

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: March XX, 2021

Region: Winston-Salem Regional Office
County: Randolph
NC Facility ID: 7600198
Inspector's Name: Robert Barker
Date of Last Inspection: 12/02/2020
Compliance Code: 3 / Compliance - inspection

Facility Data	Permit Applicability (this application only)
<p>Applicant (Facility's Name): Norcraft Companies, LP, dba UltraCraft Cabinetry</p> <p>Facility Address: Norcraft Companies, LP, dba UltraCraft Cabinetry 6163 Old 421 Road Liberty, NC 27298</p> <p>SIC: 2434 / Wood Kitchen Cabinets NAICS: 33711 / Wood Kitchen Cabinet and Countertop Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>	<p>SIP: 15A NCAC 02D .0515, .0521, .1806 NSPS: NA NESHAP: 40 CFR 63 Subpart JJ PSD: NA PSD Avoidance: Deleted 15A NCAC 02Q.0317 for 02D .1111 NC Toxics: NA 112(r): NA Other: NA</p>

Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	
Jim Mullen Director of Facilities (866) 259-5799 6163 Old 421 Road Liberty, NC 27298	Troy Brafford General Manager (800) 262-4046 6163 Old 421 Road Liberty, NC 27298	Peter Koech Human Resources Manager 6163 Old 421 Road Liberty, NC 27298	<p>Application Number: 7600198.20A Date Received: 11/17/2020 Application Type: Modification Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 05951/T22 Existing Permit Issue Date: 02/21/2017 Existing Permit Expiration Date: 01/31/2022</p>

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2019	0.0100	1.39	162.13	1.17	0.9800	5.09	4.08 [Xylene (mixed isomers)]
2018	---	1.47	149.14	1.23	0.6100	4.66	3.14 [Xylene (mixed isomers)]
2017	---	1.16	143.84	0.9800	0.6100	4.31	2.83 [Xylene (mixed isomers)]
2016	---	0.4100	143.66	0.3400	0.5500	4.69	2.82 [Xylene (mixed isomers)]
2015	0.0100	1.03	196.81	0.8700	0.6100	4.69	2.43 [Xylene (mixed isomers)]

<p>Review Engineer: Richard Simpson</p> <p>Review Engineer's Signature: _____ Date: March XX, 2021</p>	<p>Comments / Recommendations:</p> <p>Issue: 05951/T23 Permit Issue Date: March XX, 2021 Permit Expiration Date: January 31, 2022</p>
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I. Introduction and Purpose of Application

- A. Norcraft Companies, LP, dba UltraCraft Cabinetry (referred to as Norcraft throughout this document) currently holds Air Permit No. 05951T22 with an expiration date of January 31, 2022 for a furniture manufacturing facility in Liberty, Randolph County, North Carolina. The facility manufactures laminated wood cabinets for residential kitchens and bathrooms. Some of the cabinet doors arrive at the facility already coated by a “foil” that does not use solvents. This “foil” process creates a smooth undercoat which can stand alone, or to which a topcoat can be applied. The facility is currently operating two shifts per day (8 hours each), 5 days per week, for 50 weeks per year or 4,000 hours per year.
- B. Permit application No. 7600198.20A was received on June 30, 2020 for a second step modification per NCAC 02Q .0501(b)(2). This permit action will address the following main changes associated with the first and second step modifications as outlined in the application:
- Modify the finishing material used in emission source spray booths (ID Nos. SB-1 through SB-20) to improve the quality of the finishing material on the cabinets. No equipment will be changed.
 - Remove HAP avoidance condition 15A NCAC 02Q .0317 for 02D .1111.
 - Add 15A NCAC 02D .1111 “Maximum Achievable Control Technology” and 40 CFR Part 63 Subpart JJ “National Emission Standards for Wood Furniture Manufacturing Operations” to the applicable sources.
 - Update permit with three 502(b)(10) requests with application numbers 7600198.18A, 7600198.19A, and 7600198.19B.

II. History/Background/Application Chronology

February 21, 2017 – Permit 05951T22 was signed and issued for a Title V renewal.

October 15, 2018 – Per a 502(b)(10) request with application No. 7600198.18A, added bagfilter (ID No. BF-3) that replaced portable bagfilters controlling miscellaneous woodworking and door operations (ID No. MWD).

