NCG piping from NHWL Estimate. The cost includes equipment, installation, engineering, and NCG Piping cost. The capital cost of the thermal oxidizer was scaled down using a engineering cost scaling factor of 0.6 ; Capital Cost = Optimization TO Cost * (LSRP Design Flow/ Optimization Design Flow)^0.6. The burner and fan size were scaled down based on the reduction in volumetric flow.

[2] EPA OAQPS Air Pollution Control Cost Manual (7th edition), November 2017, Section 3.2, Chapter 2. Used typical life expectancy of 20 years. Scrubber life expectancy (20 years) provided by Tony Criscitiello, DOMTAR (9-28-15 email).

[3] Assumed 8760 hours per year of operation

[4] Plymouth, DOMTAR Mill Cost, Shift Data (3 shifts/day), 2x for maintenance and labor of two control devices

[5] Interest rate (9%) from previous Domtar Projects

[6] EPA CATC Fact sheet for Thermal Incinerators, https://www3.epa.gov/ttnchie1/mkb/documents/fthermal.pdf for typical removal efficiencies.

[7] Uncontrolled emission rate provided by Valmet includes a 50% safety factor. Vendor H2S and methyl mercaptan removal efficiencies by scrubber.

[8] Scrubber quote provided from Valmet. The cost includes equipment, installation, engineering, and excludes the NCG Piping and stack cost as this is already included with the TO estimate. Scrubber fan is 50 hp and pumps are 7.5 and 20 HP. The capital cost, pump size, and fan size were utilized directly from the project scrubber cost as we have assumed the TO exhaust will be quenched. Cost for caustic is expected to be negligible cost when accounting for sulfur recovery to Mill.

TABLE 4
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of Regenerative Thermal Oxidizer followed by a Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

	Cost Factor / Equation	Component Cost	Cost Reference
Capital Cost of Regenerative Thermal Oxidizer		$1,800,000	[1]
Capital Cost of RTO Foundation	8% Equipment Cost	$144,000	[2]
Capital Cost of Piping from NCG system		$1,108,263	[8]
Capital Cost of Scrubber		$2,840,228	[8]
TOTAL CAPITAL INVESTMENT		$5,892,491	Sum

Annual Cost	Cost Factor/ Equation	Unit Cost in 2018 dollars	Component Cost	
Direct Annual Costs, DC				
Operating Labor				
Operator	1/2 hr / shift	31.14 $/hr	$34,098	[2, 3, 4]
Supervisor	15% of operator		$5,115	[2]
Maintenance				
Labor	1/2 hr / shift	34.92 $/hr	$38,237	[2, 3, 4]
Material	100% of Lbr		$38,237	[2]
Utilities				
Electricity (Fan)	44 hp	.1000 $/kW-hr	$29,050	[1]
Natural Gas Cost (Fuel Usage)		4.45 $/MMBtu	$0	[1]
Electricity (Fan and Pumps)	78 hp	.1000 $/kW-hr	$50,626	[4, 8]
Cost for Caustic Use			$0	[4, 8]
Total DC			$195,363	
Indirect Annual Costs, IC				
Overhead	60% of Labor and Materials		$69,413	[2]
Administrative charges	2% TCI		$117,850	[2]
Property Taxes	1% TCI		$58,925	[2]
Insurance	1% TCI		$58,925	[2]
Capital Recovery Costs = CRF*TCI				
Capital Recovery (CR) = capital recovery factor (CRF)* total capital investment (TCI)				
Capital Recovery Factor = i (1+ i) ^ n / ((1+i)^ n-1) ; i= interest rate , n= years				
Capital Recovery Factor Scrubber (20 yr life)=	0.1095			[2, 5]
Capital Recovery Factor RTO (2 yr life)=	0.5685			[1]
Capital Recovery = (CRF) * TCI =			$1,471,562	[1, 2, 5]
Total IC			$1,776,674	[2]
Total Annual Cost			**$1,972,038**	[2]

TABLE 4
Domtar Plymouth Mill - Lignin Project
Total Capital and Annual Costs for Installation of Regenerative Thermal Oxidizer followed by a Scrubber for TRS/H_2S Control on the LSRP
Control of LSRP Sources Planned for the Proposed Scrubber

Max TRS reduction from incineration is calculated as follows based on a control efficiency of	98%	Hydrogen sulfide and TRS	[6]
Max TRS reduction is calculated as follows based on a control efficiency of	95%	Hydrogen sulfide	[7]
	75%	Methyl mercaptan	[7]

TRS Emission Sources to Control:

	H2S	MeSH	DMS and DMDS	
Total Uncontrolled Emissions (tpy)	410	43	5	[7]
(1) Pollutant Reduction Incineration (tpy) =	402	42	5	
(2) Pollutant Reduction Scrubber (tpy) =	8	1	0.1	
(3) Total Pollutant Reduction (tpy) =	410	43	5	
			458	
			TOTAL TRS Reduction	

Cost Effectiveness is calculated using the Annual Cost.
Cost Effectiveness ($/ton TRS/H2S removed) = Annual Cost ($/yr) / TRS reduction(tons/yr)

Cost Effectiveness: $/ton TRS removed =	**$4,306**
Cost Effectiveness: $/ton H2S removed =	**$4,813**

References:

[1] RTO quote provided by Durr Systems Inc. The cost includes equipment, installation, engineering, and training. The cost excludes the foundation and NCG piping. Durr did not provide a fan size and anticipates annual fuel cost will be minimal post startup. The quote assumes the RTO will be made of Hastelloy Steel due to the potential for Sulfuric Acid corrosion. When asked to provide an extended warranty on the materials of construction, the vendor would be willing to guarantee the integrity of this system for only two years. Accordingly, the RTO was amortized over 2 years.

[2] EPA OAQPS Air Pollution Control Cost Manual (7th edition), November 2017, Section 3.2, Chapter 2. Used typical life expectancy of 20 years. Scrubber life expectancy (20 years) provided by Tony Criscitiello, DOMTAR (9-28-15 email).
The pressure drop for the fan power was estimated for the RTO using 19 in w.c. from the cost manual pg. 2-50. Assumed the flow rate is similar to that entering the proposed scrubber (12,003 scfm).

[3] Assumed 8760 hours per year of operation

[4] Plymouth, DOMTAR Mill Cost, Shift Data (3 shifts/day), 2x for maintenance and labor of two control devices

[5] Interest rate (9%) from previous Domtar Projects

[6] EPA CATC Fact sheet for Thermal Incinerators, https://www3.epa.gov/ttnchie1/mkb/documents/fthermal.pdf for typical removal efficiencies.

[7] Uncontrolled emission rate provided by Valmet includes a 50% safety factor. Vendor H2S and methyl mercaptan removal efficiencies by scrubber.

[8] Scrubber quote provided from Valmet. The cost includes equipment, installation, engineering, and excludes the stack cost as this is already included with the RTO estimate. The NCG piping cost from NHWL was added as this was not included in the RTO cost estimate. Scrubber fan is 50 hp and pumps are 7.5 and 20 HP. The capital cost, pump size, and fan size were utilized directly from the project scrubber cost as we have assumed the RTO exhaust will be quenched. Cost for caustic is expected to be negligible cost when accounting for sulfur recovery to Mill.

TABLE 5

Domtar Plymouth Mill - Lignin Project

Total Capital and Annual Costs for Incineration in the Existing Recovery Furnace for TRS/H_2S Control from the LSRP

Control of LSRP Sources Planned for the Proposed Scrubber

	Cost Factor / Equation	Component Cost	Cost Reference
Cost for Piping LSRP gases to the Existing Recovery Boiler		$5,791,453	[1]
Modifications to the Boiler			
Upgrades to HVLC Collection System (enclosures/capture and delivery system)			
TOTAL CAPITAL INVESTMENT		$5,791,453	Sum

Annual Cost	Cost Factor/ Equation	Unit Cost in 2018 dollars	Component Cost	
Direct Annual Costs, DC				
Operating Labor				
Operator	1/2 hr / shift	31.14 $/hr	$17,049	[2, 3, 4]
Supervisor	15% of operator		$2,557	[2]
Maintenance				
Labor	1/2 hr / shift	34.92 $/hr	$19,119	[2, 3, 4]
Material	100% of Lbr		$19,119	[2]
Utilities				
Steam (low pressure)	1,300 lb/hr	6.46 $/1000 lb	$73,566	[1, 4]
Electricity (Fan)	300 hp	.1000 $/kW-hr	$195,970	[1, 4]
Total DC			$327,380	
Indirect Annual Costs, IC				
Overhead	60% of Labor and Materials		$34,706	[2]
Administrative charges	2% TCI		$115,829	[2]
Property Taxes	1% TCI		$57,915	[2]
Insurance	1% TCI		$57,915	[2]
Capital Recovery Costs = CRF*TCI				
Capital Recovery (CR) = capital recovery factor (CRF)* total capital investment (TCI)				
Capital Recovery Factor = i (1+ i) ^ n / ((1+i)^ n-1) ; i= interest rate , n= years				
Capital Recovery Factor =	0.1095			
Capital Recovery = (CR) is 0.1095 *TCI (assuming a 20 yr life @ 9% interest)			$634,433	[1]
Total IC			$900,798	[2]
Total Annual Cost			**$1,228,178**	[2]

Max TRS reduction is calculated as follows based on a control efficiency of 98% TRS [5]

TRS Emission Sources to Control:

	Total TRS	H2S	
Total Uncontrolled Emissions	459	410	[6]
Emissions Reduction (tpy) =	449	402	

Cost Effectiveness is calculated using the Annual Cost.

Cost Effectiveness ($/ton TRS/H2S removed) = Annual Cost ($/yr) / TRS reduction(tons/yr)

Cost Effectiveness: $/ton TRS removed = **$2,732**

Cost Effectiveness: $/ton H2S removed = **$3,056**

References:

[1] 2015 Vendor quote from Robins & Morton was provided by Doug Wall on 12/21/18, scaled up by 3% annually to represent 2018 costs.

[2] EPA OAQPS Air Pollution Control Cost Manual (7th edition), November 2017, Section 3.2, Chapter 2

[3] Assumed 8760 hours per year of operation

[4] Plymouth, DOMTAR Mill Cost and Shift Data (3 shifts/day)

[5] Interest rate (9%) from previous Domtar Projects and life expectancy (20 years) provided by Tony Criscitiello, DOMTAR (9-28-15 email)

[6] Uncontrolled emission rate provided by Valmet includes a 50% safety factor. There will be additional SO2 generated, but it will be minimized of the sulfur in the fume generated above the smelt bed (Note: expected that during normal operation, SO2 removal in a recovery boiler is 95+% per Arun Someshwar, NCASI).

TABLE 6
Summary of Top-Down BACT: Economic Impact Analysis for LSRP
Domtar Plymouth Mill - Lignin Project

Control Alternatives	TRS Emissions Reduction (ton/yr)	H_2S Emissions Reduction (ton/yr)	Economic Impacts					
			Total Capital Cost ($)	Annual Cost ($/yr)	TRS Cost Effectiveness ($/ton)	H_2S Cost Effectiveness ($/ton)	Incremental TRS Cost Effectiveness ($/ton)[1]	Incremental H_2S Cost Effectiveness ($/ton)[1]
Caustic Scrubber	422	390	$4,068,491	$751,604	$1,781	$1,929	N/A	N/A
TO + Caustic Scrubber	458	410	$6,187,699	$2,094,334	$4,573	$5,111	$37,268	$66,811
RTO + Scrubber	458	410	$5,892,491	$1,972,038	$4,306	$4,813	$33,874	$60,726
Incineration in Recovery Furnace	449	402	$5,791,453	$1,228,178	$2,732	$3,056	$17,341	$38,731

1. Incremental cost effectiveness of selecting the listed control scenario vs. the caustic scrubber control scenario.

TABLE 7
Economic Impact Analysis for the Other LSRP Sources
Domtar Plymouth Mill - Lignin Project

Control Alternatives	TRS Emissions Reduction (ton/yr)	H_2S Emissions Reduction (ton/yr)	Economic Impacts			
			Total Capital Cost ($)[2]	Annual Cost ($/yr)[3]	TRS Cost Effectiveness ($/ton)	H_2S Cost Effectiveness ($/ton)
Incineration in Recovery Furnace	3.00	2.33	$879,550	$96,352	$32,102	$41,429
Caustic Scrubber	2.91	2.25	$879,550	$96,352	$33,115	$42,737
TO + Caustic Scrubber	3.06	2.37	$879,550	$96,352	$31,491	$40,641
RTO + Scrubber	3.06	2.37	$879,550	$96,352	$31,491	$40,641

1. Additional Cost to control the No. 2 Filter Press Area includes press enclosure, fan, ductwork and installtion per SEI Quote May 12, 2017. Cost of electrical equipment, piping, engineering, and installation of piping and electrical provided by Domtar 12/13/2018.
2. Capital Recovery = (CR) is 0.1095 *TCI (assuming a 20 yr life @ 9% interest)

TABLE 8
Summary of Top-Down BACT: Environmental and Energy Impact Analysis
Domtar Plymouth Mill - Lignin Project

Control Alternatives	Pollutant Impacts				Adverse Impacts From Other Air Pollutants?[3] (Yes/No)	Additional SO_2 Generated (ton/yr)[4]	Additional NOx Generated (ton/yr)[5]	Additional CO_2 Generated (ton/yr)[6]	Hazardous Waste Impacts? (Yes/No)	Energy Impacts	
	TRS		H_2S								
	Emission Reduction (ton/yr)[1]	Cost Effectiveness ($/ton)[2]	Emission Reduction (ton/yr)[1]	Cost Effectiveness ($/ton)[2]						Electrical (kW*hr/yr)	Fuel (MM Btu/yr)
Incineration in Recovery Furnace	449	$2,732	402	$3,056	Yes	41	0	0	No	1,960,488	0
Caustic Scrubber	422	$1,781	390	$1,929	No	0.0	0	0	No	506,459	0
TO + Caustic Scrubber	458	$4,573	410	$5,111	Yes	41	5	11760	No	873,066	201,486
RTO + Scrubber	458	$4,306	410	$4,813	Yes	41	< 5	< 11760	No	506,459	minimal

Notes:
1. Emission reductions based on maximum uncontrolled emission rates and control efficiencies for each control option.
2. Cost effectiveness based on emission reductions shown in this table divided by annual costs presented in the cost analysis for each control option.
3. Determination of whether adverse impacts are caused by control alternative evaluated. "Yes" response indicates that criteria or hazardous air pollutants are emitted.
4. Assumes 95% Control of SO_2 by Scrubbing or Recovery Boiler
5. NOx emissions estimated using US EPA AP-42, Fifth Edition, Volume 1, Chapter 1, Table1.4-1 for Low NOx Burners.
6. 40 CFR Part 98, Subpart C, Table C-1, Default Natural Gas CO2 Emission Factor

Appendix E

Toxics Modeling Tables

Domtar Paper Company
Plymouth Mill
Plymouth, North Carolina
Martin County

Modeling Parameters and Results

Table E-1
Buildings/Structures
Domtar Paper Company
Plymouth Mill

Description	Tier	Height (m)	Description	Tier	Height (m)
filplant	1	2.44	N00005	1.00	12.80
filplant	2	6.10	N00006	1.00	12.80
filplant	3	9.14	E00044	1.00	6.71
Shedarea	1	17.07	E00045	1.00	6.71
Shedarea	2	21.64	E00046	1.00	6.71
Nor1&2	1	10.67	E00047	1.00	6.71
secfiber	1	12.19	E00048	1.00	6.71
RilTur	1	19.81	E00049	1.00	6.71
RilBoil	1	33.53	E00051	1.00	2.50
6&7fiber	1	30.48	E00052	1.00	2.50
6&7fiber	2	48.77	5WLCTNK	1.00	21.34
nor-fib	1	30.48	E00039	1.00	15.24
6&7ODELI	1	9.08	E00040	1.00	15.24
6BLEACH1	1	22.90	F00014	1.00	15.24
NC4&5B	1	10.67	F00015	1.00	12.19
NC4&5B	2	15.50	C00054	1.00	13.41
NC4&5B	3	15.50	C00035	1.00	18.29
NC4&5B	4	17.48	C00039	1.00	6.10
NC4&5B	5	21.80	C00053	1.00	16.46
WAREHOUS	1	10.67	C00006	1.00	15.24
1&2pap	1	12.80	C00004	1.00	15.24
eas1&2pa	1	10.67	C00003	1.00	15.24
18	1	18.90	C00001	1.00	15.24
maint.	1	7.62	A00001	1.00	15.54
(8-2hfb)	1	35.05	S30BLST	1.00	15.24
53b	1	23.77	RBFuel	1.00	17.07
53a	1	18.29	A00004	1.00	16.46
53c	1	18.29	A00005	1.00	16.46
scrubhi	1	27.40	A00006	1.00	12.80
1hfb	1	28.96	A00007	1.00	15.54
1hfb	2	35.05	P00014	1.00	7.62
hfturb	1	23.77	SLfeedTk	1.00	18.59
64	1	57.91	slholdtk	1.00	6.10
64	2	65.53	TankP27G	1.00	15.24
65	1	27.43	TankP27F	1.00	7.62
66	1	27.43	TankP27E	1.00	7.62
67	1	21.95	TankP27D	1.00	10.67
68	1	21.95	TankP23D	1.00	7.62
69	1	21.95	TankP27H	1.00	7.62
70	1	21.95	TankP23E	1.00	7.62
KILNSB	1	9.75	TankP23G	1.00	7.62
Sludge1	1	13.72	TankP23F	1.00	7.62
Sludge2	1	7.62	NorthPCC	1.00	9.14
R10	1	26.82	SouthPCC	1.00	9.14
NC3MB	1	24.38	RecycFib	1.00	9.14
PowerOff	1	13.72	#7Filt	1.00	9.14
RileyPre	1	27.43	No1BCST	1.00	9.75
PandV	1	7.32	No2BCST	1.00	9.75
FiberOPS	1	16.76	No5Clo2	1.00	7.42
Carpentr	1	10.67	EastNC3	1.00	19.81
COOLTWR	1	10.67	WestNC3	1.00	19.81
LRPPRSBD	1	16.92	NC2CWWT	1.00	8.53
LRPPRSBY	1	9.57	AlumTank	1.00	6.10
J00027	1	21.55	N07HD	1.00	12.19
J00026	1	21.55	NC2Surge	1.00	9.14
J00025	1	21.95	TankR18	1.00	15.24
K00008	1	17.37	TankR19	1.00	15.24
K00009	1	17.37	TankW03	1.00	5.49
K00010	1	3.81	R40Tank	1.00	13.72
K00035	1	32.00	R41Tank	1.00	13.72
K00036	1	32.00	R71Tank	1.00	13.72
J00028	1	12.67	R43Tank	1.00	13.72
J00029	1	12.67	R42Tank	1.00	13.72
J00030	1	12.67	No5Soap	1.00	12.19
J00022	1	23.62	LiqSep	1.00	6.10
J00020	1	23.62	5GLCTNK	1.00	13.72
J00021	1	23.62	09272770	1.00	3.74
P00004	1	27.74	09272500	1.00	4.93
P00008	1	52.73	09271720	1.00	12.10
P00009	1	47.19	09271200	1.00	8.69
P00013	1	22.56	09271710	1.00	12.10
I00019	1	19.54	09271000	1.00	10.10

