State of Utah

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Department of
Environmental Quality

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DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

September 22, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers. ~~The facility is sanitized daily between processing shifts in accordance with USDA regulations.~~

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will ~~be stored in~~ utilize two subbase fuel tanks.

Commented [CW1]: I did not make this change. The diesel will not utilize the tanks, I think stored is a better verb here.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson
Site: Eagle Mountain Meat Packaging Plant

Results TBD [Last updated September 22, 2020]

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 (TP
CO_2 Equivalent	44165.00	41165.00
Carbon Monoxide	28.98	28.98
Nitrogen Oxides	13.99	13.99
Particulate Matter - PM_{10}	3.74	3.74
Particulate Matter - $PM_{2.5}$	2.74	2.74
Sulfur Dioxide	0.27	0.27
Volatile Organic Compounds	1.98	1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)	2040	2040
	Change (TPY)	**Total (TPY)**
Total HAPs	1.02	1.02

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

Commented [CW2]: I don't think I should add this. The note below says that the change in emissions is the difference between the previous AO and the proposed modification. Since they don't have a previous AO, I don't think this should be filled in.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- SCR
- SNCR

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically ~~technically~~ feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated September 22, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Commented [TA3]: This should not be in a BACT Analysis. Better suited in project description or a reviewer comment.

Commented [CW4]: I think this is important to note somewhere. It is the basis for the 3000 hours per year limit. I deleted it from the project description as you proposed, but I will leave it here.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Commented [TA5]: That is a lot of information to get to the high turndown ratio

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

Commented [TA6]: Is this per unit?

Commented [CW7R6]: Yes, clarified.

[Last updated September 22, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated September 22, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. Emissions from the silo, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$. The silo will be equipped with a baghouse.

Commented [TA8]: Before or after baghouse?

Commented [CW9R8]: After, clarified.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated September 22, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. All other sources - 20% opacity [R307-201, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]
II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]

Commented [TA10]: Need to add Baghouse opacity of 10% per BACT.

Commented [CW11R10]: Added.

Commented [TA12]: How do you deal with R307-309, boundary 10% and on site 20%?

Commented [CW13R12]: Good catch – added a limit for haul roads

II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 [R307-401-8, 40 CFR 63 Subpart ZZZZ]
II.B.3.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install an emergency engine that is certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm. [Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**
40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**
40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah
GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality
L. Scott Baird
Executive Director
DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

October 23, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist of natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

Commented [CW1]: Added.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA,
Utah 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
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- SCR
- SNCR

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination
Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated October 16, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x
Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation for each unit to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated October 16, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

Commented [CG2]: Did they provide the certifications as part of the NOI?

Commented [CW3R2]: NO, they did not

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use of Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

Commented [CW4]: Added

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated September 22, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. The silo will be equipped with a baghouse. Emissions from the silo with a baghouse, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated October 16, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

Commented [CG5]: Should they be required to stack test these units? I ask because Frito-Lay (11297) has one 25 MMBtu/hr boiler and they are required to stack test. Maybe there is a difference since Frito-Lay has a boiler and these are listed as water heaters?

Commented [CW6R5]: Frito Lays – boiler is older unit (pre 2011 AO) and rated at 66 ppm,

I looked at other meat packaging facilities and this is what I found:

10051 – Boilers are not required to be tested, NOx rolling limit
U of U – Has two 25 MMBtu boilers and not required to test
Dannon 11652 – Several boilers between 16 and 21 MMBtu, no testing required.
12393 Western Quality Foods – 20 and 29 MMBtu boilers, no testing.
14024 West Liberty Foods – 32.6 MMBtu boiler, no testing

We do require testing for an similar size boiler at ATK, but the boiler was installed as part of the SIP and this is a major SIP-listed source

Also, the PTE for each unit is 1.33 tpy

Given all of this, I do not think that testing is warranted.

Commented [CG7]: Is the size of the silo known? Is the baghouse equipped with a manometer? Should there be a condition referencing a pressure drop range?

Commented [CW8R7]: It's a pretty small unit. Flow rate of the baghouse is 800 cfm. The PTE for this emission unit is 0.002 tpy of PM10 and PM2.5. This was estimated based on 26 loading events per year lasting about 1.25 hrs, and a grain loading of 0.02.

Given how small this unit is, I did not think the condition regarding the manometer and associated recordkeeping was warranted. Also, I don't think we usually require that of silo baghouses, unless the facility has several units or it's a more significant emission source.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. Baghouses - 10% opacity D. Haul Roads and Storage Areas - 20% opacity on site and 10% opacity at the property boundary E. All other sources - 20% opacity [R307-201, R307-309, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]

II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install ~~an~~ emergency engines that are~~is~~ certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

Commented [CG9]: How will they demonstrate this over time? Stack testing? Did they provide manufacturer documentation referencing if they test/replace the burner at scheduled intervals to ensure the 9 ppm limit?

Commented [CW10R9]: Please refer to my previous response on this issue. This is our standard condition when we don't require testing.

Commented [CG11]: Should IIII be referenced here and in the following conditions?

Commented [CW12R11]: Added

Commented [CW13R11]:

Commented [CW14]: changed

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Commented [CG15]: Was this provided with the NOI?

Commented [CW16R15]: Yes, they provided manufacturer information for these units

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Commented [CG17]: Was this provided with the NOI?

Commented [CW18R17]: No, they did not provide manufacturer information for this.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm.

[Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**
40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**
40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

4.3 HOT WATER HEATERS (REVISED 9/17/2020)

Tyson proposes to install two 25 MMBtu/hr natural gas-fired hot water heaters used primarily to provide hot water for cleaning the production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) that are specified by the manufacturer to operate at 9 ppmvd at 3% oxygen, which is equivalent to 0.012 lb/MMBtu. Natural gas is considered an inherently clean fuel and as a result, the criteria pollutants, except for NO_X result in less than one ton per year of emissions from each hot water heater. Therefore, Tyson is conducting a BACT analysis of potential control options for NO_X for the hot water heaters, but not conducting a detailed BACT analysis for the other criteria pollutants beyond the practice of good operating practices that will assure the minimization of the products of combustion. Additionally, Tyson did not conduct a CO BACT analysis for the hot water heaters as each unit is proposed to emit no more than approximately 9 tons per year of CO in an attainment area.

As proposed by Tyson the hot water heaters will be equipped with ULNB. Thus, Tyson considered the technical and economic feasibility of add-on controls for the further reduction of NO_X emissions from the hot water heaters. Specifically, selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) were considered as potential add-on control options for NO_X BACT.

4.3.1 Selective Catalytic Reduction

SCR is an add-on control technology used to convert NO_x into diatomic N_2 and H_2O using a catalyst. The reduction reactions used by SCR require O_2, so it is most effective at O_2 levels above 2-3%. Base metals, such as vanadium or titanium, are often used for the catalyst due to their effectiveness as a control technology for NO_X and cost-effectiveness for use with natural gas combustion. In addition, a gaseous reductant such as aqueous ammonia is added to the exhaust gas and absorbed onto the catalyst.[1]

The costs of installing and operating an SCR for each of the hot water heater boilers are estimated using U.S. EPA "Air Pollution Control Cost Estimation Spreadsheet for Selective Catalytic

[1]EPA (U.S. Environmental Protection Agency). May 2016., "Chapter 2, Selective Catalytic Reduction" https://www3.epa.gov/ttn/ecas/docs/SCRCostManualchapter7thEdition_2016.pdf"

Reduction (SCR)" (June 2019). The spreadsheet calculates capital and annualized costs of installing and operating an SCR based on site specific data such as boiler design and operating data. **Table 1** summarizes the capital cost, annual cost, and cost effectiveness of implementing this control technology for each hot water heater boiler. Installation of an SCR is not considered cost effective for either unit as the cost effectiveness values are unreasonably high as demonstrated in **Table 1**.

Table 1
SCR Cost Summary

NO_X Removed (tons)	Total Capital Investment ($)	Total Annual Cost ($/yr)	Cost Effectiveness of Controls ($/ton)
5.27E-06	$1,762,930	$145,194	$27,550,876,719

In addition to the cost impacts as listed in **Table 1**, the environmental and energy impacts associated with SCR include the transport, handling, and use of aqueous ammonia, a corrosive hazardous material. Ammonia poses a potential health exposure and safety risk. The spent catalyst from the SCR would be required to be periodically replaced and disposed of properly, creating residual waste that would need to be landfilled or otherwise disposed. SCRs can also result in adverse air impacts due to ammonia slip, possible formation of a visible ammonium chloride plume from, oxidation of carbon monoxide to carbon dioxide. Therefore, Tyson does not consider SCR a feasible add-on control technology for reducing NO_X emissions from the hot water heaters based on the economic and environmental impacts.

4.3.2 Selective Non-Catalytic Reduction

SNCR is a post-combustion control technology for NO_X emissions that uses a reduction-oxidation reaction to convert NO_X into nitrogen, water, and carbon dioxide. Like SCR, SNCR involves injecting ammonia (or urea) into the exhaust gas stream, which must be between approximately 1,400 and 2,000°F for the chemical reaction to occur. NO_X reduction levels range from 30 - 50%;

however, operating constraints on temperature, reaction time, and mixing often lead to less effective results when using SNCR in practice.[2]

As stated in the EPA's Office of Air Quality Planning and Standards (OAQPS) Cost Control Manual 7th Edition, Section 1.2.5, *"An SNCR process reduces the thermal efficiency of a boiler. The reduction reaction uses thermal energy from the boiler, which decreases the energy available for power or heat generation. As a result, additional energy is required for the boiler to maintain the same steam output. Pretreatment and injection equipment, pumps, and compressors, and control systems, also require electricity. This increased usage of fuel and electricity increases the annual costs to operate the boiler."* Additionally, the 7th Edition of the OAQPS Cost Control Manual indicates that SNCR has the highest levels of reduction efficiency for higher concentrations of NO_X. As indicated in Figure 1.1c of the 7th Edition of the OAQPS Cost Control Manual, NO_X reduction efficiency for pre-control NO_X concentrations less than 30 ppm are estimated at no more than 25% reduction effectiveness. The NO_X concentration from the proposed hot water heaters will be no greater than 9 ppm. Thus, SNCR control would offer little, if any, reduction of NO_X emissions for this specific application. Additionally, SNCR results in ammonia emissions because it is necessary to add more reagent than is stoichiometrically required for effective NO_X control. It is typical for an SNCR system to result in 5-10 ppm ammonia slip emissions. Given the considerations outlined herein, Tyson proposes that the application of SNCR for the hot water heaters is not reasonable as a post-combustion NO_X control option given the resulting thermal efficiency loss, the limited NO_X reduction achievable for this application, the complexity of an SNCR system due to the equipment needs and the environmental concerns for ammonia slip.