July 31, 2019 – Per a 502(b)(10) request with application No. 7600198.19A, added testing spray booth (ID No. SB-20).

December 19, 2019 – Per a 502(b)(10) request with application No. 7600198.19B, added an extra sealer oven rated at 0.8 million Btu per hour to bake oven (ID No. BO-3). The combined capacity is 1.6 million Btu per hour.

January 30, 2020 - The facility was inspected by Robert Barker from the Winston-Salem Regional Office. At the time of the inspection, the facility appeared to operate in compliance with all applicable regulations.

November 18, 2020 – Permit application 7600198.20A was received as a significant one step NCAC 15A .02Q .0501(c)(2) Title V modification.

December 4, 2020 – Robert Barker from the Winston-Salem Regional Office submitted comments to DAQ permit engineer. Comments were included.

January 11-12, 2021 – Contacted the facility with questions on bagfilter (ID No. BF-3) related to CAM applicability. Calculations were provided from the facility that exempt BF-3 from CAM for this modification.

January 13-18, 2021 – The facility, Winston-Salem Regional Office, and Stationary Compliance Section were requested by the Permitting Section to comment on the modification. Comments were received and included in the permit and review from DAQ.

January XX, 2021 – Title V Equipment Editor (TVEE) changes were approved by Ms. Jenny Sheppard TVEE Coordinator.

January XX, 2021 – DRAFT permit sent to public notice and EPA for review prior to issuance. The 30-day public comment period ended **February XX, 2021** with the receipt of no comments. The 45-day EPA review period ended **March XX, 2021** with the receipt of no comments.

March 20, 2021 – Permit 05951T23 was signed and issued.

III. Permit Renewal/Modification/Changes

The following table lists all changes made from previous permit No. 05951T23

Page No.	Section	Description of Changes
Cover Letter	N/A	Updated cover letter with application number, permit numbers, and dates.
3	Section 1	Added MACT JJ to applicable sources.
3, 4	Section 1, Section 2.1 A.	Per 502(b)(10) dated October 15, 2018 for application No. 7600198.18A, added bagfilter (ID No. BF-3) that replaced portable bagfilters controlling miscellaneous woodworking and door operations (ID No. MWD).
3, 6	Section 1, Section 2.1 B.	Per WSRO permit review and inspection, deleted emission source “one gluing operation” with ID No. GLU-1 since source is no longer used.
3, 6	Section 1, Section 2.1 B.	Per 502(b)(10) dated July 31, 2019 for application No. 7600198.19A, added testing spray booth (ID No. SB-20).
3, 6	Section 1.	Per 502(b)(10) dated December 19, 2019 for application No. 7600198.19B, added an extra sealer oven rated at 0.8 million Btu per hour to bake oven (ID No. BO-3). The combined capacity is 1.6 million Btu per hour.
6	Section 2.1 B.	In Table, deleted HAP avoidance conditions, added MACT JJ and odor rule.
9	Section 2.2 A.	In Table, deleted HAP avoidance conditions.
NA	Section 2.2 A.2.	Deleted HAP avoidance conditions.
10	Section 2.2 A. 2.	Moved toxics rule from Section 2.2 A. 3 to Section 2.2 A.2.

Page No.	Section	Description of Changes
11	Section 2.2 B.	Added 15A NCAC 02D .1111 “Maximum Achievable Control Technology” and 40 CFR Part 63 Subpart JJ “National Emission Standards for Wood Furniture Manufacturing Operations” to applicable sources.
16	Section 3	The General Conditions were updated to the latest version of DAQ shell.

There were changes made to the Title V Equipment Editor (TVEE) under this permit modification.