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Point Sources										
Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
			(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
F09	No 6 1st stage o2 surge tank vent	y	339138.26	3970086.75	2.01	13.72	361.08	0.01	0.15
F11	White Liquor surge tank		339190.31	3970221.53	2.13	17.07	299.97	0.01	0.15
F12	2nd stage o2 blow tube vent	y	339142.15	3970101.77	2.01	14.02	363.86	0.01	0.25
F13	2a/2b filtrate tank vent	y	339165.79	3970086.75	1.96	76.50	349.97	0.01	0.26
F14	No. 6 2nd stage washer tower vent	y	339156.06	3970078.96	1.99	52.12	355.52	0.01	0.38
F15	2c washer tank		339157.63	3970238.02	1.99	45.72	299.97	12.92	0.46
F16	No. 6 Bleach plant white liquor scrubber		339160.69	3970251.93	1.96	45.72	319.41	18.29	0.46
F17	No. 28 HD Tank		339190.26	3970261.57	2.07	24.38	305.52	0.01	1.52
F18	No. 29 HD Tank		339176.58	3970264.18	1.95	24.38	305.52	0.01	1.52
F19	No. 30 HD Tank		339163.27	3970268.16	1.83	24.38	305.52	0.01	1.52
F23	1st stage o2 surge tank vent	y	339126.57	3970093.15	1.99	15.24	361.08	0.01	0.15
F24	3rd stage feed tank	y	339137.70	3970139.88	2.11	45.72	344.41	0.03	1.44
F25	1st stage o2 blow tube	y	339129.63	3970105.67	1.98	21.34	363.86	0.01	0.30
F26	1a/1b filtrate tank	y	339144.10	3970108.72	2.01	10.36	355.52	0.01	0.30
F27	1st stage washer tower vent	y	339133.25	3970124.02	1.98	52.12	355.52	0.01	0.46
F30	No. 7 bleach plant scrubber fan		339152.72	3970157.13	2.14	49.07	319.41	14.94	0.61
F34	Chloride dioxide scrubber		339210.52	3970287.60	1.81	28.96	319.41	18.59	0.24
F35	No. 32 HD Pulp Tank		339102.65	3970105.39	2.13	32.00	305.52	0.01	0.61
F41	#6 BPDigester sand separator dumpster		339138.53	3970034.72	2.10	3.05	322.19	0.01	0.76
F42	#7 BPDigester sand separator dumpster		339090.42	3970043.19	2.00	3.05	322.19	0.01	0.76
F60	No. 5 hot water tank		339200.05	3970211.24	2.16	6.10	366.63	0.01	0.30
F61	nitric acid storage tank		339087.79	3969960.36	1.83	3.96	293.30	0.01	0.10
PO01A	No. 1 Hog Fuel Boiler	y	339672.35	3970089.24	2.74	76.20	468.30	21.91	5.49
PO01C	No. 5 Recovery Boiler	y	339672.35	3970089.24	2.74	76.20	468.71	19.27	4.80
PO13A	No. 2 Hog Fuel Boiler	y	339732.17	3970021.69	2.46	76.20	449.97	22.23	2.74
P09A	No.21 LD Stock Tank		339316.81	3970080.70	2.13	12.19	293.30	0.01	7.32
P09B	No. 5 HD Stock Tank		339408.75	3970113.27	2.14	15.24	293.30	0.01	7.62
P09C	No. 6 HD Stock Tank		339406.80	3970103.53	2.11	12.19	293.30	0.01	7.62
P09D	No. 7 HD Stock Tank		339404.30	3970093.52	2.04	12.19	293.30	0.01	9.14
P09E	No. 16 HD Stock Tank		339296.09	3970097.13	2.17	15.24	293.30	0.01	9.14
P09F	No. 22 LD Stock Tank		339314.73	3970071.82	2.13	12.19	293.30	0.01	7.32
P27A	No. 25 HD Stock Tank		339127.02	3970226.40	2.07	15.24	293.30	0.01	0.61
P27B	No. 26 HD Stock Tank		339132.80	3970250.13	1.97	15.24	293.30	0.01	0.61
P27C	No. 27 HD Stock Tank		339137.77	3970268.03	1.87	15.24	293.30	0.01	0.61
P27D	Mill Broke Tank		339066.58	3970266.31	2.48	12.19	293.30	0.01	0.61
P27E	NC5 Broke Tank		339082.13	3970264.19	2.43	9.14	293.30	0.01	0.61

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Point Sources										
Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
			(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
P27F	NC5 Hardwood LF Stock Tank		339095.06	3970260.84	2.44	8.53	293.30	0.01	0.61
P27G	NC5 Pine LD Stock Tank		339107.87	3970259.09	2.28	15.24	293.30	0.01	0.61
P27H	NC4/5 Sawdust LD Stock Tank		339094.81	3970204.38	2.36	8.53	293.30	0.01	0.61
R01A	No. 5 Lime Kiln Scrubber	y	339505.08	3969793.77	2.53	64.92	338.86	8.87	1.71
R03	North Smelt Tank	y	339624.51	3970136.61	2.87	69.34	352.74	7.89	1.68
R04	South Smelt Tank	y	339621.17	3970115.47	2.88	69.34	352.74	7.89	1.68
R05	No. 5 Precipitator		339659.84	3970117.14	2.80	24.38	355.52	3.96	0.15
R07	Hydrosulfide Storage Tank		339482.99	3969873.73	3.87	24.38	305.52	0.01	0.10
R09	Dregs Filter Hood Exhaust Fan		339499.61	3969968.71	3.08	3.66	306.08	0.01	0.30
R10	Dregs Filtrate Silencer Tank		339499.61	3969968.71	3.08	6.10	306.08	0.01	0.20
R12	Dregs Dumpster		339499.61	3969968.71	3.08	3.05	293.30	0.01	0.61
R13	Dregs Tank		339499.61	3969968.71	3.08	5.18	306.08	0.01	0.15
NO5GLC	No. 5 Green Liquor Clarifier		339465.03	3969929.47	2.98	13.92	355.52	0.01	0.20
R15	Lime Mud Storage Tank		339481.47	3969840.16	3.09	12.28	319.41	0.01	0.20
NO5WLC	No. 5 White Liquor Clarifier		339510.66	3969955.30	2.98	13.92	355.52	0.01	0.20
R17	No. 4 White Liquor Clarifier		339498.70	3969905.79	3.54	15.33	355.52	0.01	0.20
R22	Synthetic Liquor Mix Tank		339509.20	3969916.12	3.28	6.10	333.30	0.01	0.15
R24	East 18% Liquor Tank Vent		339510.24	3970217.38	2.30	17.07	311.08	0.01	0.30
R25	18% Liquor Mix Tank		339479.09	3970224.89	2.12	15.24	336.08	0.01	0.21
R26	West 18% Liquor Tank		339497.73	3970220.44	2.30	17.07	343.30	0.01	0.30
R27	North 48% Black Liquor Storage		339766.65	3970080.78	2.02	15.54	368.86	2.59	0.30
R28	South 48% Black Liquor Storage		339760.81	3970059.36	2.08	15.54	354.41	2.59	0.30
R29	East 65% Liquor Storage		339647.60	3970095.45	2.81	20.57	361.63	0.82	0.24
R30	West 65% Liquor Storage		339638.14	3970100.73	2.87	11.58	367.19	0.01	0.24
R31	East Emergency Save-all tank		339849.55	3970049.34	1.87	15.54	303.30	0.01	0.24
R32	West Emergency Save-all tank		339807.54	3970057.97	2.12	15.54	306.63	0.01	0.24
R33	Save all tank		339555.03	3970208.20	2.17	15.24	329.97	0.01	0.25
R34	No. 6 Evaporator Soap Skim Tank		339545.85	3970207.37	2.28	9.75	314.41	0.01	0.15
R36	E&W Liquor Heaters (A&B)		339517.20	3970178.99	2.07	0.15	361.08	0.01	0.30
R37	No. 7 Evap. Soap Skimmer Tank Standpipe		339545.29	3970166.20	1.99	6.40	317.74	0.01	0.25
R38	No. 7 Evap Boilout Tank		339572.83	3970172.87	2.02	16.76	301.63	0.01	0.24
R39	Soap Collection Tank		339772.49	3970067.98	2.07	7.62	372.19	0.01	0.18
R40	No. 1 Soap Storage Tank		339472.41	3970199.02	2.17	13.72	302.19	0.34	0.30
R41	No. 2 Soap Storage Tank		339481.32	3970199.58	2.14	14.33	302.19	0.15	0.46
R42	No. 3 Soap Storage Tank		339484.19	3970192.60	2.20	14.33	302.19	0.15	0.46
R43	No. 4 Soap Storage Tank		339479.65	3970194.29	2.16	14.33	302.19	0.15	0.46

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Point Sources									
Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
			(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
R44	Diverter Tank		339592.94	3970134.91	2.55	9.75	377.74	0.01	0.24
R45	Weak Wash Storage Tank		339460.00	3970089.00	2.19	15.24	372.19	0.01	0.15
R46	Lime Mud Mix Tank		339493.86	3969919.66	3.40	3.51	333.30	0.01	0.15
R47	No. 2 Lime Mud Wash Tank		339444.08	3970083.43	2.02	9.30	322.19	0.01	0.08
R49	No. 3 Lime Mud Wash Tank		339489.10	3969859.34	3.86	15.33	322.19	0.01	0.20
R50	East and West Lime Mud Filter		339499.00	3969848.00	2.71	15.24	327.74	0.01	0.76
R53	East Lime Slaker and Caust. Scrubber		339536.73	3969936.59	3.04	6.10	313.30	0.55	0.49
R58	West Lime Slaker and Caust. Scrubber		339524.75	3969939.31	3.03	6.10	323.30	1.70	0.49
R65	Lime Mud Filter Vacuum System #1		339483.41	3969791.01	2.71	12.19	304.41	0.01	0.46
R66	Lime Mud Filter Vacuum System #2		339483.41	3969791.01	2.71	12.19	304.41	0.01	0.46
R70	Slaker Scrubber Water Standpipe		339497.70	3969780.42	1.93	4.88	330.52	0.01	0.15
R71	Combined Condenstate Tank		339490.95	3970194.46	2.28	12.00	344.41	3.57	0.15
R72	NE Saveall Tank		339910.24	3970064.36	1.29	15.54	306.08	0.01	0.30
R76	Scrubber Water Clarifier		339511.59	3969801.59	2.20	6.40	338.86	0.01	0.20
SWBLTANK	South Weak Black Liquor Tank		339510.52	3970164.81	2.06	18.90	366.00	0.01	0.25
6N7SPLTK	No. 6&7 Fiberline Spill Collection Tank		339142.49	3970014.90	2.10	8.23	355.00	0.01	0.10
FPDE	Fine Paper Diesel Fire Pump Engine	y	338634.68	3970281.35	1.90	2.13	727.60	18.62	0.13
LKDE	No. 5 Lime Kiln Diesel Backup Engine	y	339505.28	3969860.46	3.64	9.14	727.60	18.62	0.10
WNCEE	Warren Neck Creek, East Diesel Fire Pump Engine	y	338253.48	3970737.12	0.25	2.74	727.60	18.62	0.13
WNCWE	Warren Neck Creek, West Diesel Fire Pump Engine	y	338253.48	3970737.12	0.26	2.74	727.60	18.62	0.13
RUNEA	Runoff Collection Sewer Lift Station Diesel Backup Engine A	y	338707.75	3970499.95	1.57	3.05	727.60	0.01	0.10
SEWEA	Fiber Line Sewer Lift Station Diesel Backup Engine A	y	339122.87	3969847.98	1.87	3.05	727.60	0.01	0.10
6FEEDTNK	No. 6 BP 6th Stage Feed Tank		339136.03	3970133.76	2.06	21.34	363.71	0.01	0.30
6BLOWTBE	No. 6 BP 6th Stage Blow Tube (standpipe)		339147.99	3970130.14	2.07	34.44	363.71	10.35	0.08
6EXHAUST	No. 6 BP 6th Stage Exhaust Blower		339140.38	3970126.25	2.03	9.14	338.71	3.18	0.41
LRPSCWT	Cloth Wash Water Tank 2		339454.00	3970164.00	2.25	3.05	298.15	0.01	0.20
LRP40%	LRP 40% Black Liquor Tank		339472.00	3970167.00	2.17	6.10	378.15	0.01	0.20
LRPPRS1A	LRP Press Building Stack A		339444.00	3970163.00	2.16	19.81	0.00	18.69	0.46
LRPPRS1B	LRP Press Building Stack B		339443.00	3970160.00	2.16	19.81	0.00	18.69	0.46
EOP	EOP		339454.24	3970088.11	2.25	28.96	341.48	0.01	0.36
PEROX	Peroxide		339453.51	3970085.31	2.24	48.77	313.15	0.01	0.36
5SOAP	No 5 Soap Storage Tank		339461.54	3970124.00	2.24	6.10	0.00	0.01	0.25
LIQSEP	New Liquor Sep Tank		339458.23	3970103.25	2.26	6.10	0.00	0.01	0.25
LRPSSUMP	LRPS Fugitives (LVHC Drain Loop and No. 1 Filtrate Sump)		339457.00	3970166.00	2.16	0.91	0.00	0.01	0.10
NC1_2_A	NC Paper Machine 2		339374.93	3970150.78	2.13	12.80	314.00	0.01	1.00
NC1_2_B	NC Paper Machine 2		339367.02	3970152.31	2.13	12.80	314.00	0.01	1.00

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Point Sources										
Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
			(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
NC1_2_C	NC Paper Machine 2		339358.61	3970154.32	2.13	12.80	314.00	0.01	1.00
NC1_2_D	NC Paper Machine 2		339346.94	3970155.90	2.13	12.80	314.00	0.01	1.00
NC1_2_E	NC Paper Machine 2		339340.03	3970157.58	2.13	12.80	314.00	0.01	1.00
NC1_2_F	NC Paper Machine 2		339333.34	3970158.82	2.13	12.80	314.00	0.01	1.00
NC1_2_G	NC Paper Machine 2		339326.98	3970160.45	2.13	12.80	314.00	0.01	1.00
NC1_2_H	NC Paper Machine 2		339320.15	3970161.71	2.13	12.80	314.00	0.01	1.00
NC1_2_I	NC Paper Machine 2		339313.41	3970163.65	2.13	12.80	314.00	0.01	1.00
NC1_2_J	NC Paper Machine 2		339306.47	3970165.06	2.13	12.80	314.00	0.01	1.00
NC1_2_K	NC Paper Machine 2		339300.25	3970166.67	2.13	12.80	314.00	0.01	1.00
NC1_2_L	NC Paper Machine 2		339292.77	3970168.28	2.13	12.80	314.00	0.01	1.00
NC1_2_M	NC Paper Machine 2		339321.82	3970148.15	2.13	12.80	314.00	0.01	1.00
NC5_1	PL44-92.0200 NO.2 PULP STORAGE AREAROOF FAN		339034.96	3970185.80	2.48	16.11	313.70	8.60	0.91
NC5_2	PL44-92.0220 NO.1 PULP STORAGE AREAROOF FAN		339064.75	3970178.69	2.48	16.11	313.70	8.60	0.91
NC5_3	PL44-92.0280 NO.4 PULP STORAGE AREAROOF FAN		339039.82	3970206.18	2.48	16.11	313.70	8.60	0.91
NC5_4	PL44-92.0340 NO.3 PULP STORAGE AREAROOF FAN		339069.62	3970199.07	2.48	16.11	313.70	8.60	0.91
NC5_5	44-92-1720 PULP STORAGE AREAWALL EXHAUST FAN		339073.73	3970168.61	2.48	5.29	313.70	12.80	1.37
NC5_6	44-92-2600 SOUTH BLDG ADDITION ROOF EXHAUST FAN EAST		338957.72	3970222.89	2.48	18.01	313.70	11.40	1.63
NC5_7	44-92-2620 SOUTH BLDG ADDITION ROOF EXHAUST FAN WEST		338936.57	3970227.94	2.48	18.01	313.70	11.40	1.63
NC5_8	44-92-2640 HYDRAULIC ROOM EXHAUST FAN		338940.27	3970214.94	2.48	5.29	313.70	13.20	1.07
NC5_9	NC5 VACUUM EXHAUST STACK		339039.70	3970264.35	2.48	23.73	322.00	45.10	1.22
NC5_10	46-40.8510 HOOD EXHAUST FAN #1		339015.01	3970263.14	2.48	24.64	349.80	23.00	1.52
NC5_11	46-40.8520 HOOD EXHAUST FAN #2		338998.76	3970267.07	2.48	24.64	349.80	18.30	1.52
NC5_12	46-40.8530 HOOD EXHAUST FAN #3		338992.83	3970268.49	2.48	24.64	349.80	21.70	1.52
NC5_13	46-40.8540 HOOD EXHAUST FAN #4		338975.89	3970272.53	2.48	24.64	349.80	18.10	1.52
NC5_14	FUTURE HOOD EXHAUST FAN		339016.07	3970262.67	2.48	24.64	349.80	18.20	1.37
NC5_15	46-40.8550 HOOD EXHAUST FAN #5		338968.63	3970274.27	2.48	24.64	349.80	40.10	1.22
NC5_16	FUTURE WINDER PULPER EXHAUST FAN		338920.73	3970290.58	2.48	24.64	316.50	15.50	0.76
NC5_17	46-92.0100 ROOF EXHAUST FAN #7		339072.32	3970243.95	2.48	24.64	313.70	11.40	1.63
NC5_18	46-92.0120 ROOF EXHAUST FAN #6		339075.56	3970231.27	2.48	24.57	313.70	11.40	1.63
NC5_19	46-92.0140 ROOF EXHAUST FAN #8		339045.64	3970250.32	2.48	24.54	313.70	11.40	1.63
NC5_20	46-92.0160 FORMER EXHAUST FAN #1		339036.74	3970252.44	2.48	24.54	313.70	11.40	1.63
NC5_21	46-92.0180 FORMER EXHAUST FAN #2		339021.92	3970255.98	2.48	24.21	313.70	11.40	1.63
NC5_22	46-92.0200 ROOF EXHAUST FAN #9		339013.03	3970258.10	2.48	24.21	313.70	11.40	1.63
NC5_23	46-92.0220 ROOF EXHAUST FAN #10		338971.52	3970268.01	2.48	24.11	313.70	11.40	1.63
NC5_24	46-92.0240 ROOF EXHAUST FAN #11		338950.77	3970272.97	2.48	24.11	313.70	11.40	1.63
NC5_25	46-92.0260 ROOF EXHAUST FAN #12		338915.19	3970281.46	2.48	24.11	313.70	11.40	1.63

