2021 Logan Boiler EP-6 PTE Calculations
Natural Gas Emission Calculations

Cleaver Brooks Low Nox Boiler Model CBLE-700-200-150st - From Fullerton Facility
200 HP

200	hp	13378280
9809.5	Watt/hp (boiler) conversion factor	Btu/Hp
3.4129	Btu/hr Watt conversion factor	
8.16	MMBtu/hr	
1020	Btu/scf (heat input) - Natural Gas	
0.008	10^6 scf/hour	

Estimated Emissions (Based on Cleaver Brooks supplied boiler data)

	As supplied by	**PTE (using AP-**	**PTE**	**PTE -**
Pollutant	EF (lb/MMBtu) (E	lb/hour	lb/day	Tons/year
NOx	0.01100	0.090	2.15	0.39
CO	0.03600	0.294	7.05	1.29
SOx	0.00170	0.014	0.33	0.06
PM/PM10	0.01000	0.082	1.96	0.36
PM/PM2.5	0.00700	0.057	1.37	0.25
VOC	0.00400	0.033	0.78	0.14

Estimated Emissions (Based on AP-42)

	AP-42 (1.4 EF	**PTE (using AP-**	**PTE**	**PTE -**	
Pollutant	EF (lb/10^6 scf)	lb/hour	lb/day	Tons/year	
NO2/NOx	32.00000	0.256	6.144	1.121	Criteria
CO	84.00000	0.672	16.128	2.943	Criteria
SOx	0.60000	0.005	0.115	0.021	Criteria
PM/PM10/PM2.5	7.60000	0.061	1.459	0.266	Criteria
VOC	5.50000	0.044	1.056	0.193	Criteria
Lead	0.00050	0.000	0.000	0.000	Criteria
2-Methylnaphthalene	2.40E-05	0.000	0.000	0.000	HAP
3-Methlychloranthrene	1.80E-06	0.000	0.000	0.000	HAP
7,12-Dimethylbenz(a)ar	1.60E-06	0.000	0.000	0.000	HAP
Acenaphthene	1.80E-06	0.000	0.000	0.000	HAP
Acenaphthylene	1.80E-06	0.000	0.000	0.000	HAP
Anthracene	2.40E-06	0.000	0.000	0.000	HAP
Benz(a)anthracene	1.80E-06	0.000	0.000	0.000	HAP
Benzene	2.10E-03	0.000	0.000	0.000	HAP
Benzo(a)pyrene	1.20E-06	0.000	0.000	0.000	HAP
Benzo(b)fluoranthene	1.80E-06	0.000	0.000	0.000	HAP
Benzo(g,h,i)perylene	1.20E-06	0.000	0.000	0.000	HAP
Benzo(k)fluoranthene	1.80E-06	0.000	0.000	0.000	HAP
Chrysene	1.80E-06	0.000	0.000	0.000	HAP
Dibenzo(a,h)anthracene	1.20E-06	0.000	0.000	0.000	HAP
Dichlorobenzene	1.20E-03	0.000	0.000	0.000	HAP
Fluoranthene	3.00E-06	0.000	0.000	0.000	HAP
Fluorene	2.80E-06	0.000	0.000	0.000	HAP
Formaldehyde	7.50E-02	0.001	0.014	0.003	HAP
Hexane	1.80E+00	0.014	0.346	0.063	HAP
Indeno(1,2,3-cd)pyrene	1.80E-06	0.000	0.000	0.000	HAP
Naphthalene	6.10E-04	0.000	0.000	0.000	HAP
Phenanathrene	1.70E-05	0.000	0.000	0.000	HAP
Pyrene	5.00E-06	0.000	0.000	0.000	HAP
Toluene	3.40E-03	0.000	0.001	0.000	HAP
Arsenic	2.00E-04	0.000	0.000	0.000	HAP
Beryllium	1.20E-05	0.000	0.000	0.000	HAP
Cadmium	1.10E-03	0.000	0.000	0.000	HAP
Chromium	1.40E-03	0.000	0.000	0.000	HAP
Cobalt	8.40E-05	0.000	0.000	0.000	HAP
Manganese	3.80E-04	0.000	0.000	0.000	HAP
Mercury	2.60E-04	0.000	0.000	0.000	HAP
Nickel	2.10E-03	0.000	0.000	0.000	HAP
Selenium	2.40E-05	0.000	0.000	0.000	HAP
Butane	2.10E+00	0.017	0.403	0.074	
Ethane	3.10E+00	0.025	0.595	0.109	
Pentane	2.60E+00	0.021	0.499	0.091	
Propane	1.60E+00	0.013	0.307	0.056	
Barium	4.40E-03	0.000	0.001	0.000	
Copper	8.50E-04	0.000	0.000	0.000	
Molybdenum	1.10E-03	0.000	0.000	0.000	
Vanadium	2.30E-03	0.000	0.000	0.000	
Zinc	2.90E-02	0.000	0.006	0.001	
Total Federal HAP		**0.015**	**0.362**	**0.066**	

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN125760005

July 7, 2021

Paul Bytheway
Schreiber Foods Incorporated
400 N Washington St.
Green Bay, WI 54301
paul.bytheway@schreiberfoods.com

Dear Paul Bytheway,

Re: Engineer Review:
Minor Modification of Approval Order, DAQE-AN125760004-13 to Add a Boiler
Project Number: N125760005

The DAQ requests a company representative review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Schreiber Foods Incorporated should complete this review within **10 business days** of receipt.