IV. Regulatory Review/Equipment Changes/Process Changes

Norcraft is subject to the following regulations, in addition to the requirements in the General Conditions:

- a. 15A NCAC 02D .0512 “Particulates from Miscellaneous Wood Products Finishing Plants.”
- b. 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"
- c. 15A NCAC 02D .0516 "Sulfur Dioxide from Combustion Sources"
- d. 15A NCAC 02D .0521 "Control of Visible Emissions"
- e. 15A NCAC 02D .1111 "Maximum Achievable Control Technology" (40 CFR Part 63 Subpart JJ)
- f. 15A NCAC 02D .1806 "Control and Prohibition of Odorous Emissions"
- g. 15A NCAC 02Q .0317 "Avoidance Conditions" (PSD Avoidance for VOC)
- h. 15A NCAC 02D .1100 "Control of Toxic Pollutants”

An extensive review for each applicable regulation is not included in this document, as the facility’s status with respect to all but two of the regulations has not changed. Compliance with these regulations will be determined during subsequent inspections, reviews of reports, and/or stack testing. The facility modification removed HAP avoidance condition 15A NCAC 02Q .0317 for 02D .1111 and is now subject to 15A NCAC 02D .1111 “Maximum Achievable Control Technology” and 40 CFR Part 63 Subpart JJ “National Emission Standards for Wood Furniture Manufacturing Operations” to the applicable sources. For a discussion of MACT requirements, see Section 6. The permit will be updated to reflect the most current stipulations for all applicable regulations. Updates and details to the permit are noted in the Table of Changes above.

V. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

NSPS – The Permittee is not currently subject to any New Source Performance Standards. This permit modification does not affect this status.

NESHAPS/MACT – Due this permit modification, the facility is subject to 15A NCAC 02D .1111 “Maximum Achievable Control Technology” and 40 CFR Part 63 Subpart JJ “National Emission Standards for Wood Furniture Manufacturing Operations”. All of the furniture production activities are subject to this rule. This does not include the miscellaneous woodworking and wood waste storage activities.

In accordance with 40 CFR 63.2, New and Existing sources are defined as below:

“New source” means any affected source the construction or reconstruction of which is commenced after the Administrator first proposes a relevant emission standard under this part establishing an emission standard applicable to such source.

“Existing” source means any affected source that is not a new source.

Therefore, for the purpose of 40 CFR 63 Subpart JJ, New source means any affected source the construction or reconstruction of which is commenced after the Administrator first proposed an emission standard for wood furniture operations under 40 CFR Part 63. That date is December 6, 1994. This facility is considered an existing source since it was operational before December 6, 1994.

The rule limits HAP emitted from various furniture manufacturing operations and provides several options for demonstrating compliance. Norcraft must keep records of material usage, calculations, operator training, and good work practice activities. Norcraft must submit a summary report of the recordkeeping activities twice per year. Specific requirements are located in permit Section 2.2 B.

PSD – Norcraft has accepted an avoidance limit for 15A NCAC 02D .0530 Prevention of Significant Deterioration. The permit condition requires the emissions of VOCs not to exceed 250 tons per year and to be calculated at the end of each month. The calculated emissions must be entered in a logbook along with the calculated rolling average for the previous 12 months. A summary report of the required monitoring and recordkeeping is required every six months including the preceding six-month period monthly emissions. The permit condition did not require any modification under this 2nd step of a Significant Modification. As per the above emissions inventory summary, VOC emissions in 2019 were reported to be 162.13 tons per year. Continued compliance with this facility-wide VOC limit is expected.

112(r) – The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in the Rule. This permit modification does not affect this status.

CAM – The woodworking operations exhaust to two wood waste collection systems (**ID Nos. WCS-1 and WCS-2**), which in turn vent to a bagfilter (**ID No. BF-1**). The sanding room (**ID No. SR**) exhaust to bagfilter (**ID No. BF-2**). Total estimated PM₁₀ actual emissions from woodworking Sources (WCS-1, WCS-2 and SR) for CY 2019 was 0.25 tons. Each of the woodworking sources are exempt from a CAM plan because pre-control PM₁₀ emissions are estimated to be below 100 tons per year.

The miscellaneous woodworking and door operations (**ID No. MWD**) exhaust to bagfilter (**ID No. BF-3**). The control devices were added as a 502(b)(10) to this permit modification. As requested by phone and email, the facility sent additional information for emission estimates on BF-3.

