NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: DRAFT

Region: Mooresville Regional Office
County: Union
NC Facility ID: 9000199
Inspector's Name: Jim Westmoreland
Date of Last Inspection: 05/17/2011
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Darnel, Inc.

Facility Address:
Darnel, Inc.
1809 Airport Road
Monroe, NC 28110

SIC: 3086 / Plastics Foam Products
NAICS: 32614 / Polystyrene Foam Product Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Walter Jones, III Plant Engineer (704) 625-9869 1809 Airport Road Monroe, NC 28110	Charles Odle General Manager (704) 625-9869 1809 Airport Road Monroe, NC 28110	Walter Jones, III Plant Engineer (704) 625-9869 1809 Airport Road Monroe, NC 28110

Application Data

Application Number: 9000199.10A
Date Received: 04/01/2010
Application Type: Modification
Application Schedule: TV-1st Time

Existing Permit Data
Existing Permit Number: 09709/R02
Existing Permit Issue Date: 11/02/2009
Existing Permit Expiration Date: 12/31/2011

Review Engineer: Kevin Godwin

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 09709/R03
Permit Issue Date:
Permit Expiration Date:

I. Introduction and Purpose of Application

Darnel, Inc. produces extruded polystyrene foam food packaging using isobutane as the foaming agent. Currently permitted sources include: five (5) extruders, eleven (11) thermoformers and associated grinders, six (6) fluff silos, and product storage.

On November 11, 2009, Darnel was issued a permit under 15A NCAC 02Q .0504 allowing the facility to be classified at Title V rather than synthetic minor. The permit was issued under 15A NCAC 02D .0300 construction and operation rules. The permit included a stipulation that required the facility to submit an application within 12-months after commencing operation to modify the construction and operation permit to meet the requirements of 2Q .0500. This application serves to satisfy the requirements under 2Q .0500.

II. Compliance History

Darnel was last inspected by Mr. Jim Westmoreland of the Mooresville Regional Office (MRO) on May 17, 2011. According to Mr. Westmoreland's inspection report, the facility appeared to operating in compliance with applicable regulations at the time of inspection. The inspection report includes the five-year compliance history as follows:

> "A Notice of Violation (NOV) dated June 21, 2007 was issued to this company by Mr. Michael Reid of SSCB in Raleigh due to an inspection of this facility on May 2, 2007 for failure to submit

a Risk Management Plan (RMP) to EPA as required by 15A NCAC 2D .2100 "Risk Management Prog1ram", which incorporates by reference 40 CFR Part 68.150(a). No enforcement action was taken by the Division of Air Quality for this violation.

Notice of Violation (NOV) letter dated August 11, 2008 was issued to this company for failure to maintain inspection and maintenance logbook of the four bagfilters (ID Nos. CD-8, CD-8A, CD-9, and CD-9A) in accordance with Specific Condition and Limitation No. A. 8. "Bagfilter Requirements" of Air Permit No. 09709R00. No enforcement action was taken by the Division of Air Quality for this violation.

A Notice of Violation (NOV) letter dated May 24, 2010 was issued to this company for failure to submit a required quarterly VOC report. No enforcement action was taken by the Division of Air Quality for this violation."

III. Regulatory Review – Specific Emission Source Limitations

A. 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes" – This regulation establishes allowable emission rates for total suspended particulate (TSP) from any stack, vent or outlet, resulting from any industrial process for which no other emission control standards are applicable. Allowable emissions shall not exceed the level calculated with the equation; $E = 4.10*(P)^{0.67}$ for process rates less than or equal to 30 tph or $E = 55.0*(P)^{0.11} - 40$ for process rates greater than 30 tph. Process rate (P) means the total weight of all materials introduced into any specific process that may cause emissions of particulate matter.

Very small amounts of particulate matter are expected from the extruding and thermoforming process. These sources are uncontrolled. Compliance is expected.

The fluff silos (ID Nos. ES-8 through ES-13) are sources of PM that vent through a stack. Off-spec product and scrap are ground and fed to the fluff silos. The material from the fluff silos is fed back to the polystyrene foam extruders. The fluff silos are each controlled by two bagfilters operating in parallel. The reported bagfilter efficiency is 99.8%. The maximum process rate per silo is 1200 lb/hr. E calculates to 2.9 lb/hr per silo. A particle size analysis indicates that only 0.32% entering the silo is TSP (ref. CHEM BAC Laboratories, Inc. 8-24-11). Therefore, before control emissions are 3.84 lb/hr. After control emissions are 0.007 lb/hr. Compliance is indicated.