Thus, based on the technical, economic, and environmental feasibility of the add-on NO_X control technologies evaluated, Tyson proposes the use of ULNBs and good combustion practice are considered NO_X BACT for the proposed hot water heaters.

[2] EPA (U.S. Environmental Protection Agency). 2003. "Selective Non-Catalytic Reduction Air Pollution Control Technology Fact Sheet." *EPA-452/F-03-031*

Table C-1
Summary of Potential Facility Emissions
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Total Potential Emissions [a],[b]	
	lb/hr	tpy
PM	2.10	12.92
PM_{10}	1.31	3.74
$PM_{2.5}$	1.22	2.74
SO_2	1.27	0.27
H_2SO_4	2.18E-01	0.10
NO_X	10.84	13.99
VOC	0.78	1.98
CO	11.68	28.98
Pb	6.38E-05	1.72E-04
HAPs	2.57E-01	1.02
$NO_X + SO_2$ [c]	12.11	14.25
Total CO_2e	15,862	41,165

[a] Small combustion devices (i.e., < 20 MMBtu/hr) assume an uncontrolled NO_X emissions factor based on AP-42.

[b] Combustion devices ≥ 20 MMBtu/hr use ultra low NO_X burners (ULNB) rated for 9 ppm.

[c] Utah County maintenance area provisions for PM_{10} National Ambient Air Quality Standards (NAAQS) requires offsets for $NO_X + SO_2$ > 25 tons per year.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating < 5 MMBtu/hr					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[a]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	7.79E-03	3.41E-02
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
PM_{10}[b]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
$PM_{2.5}$[b]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.46E-03	1.08E-02
H_2SO_4[c]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.13E-03	4.95E-03
NO_X[d]	100.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	0.41	1.79
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.25E-02	0.10
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	0.34	1.51
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.05E-06	8.97E-06
Total CO_2e	-	-	-	489	2,144
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*489*	*2,142*
CH_4 CO_2e	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*0.23*	*1.01*
N_2O CO_2e	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*0.27*	*1.20*

[a] Potential emissions rates based on parameters identified below.

4.18	MMBtu/hr
1,000,000	Btu/MMBtu
1,020	Btu/scf
8,760	hrs/yr
2.20462	lb/kg
2,000	lbs/ton
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[b] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[c] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[d] Small combustion devices (i.e., < 20 MMBtu/hr) assume an uncontrolled NO_X emissions factor based on AP-42.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating > 5 MMBtu/hr and < 20 MMBtu/hr [h]					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[e]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.42E-01	2.12E-01
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
PM_{10} [f]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
$PM_{2.5}$ [f]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	4.47E-02	6.70E-02
H_2SO_4 [g]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.05E-02	3.08E-02
NO_X [h]	0.082	lb/MMBtu	See footnote (h)	6.23	9.35
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	4.10E-01	0.61
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	6.26	9.39
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.72E-05	5.59E-05
Total CO_2e	-	-	-	8,897	13,345
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*8,888*	*13,332*
CH_4 CO_2e	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*4.19*	*6.28*
N_2O CO_2e	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*4.99*	*7.49*

[e] Potential emissions rates based on parameters identified below.

75.98	MMBtu/hr
1,000,000	Btu/MMBtu
1,020	Btu/scf
3,000	***hrs/yr*** [i]
2.20462	lb/kg
2,000	lbs/ton
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[f] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[g] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[h] Combustion devices > 5 MMBtu/hr and < 20 MMBtu/hr assume an uncontrolled NO_X emissions factor based on vendor provided information. These devices consist of air handling units for facility operations.

[i] Hours for the air handling devices lowered to maintain facility operations combined emissions < 25 tpy NOx + SO_2 to avoid emissions offsets requirements.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating ≥ 20 MMBtu/hr					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[j]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.09	0.41
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
PM_{10}[k]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
$PM_{2.5}$[k]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.94E-02	0.13
H_2SO_4[l]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.35E-02	5.92E-02
NO_X[m]	0.012	lb/MMBtu	Manufacturer Guarantee (9 ppm NOx)	0.61	2.67
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.27	1.18
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	4.12	18.04
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.45E-05	1.07E-04
Total CO_2e	-	-	-	5,855	25,644
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*5,849*	*25,618*
$CH_4\ CO_2e$	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*2.76*	*12.07*
$N_2O\ CO_2e$	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*3.28*	*14.39*

[j] Potential emissions rates based on parameters identified below.

50.00	MMBtu/hr
14,000	ACFM
1,020	Btu/scf
8,760	hrs/yr
2.20462	lb/kg
2,000	lbs/ton
1,000,000	Btu/MMBtu
46.0	lb/lb*mol NO_2
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[k] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[l] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[m] Combustion devices ≥ 20 MMBtu/hr assumes emissions concentrations provided by the manufacturer.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Total Potential Emissions from Natural Gas Combustion Devices	
	lb/hr	tpy
PM Filterable	2.42E-01	0.65
PM	0.97	2.62
PM_{10}	0.97	2.62
$PM_{2.5}$	0.97	2.62
SO_2	7.66E-02	0.21
H_2SO_4	3.52E-02	0.09
NO_X	7.25	13.81
VOC	0.70	1.89
CO	10.72	28.93
Pb	6.38E-05	1.72E-04
$NO_X + SO_2$	7.33	14.01
Total CO_2e	15,241	41,134
CO_2	15,226	41,091
CH_4 CO_2e	7.17	19.36
N_2O CO_2e	8.55	23.08

NOTICE OF INTENT APPLICATION

TYSON FOODS, INC. – EAGLE MOUNTAIN, UT FACILITY

JULY 2020

Submitted by:

Tyson Foods, Inc.

Tyson Foods, Inc. – Eagle Mountain, UT Facility
Fresh Meat Division
3867 N. Tyson Industrial Pkwy
Eagle Mountain, Utah 84005

Submitted to:

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
AIR QUALITY

Utah Department of Environmental Quality
Utah Division of Air Quality
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1. INTRODUCTION

Tyson Foods, Inc. (Tyson) Fresh Meats Division retained ALL4 LLC (ALL4) to prepare this Notice of Intent (NOI) Application for the proposed greenfield Eagle Mountain, Utah Facility (Facility) located at 3867 N. Tyson Industrial Parkway, Eagle Mountain, UT, 84005 in Utah County. Tyson completed a pre-NOI application meeting with the Utah Division of Air Quality (UDAQ) on May 20, 2020.

Upon completion of the application process and receipt of a New Source Review (NSR) Approval Order (AO), the Facility intends to operate general natural gas combustion equipment, emergency generators, a salt silo, and truck trailer traffic to support the production of case-ready packages of beef and pork for consumer sale.

Tyson is submitting this NOI application for the construction and operation of a minor source pursuant to Utah Administrative Code (UAC) Regulation (R) R307-401 – Permit: New and Modified Sources.

1.1 APPLICATION ORGANIZATION

The remainder of this application is organized according to the UDAQ's NOI form (Form 1) and includes the following sections and appendices:

- Section 1: Introduction and Application Organization – contains general information regarding the Facility and an overview of the application.
- Section 2: Process Description and Emissions Units – provides information about the Facility's new greenfield site operations and emissions rates.
- Section 3: Regulatory Analysis – identifies State and Federal applicable requirements.
- Section 4: Best Available Control Technology – identifies the best available control technology requirements and analysis for the Facility.
- Appendix A: UDAQ NOI Forms – contains the required forms for a complete NOI Application.
- Appendix B: Fugitive Dust Control Plan – contains copies of the approved construction and operations Fugitive Dust Control Plan for the truck traffic activity at the Facility.
- Appendix C: Emissions Inventory – contains the emissions calculations for the Facility.

- Appendix D: Figures – contains the proposed site map, plot plan, and process flow diagram for the Facility.

- Appendix E: Additional BACT Information – contains supporting information related to the BACT analysis.

- Appendix F: NO_2 Emissions Impact Analysis – contains the 1-hour NO_2 emissions modeling summary

2. PROCESS DESCRIPTION AND EMISSIONS UNITS

2.1 PROCESS DESCRIPTION

The Facility will produce case-ready packages of beef and pork for consumer sale. The food production operations at the Facility include case-ready meat-cutting and packaging to produce steaks, chops, roasts and ground beef. The raw materials include larger cuts of fresh beef and pork received from packing plants in the region. The products are weighed, packaged, labeled, and then shipped to retailers for sale in grocery store meat cases.

2.2 EMISSIONS UNITS - COMBUSTION

The Facility proposes to operate multiple combustion devices of varying size and purpose. This will include:

- Two 25 million British thermal units per hour (MMBtu/hr) natural gas fired hot water heaters used primarily for cleaning the production areas.
- Seven Critical Process Air (CPA) handling units (AHUs) each with a 10.85 MMBtu/hr natural gas fired burner used primarily for daily sanitation that occurs between processing shifts.
- 23 small natural gas fired units each with a heat input capacity of less than 1 MMBtu/hr. These units include three water heaters and miscellaneous pieces of building support equipment.