Schreiber Foods Incorporated should contact **Andrea Bartlett** at (801) 834-8417 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email abartlett@utah.gov the signed cover letter to Andrea Bartlett. Upon receipt of the signed cover letter, the DAQ will prepare an ITA for a 30-day public comment period. At the completion of the comment period, the DAQ will address any comments and will prepare an AO for signature by the DAQ Director.

If Schreiber Foods Incorporated does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Schreiber Foods Incorporated has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature __  07/21/2021

(Signature & Date)

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N125760005
Owner Name	Schreiber Foods Incorporated
Mailing Address	400 N Washington St. Green Bay, WI, 54301
Source Name	Schreiber Foods Incorporated- Logan Cheese Processing Plant
Source Location	885 North 600 West Logan, UT 84321
UTM Projection	429,324 m Easting, 4,622,172 m Northing
UTM Datum	NAD83
UTM Zone	UTM Zone 12
SIC Code	2022 (Cheese - Natural, Processed & Imitation)
Source Contact	Paul Bytheway
Phone Number	(920) 455-6109
Email	paul.bytheway@schreiberfoods.com
Project Engineer	Andrea Bartlett, Engineer
Phone Number	(801) 834-8417
Email	abartlett@utah.gov
Notice of Intent (NOI) Submitted	April 27, 2021
Date of Accepted Application	June 7, 2021

SOURCE DESCRIPTION

General Description
Schreiber Foods Logan Cheese Processing Plant (Schreiber) is a distribution center that produces various cheese and yogurt. Raw ingredients are blended, cooked, and packaged onsite. The source has boilers, an emergency generator, and various tanks onsite.

NSR Classification:
Minor Modification at Minor Source

Source Classification
Located in Cache County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Project Proposal
Minor Modification of Approval Order, DAQE-AN125760004-13 to Add a Boiler

Project Description
The source has requested to add an 8.16 MMBtu/hr natural gas-fired boiler to its facility. Facility-wide PTE was evaluated as part of this modification based on an updated equipment list and operation. Condition II.B.1.b was removed due to emissions being restricted by annual hours.

EMISSION IMPACT ANALYSIS

All increases in criteria pollutants and HAP emissions are below their respective thresholds in R307-410-4 and R307-410-5. Therefore, modeling is not required at this time. [Last updated June 30, 2021]

SUMMARY OF EMISSIONS

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	10922	33510.00
Carbon Monoxide	1.28	20.55
Nitrogen Oxides	0.40	28.88
Particulate Matter - PM_{10}	0.36	1.98
Particulate Matter - $PM_{2.5}$	0.36	1.98
Sulfur Dioxide	0.05	2.25
Volatile Organic Compounds	0.15	2.15

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Formaldehyde (CAS #50000)	0	26
Hexane (CAS #110543)	0	676
	Change (TPY)	**Total (TPY)**
Total HAPs	0	0.35

Note: Change in emissions indicates the difference between previous AO and proposed modification.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding 8.16 MMBtu/hr Boiler**

Schreiber is requesting to add a new 8.16 MMBtu/hr natural gas-fired boiler to their facility.

NO_x

NO_x emissions are generated when combustion occurs in the presence of nitrogen. The available control to reduce NO_x emissions includes combustion control technologies and post-combustion control technologies. Combustion control technologies include low NO_x burners and flue gas recirculation. Post-combustion control technologies include selective catalytic reduction and selective non-catalytic reduction.

The source has selected an ultra-low NO_x burner. The emission concentration for the burner is 9 ppm, according to the manufacturer specifications. Due to the size of the boiler and the low amount of NO_x emissions (0.39 tpy), post combustion technology is not economically feasible.

CO

Carbon monoxide emissions are due to incomplete combustion of hydrocarbons in fuel. The available control technologies to reduce CO emissions include good combustion practices and post combustion control technology, such as, use of an oxidation catalyst. Oxidation catalysts are an exhaust treatment that increase oxidation of CO to CO_2. Due to the presence of oxygen in the exhaust stream, the reaction to CO_2 proceeds with just a catalyst. Installation of an oxidation catalyst is not common in a boiler this size. The incremental cost for post combustion CO control is extremely high, therefore it is not considered BACT

SO_2

Sulfur Dioxide emissions are generated when sulfur is present in fuel. The available control technologies to reduce SO_2 emissions include good combustion practices, low sulfur fuel, and post combustion control technology. Natural gas is a low sulfur fuel. Post combustion technology would have a large incremental cost, therefore it is not considered BACT.