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Point Sources

Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter
			(m)	(m)	(m)	(m)	(K)	(m/s)	(m)
NC5_26	46-92.0280 ROOF EXHAUST FAN #13		338892.46	3970278.11	2.48	24.11	313.70	11.40	1.63
NC5_27	46-92.0300 ROLL WRAPPERROOF EXHAUST FAN #14		338899.31	3970308.13	2.48	19.89	313.70	13.50	1.37
NC5_28	PL46-92.2750 NC5 EXHAUST FAN(NORTH WALL)		338891.88	3970322.02	2.48	12.33	313.70	4.10	1.52
NC5_29	PL46-92.2760 NC5 EXHAUST FAN(EAST WALL)		338914.15	3970300.15	2.48	10.81	313.70	4.40	2.03
THERMALOX	Thermal Oxidizer		339678.97	3970030.57	3.21	45.72	1144.26	2.50	2.29
LSRPSCRUB	LRP Press to Scrubber		339441.66	3970170.16	2.16	30.48	327.59	7.16	1.30

Area Sources

Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Release Height	Easterly Length	Northerly Length	Angle from North
			(m)	(m)	(m)	(m)	(m)	(m)	(degrees)
FIBLIFT	Fiberline Lift Station		339129.34	3969847.59	1.22	1.00	6.10	9.14	17
NO2LIFT	#2 Lift Station		339078.43	3969514.25	2.40	1.00	7.62	7.62	17
PUCHANN	Pulp Milll Channel and Sewer		339425.00	3969945.00	2.57	1.00	1.52	12.19	17
2SEW1LFT	paper bleach plant sewer ditch/No. 1 lift station		339337.00	3969726.00	2.64	1.00	85.00	65.00	17
RIFFLER	Riffler		338016.28	3969388.18	3.41	1.00	6.10	30.48	1
SEWER	Sewer Lines		332864.73	3934072.22	787.67	1.00	104.00	40.00	23

Table E-2
Source Parameters
Domtar Paper Company
Plymouth Mill

Area Poly Sources							
Source ID	Source Description	Subject to MACT?	Base Elevation	Release Height	Number of Vertices	Source Area	Initial Vert. Dimension
			(m)	(m)		(m^2)	(m)
RETPOND2	Retention Pond #2		2.13	1.00	9	1,139,320	-
RETPOND1	Retention Pond #1		2.89	1.00	4	146,915	-
AIRBASIN	Aeration Basin		1.77	1.00	6	290,747	-
SETPOND2	Settling Pond 2		3.77	1.00	7	129,479	-
SETPOND1	Settling Pond 1		2.20	1.00	7	85,383	-

Volume Sources									
Source ID	Source Description	Subject to MACT?	Easting (X)	Northing (Y)	Base Elevation	Release Height	Init. Horizontal Dimension	Initial Vert. Dimension
			(m)	(m)	(m)	(m)	(m)	(m)
6BLEACH	No. 6 Bleach Plant Building Fugitives		339167.74	3970228.03	2.00	11.43	10.63	10.63
7BLEACHA	No. 7 Bleach Plant Building Fugitives		339135.20	3970099.27	2.00	4.57	2.27	4.25
7BLEACHB	No. 6 & 7 Fiberline Building Fugitives		339139.09	3970118.46	2.00	4.57	2.27	4.25
7BLEACHC	No. 7 Bleach Plant Building Fugitives		339145.00	3970143.00	2.13	4.57	2.27	4.25
7BLEACHD	No. 7 Bleach Plant Building Fugitives		339151.89	3970166.30	2.14	4.57	2.27	4.25
LRPPRS2	LRP Building Fugitives		339452.06	3970157.31	2.20	11.18	4.09	5.20

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour (g/s)	1 - hour (g/s)	1 - hour (g/s)	Annual (g/s)	Annual (g/s)	Annual (g/s)	Annual (g/s)	Annual (g/s)	24 - hour (g/s)	Annual (g/s)	Annual (g/s)	24 - hour (g/s)	Annual (g/s)	24 - hour (g/s)	1 - hour (g/s)	1 - hour (g/s)
F09	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F11	-	-	-	-	4.05E-05	-	-	-	-	-	-	-	-	-	-	3.08E-03
F12	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F13	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F14	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F15	3.91E-03	1.49E-04	-	-	1.37E-04	-	1.18E-04	-	2.65E-04	1.21E-05	6.33E-03	-	-	-	-	1.48E-03
F16	3.91E-03	1.49E-04	-	-	1.37E-04	-	1.18E-04	-	2.65E-04	1.21E-05	6.33E-03	-	-	-	-	1.48E-03
F17	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F18	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F19	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F23	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F24	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F25	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F26	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F27	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F30	1.22E-02	4.64E-04	-	-	4.28E-04	-	3.68E-04	-	8.27E-04	3.77E-05	3.73E-02	-	-	-	-	4.63E-03
F34	-	-	-	-	-	-	-	-	-	-	7.54E-05	-	-	-	-	-
F35	6.55E-04	-	-	-	2.20E-06	-	-	-	-	-	6.09E-04	-	-	-	-	-
F41	7.16E-05	1.75E-05	-	-	7.70E-06	-	2.40E-06	-	1.18E-05	2.98E-06	3.18E-05	-	1.93E-06	-	-	2.00E-06
F42	5.32E-04	3.65E-05	-	-	1.60E-05	-	5.00E-06	-	2.46E-05	6.21E-06	6.63E-05	-	4.01E-06	-	-	1.54E-05
F60	3.68E-03	1.16E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	2.23E-05
F61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PO01A	2.15E-02	1.74E-02	-	2.11E-04	3.22E-02	4.11E-04	-	4.11E-04	2.57E-02	4.77E-03	3.49E-04	7.07E-04	4.00E-03	3.65E-02	3.65E-02	5.17E-02
PO01C	6.53E-02	-	-	6.70E-04	1.60E-02	4.81E-04	2.80E-03	6.82E-04	1.16E-02	2.13E-04	2.50E-04	6.24E-04	5.47E-06	4.24E-02	4.24E-02	1.92E-01
PO13A	2.30E-02	1.54E-02	-	6.31E-05	3.17E-02	2.72E-07	9.00E-08	2.12E-04	2.24E-02	2.31E-03	3.61E-04	5.23E-04	3.48E-03	3.18E-02	3.18E-02	4.70E-02
P09A	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P09B	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P09C	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P09D	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P09E	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P09F	2.75E-04	-	-	-	1.34E-05	-	-	-	-	2.83E-04	2.44E-04	-	5.97E-05	-	-	-
P27A	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27B	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27C	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27D	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27E	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27F	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27G	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
P27H	5.30E-04	-	-	-	2.39E-05	-	-	-	-	5.06E-04	4.36E-04	-	1.07E-04	-	-	-
R01A	1.79E-02	1.54E-03	-	4.64E-06	2.57E-03	7.86E-08	1.94E-04	3.47E-06	8.78E-04	-	2.79E-04	1.19E-04	-	6.61E-03	6.61E-03	1.39E-02
R03	9.68E-03	1.97E-03	7.33E-01	8.21E-06	2.70E-05	9.68E-07	-	4.54E-06	1.07E-01	3.40E-05	6.19E-05	2.97E-05	6.00E-05	-	-	2.75E-03
R04	1.15E-02	2.08E-03	7.33E-01	8.21E-06	3.11E-05	9.68E-07	-	4.54E-06	1.42E-01	3.40E-05	6.19E-05	2.97E-05	6.00E-05	-	-	2.86E-03
R05	1.89E-03	1.07E-04	-	-	4.06E-06	-	-	-	9.88E-05	-	-	-	-	-	-	1.13E-04
R07	-	-	-	-	4.05E-05	-	-	-	-	-	-	-	-	-	-	3.08E-03
R09	2.10E-05	-	-	-	5.87E-06	-	-	-	-	-	-	-	-	-	-	-
R10	2.10E-05	-	-	-	5.87E-06	-	-	-	-	-	-	-	-	-	-	-
R12	2.10E-05	-	-	-	5.87E-06	-	-	-	-	-	-	-	-	-	-	-
R13	2.10E-05	-	-	-	5.87E-06	-	-	-	-	-	-	-	-	-	-	-
NO5GLC	2.80E-04	-	-	-	1.49E-04	-	-	-	-	-	-	-	-	-	-	-
R15	-	-	-	-	1.31E-05	-	-	-	-	-	-	-	-	-	-	-
NO5WLC	-	-	-	-	4.05E-05	-	-	-	-	-	-	-	-	-	-	3.08E-03

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
F09	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F11	-	-	-	-	-	-	-	-	-	-	-	-	-
F12	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F13	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F14	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F15	6.68E-05	5.49E-02	7.76E-02	-	-	3.91E-03	9.28E-05	9.28E-05	-	9.23E-03	-	-	-
F16	6.68E-05	5.49E-02	7.76E-02	-	-	3.91E-03	9.28E-05	9.28E-05	-	9.23E-03	-	-	-
F17	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F18	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F19	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F23	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F24	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F25	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F26	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F27	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F30	2.09E-04	1.71E-01	1.44E-01	-	-	1.22E-02	2.90E-04	2.90E-04	-	2.89E-02	-	-	-
F34	-	1.06E-03	-	-	-	-	-	-	-	-	-	-	-
F35	2.13E-05	-	2.96E-04	-	-	3.96E-04	-	-	-	8.05E-03	-	-	-
F41	1.62E-05	-	-	-	-	4.53E-07	6.21E-05	6.21E-05	-	4.11E-04	-	-	-
F42	3.37E-05	-	-	-	-	3.40E-05	1.29E-04	1.29E-04	-	8.55E-04	-	-	-
F60	-	-	2.59E-04	-	-	3.18E-03	-	-	-	-	-	-	-
F61	-	-	-	-	-	-	-	-	-	-	-	-	-
PO01A	2.35E-01	4.74E-02	-	3.37E-02	4.11E-04	-	3.86E-03	3.86E-03	6.07E-04	2.10E-03	1.40E-02	1.40E-02	2.52E-03
PO01C	2.76E-01	1.06E+00	9.73E-01	1.68E-03	5.97E-04	2.19E-01	3.16E-03	3.16E-03	7.98E-04	2.42E-01	2.65E-01	2.65E-01	5.42E-05
PO13A	2.05E-01	4.13E-02	7.18E-01	1.84E-02	5.15E-05	1.63E-01	3.36E-03	3.36E-03	6.36E-04	2.31E-03	7.47E-02	7.47E-02	2.19E-03
P09A	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P09B	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P09C	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P09D	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P09E	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P09F	-	-	-	-	-	-	1.26E-04	1.26E-04	-	-	-	-	-
P27A	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27B	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27C	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27D	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27E	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27F	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27G	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
P27H	-	-	-	-	-	-	2.25E-04	2.42E-04	-	-	-	-	-
R01A	4.26E-02	5.31E-03	3.57E-01	1.72E-04	3.86E-06	5.04E-03	3.63E-04	3.63E-04	3.52E-05	2.49E-02	1.90E-06	1.90E-06	-
R03	4.06E-04	-	5.21E-02	1.33E-04	1.33E-06	1.36E-02	3.40E-04	3.40E-04	1.46E-05	5.35E-03	-	-	-
R04	4.11E-04	-	5.21E-02	1.33E-04	1.33E-06	1.36E-02	7.34E-04	7.34E-04	1.46E-05	5.97E-03	-	-	4.97E-06
R05	5.10E-06	-	-	-	-	1.27E-03	3.99E-04	3.99E-04	-	6.35E-04	-	-	-
R07	-	-	-	-	-	-	-	-	-	-	-	-	-
R09	-	-	1.80E-04	-	-	1.17E-04	-	-	-	-	-	-	-
R10	-	-	1.80E-04	-	-	1.17E-04	-	-	-	-	-	-	-
R12	-	-	1.80E-04	-	-	1.17E-04	-	-	-	-	-	-	-
R13	-	-	1.80E-04	-	-	1.17E-04	-	-	-	-	-	-	-
NO5GLC	-	-	1.03E-04	-	-	5.21E-03	-	-	-	-	-	-	-
R15	-	-	-	-	-	-	-	-	-	-	-	-	-
NO5WLC	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
R17	-	-	-	-	4.05E-05	-	-	-	-	-	-	-	-	-	-	3.08E-03
R22	-	-	-	-	4.05E-05	-	-	-	-	-	-	-	-	-	-	3.08E-03
R24	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R25	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R26	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R27	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R28	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R29	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R30	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R31	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R32	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R33	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R34	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R36	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R37	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R38	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R39	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R40	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R41	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R42	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R43	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
R44	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R45	3.35E-03	1.10E-04	-	-	1.14E-04	-	-	-	-	-	-	-	-	-	-	-
R46	5.59E-04	-	-	-	1.31E-05	-	-	-	-	-	-	-	-	-	-	-
R47	-	-	-	-	3.91E-05	-	-	-	-	-	-	-	-	-	-	-
R49	-	-	-	-	3.91E-05	-	-	-	-	-	-	-	-	-	-	-
R50	4.31E-03	1.49E-04	-	-	3.35E-05	-	-	-	-	-	3.91E-05	-	3.55E-05	-	-	4.89E-04
R53	2.43E-02	1.06E-04	1.59E-01	-	2.60E-05	-	-	-	5.03E-06	-	-	-	-	-	-	6.16E-05
R58	2.43E-02	1.06E-04	1.59E-01	-	2.60E-05	-	-	-	5.03E-06	-	-	-	-	-	-	6.16E-05
R65	3.19E-02	-	-	-	1.66E-05	-	-	-	1.59E-04	-	2.12E-04	-	-	-	-	-
R66	3.19E-02	-	-	-	1.66E-05	-	-	-	1.59E-04	-	2.12E-04	-	-	-	-	-
R70	3.35E-03	1.10E-04	-	-	1.14E-04	-	-	-	-	-	-	-	-	-	-	-
R71	6.45E-04	-	-	-	3.97E-05	-	-	-	-	-	-	-	-	-	-	3.50E-06
R72	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05
R76	3.35E-03	1.10E-04	-	-	1.14E-04	-	-	-	-	-	-	-	-	-	-	-
SWBLTANK	1.03E-05	-	8.65E-05	-	2.52E-06	-	-	-	9.85E-06	1.36E-07	7.73E-06	-	6.40E-06	-	-	2.37E-06
6N7SPLTK	1.91E-03	-	4.80E-03	-	9.32E-06	-	-	-	3.63E-05	1.83E-04	2.85E-05	-	2.36E-05	-	-	-
FPDE	2.03E-04	2.45E-05	-	6.04E-08	1.41E-05	4.53E-08	5.91E-07	4.53E-08	-	-	-	7.94E-07	-	-	-	3.12E-04
LKDE	4.90E-04	5.91E-05	-	1.46E-07	3.41E-05	1.09E-07	1.43E-06	1.09E-07	-	-	-	1.92E-06	-	-	-	7.55E-04
WNCEE	2.03E-04	2.45E-05	-	6.04E-08	1.41E-05	4.53E-08	5.91E-07	4.53E-08	-	-	-	7.94E-07	-	-	-	3.12E-04
WNCWE	2.64E-04	3.18E-05	-	7.85E-08	1.83E-05	5.89E-08	7.68E-07	5.89E-08	-	-	-	1.03E-06	-	-	-	4.06E-04
RUNEA	1.35E-04	1.63E-05	-	4.03E-08	9.39E-06	3.02E-08	3.94E-07	3.02E-08	-	-	-	5.29E-07	-	-	-	2.08E-04
SEWEA	1.35E-04	1.63E-05	-	4.03E-08	9.39E-06	3.02E-08	3.94E-07	3.02E-08	-	-	-	5.29E-07	-	-	-	2.08E-04
6FEEDTNK	3.06E-03	-	-	-	2.73E-05	-	-	-	-	-	1.82E-03	-	-	-	-	-
6BLOWTBE	1.43E-02	-	-	-	1.28E-04	-	-	-	-	-	8.54E-03	-	-	-	-	-
6EXHAUST	5.07E-02	-	-	-	4.53E-04	-	-	-	-	-	3.02E-02	-	-	-	-	-
LRPSCWT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRP40%	2.55E-03	2.26E-06	-	-	1.13E-06	-	4.50E-06	-	2.51E-04	-	1.01E-06	-	-	-	-	6.30E-05