Provided below in Table 2-1 is a list of the proposed sources and the heat capacities of each source within the Facility.

Table 1
Proposed Combustion Devices for the Facility

Equipment Number	Description	Heating Capacity (MMBtu/hr)
TBD	Water Heater	25.0
TBD	Water Heater	25.0
GB-1	Critical Process AHU	10.85
GB-2	Critical Process AHU	10.85
SL-1	Critical Process AHU	10.85
SL-2	Critical Process AHU	10.85
SL-3	Critical Process AHU	10.85
SL-4	Critical Process AHU	10.85
SL-5	Critical Process AHU	10.85
TBD	Misc. Process/Building Support	0.750
UH-1	Misc. Process/Building Support	0.400
UH-2	Misc. Process/Building Support	0.400
RTU-12	Misc. Process/Building Support	0.300
RTU-13	Misc. Process/Building Support	0.300
TBD	Misc. Process/Building Support	0.300
RTU-03	Misc. Process/Building Support	0.200
RTU-07	Misc. Process/Building Support	0.200
RTU-15	Misc. Process/Building Support	0.200
RTU-02	Misc. Process/Building Support	0.125
RTU-18	Misc. Process/Building Support	0.125
RTU-23	Misc. Process/Building Support	0.100
RTU-04	Misc. Process/Building Support	0.075

Equipment Number	Description	Heating Capacity (MMBtu/hr)
RTU-05	Misc. Process/Building Support	0.075
RTU-06	Misc. Process/Building Support	0.075
RTU-08	Misc. Process/Building Support	0.075
RTU-09	Misc. Process/Building Support	0.075
RTU-10	Misc. Process/Building Support	0.075
RTU-16	Misc. Process/Building Support	0.075
RTU-22	Misc. Process/Building Support	0.075
TBD	Water Heater	0.060
TBD	Water Heater	0.060
TBD	Water Heater	0.060

The combustion devices will emit criteria pollutants and hazardous air pollutants (HAPs) as provided in Tables C-2 and C-3 in Appendix C.

The emissions for the combustion devices were calculated using guidance from United States Environmental Protection Agency (U.S. EPA) AP-42: Compilation of Emissions Factors, Chapter 1.4 Natural Gas Combustion along with vendor provided NO_X emissions information as relevant. The combustion devices were split into three categories to calculate emissions as consistent with the burner type and size distinctions in AP-42 guidance:

- Units < 5 MMBtu/hr
- Units > 5 MMBtu/hr and < 20 MMBtu/hr
- Units ≥ 20 MMBtu/hr

2.3 EMISSIONS UNITS – TRUCK TRAFFIC

The truck traffic operations on the Facility roadways will emit fugitive emissions of particulate matter (PM), PM of less than 10 microns (PM_{10}), and PM of less than 2.5 microns ($PM_{2.5}$) as provided in Appendix C, Table C-4. Emissions from paved roadways were calculated according

to UDAQ guidance "Emission Factors for Paved and Unpaved Haul Roads" which references AP-42, Chapter 13.2.2. As outlined in the emissions calculations, conservative assumptions were made in truck weight, route, and distance to determine the emissions.

2.4 EMISSIONS UNITS – EMERGENCY ENGINES

Tyson is proposing to install two U.S. EPA certified Tier 3 stationary engines, a 225 kilowatt (kW) and 154 kW standby generator rating, respectively. The two reciprocating internal combustion engine (RICE) generators will combust ultra-low sulfur diesel (ULSD) and operate intermittently no more than 100 hours/year. The engines emissions were determined using a combination of manufacturer provided emissions factors and AP-42, Chapter 3.2. The emissions are provided in Tables C-5 through C-8 of Appendix C.

Each engine will be fed ULSD fuel from a sub-base storage tank located underneath the engine. The tanks are 316 and 555 gallons, respectively. The emissions are determined using emissions factors from AP-42 Chapter 7.1. The emissions are provided in Table C-9 of Appendix C.

2.5 EMISSIONS UNITS – SALT SILO

Tyson proposes to operate a salt silo to feed an industrial brine maker. The silo vent will be equipped with a baghouse to reduce particulate emissions during the bimonthly salt loading events. The emissions associated with the salt loading are provided in Table C-10 of Appendix C.

2.6 OVERALL EMISSIONS

The overall Facility emissions are included in Table C-1 of Appendix C and provided below in Table 2. Tyson proposes the emissions as the Facility's potential-to-emit (PTE).

Table 2
Summary of Potential Facility Emissions

Pollutant	Total Potential Emissions [a],[b]	
	lb/hr	tpy
PM	2.10	12.92
PM_{10}	1.31	3.74
$PM_{2.5}$	1.22	2.74
SO_2	1.27	0.27
H_2SO_4	2.18E-01	0.10
NOX	11.24	15.77
VOC	0.78	1.98
CO	11.68	28.98
Pb	6.38E-05	1.72E-04
HAPs	2.57E-01	1.02
$NO_X + SO_2$ [c]	12.52	16.03
Total CO_2e	15,862	41,165

[a] Small combustion devices (i.e., < 20 MMBtu/hr) assume an uncontrolled NO_X emissions factor based on AP-42.
[b] Combustion devices ≥ 20 MMBtu/hr use ultra low NO_X burners (ULNB) rated for 0.015 lb/MMBtu.
[c] Utah County maintenance area provisions for PM_{10} National Ambient Air Quality Standards (NAAQS) requires offsets for $NO_X + SO_2$ > 25 tons per year.

3. REGULATORY ANALYSIS

Tyson reviewed Federal and State of Utah air quality regulations to determine potentially applicable air quality requirements for the Facility. The regulations that potentially apply to the proposed Facility operations are described in the following subsections.

3.1 STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

The U.S. EPA has promulgated standards of performance for specific new, reconstructed, and modified sources, otherwise known as Standards of Performance for New Stationary Sources (NSPS), which are codified at 40 CFR Part 60. Tyson has reviewed the NSPS and determined that the following NSPS promulgated under 40 CFR Part 60 potentially apply to the Facility emissions units.

3.1.1 40 CFR Part 60, Subpart A – General Provisions

The provisions of 40 CFR Part 60, Subpart A apply to the owner or operator of any stationary source subject to an NSPS. These general provisions include recordkeeping, reporting, monitoring, and testing requirements. Because the Project will be subject to an NSPS, it will be required to comply with the applicable requirements of 40 CFR Part 60, Subpart A.

3.1.2 40 CFR Part 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

40 CFR Part 60, Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) applies to steam generating units in which construction, modification, or reconstruction commenced after June 9, 1989 and has a heat capacity between 2.9 MW (10 MMBtu/hr) and 29 MW (100 MMBtu/hr). The two 25 MMBtu/hr hot water heaters are subject to the regulations of Subpart Dc.

40 CFR Subpart Dc regulates emissions limits, testing, monitoring, and recordkeeping of SO_2 and PM emissions. Because the hot water heaters at Tyson operate with natural gas, they are only subject to the 40 CFR 60.48c reporting and recordkeeping requirements.

Pursuant to 40 CFR 60.48c(a), Tyson will notify the Administrator of a date of construction with the applicable information outlined in this rule. Tyson will maintain records of natural gas usage and supplier information including potential sulfur emission rates to meet the requirements of 40 CFR 60.48c(f)(4) and (g)(2). Tyson will maintain all records for at least two years and will submit to the Administrator as applicable.

3.1.3 40 CFR Part 60, Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

40 CFR Part 60, Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m^3) under 40 CFR §60.110b. The Project includes two diesel fuel storage tanks with a capacity of 316 and 555 gallons (1.2 and 2.1 m^3, respectively). The tanks are less than 75 m^3; therefore, Subpart Kb does not apply to the Project.

3.1.4 40 CFR Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The requirements of 40 CFR Part 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) apply to the owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) that commence operation after July 11, 2005 and are manufactured after the dates specified in 40 CFR §60.4200. Subpart IIII applies to the proposed diesel fuel-fired engines.

The emissions standards applicable to the proposed engines are presented in 40 CFR §60.4205(b), where owners and operators of 2007 or later model year emergency stationary CI ICE and a displacement of less than 30 liters per cylinder must comply with the emissions standards in 40 CFR §60.4202. Emergency diesel fuel-fired RICE must be certified by manufacturers to meet the applicable emissions standards for new, non-road compression ignition engines for the same model year and maximum engine power in Table 1 of 40 CFR §89.112. Under 40 CFR §89.112(a), emergency engines with power ratings greater than 37 kW (i.e., 50 bhp), steady-state exhaust emissions may not exceed the following applicable Tier 3 emissions standards:

- 0.67 grams per kilowatt-hour (g/kW-hr) of NO_X
- 3.5 g/kW-hr of carbon monoxide (CO)
- 4.0 g/kW-hr of nonmethane hydrocarbons (NMHC)
- 0.2 g/kW-hr of particulate matter (PM)

Since October 1, 2010, 40 CFR §60.4207(b) requires engines to use compliant fuel in accordance with 40 CFR §80.510(b). Such fuel must not exceed a maximum sulfur content of 15 parts per million (ppm) and have a minimum cetane index of 40 or not exceed a maximum aromatic content of 35% by volume. Therefore, the proposed RICE will use ULSD. Additionally, per 40 CFR §60.4211(a), Tyson must operate and maintain the RICE according to the manufacturers' written instructions. Tyson may also change only those emission-related settings that are permitted by the manufacturer. Tyson will comply with the applicable monitoring, recordkeeping, and reporting requirements under Subpart IIII.

3.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The National Emission Standards for Hazardous Air Pollutants (NESHAP) originally required by the 1970 Clean Air Act (CAA), found at 40 CFR Part 61, apply to specific compounds emitted from specific source categories. The Facility does not fall under any of the source categories regulated by 40 CFR Part 61. Therefore, 40 CFR Part 61 requirements are not applicable to the Facility emissions units.