VOC Emissions

VOC emissions occur due to incomplete combustion of hydrocarbon fuel. They occur when there is insufficient time at high temperatures for the hydrocarbon oxidation to complete. Post-combustion technologies include carbon adsorption, thermal oxidizers, and oxidizing catalysts. For the low amount of VOC emitted from boilers rated 10 MMBtu/hr or less, these post-combustion technologies have a high incremental cost. Good combustion practices should be used.

PM Emissions

Particulate Matter emissions are generated when solid material is released during combustion. PM emissions are more prevalent when combusting solid fuels. Available controls for PM emissions include good combustion practices and using gaseous fuel. Post combustion technology, such as, baghouse, cyclones and scrubbers, should also be considered. The boiler the source has proposed is small and uses natural gas for fuel. The incremental cost to control the particulate matter is large, therefore post combustion technology is not considered BACT.

BACT for the boiler is good combustion practices, including proper manufacturer maintenance. BACT also includes only using natural gas as a fuel and using an ultra-low NO_x burner. The burner will include a manufacturer specification sheet that NO_x emissions will meet a concentration of 9 ppm or less. The source will maintain an opacity of 10% or less for this boiler. [Last updated June 22, 2021]

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

I.1	All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
I.2	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.3	Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
I.4	All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of two (2) years. [R307-401-8]
I.5	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]
I.8	The owner/operator shall submit documentation of the status of construction or modification to the Director within 18 months from the date of this AO. This AO may become invalid if construction is not commenced within 18 months from the date of this AO or if construction is discontinued for 18 months or more. To ensure proper credit when notifying the Director, send the documentation to the Director, attn.: NSR Section. [R307-401-18]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.A THE APPROVED EQUIPMENT

II.A.1	**Logan Cheese Processing Plant**
II.A.2	**Boiler EP-1** Rating: 10.2 MMBtu/hr Fuel: Natural Gas Control: Low NO_x Burner NSPS Applicability: Subpart Dc
II.A.3	**Boiler EP-2** Rating: 8.2 MMBtu/hr Fuel: Natural Gas Secondary Fuel: Propane Control: Low NO_x Burner,Flue Gas Recirculation (FGR)
II.A.4	**Boiler EP-3** Rating: 8.2 MMBtu/hr Fuel: Natural Gas Secondary Fuel: Propane Control: Low NO_x burner, FGR
II.A.5	**Boiler EP-4** Rating: 16.7 MMBtu/hr Fuel: Natural Gas Secondary Fuel: Propane Control: Low NO_x Burner, FGR NSPS Applicability: Subpart Dc
II.A.6 NEW	**Boiler EP-5 (NEW)** Boiler Rating: 8.16 MMBtu/hr Fuel: Natural Gas Control: Ultra Low NO_x Burner
II.A.7	**Emergency Generator Engine** Rating: 150 kW Fuel: Ultra-low Sulfur Diesel NSPS Applicability: Subpart IIII MACT Applicability: Subpart ZZZZ
II.A.8	**Pressure Vessel Safety Vents.** The vents are only active during emergency situations.

II.A.9	**Ammonia Storage Tanks and Refrigeration System** The pressure relief valve is only activated during an emergency situation.
II.A.10	**Parts Washer** A recirculating system that is not vented to the atmosphere. For informational purposes only.
II.A.11	**Used Oil Tank** A self-contained system that does not release to the atmosphere. For informational purposes only.
II.A.12	**Propane Tank** For informational purposes only.
II.A.13	**Carbon Dioxide Tank** For informational purposes only.

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.B REQUIREMENTS AND LIMITATIONS

II.B.1 NEW	**Site-Wide Requirements**
II.B.1.a NEW	The owner/operator shall not allow visible emissions to exceed the following values: A. All boilers- 10% opacity B. Diesel-fired emergency generator engine- 20% opacity C. All other points- 20% opacity. [R307-305-3, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.2 NEW	**Boiler Requirements**
II.B.2.a NEW	The owner/operator shall operate Boiler EP-4 with an oxygen trim system in use. [R307-401-8]
II.B.2.a.1 NEW	The owner/operator shall demonstrate compliance by maintaining a daily operating status log of the boiler, FGR system, and oxygen trim system. [R307-401-8]
II.B.2.b NEW	The owner/operator shall install and operate Boiler EP-5 with a manufacturer specification of a NO_x emissions concentration of 9 ppm or less. [R307-401-8]

II.B.2.b.1 NEW	The owner/operator shall keep a record of the manufacturer specifications for Boiler EP-5. These records shall be kept for the lifetime of the equipment. [R307-401-8]
II.B.2.c NEW	The owner/operator shall use a flue gas recirculation system at all times with Boiler's EP-2, EP-3, and EP-4. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate the emergency engine on site for more than 100 hours per rolling 12-month period during non-emergency situations. There is no time limit on the use of the engine during emergencies. [40 CFR 60 Subpart ZZZZ, R307-401-8]
II.B.3.a.1 NEW	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each emergency engine shall be kept in a log and shall include the following: A. The date the emergency engine was used B. The duration of operation in hours C. The reason for the emergency engine usage. [40 CFR 60 Subpart ZZZZ, R307-401-8]
II.B.3.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for the emergency engine. [40 CFR 60 Subpart ZZZZ, R307-401-8]
II.B.3.b NEW	The owner/operator shall only use diesel fuel (e.g. fuel oil #1, #2, or diesel fuel oil additives) as fuel in the emergency engine. [R307-401-8]
II.B.3.b.1 NEW	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.3.b.2 NEW	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate that the diesel fuel meets the ULSD requirements. [R307-401-8]