B. 15A NCAC 02D .0521 "Control of Visible Emissions" – This regulation establishes an opacity standard based on equipment manufacture date. For sources manufactured after July 1, 1971, visible emissions shall not exceed 20% opacity when averaged over a six-minute period. The latest inspection report did not note any VE problems. Continued compliance is expected.

IV. Regulatory Review – Multiple Emission Source Limitations

A. The following is taken from the review for P/N 09709R02 dated November 11, 2009:

15A NCAC 2Q .0317 for Avoidance of 15A NCAC 2D .0531 Sources in Nonattainment Areas – The facility has requested to take a limit on VOC emissions to avoid applicability of 2D .0531.

According to the application, VOC emissions are calculated based on the scrap rates from the extrusion system and the thermoforming systems. The excess material from the thermoforming system is calculated based on the shape of the parts and the size of the web and is consistent for any given part. The reject material at start-up, changeover, and process upsets at the extruder is monitored and logged by operators and quantified in daily reports. Reject material from the thermoformers is monitored and logged by operators and quantified in daily reports. Total scrap rates are calculated based on products made and scrap rates from the extrusion thermoforming areas. On a quarterly basis, these numbers are reviewed and modifications made to product mix, if necessary to ensure isobutane emission levels are not exceeded.

The facility established a limit on VOC emissions using the following formula:

Limit = Baseline Actual Emissions + PSD major source threshold rate for VOCs.

Baseline Actual Emissions (BAE) are defined at 40 CFR 51.166(b)(48). For existing units the BAE is determined based on actual emissions. However for "new" emission units after initial permitting, the BAE is defined by rule as the unit's PTE. There are several emission units that are still considered "new" under the NSR rules (i.e. that is they are less than 2 years old).

Baseline Actual Emissions = Actual emissions from all existing units (based on 24 month timeframe) for the existing equipment + Potential emissions from new equipment (less than 2 years old)

Actual emissions for used equipment = 32 tons
Potential emissions from new equipment = 45 tons

Therefore, BAE for this facility is 75 tpy. In order ensure that this change is not a major modification by itself, the permit will include a condition limiting emissions to BAE + the major source threshold of 100 tpy.

A condition is included in the revised permit with the above avoidance limit and appropriate recordkeeping/reporting requirements.

Note With Respect to Fugitive Emissions

This source is not a listed source and therefore fugitive emissions are not included in determining NSR applicability. 40 CFR 51.166(b)(20) defines "fugitive emissions" as "those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening."

Determining whether an emission is fugitive requires a case-by-case analysis. However, an emission should not be considered non-fugitive simply because is passes through a stack, chimney, vent, or other functionally equivalent opening. The touchstone in determining whether an emission is fugitive is whether the emissions can be reasonably collected.

The preamble to the U.S. EPA's original 1980 promulgation of the definition for "fugitive emissions" states:

> EPA has considered comments with respect to the proposed definition of "fugitive emissions," and has determined that one change is appropriate. Instead of defining fugitive emissions as "those emissions which do not pass through a stack, chimney, vent, or other functionally equivalent opening," EPA believes that the term should apply to "those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening." This change will ensure that sources will not discharge as fugitive emissions those emissions which would ordinarily be collected and discharged through stacks or other functionally equivalent openings, and will eliminate disincentives for the construction of ductwork and stacks for the collection of emissions. Emissions which could reasonably pass through a stack, chimney, vent, or other functionally equivalent opening will be treated the same as all other point emissions for threshold calculation purposes.

Other factors to consider in making this determination include whether other similar facilities collect, capture, or control the same pollutant, and the cost to both collect and control the emissions, the quantity of emission, and the ambient impact of the emissions. As demonstrated in the application, a summary provided in the RACT section below, the VOCs emitted from this process are emitted slowly throughout the process and there is no area of the process (with the exception of the reclaim) where the concentration of VOCs is such that collecting them is reasonable. Moreover, no other similar facility in North Carolina collects these emissions. Finally, as demonstrated by the RACT analysis, the cost of collecting and treating the VOCs is prohibitive. As a result, the NCDAQ has determined that with the exception of VOCs emitted from the reclaim, the remainder of the VOCs emitted are fugitive and therefore do not count towards PSD applicability.

B. 15A NCAC 2D .0902 Reasonably Available Control Technology (RACT) – Darnel is located in the Metrolina Nonattainment Area with a potential to emit VOC greater than 100 tpy. As such, it is subject to

RACT. Since no other RACT rule appears to apply, 15A NCAC 02D .0951 "Miscellaneous Volatile Organic Compound Emissions" applies. Pursuant to Rule 02D .0951(c)(1), the owner or operator shall install and operate reasonably available control technology. "Reasonably available control technology" means the lowest emission limit which a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

A RACT analysis is included in the application. The analysis evaluated four control technologies; 1) carbon adsorption, 2) condensation, 3) thermal/catalytic oxidation, and 4) flare. In order to determine economic feasibility, the applicant developed cost/ton for each control technology based on the Federal Cost Workbook. For each of the design cases, the following assumptions were made:

- Six silo vents each with a flow rate of 8,000 cfm,
- Maximum isobutane emissions of 175 tons per year, and
- Average emission rate of 42 lb/hr.

