

**Northeast Packaging Company  
Aroostook County  
Presque Isle, Maine  
A-894-71-B-A**

**Departmental  
Findings of Fact and Order  
Air Emission License**

After review of the air emission license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

**I. REGISTRATION**

A. Introduction

Northeast Packaging Company (NPC) of Presque Isle, Maine has applied for an amendment to its Air Emission License, permitting the operation of a new thermal oxidizer to control VOC emissions from their bag printing operations.

B. Application Classification

The modification of a minor source is considered a major modification based on whether or not expected emission increases exceed the “Significant Emission Levels” as defined in the Department’s regulations. The emission increases are determined by subtracting the current licensed emissions preceding the modification from the maximum future licensed allowed emissions, as follows:

<b><u>Pollutant</u></b>	<b><u>Current License (TPY)</u></b>	<b><u>Future License (TPY)</u></b>	<b><u>Change (TPY)</u></b>	<b><u>Sig. Level</u></b>
PM	N/A	0.1	0.1	100
PM <sub>10</sub>	N/A	0.1	0.1	100
SO <sub>2</sub>	N/A	0.2	0.2	100
NO <sub>x</sub>	N/A	1.1	1.1	100
CO	N/A	0.3	0.3	100
VOC	39.9	24.9	(15)	50

This modification will reduce VOC emissions; however, the firing of propane will slightly increase the other criteria pollutant emissions. This increase in emissions is below major modification thresholds and therefore this license modification is considered minor and has been processed as such.

## **II. BEST PRACTICAL TREATMENT (BPT)**

### **A. Introduction**

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Definitions Regulation, 06-096 CMR 100 (last amended December 24, 2005). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in Definitions Regulation, 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

### **B. Process Description**

NPC prints and manufacturers multiwall paper bags and printed polyethylene film bags. Currently NPC uses both water based and solvent based inks for printing purposes. The facility was under licensing thresholds using mainly water based inks for many years. However, several customers, including several of the major supermarket stores have required certain product quality and appearance that can only be achieved currently through use of solvent-based inks. NPC is working with new ink suppliers on water-based technology for printing on polyethylene. Water-based inks are improving constantly; however, solvent-based inks are still necessary for current orders.

The Department determined through Air Emission License, A-894-71-A-N, that NPC is a minor source. With the #2 oil-fired boiler and dryer heaters less than 1.0 MMBtu/hr each, these units were considered insignificant per 06-096 CMR 115 of the Department regulations. For this reason, no emissions from these units were calculated. The VOC emission limit of 39.9 tons per year was established to keep the facility licensed below the major source thresholds and the

applicability to VOC RACT and therefore this facility is considered a synthetic minor.

C. Regenerative Thermal Oxidizer (RTO) Installation

NPC is proposing to purchase and install an RTO to reduce Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAP) used in the printing of their polyethylene bags. The RTO is a Millennium 10,000 unit with a capacity of handling 172 pounds per hour of solvent, which would far exceed the current production at their three printing presses. The RTO system will also reduce odor associated with the VOC emissions. It combines high temperature thermal oxidation with a regenerative heat exchange to efficiently convert VOCs and other odor causing organic compounds to carbon dioxide and water vapor.

The RTO consists of two (2) energy recovery columns connected by a high temperature combustion chamber. Flow is directed through the unit by pneumatic valves such where one column is in a gas-heating (inlet) mode and the other column is in a gas-cooling (outlet) mode. VOC-laden air enters the oxidizer through the inlet header and is fed into the base of the first column where it passes vertically up through ceramic heat exchange media and is preheated almost to the combustion chamber temperature. The burner in the combustion chamber raises the air temperature to the operating set point where the oxidation process is completed. Hot purified air then enters column B and passes vertically down through the ceramic media and is cooled before exhausted to atmosphere.