PERMIT HISTORY

When issued, the approval order shall supersede (if a modification) or will be based on the following documents:

Supersedes	DAQE-AN0125760004-13 dated September 6, 2013
Is Derived From	NOI dated April 27, 2021
Incorporates	Additional Information dated May 26, 2021

REVIEWER COMMENTS

1. **Comment regarding New Boiler Emissions:**
Emission estimates for the 8.16 MMBtu/hr natural gas-fired boiler were calculated using the following emissions factors:

NO_x: 0.011 lb/MMBtu (manufacturer)
CO: 0.036 lb/MMBtu (manufacturer)
SO_x: 0.0017 lb/MMBtu (manufacturer)
PM_{10}: 0.01 lb/MMBtu (manufacturer)
$PM_{2.5}$: 0.007 lb/MMBtu (manufacturer)
VOC: 0.004 lb/MMBtu (manufacturer)

HAP Emissions: AP-42 Chapter 1.4 Emissions Factors for Natural Gas Combustion, Small Boilers [Last updated June 30, 2021]

2. **Comment regarding Natural Gas and Propane Limit Removal:**
The emissions for the boilers are limited by annual hours of 8760; therefore, a restriction on fuel use is unnecessary. [Last updated June 30, 2021]

3. **Comment regarding NSPS and MACT Applicability:**
40 CFR 60 (NSPS) Subpart Dc applies to owner/operators of steam generating units for which construction commenced after June 9, 1989 and that have a heat capacity of 10 MMBtu/hr to 100 MMBtu/hr. The source has two boilers this size, constructed after 1989, therefore, Subpart Dc applies to this facility.

40 CFR 60 (NSPS) Subpart IIII applies to owners/operators and manufacturers of Stationary Compression Ignition Internal Combustion Engine (CI ICE). The emergency diesel generator onsite is CI ICE and was purchased/constructed after 2007, therefore NSPS Subpart IIII applies to this facility.

40 CFR 63 (MACT) Subpart ZZZZ applies to owners/operators of stationary RICE at a major or area sources of HAP emissions. The facility is an area HAP source and the station operates a stationary RICE as defined in this subpart, therefore, Subpart ZZZZ applies to this facility.

[Last updated June 22, 2021]

4. **Comment regarding Title V Applicability:**
Title V of the 1990 Clean Air Act (Title V) applies to the following:

1. Any major source

2. Any source subject to a standard, limitation, or other requirement under Section 111 of the Act, Standards of Performance for New Stationary Sources;
3. Any source subject to a standard or other requirement under Section 112 of the Act, Hazardous Air Pollutants.
4. Any Title IV affected source.

This facility is not a major source and is not a Title IV source. The facility is subject to NSPS Subpart Dc, NSPS Subpart IIII, and MACT Subpart ZZZZ. It is not subject to 40 CF 61 (NESHAP) regulations. NSPS Subpart IIII, and MACT Subpart ZZZZ are exempt from Title V requirements. NSPS Subpart Dc is subject to Title V, however, since no solid fuel is used in the burners, only record keeping requirements apply to this source. Therefore, the source is considered a nominal source and is not required to apply for a Title V permit. There are no other reasons why this source would be required to obtain a 40 CFR part 70 permit; therefore, Title V does not apply to this source. [Last updated June 22, 2021]

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ/UDAQ	Division of Air Quality
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
LB/YR	Pounds per year
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
VOC	Volatile organic compounds

Schreiber Foods, Inc.
400 North Washington Street
Green Bay, WI 54301
United States of America
+1 920 437 7601
schreiberfoods.com

April 21, 2021

Mr. Alan Humpherys
Utah Division of Air Quality
195 North 1950 West
Salt Lake City, UT 84116

Subject: Schreiber Foods, Inc. Logan Facility: Addition of 200 HP Cleaver Brooks Boiler with Ultra-Low NOx Burner

Dear Mr. Humpherys,

Schreiber Foods, Inc. is submitting the enclosed Notice of Intent (NOI) to modify Approval Order DAQE-AN0125760003-10 to add one 200 HP Cleaver Brooks boiler with ultra-low NOx burner as well as supporting documentation and application fee.

If you have any questions regarding this permit application, please contact me at (920) 455-6109 or paul.bytheway@schreiberfoods.com.