The provisions of 40 CFR Part 63 implement Maximum Achievable Control Technology (MACT) standards which apply to specific source categories that are considered either major or area sources of HAP. A major source of HAP is defined as a stationary source that has the PTE 10 tons per year (tpy) or more of any single HAP, or 25 tpy or more of any combination of HAP. Emissions from the Facility do not exceed the 10 tpy threshold for any single HAP, or the 25 tpy threshold for any combination of HAP; therefore, the Facility is an area source of HAP.

3.2.1 40 CFR Part 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63, Subpart ZZZZ (National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines) (also referred to as RICE MACT) applies

to stationary RICE located at a major or area source of HAP emissions. Therefore, the provisions of 40 CFR Part 63, Subpart ZZZZ apply to the emergency engines. In accordance with 40 CFR §63.6590(c)(1), a stationary RICE located at an area source of HAP meets the requirements of 40 CFR Part 63, Subpart ZZZZ by meeting the requirements of 40 CFR Part 60, Subpart IIII or 40 CFR Part 60, JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines). The diesel fuel-fired emergency engine will comply with the applicable requirements of Subpart IIII. Therefore, the requirements of Subpart ZZZZ will be met.

3.2.2 40 CFR Part 63, Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

40 CFR Part 63, Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to boilers located at or part of a source of HAPs. Tyson boilers are natural gas fired and meet the exemption listed in 40 CFR 63.11195(e); therefore, Subpart JJJJJJ does not apply.

3.3 STATE OF UTAH AIR QUALITY REGULATIONS

Potentially applicable state of Utah Air Quality regulations as codified in Title R307 of the Utah Administrative Code are summarized below and discussed in the subsequent subsections.

- R307-201 – General Emissions Standards
- R307-205 – Emission Standards: Fugitive Emissions and Fugitive Dust
- R307-230 – NO_x Emission Limits for Natural Gas-Fired Water Heaters
- R307-305 – Nonattainment and Maintenance Areas for PM_{10}: Emission Standards
- R307-309 – Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust
- R307-325 – Ozone Nonattainment and Maintenance Areas: General Requirements
- R307-401 – New and Modified Sources
- R307-403 – New and Modified Sources in Nonattainment Areas and Maintenance Areas
- R307-410 – Permits: Emissions Impact Analysis
- R307-415 – Permits: Operating Permit Requirements
- R307-416 – Permits: Acid Rain Sources

- R307-421 – Permits: PM_{10} Offset Requirements in Salt Lake County and Utah County

3.3.1 Permit Applicability

Tyson evaluated the proposed emissions and the Facility siting to determine the requirements with respect to prevention of significant deterioration (PSD) and nonattainment new source review (NNSR) permitting. Table 3 provides the attainment status of each pollutant applicable to the proposed Facility siting in Utah County, UT. Utah County is considered nonattainment for ozone and $PM_{2.5}$, and a maintenance area for PM_{10} as of March 2020. According to 85 Federal Register (FR) 10989, Utah County attained the PM_{10} NAAQS, and requested re-designation to attainment, which was granted on March 27, 2020. The source classifications outlined in Table 2 are determined using the attainment status of each pollutant and the applicable major source thresholds as outlined in Table 2. The Facility is considered a minor source for all PSD and NNSR pollutants.

Table 3
Nonattainment New Source Review Analysis

Pollutant	Potential Emissions (tpy)	Attainment Status	Major Source Threshold for NNSR (tpy)	Reference	Subject to NNSR Yes/No?
NO_x	15.77	Ozone Non-attainment - Marginal	100	R307-403 Pursuant to 40 CFR §51.165	No
CO	28.98	Attainment	250	R307-405 Pursuant to 40 CFR §51.165	No
VOC	1.98	Ozone Non-attainment - Marginal	100	R307-403 Pursuant to 40 CFR §51.165	No
SO_2	0.27	Attainment	250	R307-405 Pursuant to 40 CFR §51.165	No
PM	12.92	Attainment	250	R307-405 Pursuant to 40 CFR §51.165	No
PM_{10}	3.74	Attainment - Maintenance Area	250	R307-403 Pursuant to 40 CFR §51.165	No
$PM_{2.5}$	2.74	Nonattainment - Serious	70	R307-403-5(2)(b)(ii)	No
Pb	1.72E-04	Attainment	250	R307-405 Pursuant to 40 CFR §51.165	No
H_2SO_4	0.10	Attainment	250	R307-405 Pursuant to 40 CFR §51.165	No

3.3.1.1 R307-401 – Permit: New and Modified Sources

R307-401 establishes the application and permitting requirements for new installations and modifications to existing installations throughout the State of Utah. This application is being submitted in accordance with R307-401-5 (Notice of Intent). Tyson understands the requirements of the Approval Order and the NOI application process and will comply with the general regulations of application submittal and public notice. Because the proposed Facility-wide potential to emit are below the PSD and nonattainment new source review thresholds, the permitting is not applicable to the provisions of R307-403 and R307-405. Thus, the Facility will comply with the provisions of R307-401.

Pursuant to R307-401-4(3), Tyson has provided a Best Available Control Technology (BACT) analysis for the Facility proposed emitting equipment in Section 4 of this application narrative.

3.3.1.2 R307-403 – Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas

R307-403 applies to the construction or major modification of major stationary sources of air pollution emissions located within any area that has been identified as not meeting the NAAQS for the pollutant for which the source is major. As discussed in Section 3.3.1, none of the NNSR pollutants trigger NNSR even though the Facility is located in an ozone nonattainment area for NO_X and VOC, a serious nonattainment area for $PM_{2.5}$, and a maintenance area for PM_{10}. Therefore, none of the requirements of R307-403 or the offset requirements apply for the proposed Facility. Similarly, none of the PSD pollutants trigger PSD, so none of the requirements of R307-405 apply for the proposed Facility.

3.3.2 R307-201 – General Emissions Standards

R307-201 establishes emission standards for all areas of the state except for sources listed in Section IX, Part H of the state implementation plan or located in a PM_{10} nonattainment or maintenance area. As of March 27, 2020, Utah County is re-designated as in attainment, but declared a maintenance area as described in the above sections. Therefore, the general PM_{10} emissions standards are not applicable to the Facility.

3.3.3 R307-205 – Emission Standards: Sulfur Content of Fuels

R307-203-1 established emission limits for sulfur content in fuel. Pursuant to R307-203-1(1), a source not covered by an NSPS must comply with the sulfur content regulations. Because the emergency engines at Tyson comply with 40 CFR Part 60 Subpart IIII, they do not need to meet this requirement. The NSPS covers all sulfur requirements of this subpart.

3.3.4 R307-205 – Emission Standards: Fugitive Emissions and Fugitive Dust

R307-205 identifies work practice and emissions standards for sources of fugitive emissions or fugitive dust except for sources listed in Section IX, Part H of the state implementation plan or located in a PM_{10} nonattainment or maintenance area. Because Utah County is listed as a maintenance area for PM_{10}, R307-205 is not applicable to the Facility. More details on the applicable fugitive dust control methods are provided in R307-309 and the separately submitted construction and operation Fugitive Dust Control Plans (FDCP). The plans are included in Appendix B.

3.3.5 R307-230 – NOx Emission Limits for Natural Gas-Fired Water Heaters

R307-230 establishes emissions limits and requirements for natural gas-fired water heaters. The Facility proposes to construct two engine room water heaters with a capacity of 25 MMBtu/hr and three water heaters with a capacity of 0.06 MMBtu/hr. Pursuant to R307-230-3(2), Tyson will purchase and operate a water heater that was manufactured using the South Coast Air Quality Management District Method 100.1. The 0.06 MMBtu/hr water heaters will meet the emission limit of 15 ppm NO_X at 3% O_2 as outlined in the State Construction and Fire Codes Act.

3.3.6 R307-305 – Nonattainment and Maintenance Areas for PM_{10}: Emission Standards

R307-305 establishes emissions standards for sources in PM_{10} nonattainment and maintenance areas. The Facility is located in a maintenance area with respect to PM_{10} and will comply with the applicable emissions standards.

Pursuant to R307-305-3(1), the Facility will not have emissions of a shade of density darker than 20% opacity except for stationary operation not exceeding three minutes in any hour. This applies

if a site-specific PM_{10} limit is established for a facility emissions source in the SIP. Therefore, testing does not apply to the proposed Tyson facility, only the general opacity standard.

3.3.7 R307-309 – Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust

R307-309 establishes work practice and emissions standards for sources of fugitive dust in $PM_{2.5}$ nonattainment areas. Utah County is a nonattainment area for $PM_{2.5}$ and a maintenance area for PM_{10}; therefore, Facility emissions are subject to the requirements outlined in this rule. Pursuant to R307-309-4, Tyson will maintain opacity from fugitive emissions below 15%.

Pursuant to R307-309-5, Tyson will maintain opacity from fugitive dust below 20% on site and 10% at the boundary. Additionally, Tyson developed a construction and operation FDCP in accordance with the requirements outlined in R307-309-6.

3.3.8 R307-325 – Ozone Nonattainment and Maintenance Areas: General Requirements

R307-325 establishes requirements for the control of VOC from materials in any nonattainment or maintenance area. Utah County is considered an ozone nonattainment area and the Facility will comply with R307-325-3 in that no VOC will be handled in a manner that would spill, discard material, or storage of material in an open container that would result in evaporation of VOC greater than if reasonably available control technology (RACT) had been applied.

3.3.9 R307-410 – Permits: Emissions Impact Analysis

R307-410 establishes the procedures and requirements for evaluating the emissions impact of a new source that requires an AO under R307-401. Pursuant to R307-410-4, new sources in an attainment area with emissions above those listed in the rule, are required to conduct air quality modeling. A complete and detailed emissions impact analysis is attached in Appendix F. The Facility emissions and the R307-410-4 emissions thresholds are provided in Table 4.