D. BACT Analysis

NPC was not required to install add-on pollution control when its original air emissions license A-894-71-A-N was issued October 12, 2006. Due to the high air volume and low VOC concentration associated with the process at NPC, add-on control technology was not feasible for the facility at that time. Therefore, a VOC limit of 39 tons per year was established as BACT for the facility, based on material usage and VOC content.

Due to an increase in printing production since the time of NPC's initial license issuance and future projections for even greater production increases, NPC has proposed to control VOC and HAP. This will allow for production flexibility and room for future company growth while maintaining a status of a minor source per 06-096 CMR 115 of the Department's regulations. The RTO will give NPC the flexibility to run more efficiently, running all three presses with solvent inks when

necessary and the flexibility to run water-based ink as well. It will also assist in maintaining accurate records since the unit records what is actually going through the system. The RTO has baffles which can block air flow from the presses that are operating with water based inks, therefore, NPC can operate some presses with solvent inks and some with water based inks. Only the presses that operate with solvents need to be ducted to the RTO.

An additional benefit will be the heat exchange system which the manufacturer has indicated will decrease the use of propane on the presses by up to fifty percent. The RTO uses a regenerative heat exchanger to capture energy used during the thermal oxidation process and return it to the incoming process exhaust. Therefore, this unit uses less energy to complete the oxidation process than traditional thermal oxidizers.

The worst case projection for emissions is running all three presses with 100% solvent ink at 105 pounds per hour maximum. Based on VOC and HAP information from Material Safety Data Sheets (MSDS), the facility running 20 hours per day, six days per week, 50 weeks per year, and with an RTO operating at 95% control, NPC estimates that worst case emissions of VOC is approximately 19 tons per year. The facility will most likely never run at these high production and solvent use levels and the RTO will likely operate closer to 98% control efficiency.

To meet BACT, the RTO shall maintain a minimum destruction efficiency of 95% and the RTO shall be operated with a set temperature of at least 1350°F.

<b>RTO General Criteria</b>	
Measurement Method	Temperature is monitored with thermocouples.
Indicator Range	Temperature at the chamber exits are maintained above 1350°F. If the temperature drops below this threshold, the system is shut down until the problem is identified and repairs are completed. The excursion is reported.
<b>Performance Criteria</b>	
Data Representativeness	Thermocouples installed at the chamber exit per manufacturer's design. Thermocouples are accurate to within +/- 40°F.
QA/QC	Inspections of the RTO, including thermocouples, are performed monthly. Annual calibrations on the thermocouples are performed in accordance with manufacturer recommendations.
Monitoring Frequency	Temperatures are measured continuously *
Data Collection Procedure	Temperature is recorded continuously on a chart recorder with a minimum sensitivity of <10°F.

\* The temperature recordings are identified as a Parameter Monitor. Each parameter monitor must record accurate and reliable data. If the parameter monitor is recording accurate and reliable data less than 98% of the source operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the parameter monitor was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions.

The RTO is initially fired using a 2.3 MMBtu/hr propane burner. The burner is designed to fire at cold start-up at approximately 18 gallons/hour. Cold startup up time is estimated from the manufacturer to last about 2 hours to reach temperature. Once the unit is at temperature, the average consumption will be less than 1 gallon per hour. The RTO manufacturer and NPC expect the combustion of VOC to maintain the necessary heat for proper RTO operation, thereby significantly decreasing propane usage.

E. Bag Machine

NPC is also proposing to install and operate an additional bag machine. NPC currently has four bag machines that cut and seal polyethylene film into finished bags. This process creates small amounts of smoke at times which is vented off the machines. In January of 2006, NPC installed Smog Hogs (manufactured by United Air Specialists) which filters and cleans smoke electrostatically. These units electrically charge microscopic PM contaminants and then capture them in the ESP collection cells. To meet BACT, NPC will install this control on the proposed new bag machine to reduce odor and emissions.

F. Annual Emissions

Based on the maximum propane fuel use of 176,000 gallons per year to the 2.3 MMBtu/hr propane-fired burner and the operation of the RTO at 95% destruction efficiency, the following table shows the facility's annual emissions.