Sincerely,

Paul Bytheway

Form 2
Company Information/Notice of Intent (NOI)

Date _____

Utah Division of Air Quality
New Source Review Section

AIR QUALITY

Application for: ☐ Initial Approval Order ☑ Approval Order Modification

General Owner and Source Information

1. Company name and mailing address:
Schreiber Foods, Inc.
400 N Washington St.
Green Bay, WI. 54301
Phone No.: (920) 455-6109
Fax No.: ( )

2. Company** contact for environmental matters:
Paul Bytheway
Phone no.: (920) 455-6109
Email: paul.bytheway@schreiberfo
** *Company contact only; consultant or independent contractor contact information can be provided in a cover letter*

3. Source name and physical address (if different from above):
Schreiber Foods - Logan
885 N. 600 W
Logan, UT. 84321
Phone no.: (920) 455-6109
Fax no.: ( )

4. Source Property Universal Transverse Mercator coordinates (UTM), including System and Datum:
UTM: 12
X: 429,324 m Easting
Y: 4,622,172 m Northing

5. The Source is located in: Cache County

6. Standard Industrial Classification Code (SIC)
2022

7. If request for modification, AO# to be modified: DAQE # AN125760004-13 DATED: 09 /06 /2013

8. Brief (50 words or less) description of process.
Schreiber Foods, Inc., a cheese processing plant, located in Logan, UT (Cache County) plans to install a 200 HP boiler with ultra-low NOx burner in addition to the 4 existing boilers on-site. The boiler will be equipped to burn natural gas.

Electronic NOI

9. A complete and accurate electronic NOI submitted to DAQ Permitting Mangers Jon Black (*jlblack@utah.gov*) or Alan Humpherys (ahumpherys@utah.gov) can expedite review process. Please mark application type.

Hard Copy Submittal ☐ Electronic Copy Submittal ☑ Both ☐

Authorization/Signature

I hereby certify that the information and data submitted in and with this application is completely true, accurate and complete, based on reasonable inquiry made by me and to the best of my knowledge and belief.

Signature: [signature] Title: Plant Manager

Jay Matthew Johnson Name (Type or print)	Telephone Number: (435) 752-8175 Email: matt.johnson@schreiberfo	Date: 4/26/2021

Form 3

Process Information

Utah Division of Air Quality
New Source Review Section

Company Schreiber Foods, Inc.

Site Logan, Utah

Process Information - For New Permit ONLY	
1. Name of process:	2. End product of this process:
3. Process Description*:	

Operating Data	
4. Maximum operating schedule: _____ hrs/day _____days/week _____weeks/year	5. Percent annual production by quarter: Winter 0% Spring 0% Summer 0% Fall 0%
6. Maximum Hourly production (indicate units.): _____	7. Maximum annual production (indicate units): _____
8. Type of operation: Continuous ☐ Batch ☐ Intermittent ☐	9. If batch, indicate minutes per cycle _____ Minutes between cycles _____

10. Materials and quantities used in process.*

Material	Maximum Annual Quantity (indicate units)

11.Process-Emitting Units with pollution control equipment*

Emitting Unit(s)	Capacity(s)	Manufacture Date(s)
200 HP Cleaver Brooks Boiler (8.16 MMBtu/hour)		

If additional space is required, please create a spreadsheet or Word processing document and attach to form.

Form 4
Project Information

Company Schreiber Foods, Inc.

Site Logan, Utah

Utah Division of Air Quality
New Source Review Section

Process Data - For Modification/Amendment ONLY

1. Permit Number DAQE-AN125760004-13

If submitting a new permit, then use Form 3

Requested Changes

2. Name of process to be modified/added:

200 HP Cleaver Brooks Natural Gas Boiler

End product of this process:

Steam Generation

3. Permit Change Type:

	New	Increase*
Equipment	☑	☐
Process	☐	☐

Condition Change _____

Other _____

Other _____

Other _____

4. Does new emission unit affect existing permitted process limits?

Yes ☐ No ☑

5. Condition(s) Changing:

None

6. Description of Permit/Process Change**

7. New or modified materials and quantities used in process. **

Material	Quantity Annually

8. New or modified process emitting units **

Emitting Unit(s)	Capacity(s)	Manufacture Date(s)
200 HP Cleaver Brooks Boiler (8.16 MMBtu/hour)	8.16	06/07/12

**If the permit being modified does not include CO_2e or $PM_{2.5}$, the emissions need to be calculated and submitted to DAQ, which may result in an emissions increase and a public comment period.*

***If additional space is required, please generate a document to accommodate and attach to form.*

Form 5
Emissions Information
Criteria/GHGs/ HAP's
Utah Division of Air Quality
New Source Review Section

Company Schreiber Foods, Inc.