BF-3 is a 68,000 cfm Donaldson Torit Baghouse. At 0.001 gr/dscf outlet grain loading for particulate emissions:

Controlled PM Emissions = 68,000 cfm * 0.001 gr/dscf * 60 min/hour * 1 lb/7,000 gr * 8760 hours/year * 1 ton/2000 lbs = 2.55 tons/year

Potential Controlled PM₁₀ Emissions = 23.8 % of total PM emissions = 0.238 * 2.55 tons/year = 0.61 tons/year

Assuming 99 % control efficiency for the bag house:

Uncontrolled PM Emissions = Controlled PM Emissions / (1 – Control Efficiency) = 2.55 / (1 - 0.99) = 255 tons/year

Potential Uncontrolled PM₁₀ Emissions = 23.8% of Total PM Emissions = 0.238 * 255 tons/year = 60.7 tons/year

The miscellaneous woodworking and door operations (**ID No. MWD**) are exempt from a CAM plan because pre-control PM₁₀ emissions are estimated to be below 100 tons per year. This permit modification does not affect this status.

VI. Facility Wide Air Toxics

Norcraft is subject to 15A NCAC 02D .1100 "Control of Toxic Pollutants". The air toxics regulations and a facility review were triggered previously for this facility. The emission limits are based on air dispersion modeling conducted for the facility. Norcraft's emission limits are set at levels that resulted in ambient concentrations of 99% of the acceptable ambient levels as determined using AERMOD. The requested emission limits are presented in permit Section 2.2 A.2. This permit modification does not affect this status.

Affected Source	Toxic Air Pollutant	Emission Limit	
		24-hour (lb/day)	1-hour (lb/hr)
Facility-wide	chlorobenzene	985	--
	di(2-ethylhexyl)phthalate	13.4	--
	ethyl acetate	--	743
	ethylene glycol monoethyl ether	53.7	10.08
	methyl ethyl ketone	1,656	470
	methyl isobutyl ketone	1,146	159
	phenol	--	5.04
	toluene	2,103	297
	toluene diisocyanate,2,4- and 2,6- isomers	0.090	--
	xylene	1,208	342
	formaldehyde	--	0.796

VII. Facility Emissions Review

Actual emissions from 2015 through 2019 are listed on Page 1. Estimated potential emissions from the proposed modification are located in Attachment 1 of this review.

VIII. Stipulation Review

The facility was last inspected by Robert Barker of the Winston-Salem Regional Office on January 30, 2020. At the time of the inspection, the facility appeared to be in compliance with all applicable air quality regulations.

IX. Compliance Status

May 4, 2018 - Notice of Violation for late quarterly report required by Condition 2.2.A.3 (2D .1100). The report was due by April 30, 2018 but was not received until May 2, 2018.

March 17, 2016 - Notice of Violation for late Annual Compliance Certification (ACC) as required by General Condition 3.P. The report was due by March 1, 2016 but was not received until March 14, 2016.

There have been no other compliance issues within the past five years.

X. Public Notice/EPA and Affected State(s) Review

A thirty-day public notice period and a forty-five-day EPA review period is required for this single step significant modification of the Title V permit. A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to the EPA. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the notice is provided to the public under 02Q .0521.

EPA's 45 Day Review period

Kelly Fortin (U.S. EPA, Region IV) was provided a PROPOSED permit for review on September 4, 2020. EPA 45-day review period ended on March XX, 2021. No comments were offered or received.

Public Notice

The 30-day public notice of the PROPOSED permit was posted on the NCDAQ website on January XX, 2021. No comments were offered or received.

XI. Other Regulatory Considerations

- A P.E. seal was not required for the permit modification.
- The appropriate number of application copies was received by the DAQ.
- A zoning consistency determination was not required for this permit modification.
- An application fee of \$988 was required and received by check for the permit modification.
- Randolph County has not triggered increment tracking under PSD for any pollutants, so no tracking is required.

XII. Conclusions, Comments, and Recommendations

The permit modification application (7600198.20A) for Norcraft Companies, LP, dba UltraCraft Cabinetry located in Liberty, Randolph County, North Carolina has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 05951T23.

Attachment 1

**Supporting Calculations For Significant Title V Modification
ONE GLUING OPERATION**

Maximum Usage

Green contact Adhesive (3M 30NF Fast Bond)^{a,b} 12 containers (assume 1 container/month)

^a Glue is 3M 30NF Fast Bond and received in 5 gallon containers.

^b Product is 1.75% solids by weight and has a density of 9.18 lb/gal.