Table 4
Facility Emissions Compared to the Air Quality Modeling Emissions Thresholds

Pollutant[a]	Facility-Wide Maximum Annual Emissions (tons/yr)	Emission Threshold Value[a] (tons/yr)	Modeling Requirement
PM_{10} - fugitive emissions	1.11	5	No
PM_{10} - non-fugitive emissions	2.62	15	No
CO	28.98	100	No
SO_2	0.27	40	No
NO_2 [b]	15.77	40	No
Lead	1.72E-04	0.6	No

[a] Emissions thresholds displayed pursuant to R307-410-4, which assumes Utah County is considered in attainment with respect to the relevant criteria pollutant NAAQS. Utah Department of Environmental Quality (DEQ) indicated to ALL4 that Utah County will be re-designated to attainment for PM_{10} as of March 27, 2020.

[b] Facility-wide emissions represented as NOx. Additionally, Utah DEQ represented that the state will conduct modeling for NOx emissions > 10 lb/hr or the facility can choose to conduct themselves.

Facility-wide Maximum NOx Hourly (lb/hr)	4
Utah DEQ Hourly Modeling Evaluation Threshold (lb/hr)	10
Modeling Requirement	NO

Table 4 reveals that the Facility is exempt from air quality modeling based on the facility-wide emissions. Tyson conducted the 1-hour NO_2 analysis to confirm the proposed Facility will not cause or contribute to violations of the 1-hour NO_2 NAAQS, with the understanding that the Utah DEQ would perform this analysis if it were not submitted with the application. NO_2 emitting sources are included in the model, and following discussion with Utah DEQ personnel, the model combines small (<1 MMBtu/hr) burners into a single area source. Additionally, the model utilizes U.S. EPA's intermittent guidance to adjust the modeled hourly emissions rate of the emergency generators to an average of the yearly emissions. Tyson will provide modeling input files to Utah DEQ via electronic mail transmission to appropriate Utah DEQ personnel.

Pursuant to R307-410-5, Tyson evaluated the modeling requirement for air toxics. The UDAQ Emissions Impact Assessment Guidelines, which specifies toxics listed in the American Conference of Governmental Industrial Hygienists (ACGIH) – "Threshold Limit Values for Chemical Substances and Physical Agents," establishes the emissions thresholds for air toxics. Toxics emissions estimates provided in Appendix C Table 3 indicate that no further modeling

assessment is required for the estimated toxics. The modeling evaluation is based on emissions rates being less than the Emissions Threshold Factors (ETF) for vertically unrestricted stack release located less than 50 meters from the property line.

Additionally, Tyson evaluated the ambient air impacts for the emergency generators. Pursuant to R307-410-5(1)(a), the engines are exempt from ambient air impact analysis for HAPs. The engines will comply with the requirements of 40 CFR, Part 63, Subpart ZZZZ.

The facility-wide toxics emissions compared to the ETF are provided in Table 5.

Table 5
Comparison of Facility Air Toxics Emissions to the Air Quality Modeling Emissions Thresholds

Pollutant[a]	Facility-Wide Maximum Short-Term Emissions (lb/hr)	Emission Threshold Value[b] (lb/hr)	Modeling Requirement
Formaldehyde	9.26E-03	1.88E-02	No
Hexane	0.22	11.63	No
Naphthalene	7.53E-05	3.46	No
Toluene	4.20E-04	4.97	No
Beryllium Compounds	1.48E-06	3.30E-06	No
Chromium Compounds	1.73E-04	2.20E-04	No
Cobalt Compounds	1.04E-05	1.32E-03	No
Manganese Compounds	4.69E-05	1.32E-02	No
Mercury Compounds	3.21E-05	6.60E-04	No
Nickel Compounds	2.59E-04	2.20E-03	No
Selenium Compounds	2.96E-06	1.32E-02	No

[a] Pollutants identified are from the list of pollutants provided by the UDAQ in the *2014 ACGIH - TLVs and UDAQ - TSLs and ETVs* spreadsheet. Pollutants that are potentially emitted by the facility and listed in Utah's spreadsheet are included in the threshold analysis.

[b] Emissions thresholds are obtained from the *Utah Division of Air Quality in the 2014 ACGIH - TLVs and UDAQ - TSLs and ETVs* spreadsheet and are based on Tysons's design plan for vertical, unrestricted stacks between 20 and 50 meters away from the property line.

Table 5 reveals that the Facility is exempt from air toxics modeling based on the facility-wide emissions.

3.3.10 R307-415 – Permits: Operating Permit Requirements

R307-415 establishes the elements and procedures of the Title V program as required in the CAA. The Facility does not meet the definition of Major Source as outlined in R307-415-3, and therefore the Facility is not required to submit a Title V application.

3.3.11 R307-416 – Permits: Acid Rain Sources

R307-416 incorporates the requirements of 40 CFR Part 72, 75, and 76 by reference. The Facility does not contain any affected sources as described in 40 CFR §72.6; therefore, the Facility is not required to complete an Acid Rain Application.

3.3.12 R307-421 – Permits: PM_{10} Offset Requirements in Salt Lake County and Utah County

Utah Administrative Code requires that under certain conditions, new or modified sources must offset the emissions increases for various pollutants. Pursuant to R307-421-1, Utah County is listed as a county that requires offsets for PM_{10} precursors to maintain the PM_{10} NAAQS. The offset requirements listed in R307-421-3 apply for new sources with a potential to emit sulfur dioxides and oxides of nitrogen that total greater than 25 tpy. Because the total SO_2 and NO_X potential to emit for the proposed Facility are less than 25 tpy as detailed in Table 2, offsets are not required per R307-421 and were not further evaluated.

4. BEST AVAILABLE CONTROL TECHNOLOGY

4.1 BEST AVAILABLE CONTROL TECHNOLOGY SUMMARY

BACT is defined at UAC R307-101-2 as "*an emission limitation and/or other controls to include design, equipment, work practice, operation standard or combination thereof, based on a maximum degree of reduction of each pollutant subject to regulation under the Clean Air Act and/or the Utah Air Conservation Act emitted from or which results from any emitting installation, which the Air Quality Board, on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable for such installation through application of production process and available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant.*"

Based on the above BACT definition, the BACT determinations in this application are case-by-case analyses that involve an assessment of control technologies capable of reducing emissions of a pollutant and are conducted considering technical feasibility, as well as, economic, environmental, and energy impacts. Tyson has included a case-by-case BACT analyses for the proposed emissions sources for the Facility, except for 23 natural gas-fired units each with a heat input capacity of less than 1 MMBtu/hr as exempted by UAC R307-401-10. These units include three water heaters and miscellaneous pieces of building support equipment.

In summary, Tyson is proposing that the use of conventional direct-fired burners is BACT for the seven AHUs, the use of Tier 3 engines is BACT for the two emergency generators, the use of ultra-low NO_X burners and good combustion practice is BACT for the two hot water heaters, and good operating practices are BACT for the haul roads and truck trailer storage operations. The case by case BACT for each unit follows in subsequent subsections.

4.2 AIR HANDLING UNITS

4.2.1 Process Summary

Tyson proposes to operate seven AHUs each with a single conventional, direct-fired natural gas burner of 10.85 MMBtu/hr that will achieve 90 ppmvd NO_X corrected to 3% oxygen, which is equivalent to 0.082 lb NO_X/MMBtu. The AHUs are operated to complete the sanitation and disinfection step prior to the next processing shift, specifically to quickly dry equipment and surfaces in the facility and eliminate fogging that occurs as a result of the temperature change between operations and sanitation (i.e., approximately a 30 degrees Fahrenheit (°F) temperature change from 42 °F to 70 °F). The sanitation and disinfection step is required to occur during a short duration of less than four hours with the drying step (i.e., operation of the direct-fired burners) occurring for approximately two hours and up to two times each day[1]. Tyson proposes an enforceable operating hour limit of 3,000 hours per year for each of the AHUs to accommodate the sanitation and disinfection drying step.

During the drying step, the tempered fresh air introduced to the building is required to be 70 °F to prevent condensation and humidification and to properly dry the building. The AHUs must be able to quickly bring the room to the appropriate temperature during the sanitation and disinfection step, which requires a 100 °F temperature rise. In other words, the AHUs must have a high turndown ratio. Specifically, the proposed AHUs are designed with a 30:1 turndown ratio. The volume of the building requires the addition of approximately 100,000 cubic feet per minute (CFM) of tempered air to meet the requirements associated with the processing of the fresh meats. Thus, the proposed AHUs have a design flowrate of 100,000 scfm for the proper sanitation and disinfection drying step[2]. The AHUs will not be used to provide building heat during fresh meat processing because fresh meats processing will occur at a room temperature of 42 °F. The AHUs will provide fresh building air during fresh meats processing to pressurize the building and to maintain a building temperature of 42 °F (i.e., refrigeration/cooling of the fresh air). Supplemental

[1] USDA 5000.1 Chapter 2, Part 1, Section E and USDA 10010.1 states the need for meat processing plants to clean and sanitize at least once per day to produce an unadulterated product. The definition of adulterated is at 9 CFR 301.2.

[2] As stated by Tyson in Appendix E, the AHU specifications are based on what is necessary to get the production areas ready to produce unadulterated product.

building heat that may be required to increase the fresh air temperature during fresh meats processing is recovered from the ammonia refrigeration component of the AHUs. The use of the recovered heat from the ammonia processing will reduce natural gas combustion and therefore, contribute to reduced NOx emissions from the AHUs.

Natural gas is considered an inherently clean fuel and as a result, the criteria pollutants and HAPs, except for NO_X, result in less than two tpy of emissions from each air handling unit. Therefore, Tyson is conducting a BACT analysis of potential control options for NO_X for the AHUs, but not conducting a detailed BACT analysis for the other criteria pollutants beyond the use of good operating practices that will assure the minimization of the products of combustion.