Site Logan, Utah

Potential to Emit* Criteria Pollutants & GHGs			
Criteria Pollutants	**Permitted Emissions (tons/yr)**	**Emissions Increases (tons/yr)**	**Proposed Emissions (tons/yr)**
PM_{10} Total	1.62	0.36	1.98
PM_{10} Fugitive			
$PM_{2.5}$	1.62	0.25	1.98
NO_x	28.48	0.39	28.88
SO_2	2.20	0.06	2.25
CO	19.27	1.29	20.55
VOC	2.00	0.14	2.15
VOC Fugitive			
NH_3			
Greenhouse Gases	**CO_2e**	**CO_2e**	**CO_2e**
CO_2		5,266.00	33,483.92
CH_4		0.08	0.50
N_2O		0.01	0.05
HFCs			
PFCs			
SF_6			
Total CO2e	22,588.00	5,270.87	33,509.96

**Potential to emit to include pollution control equipment as defined by R307-401-2.*

Hazardous Air Pollutants** *(**Defined in Section 112(b) of the Clean Air Act)*				
Hazardous Air Pollutant***	**Permitted Emissions (tons/yr)**	**Emission Increase (tons/yr)**	**Proposed Emission (tons/yr)**	**Emission Increase (lbs/hr)**
Total HAP	0.35	0.07	0.42	0.01

**** Use additional sheets for pollutants if needed*

Document Date: 02/28/2018

DAQ-2018-002267

Detailed Process Description

Schreiber Foods, Inc., a dairy processing plant, located in Logan, UT (Cache County) plans to install a natural gas fired 200 HP Cleaver Brooks boiler with ultra-low NOx burner. The site is currently operating under approval order DAQE-AN0125760003-10 issued on September 6, 2013.

Emission calculations for the boiler and updated facility wide emission calculations are included with this application.

The following emission sources are included as insignificant emission sources in the current approval order and are still in operation at the facility:

- One (1) parts washer
- Misc. space heaters
- Infrared dock heaters
- Sodium citrate solution (SCS) exhaust
- Ammonia storage tank and refrigeration system
- Pressured vessel safety vents
- One (1) used oil tank
- Carbon dioxide tank

BACT Analysis

When selecting this boiler, we reviewed low NOx burner options and selected the Ultra-Low NOx burner for this application, which is the most stringent option available for burner NOx emissions. We therefore believe that we have selected the best available control technology available for our application.

CleaverBrooks Emissions Datasheet

Cleaver-Brooks Boiler Expected Emission Data

Producing Steam Firing — **Nat Gas**

BACKGROUND INFORMATION		Boiler Model	CB(LE)
Date	6/7/2012 12:00:00 AM	Altitude (feet)	700
Author	L.C. Banks	Operating Pressure (psig)	110.00
Customer	Schreiber Food , Inc.	Furnace Volume (cuft)	46.88
City & State	----, ---	Furnace Heat Release (btu/hr/cu ft)	174,168
		Heating Surface (sqft)	1,000
		Nox System	9

Nat Gas		Firing Rate			
		25%	**50%**	**75%**	**100%**
Horsepower		50	100	150	200
Input , Btu/hr		2,041,000	4,082,000	6,123,000	8,165,000
CO	ppm	50	50	50	50
	lb/MMBtu	0.036	0.036	0.036	0.036
	lb/hr	0.11	0.15	0.22	0.30
	tpy	0.490	0.653	0.979	1.305
NOx	ppm	9	9	9	9
	lb/MMBtu	0.011	0.011	0.011	0.011
	lb/hr	0.02	0.04	0.06	0.09
	tpy	0.095	0.189	0.284	0.379
NO	ppm	7	7	7	7
	tpy	0.08	0.15	0.23	0.30
NO2	ppm	2	2	2	2
	tpy	0.02	0.04	0.06	0.08
SOx	ppm	1.00	1.00	1.00	1.00
	lb/MMBtu	0.0017	0.0017	0.0017	0.0017
	lb/hr	0.0034	0.0069	0.0103	0.0137
	tpy	0.015	0.030	0.045	0.060
HC/VOCs	ppm	10	10	10	10
	lb/MMBtu	0.004	0.004	0.004	0.004
	lb/hr	0.008	0.016	0.024	0.033
	tpy	0.036	0.072	0.107	0.143
PM10 (Filterable)	ppm	N/A	N/A	N/A	N/A
EPA Method 5	lb/MMBtu	0.010	0.010	0.010	0.010
	lb/hr	0.020	0.041	0.061	0.082
	tpy	0.089	0.179	0.268	0.358
PM2.5 (Filterable)	lb/MMBtu	0.007	0.007	0.007	0.007
	tpy	0.06	0.12	0.18	0.24
Exhaust Data					
Temperature, F		341	366	381	386
Flow	ACFM	625	1,300	1,996	2,681
	SCFM (70 Degrees Fah.)	424	854	1,287	1,719
	DSCFM	380	765	1,153	1,540
	lb/hr	1,908	3,844	5,792	7,735
Velocity	ft/sec	7.47	15.53	23.83	32.02
	ft/min	448	932	1,430	1,921

Notes:

1) All ppm levels are corrected to dry at 3% oxygen.
2) Emission data based on 82% boiler efficiency.
3) % H2O , by volume in exhaust gas is **16.05** % O2, by volume **3.81**
4) Water vapor in exhaust gas is **99.39** lbs/MMBtu of fuel fired
5) CO2 produced is **116.31** lbs/MMBtu of fuel fired
6) Particulate is exclusive of any particulates in combustion air or other sources of residual particulates from material. PM level indicated on this form is based on combustion air and fuel being clean and turndown up to 4:1.
7) Heat input is based on high heating value (HHV).
8.) Emission produced in tons per year (tpy) is based on 24 hours per day for 365 days = 8,760 hours per year