Condensation was determined to be technically infeasible due to the low condensation temperature (-190^{o}F) necessary to remove isobutane from the air stream.

The following table provides a summary of the resulting cost analysis:

Control Technology	**Cost** ($/ton)
Carbon adsorption	3,775
Catalytic oxidation	5,051
Thermal oxidation	10,292
Flare	3,055

A review of EPA 450/3-90-020 looking at alternative control technologies (ACT) confirms that isobutane emissions are primarily fugitive and difficult to capture. The document also confirms that incineration costs are high. The environmental cost of incineration is high as well considering the trade-off between VOC and NOx emissions particularly in an ozone non-attainment area. The applicant indicates that, presently there is no acceptable substitution for isobutane as a blowing agent. HCFCs are not allowed by FDA for food service trays and packaging. Moreover, the HCFC's that, in theory, could be used as substitutes for isobutane have significantly higher Global Warming Potential (GWP).

DAQ maintains that the above control technologies are economically infeasible. Therefore, DAQ recommends RACT require no additional controls and no further analysis be required for meeting the sources obligation as a 100 ton per year VOC source in Metrolina. It should be noted that, other than a BACT determination, there does not appear to be any later determinations in the RACT/BACT/LAER Clearinghouse for extruded polystyrene foam blowing.

Insignificant activities designated in this permit are exempt from RACT as emissions are less than 15 pounds per day.

V. Section 112(r) applicability

Darnel, Inc. is subject to the requirements of the Chemical Accident Release Prevention Program, Section 112(r) of the Clean Air Act. This facility uses butane as a blowing agent in the extrusion process. This company has one 30,000 gallon tank to store the butane. The threshold limit for butane is 10,000 pounds. According to the DAQ database, the risk management plan (RMP) was submitted to EPA on August 23, 2007. The 112(r) inspection was conducted by MRO on June 6, 2009. According to the inspection report, all required elements of the RMP were found to be in order, and compliance was indicated. A condition relating the requirements of 112(r) is included in the 1st Time Title V Permit.

VI. Compliance Assurance Monitoring (CAM)

The fluff silos are the only sources with control devices. Uncontrolled total PM emissions are estimated to be 263 tpy per silo. A particle size analysis indicates only 0.0001% entering the silos are PM-10 (ref. CHEM-GAC Laboratories, Inc., 8-24-11). Therefore, uncontrolled PM-10 emissions are < 1 tpy. Because pre-controlled

emissions are less than 100% of the amount required for a source to be classified as major, the control devices are exempt from CAM requirements.

VII. MACT Applicability

Darnel is an area source of hazardous air pollutants (HAP). The potential to emit is less than 10 tpy for all individual HAP and less than 25 tpy for total, combined HAP. No MACT applies to this facility.

VIII. New Source Review

Darnel is located in Union County which is classified as nonattainment for ozone. Darnel is an existing major source under the NSR permitting program with a potential to emit greater than 100 tpy of VOC. The existing permit includes a NSR avoidance condition as described above.

IX. Insignificant Activities

The isobutene storage tank (ID No. I-tank) is insignificant because of size or production rate under 15A NCAC 02Q .0503(8). No other insignificant activities are identified in the application.

X. Actual Emission Summary

The following are actual criteria pollutant emissions as reported in the Annual Air Pollutant Emission Inventory:

	2009	2010
TSP	6.53 tpy	6.93 tpy
VOC	75.56 tpy	90.78 tpy

XI. Other Regulatory Considerations

- An application fee of $867.00 is required and was received by DAQ on April 18, 2010.
- A zoning consistency determination was included with the application under 02Q .0300 and is not required for this 1st Time application.
- A Professional Engineer's seal is not required for this 1st Time Title V application.
- DAQ received the reduction and recycling activities form (A4).
- According to the application, 112r Prevention of Accidental Releases does apply to this facility.

XII. Draft/Proposed Permit Review Summary

A draft permit was provided to MRO on September 7, 2011.

NCDAQ published a Public Notice of the proposed 1st Time Title V permit in the ….. edition of ….

U.S. EPA, Region IV was provided a proposed permit for review on ….

XIII. Recommendations

This application for a 1st Time Title V permit has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility appears to be complying or is expected to achieve compliance as specified in the permit with all applicable requirements.

Issue P/N 09709T03.