Product	Usage (gal)	Usage (lb)
3M 30NF Fast Bond	60	551

Emissions (tons)

VOC =	551 lbs *	50% VOC	275.40 lb/yr	0.1377 tons/yr
Methanol =	551 lbs *	2.04% methanol	11.24 lb/yr	0.0056 tons/yr
Toluene =	551 lbs *	2.64% toluene	14.54 lb/yr	0.0073 tons/yr

No control device for this source.

**Supporting Calculations For Significant Title V Modification
20 Dry Filter Spray Booths**

Based on the projected production and changes to the formulation in the finishes, UltraCraft anticipates an increased in xylene.

Annual Projected Xylene Emissions 12.49

For the Spray Booth emissions (SB-1 through SB-20), the projected xylene ratio increase from current finishing material emissions to projected finishing material emissions was calculated by taking the highest xylene production month in 2019 and comparing it to the projected xylene emissions level provided by the facility of 12.49 tpy. This projection factor was applied to all finishing HAPS/TAPS to conservatively calculate potential increases for all other HAPS/TAPS. VOC and PM emissions are not anticipated to change significantly.

Chemical	CAS	Potential Controlled Emissions				Potential Uncontrolled Emissions			
		Max. Highest Emissions (lb/mo)	Max. Highest Emissions (lb/yr)	Max. Highest Emissions (tpy)	Projected Emissions for HAPs ^{1,2} (tpy)	Max. Highest Emissions (lb/mo)	Max. Highest Emissions (lb/yr)	Max. Highest Emissions (tpy)	Projected Emissions for HAPs (tpy)
Formaldehyde	050-00-0	40.0	480	0.24	0.62	40.0	480	0.24	0.62
Methanol	067-56-1	5.10	61.2	0.03	0.08	5.10	61.2	0.03	0.08
MEK	078-93-3	41.8	501	0.25	0.65	41.8	501	0.25	0.65
Naphthalene	091-20-3	0.02	0.26	1.32E-04	3.44E-04	0.02	0.26	1.32E-04	3.44E-04
Isopropyl Benzene or Cumene	098-82-8	16.9	202	0.10	0.26	16.9	202	0.10	0.26
Ethylbenzene	100-41-4	118	1,421	0.71	1.85	118	1,421	0.71	1.85
MIBK	108-10-1	11.5	138	0.07	0.18	11.5	138	0.07	0.18
Maleic Anhydride	108-31-6	0.19	2.29	1.15E-03	2.98E-03	0.19	2.29	1.15E-03	2.98E-03
Toluene	108-88-3	1.06	12.7	0.01	0.02	1.06	12.7	0.01	0.02
Xylene	1330-20-7	801	9,613	4.81	12.5	801	9,613	4.81	12.5
Ethyl Acetate	141-78-6	158	1,901	0.95	2.47	158	1,901	0.95	2.47
Sulfuric Acid	7664-93-9	0.68	8.20	4.10E-03	0.01	30.75	369.01	1.85E-01	0.48
Glycol Ethers	N231	2.38E-03	2.86E-02	1.43E-05	3.71E-05	2.38E-03	0.03	1.43E-05	3.71E-05
Chromium Compounds	N090	2.14E-02	0.26	1.28E-04	3.33E-04	9.61E-01	11.5	5.76E-03	0.01
Manganese Compounds	N450	3.70E-03	4.44E-02	2.22E-05	5.77E-05	1.67E-01	2.00	9.99E-04	2.60E-03
Polycyclic Organic Matter (POMTV)	N591	2.20E-02	0.26	1.32E-04	3.44E-04	2.20E-02	0.26	1.32E-04	3.44E-04
VOC ¹		31,303	375,637	188		31,303	375,637	188	
PM		122	1,459	0.73		5,472	65,667	32.8	

¹VOC content not anticipated to increase. Substituting non-regulated VOCs with VHAPs

²Projected Emissions for HAPs calculated using the methodology in Table 1 below.