2010 Logan Boiler EP-2 and EP-3 PTE Calculations
Natural Gas Emission Calculations

Cleaver Brooks Low Nox Boiler Model CBLE-700-200-150st - From Fullerton Facility
200 HP

200	hp	13378280
9809.5	Watt/hp (boiler) conversion factor	Btu/Hp
3.4129	Btu/hr Watt conversion factor	
8.16	MMBtu/hr	
1020	Btu/scf (heat input) - Natural Gas	
0.008	10^6 scf/hour	

Estimated Emissions (Based on Cleaver Brooks supplied boiler data)

	As supplied by boiler manufacturer	**PTE (using AP-42)**	**PTE**	**PTE - 8760 Hours***
Pollutant	EF (lb/MMBtu) (E	lb/hour	lb/day	Tons/year
NOx	0.01100	0.090	2.15	0.39
CO	0.03600	0.294	7.05	1.29
SOx	0.00170	0.014	0.33	0.06
PM/PM10	0.01000	0.082	1.96	0.36
PM/PM2.5	0.00700	0.057	1.37	0.25
VOC	0.00400	0.033	0.78	0.14

Estimated Emissions (Based on AP-42)

	AP-42 (1.4 EF for Natural Gas Combustion, Small Boilers < 100 MMBtu/hr)	**PTE (using AP-42)**	**PTE**	**PTE - 8760 Hours***	
Pollutant	EF (lb/10^6 scf)	lb/hour	lb/day	Tons/year	
NO2/NOx	32.00000	0.256	6.144	1.121	Criteria
CO	84.00000	0.672	16.128	2.943	Criteria
SOx	0.60000	0.005	0.115	0.021	Criteria
PM/PM10/PM2.5	7.60000	0.061	1.459	0.266	Criteria
VOC	5.50000	0.044	1.056	0.193	Criteria
Lead	0.00050	0.000	0.000	0.000	Criteria
2-Methylnaphthalene	2.40E-05	0.000	0.000	0.000	HAP
3-Methlychloranthrene	1.80E-06	0.000	0.000	0.000	HAP
7,12-Dimethylbenz(a)ant	1.60E-06	0.000	0.000	0.000	HAP
Acenaphthene	1.80E-06	0.000	0.000	0.000	HAP
Acenaphthylene	1.80E-06	0.000	0.000	0.000	HAP
Anthracene	2.40E-06	0.000	0.000	0.000	HAP
Benz(a)anthracene	1.80E-06	0.000	0.000	0.000	HAP
Benzene	2.10E-03	0.000	0.000	0.000	HAP
Benzo(a)pyrene	1.20E-06	0.000	0.000	0.000	HAP
Benzo(b)fluoranthene	1.80E-06	0.000	0.000	0.000	HAP
Benzo(g,h,i)perylene	1.20E-06	0.000	0.000	0.000	HAP
Benzo(k)fluoranthene	1.80E-06	0.000	0.000	0.000	HAP
Chrysene	1.80E-06	0.000	0.000	0.000	HAP
Dibenzo(a,h)anthracene	1.20E-06	0.000	0.000	0.000	HAP
Dichlorobenzene	1.20E-03	0.000	0.000	0.000	HAP
Fluoranthene	3.00E-06	0.000	0.000	0.000	HAP
Fluorene	2.80E-06	0.000	0.000	0.000	HAP
Formaldehyde	7.50E-02	0.001	0.014	0.003	HAP
Hexane	1.80E+00	0.014	0.346	0.063	HAP
Indeno(1,2,3-cd)pyrene	1.80E-06	0.000	0.000	0.000	HAP
Naphthalene	6.10E-04	0.000	0.000	0.000	HAP
Phenanathrene	1.70E-05	0.000	0.000	0.000	HAP
Pyrene	5.00E-06	0.000	0.000	0.000	HAP
Toluene	3.40E-03	0.000	0.001	0.000	HAP
Arsenic	2.00E-04	0.000	0.000	0.000	HAP
Beryllium	1.20E-05	0.000	0.000	0.000	HAP
Cadmium	1.10E-03	0.000	0.000	0.000	HAP
Chromium	1.40E-03	0.000	0.000	0.000	HAP
Cobalt	8.40E-05	0.000	0.000	0.000	HAP
Manganese	3.80E-04	0.000	0.000	0.000	HAP
Mercury	2.60E-04	0.000	0.000	0.000	HAP
Nickel	2.10E-03	0.000	0.000	0.000	HAP
Selenium	2.40E-05	0.000	0.000	0.000	HAP
Butane	2.10E+00	0.017	0.403	0.074	
Ethane	3.10E+00	0.025	0.595	0.109	
Pentane	2.60E+00	0.021	0.499	0.091	
Propane	1.60E+00	0.013	0.307	0.056	
Barium	4.40E-03	0.000	0.001	0.000	
Copper	8.50E-04	0.000	0.000	0.000	
Molybdenum	1.10E-03	0.000	0.000	0.000	
Vanadium	2.30E-03	0.000	0.000	0.000	
Zinc	2.90E-02	0.000	0.006	0.001	
Total Federal HAP		**0.015**	**0.362**	**0.066**	