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
R17	-	-	-	-	-	-	-	-	-	-	-	-	-
R22	-	-	-	-	-	-	-	-	-	-	-	-	-
R24	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R25	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R26	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R27	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R28	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R29	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R30	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R31	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R32	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R33	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R34	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R36	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R37	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R38	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R39	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R40	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R41	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R42	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R43	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
R44	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R45	-	-	-	-	-	-	-	-	-	-	-	-	-
R46	-	-	6.63E-04	-	-	2.07E-03	-	-	-	-	-	-	-
R47	-	-	-	-	-	-	-	-	-	-	-	-	-
R49	-	-	-	-	-	-	-	-	-	-	-	-	-
R50	4.08E-05	-	-	-	-	7.83E-04	8.33E-05	8.33E-05	-	-	-	-	-
R53	4.78E-06	-	-	-	-	-	1.07E-02	1.07E-02	-	2.08E-03	-	-	-
R58	4.78E-06	-	-	-	-	-	1.07E-02	1.07E-02	-	2.08E-03	-	-	-
R65	2.81E-04	-	6.71E-05	-	-	6.29E-04	1.04E-04	1.04E-04	-	-	-	-	-
R66	2.81E-04	-	6.71E-05	-	-	6.29E-04	1.04E-04	1.04E-04	-	-	-	-	-
R70	-	-	-	-	-	-	-	-	-	-	-	-	-
R71	-	-	2.59E-04	-	-	3.18E-03	-	-	-	-	-	-	-
R72	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-
R76	-	-	-	-	-	-	-	-	-	-	-	-	-
SWBLTANK	-	3.39E-05	-	-	-	-	5.49E-06	5.49E-06	-	-	-	-	4.05E-06
6N7SPLTK	-	1.26E-04	-	-	-	-	2.03E-05	2.03E-05	-	-	-	-	1.49E-05
FPDE	-	6.83E-04	-	1.59E-06	7.94E-07	-	-	-	7.94E-07	-	-	-	-
LKDE	-	1.65E-03	-	3.84E-06	1.92E-06	-	-	-	1.92E-06	-	-	-	-
WNCEE	-	6.83E-04	-	1.59E-06	7.94E-07	-	-	-	7.94E-07	-	-	-	-
WNCWE	-	8.87E-04	-	2.06E-06	1.03E-06	-	-	-	1.03E-06	-	-	-	-
RUNEA	-	4.55E-04	-	1.06E-06	5.29E-07	-	-	-	5.29E-07	-	-	-	-
SEWEA	-	4.55E-04	-	1.06E-06	5.29E-07	-	-	-	5.29E-07	-	-	-	-
6FEEDTNK	2.80E-05	-	-	-	-	-	-	-	-	-	-	-	-
6BLOWTBE	1.31E-04	-	-	-	-	-	-	-	-	-	-	-	-
6EXHAUST	4.64E-04	-	-	-	-	-	-	-	-	-	-	-	-
LRPSCWT	-	-	-	-	-	-	-	-	-	-	-	-	-
LRP40%	5.00E-06	-	6.16E-03	-	-	1.26E-05	4.65E-06	4.65E-06	-	1.27E-04	-	-	-

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
LRPPRS1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EOP	3.28E-03	8.39E-05	-	-	2.94E-05	-	-	-	-	4.40E-04	1.96E-03	-	-	-	-	-
PEROX	3.28E-03	8.39E-05	-	-	2.94E-05	-	-	-	-	4.40E-04	1.96E-03	-	-	-	-	-
5SOAP	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
LIQSEP	5.97E-05	1.71E-05	-	-	5.03E-06	-	6.26E-06	-	1.26E-03	8.57E-07	1.05E-07	-	1.90E-05	-	-	2.52E-05
LRPSSUMP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NC1_2_A	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_B	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_C	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_D	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_E	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_F	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_G	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_H	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_I	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_J	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_K	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_L	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC1_2_M	9.81E-04	4.36E-04	-	-	6.04E-05	-	-	-	1.98E-04	-	4.27E-05	-	-	-	-	5.57E-04
NC5_1	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_2	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_3	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_4	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_5	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_6	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_7	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_8	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_9	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_10	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_11	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_12	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_13	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_14	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_15	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_16	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_17	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_18	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_19	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_20	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_21	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_22	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_23	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_24	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_25	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_26	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_27	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_28	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
NC5_29	1.22E-03	5.42E-04	-	-	6.29E-05	-	-	-	2.22E-04	-	4.44E-05	-	-	-	-	6.93E-04
THERMALOX	4.73E-04	2.32E-04	-	1.08E-06	1.13E-05	6.48E-08	9.00E-08	5.94E-06	1.06E-05	2.55E-04	5.56E-05	7.56E-06	-	-	-	4.05E-04
LSRPSCRUB	2.55E-03	2.26E-06	4.61E-05	-	2.48E-06	-	4.50E-06	-	2.56E-04	2.65E-05	1.10E-05	-	3.41E-06	-	-	6.43E-05

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
LRPPRS1A	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS1B	-	-	-	-	-	-	-	-	-	-	-	-	-
EOP	3.01E-05	-	-	-	-	5.80E-04	2.03E-04	2.03E-04	-	-	-	-	-
PEROX	3.01E-05	-	-	-	-	5.80E-04	2.03E-04	2.03E-04	-	-	-	-	-
5SOAP	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
LIQSEP	4.79E-07	-	4.88E-04	-	-	5.17E-04	2.44E-05	2.44E-05	-	-	-	-	-
LRPSSUMP	-	-	1.54E-02	-	-	3.41E-04	-	-	-	-	-	-	-
NC1_2_A	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_B	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_C	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_D	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_E	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_F	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_G	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_H	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_I	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_J	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_K	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_L	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC1_2_M	5.99E-05	-	-	-	-	2.40E-03	4.86E-04	4.39E-04	-	1.78E-03	-	-	-
NC5_1	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_2	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_3	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_4	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_5	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_6	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_7	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_8	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_9	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_10	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_11	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_12	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_13	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_14	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_15	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_16	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_17	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_18	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_19	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_20	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_21	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_22	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_23	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_24	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_25	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_26	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_27	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_28	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
NC5_29	6.72E-05	-	-	-	-	2.98E-03	5.06E-04	5.45E-04	-	2.21E-03	-	-	-
THERMALOX	9.72E-03	-	7.16E-02	2.05E-06	1.40E-06	1.60E-01	9.30E-08	9.30E-08	1.13E-05	2.13E-04	-	-	-
LSRPSCRUB	5.00E-06	1.81E-05	6.11E-01	-	-	3.15E-01	7.57E-06	7.57E-06	-	1.27E-04	-	-	2.15E-06

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
6BLEACH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS2	4.98E-07	-	4.19E-06	-	1.22E-07	-	-	-	4.77E-07	2.41E-06	3.74E-07	-	3.10E-07	-	-	1.15E-07

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)
FIBLIFT	4.52E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO2LIFT	1.30E-05	-	3.68E-06	-	-	-	-	-	-	-	-	-	-	-	-	-
PUCHANN	2.96E-03	-	8.48E-03	-	-	-	-	-	-	-	-	-	-	-	-	3.95E-06
2SEW1LFT	5.93E-07	-	1.61E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
RIFFLER	-	-	5.75E-06	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND2	-	-	1.66E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND1	-	-	1.16E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
AIRBASIN	9.19E-08	-	2.18E-06	-	-	-	-	-	-	-	-	-	-	-	-	1.14E-09
SETPOND2	1.42E-06	-	9.43E-07	-	-	-	-	-	1.43E-13	-	2.08E-08	-	-	-	-	4.57E-09
SETPOND1	7.55E-06	2.95E-09	3.85E-06	-	-	-	-	-	1.42E-12	-	1.55E-07	-	-	-	-	9.38E-08

Table E-3
Potential Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
6BLEACH	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHA	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHB	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHC	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHD	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS2	-	1.64E-06	4.01E-02	-	-	-	2.66E-07	2.66E-07	-	-	-	-	1.96E-07

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)
FIBLIFT	-	-	6.83E-04	-	-	-	-	-	-	-	-	-	-
NO2LIFT	-	-	-	-	-	-	-	-	-	-	-	-	-
PUCHANN	-	-	-	-	-	-	-	-	-	1.06E-06	-	-	-
2SEW1LFT	-	-	-	-	-	-	-	-	-	-	-	-	-
RIFFLER	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND2	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND1	-	-	-	-	-	-	-	-	-	-	-	-	-
AIRBASIN	-	-	-	-	-	-	-	-	-	-	-	-	-
SETPOND2	-	-	-	-	-	-	-	-	-	4.34E-09	-	-	-
SETPOND1	-	-	-	-	-	-	8.90E-15	8.90E-15	-	2.17E-08	-	-	-

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
F09	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F11	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	-	-	-	2.78E-02
F12	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F13	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F14	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F15	1.34E-01	2.02E-03	-	-	4.50E-04	-	3.58E-03	-	3.10E-03	7.10E-04	2.57E-02	-		-	-	1.34E-02
F16	1.34E-01	2.02E-03	-	-	4.50E-04	-	3.58E-03	-	3.10E-03	7.10E-04	2.57E-02	-	-	-	-	1.34E-02
F17	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F18	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F19	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F23	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F24	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F25	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F26	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F27	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F30	4.19E-01	6.32E-03	-	-	1.41E-03	-	1.12E-02	-	9.68E-03	2.22E-03	1.51E-01	-	-	-	-	4.19E-02
F34	-	-	-	-	-	-	-	-	-	-	3.06E-04	-	-	-	-	-
F35	2.24E-02	-	-	-	7.25E-06	-	-	-	-	-	2.47E-03	-	-	-	-	-
F41	2.45E-03	2.39E-04	-	-	2.53E-05	-	7.29E-05	-	1.38E-04	1.75E-04	1.29E-04	-	1.54E-04	-	-	1.81E-05
F42	1.82E-02	4.97E-04	-	-	5.28E-05	-	1.52E-04	-	2.88E-04	3.65E-04	2.69E-04	-	3.20E-04	-	-	1.39E-04
F60	1.26E-01	1.59E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	2.02E-04
F61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PO01A	7.37E-01	2.37E-01	-	1.89E-02	1.06E-01	1.47E-01	-	8.94E-02	3.01E-01	2.80E-01	1.42E-03	7.18E-01	3.19E-01	2.70E+01	6.75E+01	4.67E-01
PO01C	2.24E+00	-	-	6.01E-02	5.25E-02	1.72E-01	8.52E-02	1.48E-01	1.36E-01	1.25E-02	1.02E-03	6.34E-01	4.36E-04	3.14E+01	7.84E+01	1.74E+00
PO13A	7.89E-01	2.09E-01	-	5.66E-03	1.04E-01	9.73E-05	2.73E-06	4.62E-02	2.62E-01	1.36E-01	1.47E-03	5.31E-01	2.78E-01	2.35E+01	5.87E+01	4.25E-01
P09A	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P09B	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P09C	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P09D	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P09E	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P09F	9.42E-03	-	-	-	4.39E-05	-	-	-	-	1.66E-02	9.89E-04	-	4.76E-03	-	-	-
P27A	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27B	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27C	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27D	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27E	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27F	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27G	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
P27H	1.82E-02	-	-	-	7.85E-05	-	-	-	-	2.97E-02	1.77E-03	-	8.51E-03	-	-	-
R01A	6.15E-01	2.09E-02	-	4.16E-04	8.46E-03	2.81E-05	5.90E-03	7.54E-04	1.03E-02	-	1.13E-03	1.21E-01	-	4.89E+00	1.22E+01	1.26E-01
R03	3.32E-01	2.68E-02	3.68E+00	7.36E-04	8.89E-05	3.46E-04	-	9.87E-04	1.25E+00	2.00E-03	2.51E-04	3.01E-02	4.78E-03	-	-	2.49E-02
R04	3.96E-01	2.83E-02	3.68E+00	7.36E-04	1.02E-04	3.46E-04	-	9.87E-04	1.66E+00	2.00E-03	2.51E-04	3.01E-02	4.78E-03	-	-	2.59E-02
R05	6.46E-02	1.45E-03	-	-	1.33E-05	-	-	-	1.16E-03	-	-	-	-	-	-	1.02E-03
R07	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	-	-	-	2.78E-02
R09	7.18E-04	-	-	-	1.93E-05	-	-	-	-	-	-	-	-	-	-	-
R10	7.18E-04	-	-	-	1.93E-05	-	-	-	-	-	-	-	-	-	-	-
R12	7.18E-04	-	-	-	1.93E-05	-	-	-	-	-	-	-	-	-	-	-
R13	7.18E-04	-	-	-	1.93E-05	-	-	-	-	-	-	-	-	-	-	-
NO5GLC	9.58E-03	-	-	-	4.89E-04	-	-	-	-	-	-	-	-	-	-	-
R15	-	-	-	-	4.32E-05	-	-	-	-	-	-	-	-	-	-	-
NO5WLC	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	-	-	-	2.78E-02

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
F09	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F11	-	-	-	-	-	-	-	-	-	-	-	-	-
F12	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F13	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F14	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F15	4.34E-01	3.68E+00	1.86E-01	-	-	4.46E-03	3.65E-03	5.60E-03	-	3.62E-01	-	-	-
F16	4.34E-01	3.68E+00	1.86E-01	-	-	4.46E-03	3.65E-03	5.60E-03	-	3.62E-01	-	-	-
F17	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F18	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F19	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F23	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F24	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F25	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F26	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F27	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F30	1.35E+00	1.15E+01	3.45E-01	-	-	1.39E-02	1.14E-02	1.75E-02	-	1.13E+00	-	-	-
F34	-	7.08E-02	-	-	-	-	-	-	-	-	-	-	-
F35	1.38E-01	-	7.08E-04	-	-	4.51E-04	-	-	-	3.16E-01	-	-	-
F41	1.05E-01	-	-	-	-	5.16E-07	2.44E-03	3.75E-03	-	1.61E-02	-	-	-
F42	2.18E-01	-	-	-	-	3.88E-05	5.09E-03	7.81E-03	-	3.35E-02	-	-	-
F60	-	-	6.19E-04	-	-	3.62E-03	-	-	-	-	-	-	-
F61	-	-	-	-	-	-	-	-	-	-	-	-	-
PO01A	1.52E+03	3.18E+00	-	1.14E+02	7.68E-01	-	1.52E-01	2.33E-01	8.06E+00	8.22E-02	2.31E+00	3.58E+00	4.80E+00
PO01C	1.79E+03	7.09E+01	2.33E+00	5.70E+00	1.12E+00	2.50E-01	1.24E-01	1.90E-01	1.06E+01	9.47E+00	4.38E+01	6.78E+01	1.03E-01
PO13A	1.33E+03	2.77E+00	1.72E+00	6.23E+01	9.63E-02	1.86E-01	1.32E-01	2.03E-01	8.45E+00	9.05E-02	1.24E+01	1.91E+01	4.18E+00
P09A	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P09B	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P09C	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P09D	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P09E	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P09F	-	-	-	-	-	-	4.94E-03	7.58E-03	-	-	-	-	-
P27A	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27B	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27C	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27D	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27E	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27F	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27G	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
P27H	-	-	-	-	-	-	8.84E-03	1.46E-02	-	-	-	-	-
R01A	2.76E+02	3.56E-01	8.52E-01	5.84E-01	7.21E-03	5.74E-03	1.43E-02	2.19E-02	4.68E-01	9.75E-01	3.15E-04	4.87E-04	-
R03	2.64E+00	-	1.24E-01	4.52E-01	2.48E-03	1.55E-02	1.34E-02	2.05E-02	1.94E-01	2.10E-01	-	-	-
R04	2.67E+00	-	1.24E-01	4.52E-01	2.48E-03	1.55E-02	2.89E-02	4.43E-02	1.94E-01	2.34E-01	-	-	9.46E-03
R05	3.31E-02	-	-	-	-	1.45E-03	1.57E-02	2.40E-02	-	2.49E-02	-	-	-
R07	-	-	-	-	-	-	-	-	-	-	-	-	-
R09	-	-	4.31E-04	-	-	1.34E-04	-	-	-	-	-	-	-
R10	-	-	4.31E-04	-	-	1.34E-04	-	-	-	-	-	-	-
R12	-	-	4.31E-04	-	-	1.34E-04	-	-	-	-	-	-	-
R13	-	-	4.31E-04	-	-	1.34E-04	-	-	-	-	-	-	-
NO5GLC	-	-	2.45E-04	-	-	5.93E-03	-	-	-	-	-	-	-
R15	-	-	-	-	-	-	-	-	-	-	-	-	-
NO5WLC	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
R17	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	-	-	-	2.78E-02
R22	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	-	-	-	2.78E-02
R24	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R25	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R26	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R27	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R28	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R29	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R30	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R31	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R32	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R33	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R34	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R36	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R37	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R38	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R39	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R40	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R41	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R42	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R43	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
R44	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R45	1.15E-01	1.50E-03	-	-	3.74E-04	-	-	-	-	-	-	-	-	-	-	-
R46	1.92E-02	-	-	-	4.32E-05	-	-	-	-	-	-	-	-	-	-	-
R47	-	-	-	-	1.29E-04	-	-	-	-	-	-	-	-	-	-	-
R49	-	-	-	-	1.29E-04	-	-	-	-	-	-	-	-	-	-	-
R50	1.47E-01	2.03E-03	-	-	1.10E-04	-	-	-	-	-	1.59E-04	-	2.83E-03	-	-	4.43E-03
R53	8.33E-01	1.44E-03	8.01E-01	-	8.55E-05	-	-	-	5.89E-05	-	-	-	-	-	-	5.58E-04
R58	8.33E-01	1.44E-03	8.01E-01	-	8.55E-05	-	-	-	5.89E-05	-	-	-	-	-	-	5.58E-04
R65	1.09E+00	-	-	-	5.45E-05	-	-	-	1.86E-03	-	8.61E-04	-	-	-	-	-
R66	1.09E+00	-	-	-	5.45E-05	-	-	-	1.86E-03	-	8.61E-04	-	-	-	-	-
R70	1.15E-01	1.50E-03	-	-	3.74E-04	-	-	-	-	-	-	-	-	-	-	-
R71	2.21E-02	-	-	-	1.31E-04	-	-	-	-	-	-	-	-	-	-	3.17E-05
R72	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04
R76	1.15E-01	1.50E-03	-	-	3.74E-04	-	-	-	-	-	-	-	-	-	-	-
SWBLTANK	3.52E-04	-	4.35E-04	-	8.29E-06	-	-	-	1.15E-04	8.01E-06	3.14E-05	-	5.10E-04	-	-	2.15E-05
6N7SPLTK	6.56E-02	-	2.41E-02	-	3.06E-05	-	-	-	4.25E-04	1.08E-02	1.16E-04	-	1.88E-03	-	-	-
FPDE	6.95E-03	3.33E-04	-	5.42E-06	4.63E-05	1.62E-05	1.79E-05	9.86E-06	-	-	-	8.06E-04	-	-	-	2.82E-03
LKDE	1.68E-02	8.05E-04	-	1.31E-05	1.12E-04	3.92E-05	4.34E-05	2.38E-05	-	-	-	1.95E-03	-	-	-	6.83E-03
WNCEE	6.95E-03	3.33E-04	-	5.42E-06	4.63E-05	1.62E-05	1.79E-05	9.86E-06	-	-	-	8.06E-04	-	-	-	2.82E-03
WNCWE	9.04E-03	4.33E-04	-	7.05E-06	6.02E-05	2.11E-05	2.33E-05	1.28E-05	-	-	-	1.05E-03	-	-	-	3.67E-03
RUNEA	4.63E-03	2.22E-04	-	3.61E-06	3.09E-05	1.08E-05	1.20E-05	6.57E-06	-	-	-	5.38E-04	-	-	-	1.88E-03
SEWEA	4.63E-03	2.22E-04	-	3.61E-06	3.09E-05	1.08E-05	1.20E-05	6.57E-06	-	-	-	5.38E-04	-	-	-	1.88E-03
6FEEDTNK	1.05E-01	-	-	-	8.98E-05	-	-	-	-	-	7.40E-03	-	-	-	-	-
6BLOWTBE	4.91E-01	-	-	-	4.21E-04	-	-	-	-	-	3.47E-02	-	-	-	-	-
6EXHAUST	1.74E+00	-	-	-	1.49E-03	-	-	-	-	-	1.23E-01	-	-	-	-	-
LRPSCWT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRP40%	8.72E-02	3.07E-05	-	-	3.73E-06	-	1.37E-04	-	2.93E-03	-	4.09E-06	-	-	-	-	5.70E-04