Projected Xylene Emissions (tpy)	12.49
Ratio of Projection to Max. Highest Emissions for Xylene	2.60
Solids Transfer Efficiency	0.55
PM Control Efficiency	0.99

Color Coding: HAP & TAP
 TAP only
 HAP only

**Supporting Calculations For Significant Title V Modification
Wood Waste Collection System**

SAWDUST TOTALS SHIPPED IN 2019

Date	Sawdust Shipped	
	lb	tons
Total	1,017,100	509

PM Size Distribution

PM

PM₁₀ estimated to be 50% of all PM

PM_{2.5} estimated to be 5% of all PM

Sawdust Generated = 509 tons/yr

Control Efficiency

99.9% (efficiency of the cyclone and baghouse)

(sawdust generated) / (control efficiency)

Potential Controlled Emissions (tons)

PM = 0.51 tons

(Sawdust generated) - (sawdust collected)

PM₁₀ = 0.25 tons

PM * PM₁₀ percent of all PM

PM_{2.5} = 0.025 tons

PM * PM_{2.5} percent of all PM

Potential Uncontrolled Emissions (tons)

PM = 509 tons

(Sawdust generated)

PM₁₀ = 255 tons

PM * PM₁₀ percent of all PM

PM_{2.5} = 25 tons

PM * PM_{2.5} percent of all PM

**Supporting Calculations For Significant Title V Modification
Gas-Fired Bake Ovens**

Maximum capacity of the the ovens: 0.8 MMBtu/hr * 3 ovens = 2.4 MMBTU/hr
 Potential hours of operation: 8,760 hours/yr
 Natural gas Heating value: 1,020 Btu/scf
 The maximum natural gas used in the three natural gas back oven is
 2.4 MMBtu/hr * 8,760 hrs/yr / 1,020 Btu/scf = 20.61 mmcf/yr

Note: usage is greater than the potential for the ovens. The usage contains NG used for comfort heating, Calculation is based on operating hours of the finishing department.

Emission Factors from AP-42 section 1.4 for natural gas combustion for small boilers, July 1988.

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION			
AIR POLLUTANT EMITTED	Emission Factor (lb/mmSCF)	Potential Emissions	
		lb/hr	tons/yr
PARTICULATE MATTER (Total)	7.60	0.02	0.08
PARTICULATE MATTER (Condensable)	5.70	0.01	0.06
PARTICULATE MATTER (Filterable)	1.90	0.00	0.02
SULFUR DIOXIDE (SO2)	0.60	1.41E-03	0.01
NITROGEN OXIDES (NOx)	100	0.24	1.03
CARBON MONOXIDE (CO)	84.0	0.20	0.87
VOLATILE ORGANIC COMPOUNDS (VOC)	5.50	0.01	0.06
LEAD	5.00E-04	1.18E-06	5.15E-06

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION			
TOXIC / HAZARDOUS AIR POLLU	CAS NUMBER	Emission Factor (lb/mmSCF)	Potential Emissions
			(lbs/yr)
Acetaldehyde (TH) ¹	75070	1.52E-05	3.13E-04
Acrolein (TH) ¹	107028	1.80E-05	3.71E-04
Ammonia (T) ¹	7664417	3.20	66.0
Benzene (TH)	71432	2.10E-03	0.04
Benzo(a)pyrene (TH)	50328	1.20E-06	2.47E-05
Cobalt unlisted compounds (H)	COC-other	8.40E-05	1.73E-03
Formaldehyde (TH)	50000	7.50E-02	1.55
Hexane, n- (TH)	110543	1.80	37.1
Lead unlisted compounds (H)	PBC-other	5.00E-04	1.03E-02
Napthalene (H)	91203	6.10E-04	1.26E-02
Selenium compounds (H)	SEC	2.40E-05	4.95E-04
Toluene (TH)	108883	3.40E-03	7.01E-02

¹ Emission factors from the NC Spreadsheet in which acetaldehyde, acrolein, and ammonia factors are from WebFIRE database.

GREENHOUSE GAS EMISSIONS		
GREENHOUSE GAS POLLUTANT	Emission Factors	Potential Emissions
	(lb/mmSCF)	tons/yr
CARBON DIOXIDE (CO ₂)	120,000	1,237
METHANE (CH ₄)	2.30	0.02
NITROUS OXIDE (N ₂ O)	2.20	0.02

**Supporting Calculations For Significant Title V Modification
GR8 Natural Gas Fired Insignificant Sources
IS-MU-1 to IS-MU-7 seven natural gas fired make-up**

Natural Gas Usage - Piedmont Natural Gas 2019

Month	Annual Natural Gas Usage		
	Therms Used	ft ³	MMcf
January	66,339	6,503,824	6.504
February	43,488	4,263,529	4.264
March	46,851	4,593,235	4.593
April	24,303	2,382,647	2.383
May	10,571	1,036,373	1.036
June	4,380	429,412	0.429
July	3,390	332,353	0.332
August	2,573	252,255	0.252
September	3,205	314,216	0.314
October	17,408	1,706,667	1.707
November	31,059	3,045,000	3.045
December	30,705	3,010,294	3.010

Annual average natural gas heating value 1,020 BTU/scf

Assumed potential usage of highest month usage in 2019 (January) for all 12 months.