4.2.2 Identification of Potential BACT

Initially, Tyson conducted a RACT/BACT/LAER Clearinghouse (RBLC) review, attached in Appendix E, and found that good combustion practices are BACT for emissions units similar in technology to AHUs (e.g., space heaters, evaporators, and dryers). Additionally, a review of BACT in California – San Joaquin Valley Air Pollution Control District identified a natural gas-fired dryer with a high turndown ratio with a NO_X rating of 0.1 lb/MMBtu and found that a Low NO_X burner was considered BACT. A U.S. EPA Control Technique Guidance (CTG) or Alternative CTG is not available for AHUs.

Tyson also requested information on alternative AHUs from EvapCo, a competing vendor. However, EvapCo's recommendation was to use the MidCo direct-fired conventional NO_X burner for this application. Additionally, EvapCo noted that they do not have an additional offering that would meet the engineering requirements of the Tyson Eagle Mountain project because the facility requires 100,000 cfm of air flow and a 100 °F temperature rise. This information can be found in Appendix E.

Based on conversations with MidCo, Tyson has identified two burner alternatives to the current AHU burner configuration: the use of six direct-fired lower NO_X burners per AHU or the use of AHUs with indirect-fired burners. The technical and economic feasibility of these alternatives are discussed in subsequent paragraphs. However, because of the Facility-specific needs for the AHUs

(i.e., large volume of tempered air with a temperature gradient of up to 100 °F), a conventional NO_X direct-fired burner is the desirable combustion technology for the AHUs.

4.2.3 Low NO_X Direct-Fired Burners

As previously explained, Tyson has a required building temperature of 70 °F during sanitation and disinfection. The proposed AHUs provide the required temperature rise and airflow to heat the building up to 70 °F within the required four-hour duration on cold days. Low NO_X direct-fired burners can achieve the same temperature rise and air flow rate, but have a lower turndown ratio (e.g., a 5:1 turndown) and are most commonly used on applications requiring a lower temperature rise and much lower air volumes.[3] Theoretically, six low NO_X direct-fired burners, each with a standby rating of 2 MMBtu/hr, could be used in place of the one proposed direct-fired burner to meet the Tyson temperature requirements. However, this would result in increased complexity, a larger footprint for the AHUs on the rooftop of the Facility, additional blowers, and increased process control complexity to achieve the same design as the proposed direct-fired AHUs.

MidCo provided a supporting letter, included in Appendix E, which presents a comparison between the proposed direct-fired AHUs and the Low NO_X direct-fired burners. This letter demonstrates that the direct burner equipment cost differential for using six LNB2000 burners in place of one HMA-2A would be approximately $210,500 per AHU. In addition to this cost, each of the six burners for a single AHU requires individual gas trains, dampers, and controls, resulting in more equipment (i.e. blowers, heat exchangers, etc.), more complex operation, and higher maintenance costs. There is also the engineering and equipment costs of the AHUs to accommodate rooftop space, rooftop support, equipment design, and controls. Thus, the use of Low NO_x burners in place of the proposed burners is not economically feasible.

4.2.4 Indirect-Fired Burners

The proposed AHUs are equipped with direct-fired burners which means that the gas is directly fed to the burner, and the burner fires in parallel with the airflow. In the case of an indirect-fired burner, the burner is fired into a heat exchanger, and the air is heated over a heat exchanger

[3] This equipment information was cited in a conversation by Eugene with MidCo on May 6, 2020.

allowing the combustion byproducts to remain within the heat exchanger. Due to the heat loss through the heat exchanger, indirect-fired burners have a 20% decrease in combustion efficiency (i.e., a 20% increase in fuel need) compared to the direct-fired units. Additionally, the indirect-fired burners have a higher equipment cost because they require the addition of heat exchanger unit(s) and have a higher price for the AHU compared to the direct-fired AHU. Under the circumstances, indirect-fired burners are technically feasible, but would have significantly higher costs. As stated in Appendix E, MidCo estimated that for the AHU equipment and engineering alone the cost differential for using the indirect burners would be approximately an additional $450,000 per AHU. In addition to this cost, there would be additional engineering and equipment costs of the AHUs to accommodate rooftop space, rooftop support, equipment design, and controls, along with the additional fuel costs for the less efficient AHUs. Thus, the use of an indirect-fired burner in place of the proposed burner is not economically feasible.

Based on the technical and economic feasibility of the various air handling burner options evaluated, Tyson proposes the use of conventional direct-fired burners to represent NO_X BACT for the AHUs for the Eagle Mountain Facility.

4.3 HOT WATER HEATERS

Tyson proposes to install two 25 MMBtu/hr natural gas-fired hot water heaters used primarily to provide hot water for cleaning the production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) that are specified by the manufacturer to operate at 15 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu. Natural gas is considered an inherently clean fuel and as a result, the criteria pollutants, except for NO_X result in less than one ton per year of emissions from each hot water heater. Therefore, Tyson is conducting a BACT analysis of potential control options for NO_X for the hot water heaters, but not conducting a detailed BACT analysis for the other criteria pollutants beyond the practice of good operating practices that will assure the minimization of the products of combustion. Additionally, Tyson did not conduct a CO BACT analysis for the hot water heaters as each unit is proposed to emit no more than approximately 9 tons per year of CO in an attainment area.

As proposed by Tyson the hot water heaters will be equipped with ULNB. Thus, Tyson considered the technical and economic feasibility of add-on controls for the further reduction of NO_X

emissions from the hot water heaters. Specifically, selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) were considered as potential add-on control options for NO_X BACT.

4.3.1 Selective Catalytic Reduction

SCR is an add-on control technology used to convert NO_x into diatomic N_2 and H_2O using a catalyst. The reduction reactions used by SCR require O_2, so it is most effective at O_2 levels above 2-3%. Base metals, such as vanadium or titanium, are often used for the catalyst due to their effectiveness as a control technology for NO_X and cost-effectiveness for use with natural gas combustion. In addition, a gaseous reductant such as aqueous ammonia is added to the exhaust gas and absorbed onto the catalyst.[4]

The costs of installing and operating an SCR for each of the hot water heater boilers are estimated using U.S. EPA "Air Pollution Control Cost Estimation Spreadsheet for Selective Catalytic Reduction (SCR)" (June 2019). The spreadsheet calculates capital and annualized costs of installing and operating an SCR based on site specific data such as boiler design and operating data. Table 6 summarizes the capital cost, annual cost, and cost effectiveness of implementing this control technology for each hot water heater boiler. Installation of an SCR is not considered cost effective for either unit as the cost effectiveness values are unreasonably high as demonstrated in Table 6.

Table 6
SCR Cost Summary

NO_X Removed (tons)	Total Capital Investment ($)	Total Annual Cost ($/yr)	Cost Effectiveness of Controls ($/ton)
9.73E-06	$1,762,930	$145,194	$14,929,870,797

[4]EPA (U.S. Environmental Protection Agency). May 2016., "Chapter 2, Selective Catalytic Reduction" https://www3.epa.gov/ttn/ecas/docs/SCRCostManualchapter7thEdition_2016.pdf"

In addition to the cost impacts as listed in Table 6, the environmental and energy impacts associated with SCR include the transport, handling, and use of aqueous ammonia, a corrosive hazardous material. Ammonia poses a potential health exposure and safety risk. The spent catalyst from the SCR would be required to be periodically replaced and disposed of properly, creating residual waste that would need to be landfilled or otherwise disposed. SCRs can also result in adverse air impacts due to ammonia slip, possible formation of a visible ammonium chloride plume from, oxidation of carbon monoxide to carbon dioxide. Therefore, Tyson does not consider SCR a feasible add-on control technology for reducing NO_X emissions from the hot water heaters based on the economic and environmental impacts.

4.3.2 Selective Non-Catalytic Reduction

SNCR is a post-combustion control technology for NO_X emissions that uses a reduction-oxidation reaction to convert NO_X into nitrogen, water, and carbon dioxide. Like SCR, SNCR involves injecting ammonia (or urea) into the exhaust gas stream, which must be between approximately 1,400 and 2,000°F for the chemical reaction to occur. NO_X reduction levels range from 30 - 50%; however, operating constraints on temperature, reaction time, and mixing often lead to less effective results when using SNCR in practice.[5]

As stated in the EPA's Office of Air Quality Planning and Standards (OAQPS) Cost Control Manual 7th Edition, Section 1.2.5, *"An SNCR process reduces the thermal efficiency of a boiler. The reduction reaction uses thermal energy from the boiler, which decreases the energy available for power or heat generation. As a result, additional energy is required for the boiler to maintain the same steam output. Pretreatment and injection equipment, pumps, and compressors, and control systems, also require electricity. This increased usage of fuel and electricity increases the annual costs to operate the boiler."* Additionally, the 7th Edition of the OAQPS Cost Control Manual indicates that SNCR has the highest levels of reduction efficiency for higher concentrations of NO_X. As indicated in Figure 1.1c of the 7th Edition of the OAQPS Cost Control Manual, NO_X reduction efficiency for pre-control NO_X concentrations less than 30 ppm are estimated at no more than 25% reduction effectiveness. The NO_X concentration from the proposed

[5] EPA (U.S. Environmental Protection Agency). 2003. "Selective Non-Catalytic Reduction Air Pollution Control Technology Fact Sheet." *EPA-452/F-03-031*

hot water heaters will be between 10-15 ppm. Thus, SNCR control would offer little, if any, reduction of NO_X emissions for this specific application. Additionally, SNCR results in ammonia emissions because it is necessary to add more reagent than is stoichiometrically required for effective NO_X control. It is typical for an SNCR system to result in 5-10 ppm ammonia slip emissions. Given the considerations outlined herein, Tyson proposes that the application of SNCR for the hot water heaters is not reasonable as a post-combustion NO_X control option given the resulting thermal efficiency loss, the limited NO_X reduction achievable for this application, the complexity of an SNCR system due to the equipment needs and the environmental concerns for ammonia slip.