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
R17	-	-	-	-	-	-	-	-	-	-	-	-	-
R22	-	-	-	-	-	-	-	-	-	-	-	-	-
R24	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R25	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R26	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R27	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R28	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R29	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R30	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R31	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R32	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R33	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R34	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R36	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R37	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R38	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R39	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R40	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R41	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R42	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R43	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
R44	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R45	-	-	-	-	-	-	-	-	-	-	-	-	-
R46	-	-	1.58E-03	-	-	2.36E-03	-	-	-	-	-	-	-
R47	-	-	-	-	-	-	-	-	-	-	-	-	-
R49	-	-	-	-	-	-	-	-	-	-	-	-	-
R50	2.65E-01	-	-	-	-	8.92E-04	3.28E-03	5.02E-03	-	-	-	-	-
R53	3.10E-02	-	-	-	-	-	4.20E-01	6.44E-01	-	8.14E-02	-	-	-
R58	3.10E-02	-	-	-	-	-	4.20E-01	6.44E-01	-	8.14E-02	-	-	-
R65	1.82E+00	-	1.60E-04	-	-	7.17E-04	4.09E-03	6.27E-03	-	-	-	-	-
R66	1.82E+00	-	1.60E-04	-	-	7.17E-04	4.09E-03	6.27E-03	-	-	-	-	-
R70	-	-	-	-	-	-	-	-	-	-	-	-	-
R71	-	-	6.19E-04	-	-	3.62E-03	-	-	-	-	-	-	-
R72	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-
R76	-	-	-	-	-	-	-	-	-	-	-	-	-
SWBLTANK	-	2.27E-03	-	-	-	-	2.16E-04	3.31E-04	-	-	-	-	7.70E-03
6N7SPLTK	-	8.45E-03	-	-	-	-	7.98E-04	1.22E-03	-	-	-	-	2.83E-02
FPDE	-	4.58E-02	-	5.38E-03	1.48E-03	-	-	-	1.05E-02	-	-	-	-
LKDE	-	1.11E-01	-	1.30E-02	3.59E-03	-	-	-	2.55E-02	-	-	-	-
WNCEE	-	4.58E-02	-	5.38E-03	1.48E-03	-	-	-	1.05E-02	-	-	-	-
WNCWE	-	5.95E-02	-	7.00E-03	1.93E-03	-	-	-	1.37E-02	-	-	-	-
RUNEA	-	3.05E-02	-	3.59E-03	9.89E-04	-	-	-	7.03E-03	-	-	-	-
SEWEA	-	3.05E-02	-	3.59E-03	9.89E-04	-	-	-	7.03E-03	-	-	-	-
6FEEDTNK	1.82E-01	-	-	-	-	-	-	-	-	-	-	-	-
6BLOWTBE	8.51E-01	-	-	-	-	-	-	-	-	-	-	-	-
6EXHAUST	3.01E+00	-	-	-	-	-	-	-	-	-	-	-	-
LRPSCWT	-	-	-	-	-	-	-	-	-	-	-	-	-
LRP40%	3.25E-02	-	1.47E-02	-	-	1.44E-05	1.83E-04	2.80E-04	-	4.99E-03	-	-	-

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
LRPPRS1A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS1B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EOP	1.13E-01	1.14E-03	-	-	9.65E-05	-	-	-	-	2.59E-02	7.94E-03	-	-	-	-	-
PEROX	1.13E-01	1.14E-03	-	-	9.65E-05	-	-	-	-	2.59E-02	7.94E-03	-	-	-	-	-
5SOAP	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
LIQSEP	2.05E-03	2.33E-04	-	-	1.65E-05	-	1.90E-04	-	1.47E-02	5.04E-05	4.27E-07	-	1.52E-03	-	-	2.28E-04
LRPSSUMP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NC1_2_A	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_B	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_C	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_D	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_E	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_F	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_G	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_H	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_I	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_J	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_K	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_L	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC1_2_M	3.36E-02	5.94E-03	-	-	1.99E-04	-	-	-	2.32E-03	-	1.73E-04	-	-	-	-	5.04E-03
NC5_1	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_2	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_3	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_4	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_5	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_6	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_7	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_8	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_9	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_10	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_11	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_12	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_13	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_14	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_15	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_16	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_17	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_18	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_19	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_20	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_21	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_22	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_23	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_24	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_25	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_26	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_27	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_28	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
NC5_29	4.18E-02	7.39E-03	-	-	2.07E-04	-	-	-	2.60E-03	-	1.80E-04	-	-	-	-	6.27E-03
THERMALOX	1.62E-02	3.16E-03	-	9.69E-05	3.73E-05	2.32E-05	2.73E-06	1.29E-03	1.24E-04	1.50E-02	2.26E-04	7.68E-03	-	-	-	3.66E-03
LSRPSCRUB	8.74E-02	3.07E-05	2.32E-04	-	8.14E-06	-	1.37E-04	-	2.99E-03	1.56E-03	4.45E-05	-	2.72E-04	-	-	5.81E-04

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
LRPPRS1A	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS1B	-	-	-	-	-	-	-	-	-	-	-	-	-
EOP	1.95E-01	-	-	-	-	6.61E-04	7.97E-03	1.22E-02	-	-	-	-	-
PEROX	1.95E-01	-	-	-	-	6.61E-04	7.97E-03	1.22E-02	-	-	-	-	-
5SOAP	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
LIQSEP	3.11E-03	-	1.17E-03	-	-	5.89E-04	9.61E-04	1.47E-03	-	-	-	-	-
LRPSSUMP	-	-	3.67E-02	-	-	3.88E-04	-	-	-	-	-	-	-
NC1_2_A	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_B	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_C	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_D	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_E	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_F	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_G	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_H	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_I	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_J	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_K	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_L	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC1_2_M	3.89E-01	-	-	-	-	2.73E-03	1.91E-02	2.65E-02	-	6.98E-02	-	-	-
NC5_1	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_2	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_3	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_4	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_5	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_6	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_7	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_8	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_9	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_10	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_11	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_12	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_13	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_14	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_15	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_16	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_17	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_18	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_19	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_20	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_21	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_22	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_23	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_24	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_25	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_26	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_27	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_28	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
NC5_29	4.36E-01	-	-	-	-	3.40E-03	1.99E-02	3.29E-02	-	8.68E-02	-	-	-
THERMALOX	6.31E+01	-	1.71E-01	6.96E-03	2.62E-03	1.82E-01	3.66E-06	5.61E-06	1.51E-01	8.36E-03	-	-	-
LSRPSCRUB	3.25E-02	1.21E-03	1.46E+00	-	-	3.59E-01	2.98E-04	4.57E-04	-	4.99E-03	-	-	4.10E-03

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
6BLEACH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS2	1.70E-05	-	2.11E-05	-	4.01E-07	-	-	-	5.58E-06	1.42E-04	1.52E-06	-	2.47E-05	-	-	1.04E-06

Source ID	Acetaldehyde	Acrolein	Ammonia	Arsenic	Benzene	Beryllium	1,3-Butadiene	Cadmium	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chromium VI	1,2 Dichloroethane	Fluoride	Fluoride	Formaldehyde
	1 - hour	1 - hour	1 - hour	Annual	Annual	Annual	Annual	Annual	24 - hour	Annual	Annual	24 - hour	Annual	24 - hour	1 - hour	1 - hour
	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)	($g/s{*}m^2$)
FIBLIFT	1.55E-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NO2LIFT	4.46E-04	-	1.85E-05	-	-	-	-	-	-	-	-	-	-	-	-	-
PUCHANN	1.01E-01	-	4.26E-02	-	-	-	-	-	-	-	-	-	-	-	-	3.57E-05
2SEW1LFT	2.03E-05	-	8.09E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
RIFFLER	-	-	2.89E-05	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND2	-	-	8.32E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND1	-	-	5.85E-08	-	-	-	-	-	-	-	-	-	-	-	-	-
AIRBASIN	3.15E-06	-	1.09E-05	-	-	-	-	-	-	-	-	-	-	-	-	1.03E-08
SETPOND2	4.87E-05	-	4.74E-06	-	-	-	-	-	1.68E-12	-	8.45E-08	-	-	-	-	4.13E-08
SETPOND1	2.59E-04	4.02E-08	1.94E-05	-	-	-	-	-	1.66E-11	-	6.30E-07	-	-	-	-	8.48E-07

Table E-5
Optimized Emission Rates
Domtar Paper Company
Plymouth Mill

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
6BLEACH	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHA	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHB	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHC	-	-	-	-	-	-	-	-	-	-	-	-	-
7BLEACHD	-	-	-	-	-	-	-	-	-	-	-	-	-
LRPPRS2	-	1.10E-04	9.59E-02	-	-	-	1.05E-05	1.60E-05	-	-	-	-	3.73E-04

Source ID	n-Hexane	Hydrogen Chloride	Hydrogen Sulfide	Manganese	Mercury	Methyl Mercaptan	Methylene Chloride	Methylene Chloride	Nickel	Phenol	Sulfuric Acid	Sulfuric Acid	Vinyl Chloride
	24 - hour	1 - hour	24 - hour	24 - hour	24 - hour	1 - hour	Annual	1 - hour	24 - hour	1 - hour	24 - hour	1 - hour	Annual
	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)	($g/s*m^2$)
FIBLIFT	-	-	1.63E-03	-	-	-	-	-	-	-	-	-	-
NO2LIFT	-	-	-	-	-	-	-	-	-	-	-	-	-
PUCHANN	-	-	-	-	-	-	-	-	-	4.14E-05	-	-	-
2SEW1LFT	-	-	-	-	-	-	-	-	-	-	-	-	-
RIFFLER	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND2	-	-	-	-	-	-	-	-	-	-	-	-	-
RETPOND1	-	-	-	-	-	-	-	-	-	-	-	-	-
AIRBASIN	-	-	-	-	-	-	-	-	-	-	-	-	-
SETPOND2	-	-	-	-	-	-	-	-	-	1.70E-07	-	-	-
SETPOND1	-	-	-	-	-	-	3.50E-13	5.37E-13	-	8.51E-07	-	-	-

Table E-4
Summary of Modeling Analysis - Baseline
Domtar Paper Company
Plymouth Mill

Compound	Year	Averaging Period	Maximum Concentration (ug/m^3)	AAL (ug/m^3)	Percent of AAL (%)	Optimization Factor
Acetaldehyde	2014	1 - Hour	772.49	27,000	2.86%	34.25
Acrolein	2013	1 - Hour	5.76	80	7.20%	13.62
Ammonia	2017	1 - Hour	526.53	2,700	19.50%	5.03
Arsenic	2013	Annual	2.29E-05	2.10E-03	1.09%	89.71
Benzene	2017	Annual	0.04	0.12	29.81%	3.29
Beryllium	2013	Annual	1.12E-05	4.10E-03	0.27%	357.81
1,3-Butadiene	2017	Annual	0.01	0.44	3.23%	30.39
Cadmium	2013	Annual	2.48E-05	5.50E-03	0.45%	217.58
Carbon Disulfide	2015	24 - Hour	15.58	186	8.38%	11.70
Carbon Tetrachloride	2017	Annual	0.11	7	1.67%	58.80
Chloroform	2017	Annual	1.04	4	24.14%	4.06
Chromium VI Compounds	2014	24 - Hour	5.98E-04	0.62	0.10%	1015.79
1,2 Dichloroethane (Ethylene Dichloride)	2017	Annual	0.0467	4	1.23%	79.73
Fluoride	2014 2013	1 - Hour 24 - Hour	0.13 0.02	250 16	0.05% 0.13%	1847.94 739.97
Formaldehyde	2015	1 - Hour	16.25	150	10.83%	9.05
n-Hexane	2013	24 - Hour	0.17	1100	0.02%	6491.24
Hydrogen Chloride	2014	1 - Hour	10.23	700	1.46%	67.04
Hydrogen Sulfide	2013	24 - Hour	49.20	120	41.00%	2.39
Manganese	2013	24 - Hour	0.01	31	0.03%	3390.63
Mercury	2014	24 - Hour	3.15E-04	1	0.05%	1869.18
Methyl Mercaptan	2016	1 - Hour	43.01	50	86.01%	1.14
Methylene Chloride	2014 2017	1 - Hour Annual	27.62 0.60	1,700 24	1.62% 2.49%	60.31 39.32
Nickel	2013	24 - Hour	4.43E-04	6	0.01%	13287.75
Phenol	2013	1 - Hour	23.75	950	2.50%	39.19
Sulfuric Acid	2014 2013	1 - Hour 24 - Hour	0.38 0.07	100 12	0.38% 0.59%	255.93 165.47
Vinyl Chloride	2017	Annual	0.0002	0.38	0.05%	1902.49

Table E-6
Summary of Modeling Analysis - Optimized
Domtar Paper Company
Plymouth Mill

Compound	Year	Averaging Period	Maximum Concentration (ug/m^3)	AAL (ug/m^3)	Percent of AAL (%)
Acetaldehyde	2014	1 - Hour	26469.63	27,000	98%
Acrolein	2013	1 - Hour	78.44	80	98%
Ammonia	2017	1 - Hour	2644.61	2,700	98%
Arsenic	2013	Annual	2.06E-03	2.10E-03	98%
Benzene	2017	Annual	0.118	0.12	98%
Beryllium	2013	Annual	4.02E-03	4.10E-03	98%
1,3-Butadiene	2017	Annual	0.43	0.44	98%
Cadmium	2013	Annual	5.38E-03	5.50E-03	98%
Carbon Disulfide	2015	24 - Hour	181.77	186	98%
Carbon Tetrachloride	2017	Annual	6.55	7	98%
Chloroform	2017	Annual	4.22	4	98%
Chromium VI Compounds	2014	24 - Hour	0.61	0.62	98%
1,2 Dichloroethane (Ethylene Dichloride)	2017	Annual	3.73	4	98%
Fluoride	2014 2013	1 - Hour 24 - Hour	244.95 15.68	250 16	98% 98%
Formaldehyde	2015	1 - Hour	146.73	150	98%
n-Hexane	2013	24 - Hour	1078.04	1100	98%
Hydrogen Chloride	2014	1 - Hour	687.29	700	98%
Hydrogen Sulfide	2013	24 - Hour	117.33	120	98%
Manganese	2013	24 - Hour	30.32	31	98%
Mercury	2014	24 - Hour	0.59	0.60	98%
Methyl Mercaptan	2016	1 - Hour	49.01	50	98%
Methylene Chloride	2014 2017	1 - Hour Annual	1662.61 23.49	1,700 24	98% 98%
Nickel	2013	24 - Hour	5.88	6	98%
Phenol	2013	1 - Hour	931.47	950	98%
Sulfuric Acid	2014 2013	1 - Hour 24 - Hour	97.95 11.76	100 12	98% 98%
Vinyl Chloride	2017	Annual	0.37	0.38	98%

Table E-7
Proposed Facility Wide TAPS Emission Limits
Domtar Paper Company
Plymouth Mill

Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
Acetaldehyde			377.52
Acrolein			6.78
Arsenic & compounds	6,030.33		
Beryllium	22,251.04		
1,3 Butadiene	8,006.69		
Cadmium	20,036.43		
Carbon disulfide		755.51	
Carbon tetrachloride	59,637.06		
Chromium (VI)		395.66	
1,2-Dichloroethane (Ethlene dichloride)	50,767.38		
Fluoride		16,537.39	1,720.79
n-Hexane		956,097.63	
Hydrogen chloride			765.93
Manganese & compounds		35,010.50	
Mercury, aryl & incorganic Compounds		382.05	
Methylene chloride	163,819.56		29.01
Nickel, metal		5,370.54	
Phenol			137.66
Sulfuric acid		11,143.09	718.11
Vinyl chloride	634,409.47		

These pollutants' potential modeled concentrations were less than 9.8% of the AAL.