Schreiber Foods, Inc. - Logan, UT

Date updated: 3/17/2021
By: Paul Bytheway

Potential to Emit Calculations (Tons/Year)

Current PTE

Emission Unit	Emission Unit	Burner Rating (MMBtu/hour)	Fuel Type	Size (HP)	CO	NO2 = NOX *	SOX	PM = PM10 = PM2.5 **	VOC	HAP	CO2	CH4	N20	CO2E
1	250 HP Cleaver Brooks Boiler	10.2	Natural Gas	250	3.68	4.38	0.03	0.33	0.24	0.08	6583.46	0.10	0.01	6588.58
2	200 HP Superior Boiler w/ Burner Retrofit	8.4	Natural Gas & Propane	200	3.38	6.03	0.54	0.32	0.44	0.07	5421.67	0.08	0.01	5425.89
3	200 HP Superior Boiler w/ Burner Retrofit	8.4	Natural Gas & Propane	200	3.38	6.03	0.54	0.32	0.44	0.07	5421.67	0.08	0.01	5425.89
4	400 HP Johnston Boiler	16.7	Natural Gas & Propane	400	8.77	11.98	1.08	0.64	0.88	0.14	10778.81	0.16	0.02	10787.19
5	150 KW Emergency Generator	1.41	Diesel	150 KW	0.06	0.07	0.00	0.00	0.00	0.00	11.53	0.00	0.00	11.53
Total:					**19.26**	**28.49**	**2.19**	**1.62**	**2.01**	**0.36**	**28217.15**	**0.42**	**0.04**	**28239.09**

Proposed PTE

Emission Unit	Emission Unit	Burner Rating (MMBtu/hour)	Fuel Type	Size (HP)	CO	NO2 = NOX *	SOX	PM = PM10 = PM2.5 **	VOC	HAP	CO2	CH4	N20	CO2E
1	250 HP Cleaver Brooks Boiler	10.2	Natural Gas	250	3.68	4.38	0.03	0.33	0.24	0.08	6583.46	0.10	0.01	6588.58
2	200 HP Superior Boiler w/ Burner Retrofit	8.4	Natural Gas & Propane	200	3.38	6.03	0.54	0.32	0.44	0.07	5421.67	0.08	0.01	5425.89
3	200 HP Superior Boiler w/ Burner Retrofit	8.4	Natural Gas & Propane	200	3.38	6.03	0.54	0.32	0.44	0.07	5421.67	0.08	0.01	5425.89
4	400 HP Johnston Boiler	16.7	Natural Gas & Propane	400	8.77	11.98	1.08	0.64	0.88	0.14	10778.81	0.16	0.02	10787.19
5	150 KW Emergency Generator	CO	Diesel	150 KW	0.06	0.07	0.00	0.00	0.00	0.00	11.53	0.00	0.00	11.53
6	200 HP Cleaver Brooks w/ ultra low Nox Burner	8.16	Natural Gas	200	1.29	0.39	0.06	0.36	0.14	0.07	5266.77	0.08	0.01	5270.87
Total:					**20.55**	**28.88**	**2.25**	**1.98**	**2.15**	**0.42**	**33483.92**	**0.50**	**0.05**	**33509.96**

* AP-42 Emission Factors for NOx are expressed as NO2.
** Assume PM2.5 Emissions = Total PM Emissions since AP-42 doesn't have separate emission factors for PM2.5.
** PTE assumes worst case burning natural gas or propane. 8760 hours is assumed.
** PTE for emergency generator assumes 100 hours.

5/24/2013

Andrea Bartlett <abartlett@utah.gov>

Emission Calculations

3 messages

Andrea Bartlett <abartlett@utah.gov> Mon, May 24, 2021 at 7:47 AM
To: Paul Bytheway <PAUL.BYTHEWAY@schreiberfoods.com>

Paul,

Good morning! I hope you had a great weekend. Our modeling team has requested the Excel file for your emission calculations. Please let me know if you have any questions.

Andrea Bartlett

Environmental Engineer | Minor NSR Section

P: (801) 834-8417
abartlett@utah.gov

airquality.utah.gov

Paul Bytheway <Paul.Bytheway@schreiberfoods.com> Wed, May 26, 2021 at 11:16 AM
To: Andrea Bartlett <abartlett@utah.gov>

Here is the excel file. Please let me know if you need anything else.

Thanks,

Paul Bytheway |Environmental Engineer | Company Affairs| Schreiber Foods

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Boiler Emissions Calcs.xlsx
26K

Andrea Bartlett <abartlett@utah.gov> Wed, May 26, 2021 at 11:39 AM
To: Paul Bytheway <Paul.Bytheway@schreiberfoods.com>

Great! Thanks, Paul. I will send this over to modeling right now.

Andrea Bartlett

Environmental Engineer | Minor NSR Section

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abartlett@utah.gov

airquality.utah.gov

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