Thus, based on the technical, economic, and environmental feasibility of the add-on NO_X control technologies evaluated, Tyson proposes the use of ULNBs and good combustion practice are considered NO_X BACT for the proposed hot water heaters.

4.4 HAUL ROADS AND TRUCK TRAILER STORAGE

Tyson proposes to operate sources of fugitive dust, including paved haul road operations and an unpaved truck trailer storage area. As required by UAC R307-309-4, Tyson submitted both a construction and an operating Fugitive Dust Control Plan which outlines the fugitive dust control strategies for the sources of fugitive dust from the proposed Facility. The potential fugitive dust sources at the facility are limited to paved haul roads and an unpaved truck trailer storage area. Paved parking areas are maintained on-site for employee parking. Internal haul roads are paved and required speed limits are posted and enforced. A clean, well-graded gravel pad will be installed and maintained to minimize emissions from the unpaved trailer storage area, along with a required speed limit posted and enforced. Vegetation and trees are maintained on the perimeters of the Facility to minimize as practicable windblown particulate emissions from the Facility.

Tyson proposes that the good operating practices discussed herein are considered particulate matter BACT for the fugitive dust sources at the Facility.

4.5 EMERGENCY GENERATOR ENGINES

Tyson proposes to install two diesel engine emergency generators to support the building during emergency power needs. Tyson is proposing to install two U.S. EPA certified Tier 3 stationary

engines, a 225 kW and 154 kW standby generator rating respectively. As requested by the Utah DEQ during the pre-application call, Tyson has completed an evaluation to consider U.S. EPA certified Tier 4 engines for the two proposed emergency generator engines.

Certified Tier 4 engines represent engines with the strictest U.S. EPA regulatory requirements that a manufacturer must meet for emissions standards of NO_X, particulate matter, and hydrocarbon emissions from the engines. Carbon monoxide emissions standards, however, remain relatively similar to those established for Tier 2 and 3 certified engines. Emergency generator engines are subject to Tier 2 and Tier 3 standards. In accordance with U.S. EPA 40 CFR Part 60, Subpart IIII (NSPS for Stationary Compression Ignition Internal Combustion Engines) and 40 CFR Part 63, Subpart ZZZZ NESHAP) they are not required to meet Tier 4 standards. However, for the purpose of this BACT analysis, Tier 4 engines are considered.

The use of a Tier 4 engine in place of the smaller 154 kW Tier 3 engine would add an additional equipment purchase cost of $37,374. The use of a Tier 4 engine in place of the 225 kW Tier 3 engine would require the purchase of two 125 kW engines because the manufacturer is unable to provide Tier 4 engines that are 225 kW in size. Thus, if Tyson chose to use a Tier 4 engine in place of the 225 kW Tier 3 engine, additional costs to install two 125KW units and cable them in parallel would be required. An upgrade to two 125 kW Tier 4 engines in place of the single 225 kW Tier 3 engine would add an additional cost of $115,782. In total, the cost to upgrade to Tier 4 engines for the proposed two emergency generator engines would be $153,156. These costs are provided in Appendix E. Upgrading from Tier 3 engines to Tier 4 engines would provide a 40% reduction in NO_X or a total reduction of 0.0634 tons per year of NO_X[6] with a total cost effectiveness of $2,415,710 per ton of NO_X reduced. Therefore, the cost of upgrading from Tier 3 to Tier 4 engines is not cost effective.

Good operating practices include both effective combustion system design and proper operation and maintenance practices. Combustion system design is implemented during the design and manufacture of an engine. Typical combustion design features include electronic fuel/air ratio and

[6] Tier 1 to Tier 3 certified engines result in an anticipated 50% reduction in NO_X. Tier 1 to Tier 4 certified engines result in an anticipated 90% reduction in NO_X. Therefore, Tyson estimated replacement of Tier 3 engines to Tier 4 engines is anticipated to have a 40% reduction in NO_X.

timing controllers, pre-chamber ignition, and intercoolers[7]. Good combustion system design is standard on new engines and therefore is included for the proposed emergency generator engines.

Based on the economic feasibility of using Tier 4 engines in place of the proposed Tier 3 engines for NO_X BACT, Tyson proposes Tier 3 engines with the use of good operating practices is BACT for the emergency generator engines.

[7] U.S. EPA AP-42. Chapter 3.3. Gasoline and Diesel Industrial Engines (10/96).

APPENDIX A – UDAQ NOTICE OF INTENT FORMS

Form 1
Notice of Intent (NOI) Application Checklist

Date July 2020

Company Tyson Foods, Inc.

Utah Division of Air Quality
New Source Review Section

Source Identification Information [R307-401-5]

1.	Company name, mailing address, physical address and telephone number	☑	
2.	Company contact (Name, mailing address, and telephone number)	☐	
3.	Name and contact of person submitting NOI application (if different than 2)	☑	
4.	Source Universal Transverse Mercator (UTM) coordinates	☑	
5.	Source Standard Industrial Classification (SIC) code	☑	
6.	Area designation (attainment, maintenance, or nonattainment)	☑	
7.	Federal/State requirement applicability (NAAQS, NSPS, MACT, SIP, etc.)	☑	
8.	Source size determination (Major, Minor, PSD)	☑	
9.	Current Approval Order(s) and/or Title V Permit numbers	☐	

NOI Application Information: [R307-401]

1.	Detailed description of the project and source process	☑	
2.	Discussion of fuels, raw materials, and products consumed/produced	☑	
3.	Description of equipment used in the process and operating schedule	☑	
4.	Description of changes to the process, production rates, etc.	☑	
5.	Site plan of source with building dimensions, stack parameters, etc.	☑	
6.	Best Available Control Technology (BACT) Analysis [R307-401-8]		
	A. BACT analysis for all new and modified equipment	☑	
7.	Emissions Related Information: [R307-401-2(b)]		
	A. Emission calculations for each new/modified unit and site-wide (Include PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOCs, HAPs, and GHGs)	☑	
	B. References/assumptions, SDS, for each calculation and pollutant	☑	
	C. All speciated HAP emissions (list in lbs/hr)	☑	
8.	Emissions Impact Analysis – Approved Modeling Protocol [R307-410]		
	A. Composition and physical characteristics of effluent (emission rates, temperature, volume, pollutant types and concentrations)	☐	
9.	Nonattainment/Maintenance Areas – Major NSR/Minor (offsetting only) [R307-403]		
	A. NAAQS demonstration, Lowest Achievable Emission Rate, Offset requirements	☑	N/A ■
	B. Alternative site analysis, Major source ownership compliance certification	☐	N/A ■
10.	Major Sources in Attainment or Unclassified Areas (PSD) [R307-405, R307-406]		
	A. Air quality analysis (air model, met data, background data, source impact analysis)	☐	N/A ■
	B. Visibility impact analysis, Class I area impact	☐	N/A ■
11.	Signature on Application	☑	

Note: The Division of Air Quality will not accept documents containing confidential information or data. Documents containing confidential information will be returned to the Source submitting the application.

Form 2
Company Information/Notice of Intent (NOI)

Date July 2020

Utah Division of Air Quality
New Source Review Section

Application for: ☑ **Initial Approval Order** ☐ **Approval Order Modification**

General Owner and Source Information

1. Company name and mailing address:
Tyson Foods, Inc.
800 Stevens Point Dr.
Dakota Dunes, SD 57049
Phone No.: (605) 235-4801
Fax No.: ( )

2. Company** contact for environmental matters:
Adam Konopasek
Phone no.: (605) 235-4801
Email: Adam.Konopasek@tyson.com

** 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):
Eagle Mountain, Utah Facili
3817 N. Tyson Industrial Pk
Eagle Mountain, UT 84005
Phone no.: (801) 789-2040
Fax no.: ( )

4. Source Property Universal Transverse Mercator coordinates (UTM), including System and Datum:
UTM: 12
X: 408051
Y: 4462061

5. The Source is located in: Utah County

6. Standard Industrial Classification Code (SIC)
2013

7. If request for modification, AO# to be modified: DAQE #_____ DATED: ____/____/____

8. Brief (50 words or less) description of process.
The Facility will be part of the Fresh Meats Division and produce case-ready packages of beef and pork for final consumer sale. Facility support operations are considered air emissions sources and include ~130 MMBtu/hr of natural gas combustion sources and truck traffic on roadways.

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: Title: SVP General Manager

Nathan Hodne Name (Type or print)	Telephone Number: (479) 290-4706 Email: Nathan.hodne@tyson.com	Date:

Form 3

Process Information

Utah Division of Air Quality
New Source Review Section

Company: Tyson Foods, Inc.

Site: Eagle Mountain, Utah Facility

Process Information - For New Permit ONLY	
1. Name of process: Fresh Meat Production	2. End product of this process: Case-ready packages of beef and pork for consumer sale.
3. Process Description*: Tyson proposes to construct and operate combustion devices with a capacity of ~130 MMBTU/hr, two engine generators, and truck traffic to produce case-ready packages of beef and pork for consumer sale.	

Operating Data	
4. Maximum operating schedule: 24 hrs/day 7 days/week 52 weeks/year	5. Percent annual production by quarter: Winter 25% Spring 25% Summer 25% Fall 25%
6. Maximum Hourly production (indicate units.): 134 MMBtu/hr	7. Maximum annual production (indicate units): 702,932 MMBtu/yr
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)
Natural Gas	1,118.00 MMScf/yr
Fuel Oil No. 2 - ULSD	1,975.00 Gal/yr

11.Process-Emitting Units with pollution control equipment*

Emitting Unit(s)	Capacity(s)	Manufacture Date(s)
GB-1 and GB-2	10.854 MMBTU/hr each	Upon Approval
SL-1 through SL-5	10.854 MMBTU/hr each	Upon Approval
Engine Room Water Heater (2)	25 MMBTU/hr each	Upon Approval
Engine Generator 1	154 kW	Upon Approval
Engine Generator 2	225 kW	Upon Approval
Salt Silo	3,600 cubic feet	Upon Approval
Refer to Section 2 of the Application for more information.		