Table E-8
Proposed Permitted Rates
Domtar Paper Company
Plymouth Mill

Permit ID (Model ID)	Emission Source	Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
ES-08-70-0900 (F11)	White liquor surge tank	ammonia (7664-41-7)			
		benzene (71-43-2)	9.27E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.21E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-06-32-2460 (F15)	2C washer	ammonia (7664-41-7)			
		benzene (71-43-2)	3.13E+01		
		chloroform (67-66-3)	1.79E+03		
		formaldehyde (50-00-0)			1.06E-01
		hydrogen sulfide (7783-06-4)		3.53E+01	
		methyl mercaptan (74-93-1)			3.54E-02
ES-06-32-2300 (F17)	No. 28 high density tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.76E+00		
		chloroform (67-66-3)	8.98E+00		
		formaldehyde (50-00-0)			1.43E-04
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			4.10E-06
ES-06-32-2340 (F18)	No. 29 high density tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.76E+00		
		chloroform (67-66-3)	8.98E+00		
		formaldehyde (50-00-0)			1.43E-04
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			4.10E-06
ES-06-32-2380 (F19)	No. 30 high density tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.76E+00		
		chloroform (67-66-3)	8.98E+00		
		formaldehyde (50-00-0)			1.43E-04
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			4.10E-06
ES-08-52-1060 (F34)	R8/10 chlorine dioxide generator	ammonia (7664-41-7)			
		benzene (71-43-2)			
		chloroform (67-66-3)	2.13E+01		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-08-40-1000 (F35)	No. 32 high density pulp tank	ammonia (7664-41-7)			
		benzene (71-43-2)	5.04E-01		
		chloroform (67-66-3)	1.72E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		1.35E-01	
		methyl mercaptan (74-93-1)			3.58E-03
ES-06-10-1200 (F41)	No. 6 digester sand separator dumpster	ammonia (7664-41-7)			
		benzene (71-43-2)	1.76E+00		
		chloroform (67-66-3)	8.98E+00		
		formaldehyde (50-00-0)			1.43E-04
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			4.10E-06
ES-07-10-1200 (F42)	No. 7 digester sand separator dumpster	ammonia (7664-41-7)			
		benzene (71-43-2)	3.67E+00		
		chloroform (67-66-3)	1.87E+01		
		formaldehyde (50-00-0)			1.10E-03
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			3.08E-04
ES-05-30-1300 (F60)	No. 5 hot water tank/evaporator condensate	ammonia (7664-41-7)			
		benzene (71-43-2)			
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			1.60E-03
		hydrogen sulfide (7783-06-4)		1.18E-01	
		methyl mercaptan (74-93-1)			2.87E-02
ES-32-STOCKTANKS (P09 A-F)	NC-2 HD and LD Stock Tanks	ammonia (7664-41-7)			
		benzene (71-43-2)	1.83E+01		
		chloroform (67-66-3)	4.12E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-FP-STOCKTANKS (P27 A-H)	NC-5 HD and LD Stock Tanks	ammonia (7664-41-7)			
		benzene (71-43-2)	4.37E+01		
		chloroform (67-66-3)	9.84E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-10-45-0450 (R05)	No. 5 precipitator mix tank	ammonia (7664-41-7)			
		benzene (71-43-2)	9.27E-01		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			8.11E-03
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			1.15E-02

Table E-8
Proposed Permitted Rates
Domtar Paper Company
Plymouth Mill

Permit ID (Model ID)	Emission Source	Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
ES-14-25-0050	Hydrosulfide storage tank	ammonia (7664-41-7)			
(R07)		benzene (71-43-2)	9.27E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.21E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-15-0800	Dregs filter	ammonia (7664-41-7)			
(R09)		benzene (71-43-2)	1.34E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		8.21E-02	
		methyl mercaptan (74-93-1)			1.06E-03
ES-14-15-0900	Dregs filter vacuum system	ammonia (7664-41-7)			
(R10)		benzene (71-43-2)	1.34E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		8.21E-02	
		methyl mercaptan (74-93-1)			1.06E-03
ES-14-15-DREGS	Dregs dumpster	ammonia (7664-41-7)			
(R12)		benzene (71-43-2)	1.34E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		8.21E-02	
		methyl mercaptan (74-93-1)			1.06E-03
ES-14-15-0600	Dregs surge tank	ammonia (7664-41-7)			
(R13)		benzene (71-43-2)	1.34E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		8.21E-02	
		methyl mercaptan (74-93-1)			1.06E-03
ES-14-10-0050	New No. 5 green liquor clarifier	ammonia (7664-41-7)			
(NO5GLC)		benzene (71-43-2)	3.40E+01		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		4.67E-02	
		methyl mercaptan (74-93-1)			4.71E-02
ES-14-30-1450	Lime mud storage tank	ammonia (7664-41-7)			
(R15)		benzene (71-43-2)	3.00E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-25-0450	New No. 5 white liquor clarifier	ammonia (7664-41-7)			
(NO5WLC)		benzene (71-43-2)	9.27E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.21E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-25-0800	No. 4 white liquor clarifier	ammonia (7664-41-7)			
(R17)		benzene (71-43-2)	9.27E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.21E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-25-0150	Synthetic liquor mix tank	ammonia (7664-41-7)			
(R22)		benzene (71-43-2)	9.27E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.21E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-09-05-0200	East 18% liquor tank	ammonia (7664-41-7)			
(R24)		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-05-0150	18% liquor mix tank (west)	ammonia (7664-41-7)			
(R25)		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-05-0100	West 18% liquor tank	ammonia (7664-41-7)			
(R26)		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03

Table E-8
Proposed Permitted Rates
Domtar Paper Company
Plymouth Mill

Permit ID (Model ID)	Emission Source	Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
ES-09-30-0010 (R27)	North 48% black liquor storage tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-30-0020 (R28)	South 48% black liquor storage tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-40-0010 (R29)	East 65% liquor storage tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-40-0020 (R30)	West 65% liquor storage tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-95 (R31,R32,R33,R72)	Four saveall tanks	ammonia (7664-41-7)			
		benzene (71-43-2)	1.93E+00		
		chloroform (67-66-3)	8.83E-01		
		formaldehyde (50-00-0)			1.54E-02
		hydrogen sulfide (7783-06-4)		8.64E+00	
		methyl mercaptan (74-93-1)			5.01E-03
ES-09-20-0070 (R34)	No. 6 evaporator soap skim tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-19-0020 (R36)	East liquor heater	ammonia (7664-41-7)			
		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-25-0140 (R37)	No. 7 evaporator soap skimmer tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-25-0540 (R38)	No. 7 evaporator boilout tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-09-30-0030 (R39)	Soap Collection tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-10 (R40,R41,R42,R43)	Four soap storage tanks	ammonia (7664-41-7)			
		benzene (71-43-2)	4.60E+00		
		chloroform (67-66-3)	1.19E-01		
		formaldehyde (50-00-0)			7.24E-03
		hydrogen sulfide (7783-06-4)		8.88E-01	
		methyl mercaptan (74-93-1)			1.87E-02
ES-09-25-0340 (R44)	Diverter tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-14-30-0310 (R46)	Lime mud mix tank	ammonia (7664-41-7)			
		benzene (71-43-2)	3.00E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		3.02E-01	
		methyl mercaptan (74-93-1)			1.87E-02

Table E-8
Proposed Permitted Rates
Domtar Paper Company
Plymouth Mill

Permit ID (Model ID)	Emission Source	Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
ES-14-30-0700 (R47)	No. 2 lime mud wash tank	ammonia (7664-41-7)			
		benzene (71-43-2)	8.95E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-30-350 (R49)	No. 3 lime mud wash tank	ammonia (7664-41-7)			
		benzene (71-43-2)	8.95E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-30-5000/6000 (R50)	East and West lime mud filter - hood exhaust	ammonia (7664-41-7)			
		benzene (71-43-2)	9.28E-01		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			8.11E-03
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			1.15E-02
ES-14-20-2020 (R53)	East lime slaker	ammonia (7664-41-7)			6.36E+00
		benzene (71-43-2)	5.94E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			4.43E-03
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-20-2085 (R58)	West lime slaker	ammonia (7664-41-7)			6.36E+00
		benzene (71-43-2)	5.94E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			4.43E-03
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-14-30-5040 and ES-14-30-6040 (R65,R66)	Two lime mud filter vacuum systems	ammonia (7664-41-7)			
		benzene (71-43-2)	7.57E+00		
		chloroform (67-66-3)	1.20E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		6.11E-02	
		methyl mercaptan (74-93-1)			1.14E-02
ES-14-70-2045 (R45)	Lime kiln scrubber water standpipe	ammonia (7664-41-7)			
		benzene (71-43-2)	5.20E+01		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-09-20-0250 (R71)	Combined condensate tank	ammonia (7664-41-7)			
		benzene (71-43-2)	9.07E+00		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			2.52E-04
		hydrogen sulfide (7783-06-4)		1.18E-01	
		methyl mercaptan (74-93-1)			2.87E-02
ES-14-70-2020 (R76)	Scrubber water clarifier	ammonia (7664-41-7)			
		benzene (71-43-2)	2.60E+01		
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-09-05-0210 (SWBLTANK)	South weak black liquor storage tank	ammonia (7664-41-7)			3.45E-03
		benzene (71-43-2)	5.76E-01		
		chloroform (67-66-3)	2.18E+00		
		formaldehyde (50-00-0)			1.70E-04
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-08-65-1060 (6N7SPLTK)	Spill collection tank	ammonia (7664-41-7)			1.92E-01
		benzene (71-43-2)	2.13E+00		
		chloroform (67-66-3)	8.06E+00		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
IES-06-P1 (6FEEDTNK)	No. 6 Bleach Plant, 6th stage hydrogen peroxide tank	ammonia (7664-41-7)			
		benzene (71-43-2)	6.25E+00		
		chloroform (67-66-3)	5.14E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-06-P2 (6BLOWTBE)	6th stage peroxide reactor blow tube	ammonia (7664-41-7)			
		benzene (71-43-2)	2.93E+01		
		chloroform (67-66-3)	2.41E+03		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			

Table E-8
Proposed Permitted Rates
Domtar Paper Company
Plymouth Mill

Permit ID (Model ID)	Emission Source	Toxic Air Pollutant	(lb/yr)	(lb/day)	(lb/hr)
ES-06-P3 (6EXHAUST)	6th stage peroxide stage washer	ammonia (7664-41-7)			
		benzene (71-43-2)	1.03E+02		
		chloroform (67-66-3)	8.52E+03		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			
ES-09-27-1000 (LRP40%)	LRP 40% Black Liquor Tank	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E-01		
		chloroform (67-66-3)	2.85E-01		
		formaldehyde (50-00-0)			4.52E-03
		hydrogen sulfide (7783-06-4)		2.81E+00	
		methyl mercaptan (74-93-1)			1.14E-04
ES-07-34-4080/4100 (EOP)	4th stage extraction tower and filtrate tank	ammonia (7664-41-7)			
		benzene (71-43-2)	6.71E+00		
		chloroform (67-66-3)	5.52E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			5.25E-03
ES-07-36-6040/6060 (PEROX)	Peroxide stage 6th stage extraction tower and filtrate tank	ammonia (7664-41-7)			
		benzene (71-43-2)	6.71E+00		
		chloroform (67-66-3)	5.52E+02		
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			5.25E-03
ES-09-12-0250 (5SOAP)	No. 5 Soap Storage Tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-12-0050 (LIQSEP)	Black Liquor Separator Tank	ammonia (7664-41-7)			
		benzene (71-43-2)	1.15E+00		
		chloroform (67-66-3)	2.97E-02		
		formaldehyde (50-00-0)			1.81E-03
		hydrogen sulfide (7783-06-4)		2.22E-01	
		methyl mercaptan (74-93-1)			4.67E-03
ES-09-27-2700 ES-09-27-2770 ES-09-27-2800 IES-09-27-3700 IES-09-27-3600 (LRPSSUMP)	Agitated Acidification Tank Acidification Overflow/Foam Tank Acitated Acid Conditioning Tank Acid Sump Pit Alkaline Sump Pit	ammonia (7664-41-7)			
		benzene (71-43-2)			
		chloroform (67-66-3)			
		formaldehyde (50-00-0)			
		hydrogen sulfide (7783-06-4)		7.00E+00	
		methyl mercaptan (74-93-1)			3.08E-03
ES-32-93-0100 (NC1_2A-M)	NC-2 line Building roof vents	ammonia (7664-41-7)			
		benzene (71-43-2)	1.80E+02		
		chloroform (67-66-3)	1.57E+02		
		formaldehyde (50-00-0)			5.20E-01
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			2.82E-01
ES-45-93-0100 (NC5_1-29)	NC-5 Building fugitives	ammonia (7664-41-7)			
		benzene (71-43-2)	4.17E+02		
		chloroform (67-66-3)	3.64E+02		
		formaldehyde (50-00-0)			1.44E+00
		hydrogen sulfide (7783-06-4)			
		methyl mercaptan (74-93-1)			7.82E-01
CD-65-60-1010 (THERMALOX)	Thermal Oxidizer	ammonia (7664-41-7)			
		benzene (71-43-2)	2.59E+00		
		chloroform (67-66-3)	1.57E+01		
		formaldehyde (50-00-0)			2.91E-02
		hydrogen sulfide (7783-06-4)		3.26E+01	
		methyl mercaptan (74-93-1)			1.45E+00
ES-09-27-3000 (LRPPRS2)	LRP Press Building Fugitives (Filter Press 2)	ammonia (7664-41-7)			1.67E-04
		benzene (71-43-2)	2.79E-02		
		chloroform (67-66-3)	1.06E-01		
		formaldehyde (50-00-0)			8.25E-06
		hydrogen sulfide (7783-06-4)		1.83E+01	
		methyl mercaptan (74-93-1)			
ES-09-27-3800 (LSRPSCRUB)	Two-Phase Packed-Bed Caustic Scrubber	ammonia (7664-41-7)			1.84E-03
		benzene (71-43-2)	5.66E-01		
		chloroform (67-66-3)	3.10E+00		
		formaldehyde (50-00-0)			4.61E-03
		hydrogen sulfide (7783-06-4)		2.78E+02	
		methyl mercaptan (74-93-1)			2.85E+00
ES-73-05-2000	WWTP operations	ammonia (7664-41-7)			5.04E+01
		benzene (71-43-2)	0.00E+00		
		chloroform (67-66-3)	4.50E+03		
		formaldehyde (50-00-0)			6.46E-01
		hydrogen sulfide (7783-06-4)		1.73E+01	
		methyl mercaptan (74-93-1)			0.00E+00

Appendix F

Approved Modeling Protocol

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL A. ABRACZINSKAS
Director

Air Quality
ENVIRONMENTAL QUALITY

January 23, 2019

Mr. Andy Holland
Air Quality Modeler
AECOM
1600 Perimeter Park Drive
Suite 400
Morrisville, NC 27560

Subject: Air Quality Modeling Protocol for the Lignin Solids Removal Plant Reconfiguration Project
Domtar Paper Company – Plymouth Mill
Facility ID: 5900069
Plymouth, NC Martin County

Dear Mr. Holland:

The Air Quality Analysis Branch (AQAB) has reviewed the air quality modeling protocol, received December 19, 2018, for the proposed Prevention of Significant Deterioration (PSD) project at the Domtar Paper Company Plymouth Mill located in Plymouth, Martin County, NC. The modeling protocol defines modeling methodologies that will be used to support the air quality analysis of ambient impacts from the proposed project emissions increases. The proposed project includes reconfiguration of the Lignin Solids Removal Plant (LSRP) by rerouting select sources through a new two stage packed bed caustic scrubber for control of total reduced sulfur 9TRS) compounds, adding a new dust collection system, and replacing multiple LSRP tanks. Preliminary estimates of project emissions increases under PSD review and covered in the modeling protocol show significant emission increases of nitrogen oxides (NO_X), sulfur dioxide (SO_2), TRS compounds, and hydrogen sulfide (H_2S) exceeding PSD Significant Emission Rates (SERs) as defined under 40 CFR 51.166(b)(23). Toxic air pollutant (TAP) emissions changes from the project will require a facility-wide modeling demonstration for affected TAPs listed under 15A NCAC 02Q .0700. Comments from the AQAB on the air quality modeling protocol are provided below.

- Any Tier 3 analysis for NO_2 (e.g., alternative minimum ARM2, PVMRM or OLM, etc.) will require consultation with EPA Region 4 to determine all appropriate AERMOD input parameters.

- Please consult with NC DAQ in the case of any Class II Area Full Impact Air Quality Analysis for PSD Increments and NAAQS.

- Note that sources included in the full impact analysis shall not be limited to 20 km without proper assessment of the significant impact area (SIA) and 20D screening methodology for each pollutant and averaging period, as appropriate.

- Please provide a certified plat, signed survey, or copy of the deed from the County Register of Deeds Office, in that order of preference, of the industrial site clearly locating all ambient boundaries (e.g., fenceline, inaccessible or patrolled property lines) modeled in the PSD modeling and air toxics analysis (ref. Section 3.7(b) of *Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina)*.

- Ambient boundary receptors shall use 25-meter spacing where permitted emissions sources are located within 100 meters of ambient air.

- Each Class I Increment screening analysis shall use a full ring (i.e., 360 degrees) of polar gridded receptors located 50 km from the project. Please use 1 ring of receptors at 50 km with 1-degree receptor spacing, and receptor elevations and hill height scales as calculated by AERMAP.

The dispersion modeling protocol for the PSD project is conditionally approved as submitted and per comments provided in this letter. This conditional approval is valid for **90 days**. This letter addresses only the modeling protocol and not the specific data submitted, which we will review upon receipt of the complete application. If you have any questions or comments, please contact me via phone (919) 707-8268 or e-mail matthew.porter@ncdenr.gov.

Sincerely,

Matthew Porter, Meteorologist
Air Quality Analysis Branch

c: Yongcheng Chen, Permit Coordinator, WARO
Booker Pullen, Engineering Supervisor, RCO
Tom Anderson, AQAB Supervisor, RCO
Heather Sands, Environmental Engineer, RCO

AECOM

AECOM
1600 Perimeter Park Drive. Suite 400
Morrisville, NC 27560
www.aecom.com

919.461.1100 tel
919.461.1415 fax

December 19, 2018

Mr. Tom Anderson
North Carolina Department of Environmental Quality
Division of Air Quality
217 West Jones Street
Raleigh, North Carolina 27603

Reference: Air Quality Modeling Protocol for the Lignin Solids Removal Plant Reconfiguration Project
Domtar Paper Company – Plymouth Mill
Facility ID No. 5900069
Title V Permit No. 04291T45

Dear Mr. Anderson:

On behalf of Domtar Paper Company, AECOM is pleased to submit the attached Air Quality Modeling Protocol for the Plymouth Mill. The modeling protocol presents the modeling methodologies that will be followed as part of the PSD Class I and Class II Area dispersion modeling analyses for the proposed project.

If you or your staff have any questions or require additional information, please contact me at 919-461-1467.

Sincerely,

Andy Holland
Air Quality Modeler - AECOM
On behalf of Domtar Paper Company

Cc:
Diane Hardison, Domtar
Claire Corta, AECOM

Air Quality Modeling Protocol for the Lignin Solids Removal Plant Reconfiguration Project

December 2018

Prepared for:

Domtar

Domtar Paper Company
Plymouth Mill
P.O. Box 747
Plymouth, North Carolina 27962

Prepared by:

AECOM

AECOM Technical Services of North Carolina, Inc.
1600 Perimeter Park Drive, Suite 400
Morrisville, NC 27560

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1.0 INTRODUCTION

Domtar Paper Company operates a pulp manufacturing facility in Martin County near Plymouth, North Carolina. The Domtar Plymouth Mill currently operates under Title V Air Quality Permit No. 04291T45 issued by the North Carolina Department of Environmental Quality (NCDEQ) on August 15, 2018.