The natural gas feed into the plant includes the seven natural gas heaters plus the gas ovens calculated in group (GR7). Therefore, the gas feed to the seven natural gas fired make-up units is the total gas used in the plant minus the three gas ovens (GR7).

$$78.05 \text{ MMBTU/yr} - 20.61 \text{ MMscf/yr} = 57.43 \text{ MMscf/yr}$$

Emission Factors from AP-42 section 1.4 for natural gas combustion for small boilers, July 1988.

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION			
AIR POLLUTANT EMITTED	Emission Factor (lb/mmSCF)	Potential Emissions	
		lb/hr	tons/yr
PARTICULATE MATTER (Total)	7.60	0.05	0.22
PARTICULATE MATTER (Condensable)	5.70	0.04	0.16
PARTICULATE MATTER (Filterable)	1.90	0.01	0.05
SULFUR DIOXIDE (SO ₂)	0.60	0.00	0.02
NITROGEN OXIDES (NO _x)	100	0.66	2.87
CARBON MONOXIDE (CO)	84.0	0.55	2.41
VOLATILE ORGANIC COMPOUNDS (VOC)	5.50	0.04	0.16
LEAD	5.00E-04	3.28E-06	1.4E-05

UltraCraft Cabinets, Inc.
 Liberty, NC
 Supporting Calculations for Significant Title V Permit Modification

Facility Emissions Summary		
AIR POLLUTANT EMITTED	Potential Controlled Emissions	Potential Uncontrolled Emissions
	tons/yr	tons/yr
CRITERIA AIR POLLUTANTS		
PARTICULATE MATTER (Total)	1.54	542
PARTICULATE MATTER < 10 MICRONS (PM10)	1.23	288
PARTICULATE MATTER < 2.5 MICRONS (PM2.5)	0.89	58
SULFUR DIOXIDE (SO2)	0.02	0.02
NITROGEN OXIDES (NOx)	3.90	3.90
CARBON MONOXIDE (CO)	3.28	3.28
VOLATILE ORGANIC COMPOUNDS (VOC)	188	188
LEAD	1.95E-05	1.95E-05
TOXIC / HAZARDOUS AIR POLLUTANTS		
Acetaldehyde	5.93E-07	5.93E-07
Acrolein	7.02E-07	7.02E-07
Ammonia	0.12	0.12
Benzene	8.19E-05	8.19E-05
Benzo(a)pyrene	4.68E-08	4.68E-08
Chromium Compounds	3.33E-04	1.50E-02
Cobalt unlisted compounds	3.28E-06	3.28E-06
Ethyl Acetate	2.47	2.47
Ethylbenzene	1.85	1.85
Formaldehyde	0.63	0.63
Glycol Ethers	3.71E-05	3.71E-05
Hexane, n-	7.02E-02	7.02E-02
Isopropyl Benzene or Cumene	0.26	0.26
Lead unlisted compounds	1.95E-05	1.95E-05
Maleic Anhydride	2.98E-03	2.98E-03
Manganese Compounds	5.77E-05	2.60E-03
Methyl Ethyl Ketone	0.65	0.65
Methanol	8.51E-02	8.51E-02
Methyl Isobutyl Ketone	0.18	0.18
Napthalene	3.67E-04	3.67E-04
Polycyclic Organic Matter (POMTV)	3.44E-04	3.44E-04
Selenium compounds	9.37E-07	9.37E-07
Sulfuric Acid	1.07E-02	4.79E-01
Toluene	2.39E-02	2.39E-02
Xylene	12.5	12.5
GREENHOUSE GAS POLLUTANTS		
CARBON DIOXIDE (CO2)	4,683	4,683
METHANE (CH4)	0.09	0.09
NITROUS OXIDE (N2O)	0.09	0.09