**Total Annual Emission for the Facility**  
(used to calculate the annual license fee)

Pollutant	Total (tons/year)
PM	0.1
PM <sub>10</sub>	0.1
SO <sub>2</sub>	0.2
NO <sub>x</sub>	1.1
CO	0.3
VOC	24.9
Single HAP	9.9
Combined HAP	24.9

### **III. AMBIENT AIR QUALITY ANALYSIS**

According to 06-096 CMR 115 of the Department's regulations, NPC's proposed modification does not trigger an air quality analyses. Based on the above total facility emissions, NPC is below the emissions level required for modeling.

### **ORDER**

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards, or increment standards either alone or in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-894-71-B-A, subject to the conditions found in Air Emission License A-894-71-A-N, and to the following conditions:

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

### **SPECIFIC CONDITIONS**

**Condition (23) of Air Emissions License A-894-71-A-N, which required NPC to submit an Annual Emission Statement per 06-096 CMR 137, shall expire as of the effective date of this amendment.**

**The following shall replace Condition (18) of Air Emissions License A-894-71-A-N:**

**(18) VOC Emissions/Records [06-096 CMR 132 and 06-096 CMR 115, BACT]**

- A. NPC shall comply with the recordkeeping requirements of Chapter 132 of the Department's regulations by compiling monthly quantities and VOC content of alcohol and ink used as a total rather than press-by-press basis.
- B. NPC shall install an RTO to reduce VOC and HAP emissions. The RTO shall be operated whenever solvent inks are used on the press. The presses that operate with water-based inks do not have to be ducted to the RTO.
- C. The RTO shall achieve 95% destruction of VOCs from the dryers of the three printing presses. Compliance with the destruction efficiency shall be demonstrated by an initial stack test within 180 days of installation and every five years thereafter in accordance with 40 CFR Part 60, Appendix A, Method 25A.
- D. The RTO shall maintain a temperature of at least 1350°F. Compliance shall be demonstrated by thermocouples (that shall not be in direct contact with the auxiliary burner flame) maintained at the incinerator chamber exit. The temperature shall be recorded continuously and meet the parameter monitor uptime requirement.
- E. NPC shall limit VOC emissions from the facility to 24.9 tons per year based on a 12-month rolling total. Records of solvent and ink VOC content and usage, along with the VOC destruction efficiency of the RTO, shall be maintained to document compliance with this limit on a monthly and 12 month rolling total basis.
- F. Total HAP emissions from the facility shall not exceed 9.9 tons/year for any single HAP and/or 24.9 tons per year for total combined HAP. (12 month rolling total). Compliance shall be demonstrated by record keeping including total usage and HAP content, and taking into account the destruction efficiency of the RTO.
- G. NPC shall operate the RTO such that the visible emissions from the stack does not exceed 10% opacity on a six (6) minute block average basis.

**The following conditions are new to Air Emission License, A-894-71-A-N:**

- (26) NPC may install and operate a new bag machine along with its existing bag machines. NPC shall maintain electrostatic filters to clean smoke vented from the bag machines. Daily inspections shall be logged to determine proper operation of the ESP collection units whenever the bag machines are operating.  
[06-096 CMR 115, BACT]
- (27) **Parameter Monitors**  
Each parameter monitor must record accurate and reliable data. If the parameter monitor is recording accurate and reliable data less than 98% of the source operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the parameter monitor was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions. [06-096 CMR 115, BPT]

DONE AND DATED IN AUGUSTA, MAINE THIS                      DAY OF                      2008.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: \_\_\_\_\_  
DAVID P. LITTELL, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-894-71-A-N.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: January 2, 2008  
Date of application acceptance: January 9, 2008  
Date filed with Board of Environmental Protection: \_\_\_\_\_

This Order prepared by Edwin Cousins, Bureau of Air Quality