Domtar is proposing to reconfigure the Lignin Solids Removal Plant (LSRP) by rerouting select sources through a new two stage packed bed caustic scrubber for control of total reduced sulfur (TRS) compounds, adding a new dust collection system, and replacing multiple LSRP tanks. The project is expected to trigger PSD review for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), TRS compounds, and hydrogen sulfide (H_2S).

1.1 Report Organization

The remainder of this protocol is divided into the following sections:

Section 2.0: Facility Information;
Section 3.0: Project Description and Emissions;
Section 4.0: Air Quality Modeling Analysis;
Section 5.0: Additional Impacts Analysis; and
Section 6.0: Submittal of Analysis Results.

The table of contents contains a detailed listing of tables, figures, and appendices.

1.2 Contact Information

Should North Carolina Division of Air Quality (NC DAQ) have any questions or comments regarding this modeling protocol, please contact Ms. Diane Hardison of Domtar Paper at (252) 793-8611 or Mr. Andy Holland of AECOM at (919) 461-1467.

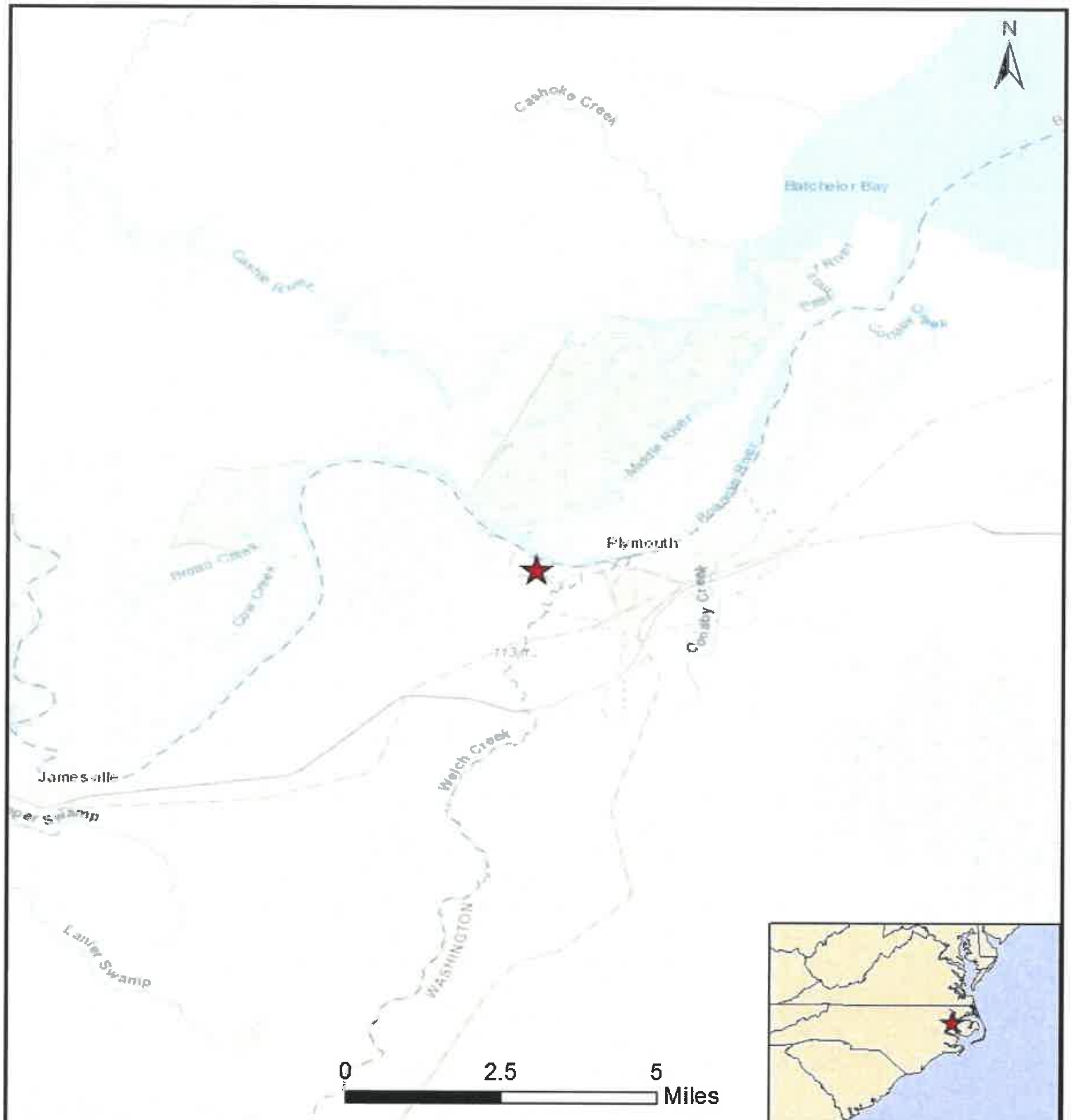
2.0 FACILITY INFORMATION

2.1 Site Location

The Domtar Plymouth Mill is located about 1 mile west of Plymouth, North Carolina at the junction of Bertie, Martin, and Washington counties in eastern North Carolina. The mill is located on approximately 4,400 acres along the Roanoke River. The approximate UTM zone 18 coordinates are, 339.5 km east, and 3,969.9 km north at an elevation of approximately 5 feet above mean sea level. **Figure 2-1** shows the site location and surrounding topography.

2.1.1 Attainment Status of Area

The Plymouth Mill is located in Martin County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Martin County is classified as "better than national standards" for the 1971 NO_2 and SO_2 National Ambient Air Quality Standards (NAAQS). Martin County is classified as "attainment/unclassifiable" for the 2010 SO_2 NAAQS and as "unclassifiable/attainment" for the 2010 NO_2 NAAQS and the 8-hour ozone standard. Therefore, the Plymouth Mill is not located in an area currently designated as "nonattainment" for any compound regulated under the NAAQS that are subject to PSD review under this proposed modification.



DOMTAR PAPER COMPANY PLYMOUTH MILL PLYMOUTH, NC	AECOM *1600 Perimeter Park Drive, Suite 400* *Morrisville, North Carolina 27560* *Telephone 919-461-1100*	SITE LOCATION & SURROUNDING TOPOGRAPHY	PROJECT NO. 60543312 FIG. NO. 2-1

Figure 2-1 Site Location and Topography

3.0 PROJECT DESCRIPTION AND EMISSIONS

The LSRP at Domtar began operation in 2013. The LSRP has faced reliability, maintenance, and operational challenges since initial startup and Domtar has been working with the vendor to redesign the existing system to achieve safe and reliable operation. Proposed modifications to the LSRP include redesigning the system to route a portion of the process gases to a caustic scrubber and replacing select tanks to improve runnability of the plant by reducing corrosion and by avoiding over pressurizing the existing HVLC system. The proposed modification also includes the addition of a dust collection system for control of particulate matter emissions from the truck bay and conveyor. The dust collection scrubber removes particulates from the process area without releasing them to the atmosphere and brings them back into the process. Dust free gasses will be exhausted through the new scrubber stack.

The modification will result in net emission increases of NO_2, SO_2, TRS compounds, and H_2S above the Prevention of Significant Deterioration (PSD) Significant Emission Rates (SER) for these compounds and thus PSD review is required. The permit application will include the final project emissions increase calculations along with the following elements listed below.

PSD permit applications require the following elements (for those pollutants subject to PSD review):

- A Best Available Control Technology (BACT) analysis for regulated compounds subject to PSD review;
- Ambient air quality analyses to demonstrate that the Project will not result in an exceedance of the applicable NAAQS or applicable PSD increments in Class II and Class I areas;
- Additional impact analyses to demonstrate that the Project will not result in adverse impacts on soil, vegetation, and visibility in Class II and Class I areas and to assess indirect impacts from general commercial, residential, industrial, and other growth associated with the Project; and
- Public participation.

The second and third bulleted items will be addressed in the following sections of this modeling protocol.

4.0 AIR QUALITY MODELING ANALYSIS

4.1 Introduction

The dispersion modeling analyses conducted for this Project will adhere to the United States Environmental Protection Agency (US EPA) "Guideline on Air Quality Models" (GAQM, which is contained in 40 CFR Part 51, Appendix W)[1], the North Carolina PSD Modeling Guidance[2], and direction received from the NCDEQ Division of Air Quality (DAQ). The following sections present the source data to be modeled, the proposed procedure for assessing ambient air impacts from the proposed Project's emissions, and the standards to which the predicted impacts will be compared.

The proposed Project will trigger PSD review for NO_2, SO_2, TRS compounds, and H_2S. There are no modeling requirements under PSD for significant increases in TRS compounds or H_2S. As such, dispersion modeling will only be performed, as required, for NO_2 and SO_2. The Project impacts on ozone NAAQS related to NO_2 and VOC emissions are described further in **Section 4.9**.

Maximum predicted impacts will be compared to the Significant Impact Levels (SILs). If predicted impacts are below the applicable SIL, no additional analysis will be necessary since, by definition, the pollutant could not cause or contribute to a NAAQS violation or an exceedance of a PSD increment. If modeling indicates that the SILs are exceeded, then a cumulative impact assessment will be undertaken to demonstrate compliance with the NAAQS and PSD increments. However, it is expected that the predicted impacts will be below the SIL.

4.2 Air Dispersion Model Selection

AERMOD Modeling System (version 18081)

The modeling analysis will be performed using the most current version of the EPA AERMOD model (version 18081). Currently, AERMOD is the preferred computer air dispersion model for conducting refined near-field (i.e., within 50 kilometers) modeling analyses. The AERMOD model will be used in regulatory default mode to model the proposed emission increases associate with the Project in order to predict maximum modeled concentrations due to the Project.

The AERMOD preprocessors, AERMAP (version 18081) and BPIP-Prime (version 04274) will also be used. BPIP-Prime will be used to calculate direction-specific building dimensions for input to AERMOD. These building dimensions will be used by AERMOD to account for building downwash in the model. AERMAP will be used to characterize the terrain and calculate receptor elevations and corresponding critical hill heights for each modeled receptor point.

4.3 Meteorological Data

A five-year meteorological data set (2013-2017) of surface meteorological data from the Elizabeth City Coast Guard Air Station/Regional Airport (Station No. 13786) and upper-air sounding data recorded at

[1] https://www3.epa.gov/ttn/scram/appendix_w/2016/AppendixW_2017.pdf
[2] https://files.nc.gov/ncdeq/Air%20Quality/permits/mets/psd_guidance.pdf

the Newport National Weather Service Office in Newport, NC (Station No. 93768) will be used in the modeling analysis as recommended by NC DAQ. The meteorological data files were obtained from the NC DAQ in a model-ready format and were prepared by the NC DAQ using AERMET version 18081.

These data will be used to calculate hourly plume rise and concentrations at downwind receptor locations for the meteorological period modeled.

4.4 Good Engineering Practice (GEP) Stack Height Analysis

A Good Engineering Practice (GEP) stack height analysis will be conducted to demonstrate compliance with stack height regulations (40 CFR Part 51) and to determine the impacts to the modeled point sources by building wake and downwash effects. The GEP analysis will be conducted using the procedures outlined in the EPA documents "Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations)" (EPA-450/4-80-023R) and the "User's Guide to the Building Profile Input Program." The latest version of the Building Profile Input Program (BPIP) with PRIME algorithms will be used to develop direction-specific building dimensions for use in the dispersion model. **Figure 4-1** shows the location of the stack(s) with emission increases and the buildings to be included in the BPIP analysis.

4.5 Ambient Air Boundary

Ambient air is defined by the US EPA in 40 CFR 50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access." In November of 2018, the US EPA released a draft Revised Policy on Exclusions from Ambient Air[3]. This draft guidance allows for more methods of precluding the public's access to property owned by the facility, other than just a fence or physical barrier. **Figure 4-2** below shows Domtar's ambient air boundary using a combination of fencing, 15 foot high river banks, impassable wetlands, no trespassing signage, and areas that are monitored by security personnel. All of these methods preclude the public's access to Domtar property.

4.6 Receptors

The dispersion modeling receptor grid will be developed following procedures outlined in the North Carolina PSD Modeling Guidance. A preliminary PSD SIL Cartesian receptor grid system will be created to adequately assess air quality impacts in all directions to a distance of up to 10 kilometers from the Plymouth Mill. This preliminary grid will include ambient air boundary receptors with a receptor spacing of 100 meters; will extend outward from the boundary to 1 kilometer at 100 meter spacing, from 1 kilometer to 5 kilometers at 250 meter spacing, and from 5 kilometers to 10 kilometers at 500 meter spacing.

Warren Neck Creek and Welch Creek traverse Domtar property and the public is allowed to travel on these creeks. Therefore, receptors will be placed along the creeks for short-term averaging periods (1-hour, 3-hour, and 24-hour). Short-term receptors will also be placed along Pulp Mill Road from the fence north to the gatehouse.

[3] https://www.epa.gov/sites/production/files/2018-11/documents/draft_ambient_air_guidance_110818.pdf

The extent of this grid is expected to be sufficient to capture maximum impacts. However, if highest impacts are predicted at the edge of the grid, additional receptors will be modeled to ensure that the Significant Impact Area (SIA) is resolved. If maximum concentrations occur in areas where the receptor spacing is greater than 100 meters, a 100 meter receptor grid will be placed around the area of maximum concentration. The grid systems will be created using the UTM coordinate system (Zone 18) using the NAD83 datum.

Receptor elevations and critical hill heights will be determined using the current version of the AERMAP processor (Version 18081). National Elevation Data (NED) will be downloaded from the National Map Seamless Server at a 1 arc second resolution (~30 meters) for an area of approximately 25 kilometers from the Plymouth Mill.

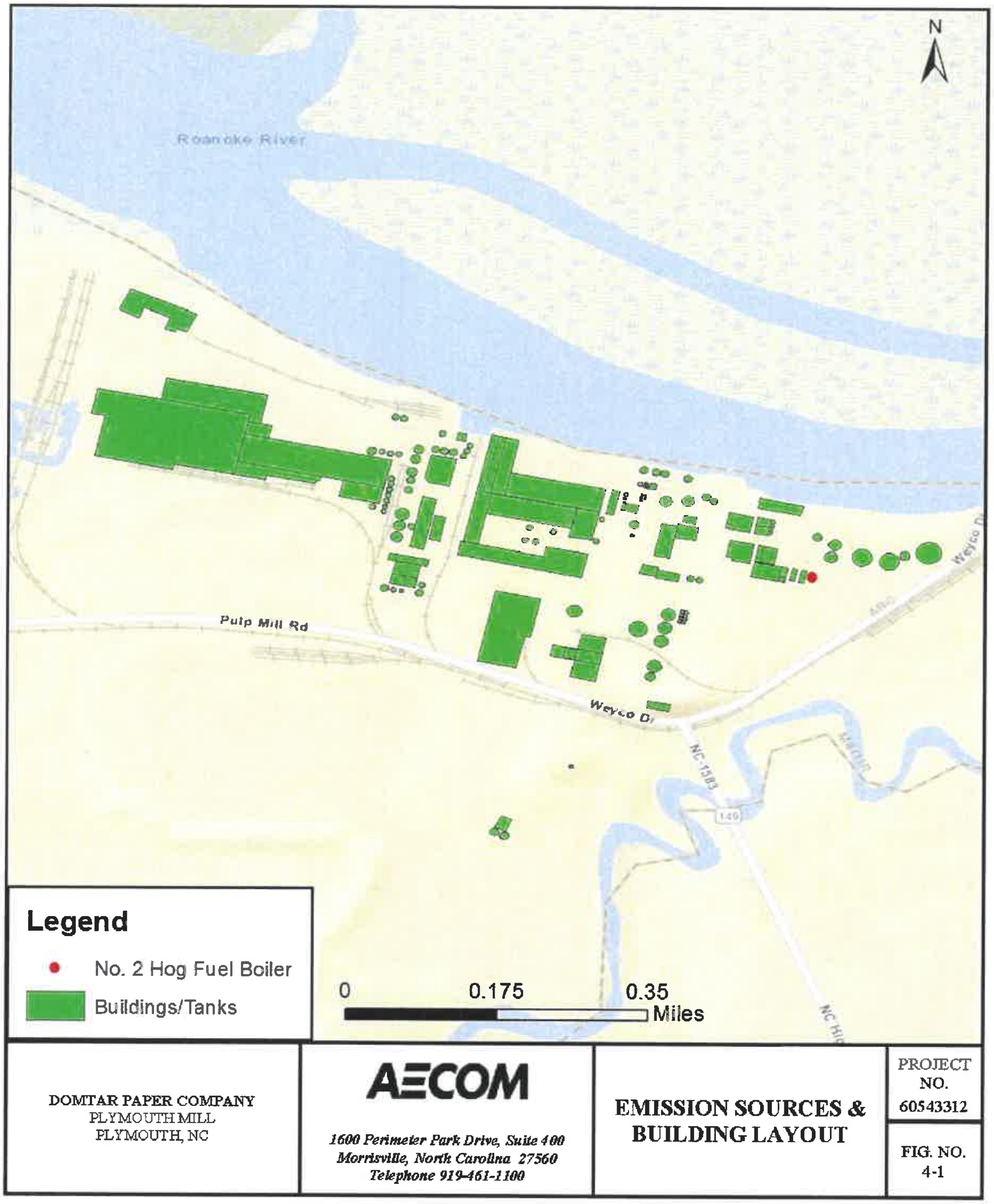
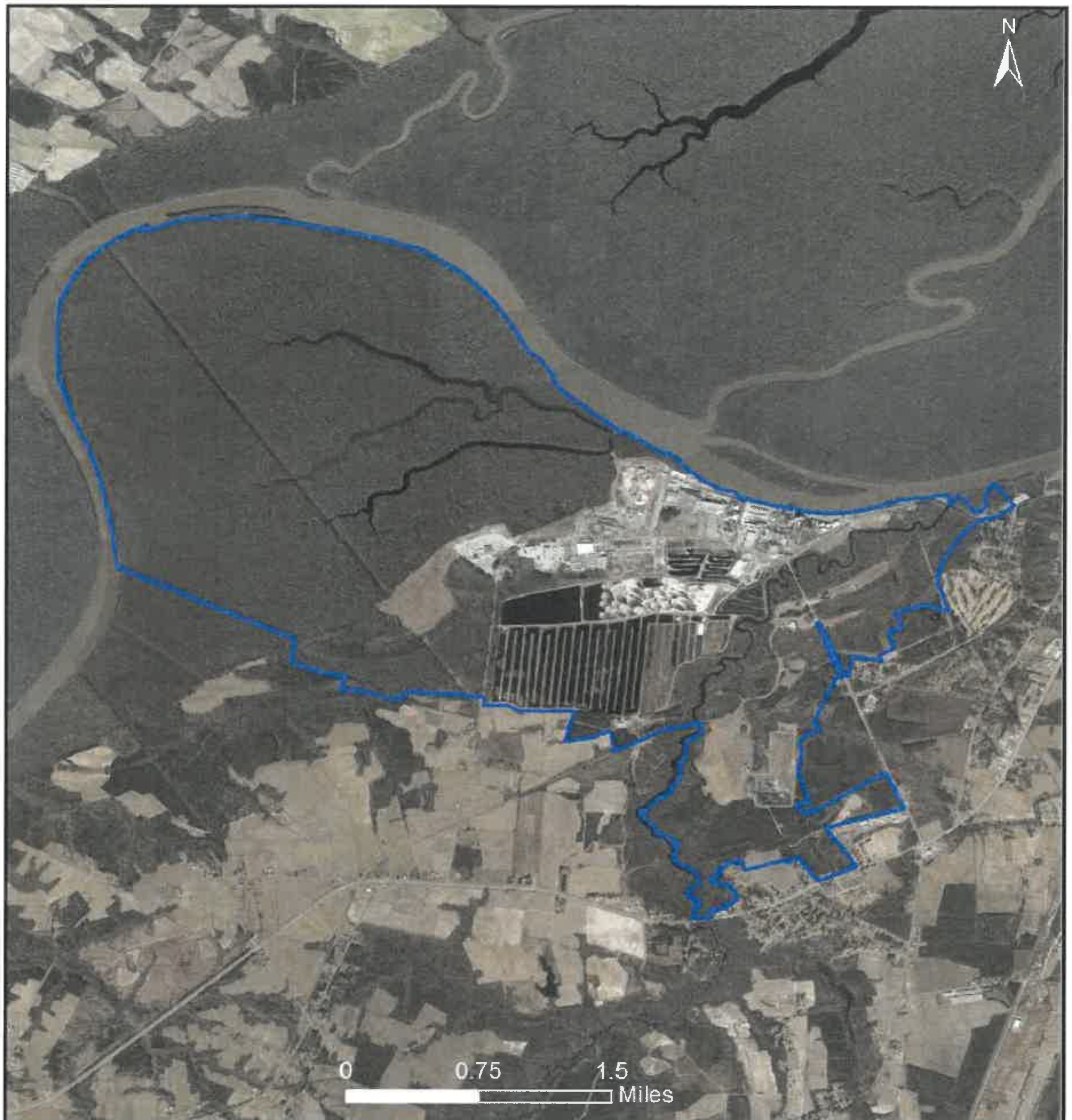


Figure 4-1 Emissions Source and Building Layout



DOMTAR PAPER COMPANY PLYMOUTH MILL PLYMOUTH, NC	AECOM *1600 Perimeter Park Drive, Suite 400* *Morrisville, North Carolina 27560* *Telephone 919-461-1100*	**AMBIENT AIR BOUNDARY**	PROJECT NO. 60543312 FIG. NO. 4-2

Figure 4-2 Ambient Air Boundary

4.7 Sources

The AERMOD model uses a steady-state Gaussian plume equation to model emissions from point sources such as stacks and vents. All sources of NO_2 and SO_2 associated with Project emission increases will be modeled using nominal stack exhaust parameters and emission rates consistent with the proposed project increases. The following parameters will be used for modeling the point sources: emission rates (grams/sec), stack height (m), stack diameter (m), stack exit velocity (m/sec), stack exhaust temperature (K), and direction-specific building dimensions (m).

4.8 Class II Area Modeling Analyses

A refined modeling analysis will be conducted using AERMOD (version 18081). The analysis will be conducted to demonstrate compliance with both state and federal applicable ambient air quality standards. For those pollutants and averaging periods that predict impacts above their applicable SIL, as shown in **Table 4-1**, a refined cumulative modeling analysis, which will consider additional NAAQS and PSD increment consuming sources, will be conducted to determine compliance with the NAAQS and PSD increments.

4.8.1 Class II Area Preliminary Impact Air Quality Analysis

The Preliminary Impact Air Quality Analysis will consist of a Class II area SIL analysis conducted using five years of airport meteorological data as described in **Section 4.3**. This modeling analysis will be used to make a determination of significance for NO_2 and SO_2. The determination of significance will be made by modeling project emission increases and using the highest 1-hour (NO_2 and SO_2), 3-hour (SO_2), 24-hour (SO_2), and annual (NO_2 and SO_2) modeled concentrations over the five years of meteorological data modeled (the 1-hour concentrations will be averaged over 5 years). If modeled concentrations of NO_2 and SO_2 are less than the SILs in **Table 4-1**, then no further modeling will be required because, by definition, those pollutants and averaging periods cannot cause or contribute to a violation of the NAAQS or exceedance of a PSD increment.

Table 4-1 Criteria Pollutant Class II Significant Impact Levels

Pollutant	Averaging Period	SIL ($\mu g/m^3$)
NO_2	1-hour	7.5
	Annual	1
SO_2	1-hour	7.8
	3-hour	25
	24-hour	5
	Annual	1

If modeled concentrations of NO_2 or SO_2 are greater than the SILs, a Full Impact Air Quality Analysis will then be performed to demonstrate compliance with applicable ambient standards as described in **Section 4.8.2**. Compliance with the ozone NAAQS will be addressed as described in **Section 4.9**.

4.8.2 Class II Area Full Impact Air Quality Analysis

As stated previously for those pollutants and averaging periods determined to have modeled concentrations less than the SILs, no further analysis will be performed. The discussion below applies only to those pollutants and averaging periods for which a significant impact is predicted with AERMOD.

Compliance with the PSD increments and NAAQS would be based on the sum of the following:

- Modeled concentrations attributable to the Project;
- Modeled concentrations from "nearby" and existing facility sources; and
- Representative ambient background concentration (NAAQS only).

Modeled concentrations attributable to the Project along with "nearby" and existing facility sources will be estimated using AERMOD along with the meteorological data and receptors grids described in **Sections 4.3** and **4.6**.

An inventory of sources will be obtained, if necessary, from DAQ if modeling results exceed the SIL, covering facilities that could contribute significantly to ambient concentrations within the SIL radius.

For the evaluation of compliance with NAAQS and PSD increments, all sources will be evaluated for potential inclusion into the modeled NAAQS inventory. Nearby sources will be included in the NAAQS analysis based on the following conditions:

1. All sources within 20 kilometers of the Project will be included in the modeling.
2. For facilities beyond 20 kilometers from the Project, if the facility's total potential emissions (in tons/year) are greater than 20 times the distance between the Project and the facility, then the facility will be included. Otherwise the facility will be excluded from the analysis.

For the Full Impact Air Quality Analysis, the modeled concentrations from the proposed Project, as well as influencing nearby emission sources, will be compared with the NAAQS. The standards to which the modeling results will be compared to are presented in **Table 4-2.** For the NAAQS analysis, a conservative background concentration will be added to modeled impacts to determine compliance. **Section 4.10** provides more detail on the use of representative monitored ambient background concentrations.

Table 4-2 Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS (µg/m³)	Class II Increment (µg/m³)	Form (Design)
NO_2	1-hour	188	-	High-eighth high daily max averaged over 5 years.
	Annual	100	25	Annual arithmetic mean.
SO_2	1-hour	196	-	High-fourth high daily max averaged over 5 years.
	3-hour	1309	512	Not to be exceeded more than once per year.
	24-hour	365	91	Not to be exceeded more than once per year.
	Annual	80	20	Annual arithmetic mean.

4.9 Ozone and Secondary $PM_{2.5}$

In December 2016, EPA released the draft *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (EPA-454/R-16-006)* [4] (EPA MERP Guidance). In February 2017, a data distribution and errata memorandum was released by the EPA to provide corrections to data tables within the draft guidance[5]. Section 7 of the draft EPA MERP Guidance provides several examples of MERP Tier 1 demonstrations for sources subject to PSD review. The examples focus on both secondary $PM_{2.5}$ and ozone precursor emissions and at what emission levels those precursors would result in a potential project insignificant impact, which would eliminate the need for project-specific modeling.

This guidance was utilized to develop the approach that will be used to assess the extent of analysis required for ozone and secondary $PM_{2.5}$ for this Project as described below.

4.9.1 Ozone

The preliminary Project emissions increases of VOC and NO_X are lower than the lowest MERP developed by EPA and presented in Table 7-1 of the MERP Guidance for sources located in any section of the continental US. Therefore, the ozone analysis will follow the example of Scenario A in Section 7 of the EPA MERP Guidance to determine if the air quality impacts expected from the Project will be below the critical air quality threshold. The proposed emissions increases will be expressed as a percent of the lowest MERP for each precursor, and then summed. A total impact less than 100% would indicate that the critical air quality impact will not be exceeded when considering the combined impacts of precursors on 8-hour daily maximum ozone.

[4] https://www3.epa.gov/ttn/scram/guidance/guide/EPA454_R_16_006.pdf
[5] https://www3.epa.gov/ttn/scram/guidance/guide/MERPs_Data_Distribution_and_Errata_Memo-02232017.pdf

4.9.2 Secondary $PM_{2.5}$

The preliminary Project emission increases of SO_2 and NO_x do not exceed the lowest MERP for sources located in any section of the continental US, and the Project does not trigger PSD review for $PM_{2.5}$. Therefore, it is expected that the air quality impacts from the Project will be below the critical air quality threshold, and a secondary $PM_{2.5}$ impacts analysis will not be performed.

4.10 Background Air Quality and Pre-Construction Monitoring

4.10.1 Available Representative Data

Ambient air quality data are used to represent the contribution to total ambient air pollutant concentrations from non-modeled sources. In accordance with 40 CFR 52.21(m), an application for a PSD permit must contain an analysis of ambient air quality in the vicinity of the proposed Project for each pollutant subject to PSD review. The objective of reviewing these data is to develop representative background concentrations which, when added to modeled impacts, are used in the NAAQS compliance analysis.

Representative background concentrations for use with the Project will be obtained from DAQ. Initially, the design concentration values provided by DAQ will be added to the modeled design concentration to estimate the total impact, for applicable pollutants.

4.10.2 Pre-construction Monitoring

The PSD regulations require that a PSD permit application contain an analysis of existing air quality for all regulated pollutants that the source has the potential to emit in significant amounts. For this project, those potential pollutants would be NO_2 and SO_2. The definition of existing air quality can be satisfied by air measurements from either a state-operated or private network, or by a pre-construction monitoring program that is specifically designed to collect data in the vicinity of the proposed source. To fulfill the pre-construction monitoring requirement for PSD without conducting on-site monitoring a source may either:

1. Justify that data collected from existing monitoring sites are conservatively representative of the air quality in the vicinity of the proposed Project site.

2. Demonstrate through modeling the ambient impacts from the proposed Project are less than the Significant Monitoring Concentrations (SMC) established by the EPA (see **Table 4-3**).

As such, if the Project-only modeled concentrations are greater than the SMCs found in **Table 4-3,** then the background air quality data provided by DAQ to quantify existing air quality will be used.

Table 4-3 Significant Monitoring Concentrations

Pollutant	Averaging Period	SMC ($\mu g/m^3$)
NO_2	1-hour	NA
	Annual	14
SO_2	1-hour	NA
	3-hour	NA
	24-hour	13
	Annual	NA

5.0 ADDITIONAL IMPACT ANALYSIS

Pursuant to the Federal PSD regulations, additional impact analyses must be addressed for projects subject to PSD review. The various components of the additional impact analyses are discussed below.

5.1 Class I Area Analysis

DAQ will send information on the Project emission increases and the distances to Class I areas to the Federal Land Managers at the National Park Service (NPS), United States Forest Service (USFS), and United States Fish and Wildlife Service (FWS) to determine if they would require an AQRV analysis. We anticipate that a Class I AQRV analysis will not be required. Therefore, the proposed Class I area analysis will address only PSD increment consumption at the nearby Class I areas.

There is only Class I area within 300 km of the proposed Project site. That is the Swanquarter Wilderness Area, approximately 65 kilometers from the Mill.

In accordance with Appendix W (Section 4.2.c.i), because AERMOD (Version 18081) is being used for the Project's nearfield assessment, it can be utilized as a screening-level analysis to estimate the Project's potential for a significant modeled impact at the PSD Class I area mentioned above. As such, AERMOD will be used as a screening analysis with the meteorological data described in **Section 3.4** and with a radial arc of receptors located 50 km from the proposed Project. Receptors along the 50-km arc will be placed every 1 degree and cover the angular distance of the entire Class I area plus an additional 3 degrees of buffer on each side.

If the modeled concentrations along the 50-km arc of receptors are less than the Class I area SILs (shown in **Table 5-1**), then no additional modeling will be required as the Project will not be able to cause or contribute to a violation of the NAAQS or PSD increments. It is anticipated that the Class I area modeling will result in modeled impacts that are less than the SILs for all pollutants and averaging periods.

Table 5-1 Criteria Pollutant Class I Significant Impact Levels

Pollutant	Averaging Period	Class I SIL ($\mu g/m^3$)
NO_2	1-hour	NA
	Annual	0.1
SO_2	1-hour	NA
	3-hour	1
	24-hour	0.2
	Annual	0.08

5.2 Visible Plume Analysis

Federal Land Managers' Air Quality Related Values Work Group Phase 1 Report – Revised (2010) recommends that an analysis of visibility impairment (i.e., plume blight) at Class I areas within 50 kilometers of the proposed Project site. The nearest Class I area is more than 50 km of the proposed Project. Therefore, a visible plume analysis is not warranted for any Class I areas.

In addition to the Class I area analysis there is a requirement, as part of the PSD additional impacts analysis, for a visibility analysis to be performed within the area affected by the facility. In that regard, DAQ will be consulted to identify a nearby state park or other sensitive area in the Project vicinity for which a visible plume analysis will be conducted.

The visible plume analysis will be conducted with the most current version of US EPA's screening model VISCREEN to determine if project emissions during normal operations have the potential to cause visibility impairment. VISCREEN will be applied with the guidance provided in US EPA's Workbook for Plume Visual Impact Screening and Analysis (Revised) (EPA 1992) (Workbook).

As such the VISCREEN model will be applied to estimate two visual impact parameters, plume perceptibility (ΔE) and plume contrast (Cp). Screening-level guidance indicates that values above 2.0 for ΔE and +/- 0.05 for Cp are considered perceptible. The Workbook offers two levels of analysis. Level 1 screening analysis which is the most simplified and conservative approach employing default meteorological data with no site-specific conditions. The Level 2 analysis takes into account representative meteorological data and site-specific conditions. According to Figure 9 in the Workbook, the background visual range recommended for the Project area is 20 kilometers. This background visual range will be used for both the Level 1 and Level 2 (if required) screening analyses.

Initially, a Level 1 analysis will be conducted and if the VISCREEN results are less than the ΔE and Cp screening values, no further analysis will be required. If necessary, a Level 2 analysis will be conducted in accordance with the recommendations in the Workbook.

5.3 Growth Analysis

A qualitative assessment will be made as to the project's potential to cause general commercial, residential, industrial or other secondary growth in the area. If substantial growth due to this project were expected, an assessment of associated air quality impacts would be required.

However, this Project is not expected to employ additional employees at this time. Therefore, secondary growth from this project is not expected, and thus an analysis of such growth is not proposed.

5.4 Soils and Vegetation Analysis

An analysis of the Project's potential impact on soils and vegetation in the vicinity of the facility will be performed in accordance with the procedures recommended in EPA's "A Screening Procedure for Impacts of Air Pollution Sources on Plants, Soils and Animals" (EPA-450/2-81-078). The highest predicted NO_2 and SO_2 impacts from the Project used in the SIL analysis will be compared to the screening concentrations listed in the above referenced document, to demonstrate compliance.

5.5 Air Toxics Analysis

Per 15A NCAC 2Q.0700, toxic air pollutant (TAP) compliance demonstrations are required for new or modified sources to ensure TAPs from the facility will not cause any acceptable ambient level (AAL) listed in 15A NCAC 02D.1104 to be exceeded beyond the property line. TAP emissions from not only the project, but also from unmodified operations of the facility are required to demonstrate compliance with the AALs.

An Air Toxic modeling analysis was performed in June 2018; therefore, this Air Toxic modeling analysis will only be performed for pollutants greater than the TPER and that had a change in emissions since the previous project. Air Toxic modeling analyses will be performed according to procedures detailed in "Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina.[6]"

[6] https://files.nc.gov/ncdeq/Air%20Quality/permits/mets/NC_Toxics_Guidance_rev_24May2018.pdf

6.0 SUBMITTAL OF ANALYSIS RESULTS

The findings of the air quality impact analyses will be submitted to DAQ in a formal report for review and approval. The report will address the following:

- Source Data: Source data required for evaluation of Project impacts will be provided. This will include criteria pollutant emission rates and stack exhaust parameters.
- Choice of Models: The chosen models including version numbers and selected options will be discussed.
- Receptor Data: A plot of the receptor grid used in the AERMOD analysis will be provided with the final application document.
- Meteorology: The meteorological conditions used in the analysis will be documented.
- Modeling Summary: Results of the modeling analyses for all operating scenarios will be documented and summarized.
- Compliance with NAAQS: A demonstration of compliance with these standards will be presented, if necessary, and supported in the report in text, tabular and/or graphical format.
- Additional impacts: The additional impacts analysis will consist of an analysis of visible plume impacts and an analysis on impacts of soils and vegetation.
- Model Output and Databases: The model input and output files will be provided to DAQ on CD/DVD-ROM. Also, BPIP-Prime input and output files will be provided. The final modeling report will also include graphics (e.g., contour maps) that show the extent of the air quality impacts for the worst case year for each pollutant and averaging period. The figures will utilize a base map that is readily understandable by the general public. Each map will clearly identify the proposed plant location relative to these air quality impacts.

Appendix G

Modeling Files