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

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

Company Tyson Foods, Inc.

Site Eagle Mountain, Utah Facility

Potential to Emit* Criteria Pollutants & GHGs			
Criteria Pollutants	**Permitted Emissions (tons/yr)**	**Emissions Increases (tons/yr)**	**Proposed Emissions (tons/yr)**
PM_{10} Total	0.00	3.74	3.74
PM_{10} Fugitive	0.00	1.11	1.11
$PM_{2.5}$	0.00	2.74	2.74
NO_x	0.00	15.77	15.77
SO_2	0.00	0.27	0.27
CO	0.00	28.98	28.98
VOC	0.00	1.98	1.98
VOC Fugitive	0.00	0.00	0.00
NH_3	0.00	0.00	0.00
Greenhouse Gases	**CO_2e**	**CO_2e**	**CO_2e**
CO_2	0.00	41,122.20	41,122.20
CH_4	0.00	19.40	19.40
N_2O	0.00	23.10	23.10
HFCs	0.00	0.00	0.00
PFCs	0.00	0.00	0.00
SF_6	0.00	0.00	0.00
Total CO2e	0.00	41,164.70	41,164.70

**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)**
See attachment located in				
Appendix C, Table C-3, C-6, and C-8				
Total HAP	0.00	1.02	1.02	0.26

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

Utah Division of Air Quality
New Source Review Section

Form 17
Diesel Powered Standby Generator

Company: Tyson Foods, Inc.
Site/Source: Eagle Mountain Facility
Date: July 2020

Company Information

1. Company Name and Address:
Tyson Foods, Inc.
800 Stevens Point Dr.
Dakota Dunes, SD 57049

Phone Number: (605) 235-4801
Fax Number: N/A

2. Company Contact:
Adam Konopasek

Phone Number: (605) 235-4801
Fax Number: N/A

3. Installation Address:
3817 N. Tyson Industrial Pkwy
Eagle Mountain, UT 84005

Phone Number: (801) 789-2040
Fax Number: N/A

County where facility is located: Utah County

Latitude, Longitude and UTM Coordinates of Facility
UTM 12 X: 408051 Y: 4462061

Standby Generator Information

4. Engines:

Manufacturer	Model	Maximum Rated Horsepower or Kilowatts	Maximum Hours of Operation	Emission Rate Rate of NO_x grams/BHP-HR	Date the engine was constructed or reconstructed
Kohler	230REOZJE	225 kW	100 hrs	2.79	Upon Approval
Kohler	150REOZJF	154 kW	100 hrs	2.79	Upon Approval

Attach Manufacturer-supplied information

5. Calculated emissions for this equipment: - Emissions included in Appendix C

PM_{10}_____ Lbs/hr _____Tons/yr
$PM_{2.5}$_____ Lbs/hr _____Tons/yr
NO_x_____Lbs/hr_____Tons/yr
SO_x _____ Lbs/hr_____Tons/yr
CO _____Lbs/hr_____Tons/yr
VOC _____Lbs/hr_____Tons/yr
CO_2 _____Tons/yr
CH_4 _____ Tons/yr
N_2O _____Tons/yr
HAPs_____ Lbs/hr (speciate)_____Tons/yr (speciate)

Submit calculations as an appendix. If other pollutants are emitted, include the emissions in the appendix.

Instructions Form 17 - Diesel Powered Standby Generator

Call the Division of Air Quality (DAQ) at (801) 536-4000 if you have problems or questions in filling out this form. Ask to speak with a New Source Review engineer. We will be glad to help!

Lines 1 and 2: Fill in the name, address, phone number, and fax number of the business applying for the permit exemption.

Line 3 Fill in the address where the equipment will be located. Directions to business if needed for remote locations, i.e., five miles south of Deseret on highway 101, turn left at farmhouse, go 1.5 miles. Identify the county the equipment will be located. Also enter the latitude, longitude and UTM coordinates of the facility.

Line 4 Fill in the manufacturer, model, maximum rated horsepower or kilowatts, maximum hours of operation, emission rate for NO_x in grams/BHP-hr, and the date the engine was constructed or reconstructed. Attach manufacturer emission information.
Note: Maximum rated horsepower not to exceed 1000hp or 750 kilowatts. Also maximum hours not to exceed 300 hours.

Line 5 Supply calculations for all criteria pollutants, greenhouse gases and hazardous air pollutants. Use EPA AP-42 or manufacturers' data to complete your calculations. Fill in the name, address, phone number, and fax number of the business applying for the

APPENDIX B – FUGITIVE DUST CONTROL PLAN

DEQ DUST
A SERVICE FROM UTAH.GOV

Review Plan

Applicant Information

EDIT

Applicant Type	Property Owner
Name	Tyson Foods, Inc.
Mailing Address	2200 Don Tyson Parkway
City	Springdale
State	Arkansas
Zip	72762
Phone	479-290-4706
Email	Nathan.hodne@tyson.com

Project Information

EDIT

Project Name	Tyson Fresh Meats New Case Ready Facility Operations (Not Construction)
Address	3817 North Tyson Parkway
City	Eagle Mountain
State	Utah
Zip	84005
Site Directions	Continue S on 73 from Cedar Fort, turn N on W 4000 N, continue 1 mile E
County	Utah
Acreage	80

Point of Contact

EDIT

Name	Adam Konopasek
Company	Tyson Fresh Meats, Inc.
Address	800 Stevens Port Drive
City	Dakota Dunes

State	South Dakota
Zip	57049
Phone	605-235-4801
Cell	712-540-8382

BMP 09 Selections EDIT

09-01. Limit disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.	false
09-02. Limit vehicle mileage and reduce speed.	09-02. Limit vehicle mileage and reduce speed.
09-03. Apply water to stabilize disturbed soils. Soil moisture must be maintained such that soils can be worked without generating fugitive dust.	09-03. Apply water to stabilize disturbed soils. Soil moisture must be maintained such that soils can be worked without generating fugitive dust.
09-04. Apply and maintain a chemical stabilizer.	false
09-05. Use wind breaks.	false
09-06. Apply cover (natural or synthetic).	false

BMP 15 Selections EDIT

15-01. Limit vehicle mileage and speed limit.	15-01. Limit vehicle mileage and speed limit.
15-02. Apply water on all vehicle traffic areas in the staging areas and unpaved access routes.	false
15-03. Pre-water and maintain surface soils in a stabilized condition.	15-03. Pre-water and maintain surface soils in a stabilized condition.
15-04. Apply and maintain a chemical stabilizer to surface soils.	false
15-05. Apply a chemical stabilizer.	false
15-06. Apply screened or washed aggregate.	false
15-07. Use wind breaks.	false
15-08. Pave.	false

15-09. Completed project will cover staging area with buildings, paving, and/or landscaping.	15-09. Completed project will cover staging area with buildings, paving, and/or landscaping.
15-10. Apply water to form adequate crust and prevent access.	false

BMP 18 Selections EDIT

18-01. Clean trackout at the end of the work shift from paved surfaces to maintain dust control	false
18-02. Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day.	false
18-03. Install gravel pad(s), clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.	18-03. Install gravel pad(s), clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.
18-04. Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.	false
18-05. Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.	false
18-06. Motorized vehicles will only operate on paved surfaces.	false
18-07. Install cattle guard before paved road entrance.	false
18-08. Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).	18-08. Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).
18-09. Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.	false

BMP 19 Selections EDIT

19-01. Limit vehicle mileage and speeds.	19-01. Limit vehicle mileage and speeds.

19-02. Apply and maintain water on surface soils.	false
19-03. Apply and maintain chemical stabilizers on surface soils.	false
19-04. Apply and maintain gravel on surface soils.	19-04. Apply and maintain gravel on surface soils.
19-05. Supplement chemical stabilizers, water or aggregate applications as necessary.	false
19-06. Apply recycled asphalt (RAP) to surface soils.	false

Print this page for your records or save it as a PDF as specified by your browser or operating system.

By submitting this plan I agree to the following terms:

A. I am authorized, on behalf of the individual or company listed in Section 1, as Applicant, to apply for a Fugitive Dust Control Plan and to commit to all of the terms and conditions of the requested plan.

B. Construction activities will be limited to lands that the applicant either owns or is authorized to use for construction activities.

C. The applicant accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this plan, comply with the terms and conditions of the Fugitive Dust Control Plan.

D. I understand that any false material statement, representation or certification made in this application may invalidate the plan or cause me to be subject to enforcement action pursuant to Utah Code Ann. 19-2-115. E. Failure to comply with fugitive dust rules may result in compliance action and penalties up to $10,000 per violation/day.

☐ My plan is ready to be submitted. *****

‹ PREVIOUS

SUBMIT PLAN ›

APPENDIX C – EMISSIONS INVENTORY

Table C-1
Summary of Potential Facility Emissions
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Total Potential Emissions [a],[b]	
	lb/hr	tpy
PM	2.10	12.92
PM_{10}	1.31	3.74
$PM_{2.5}$	1.22	2.74
SO_2	1.27	0.27
H_2SO_4	2.18E-01	0.10
NO_X	11.24	15.77
VOC	0.78	1.98
CO	11.68	28.98
Pb	6.38E-05	1.72E-04
HAPs	2.57E-01	1.02
$NO_X + SO_2$ [c]	12.52	16.03
Total CO_2e	15,862	41,165

[a] Small combustion devices (i.e., < 20 MMBtu/hr) assume an uncontrolled NO_X emissions factor based on AP-42.

[b] Combustion devices ≥ 20 MMBtu/hr use ultra low NO_X burners (ULNB) rated for 0.015 lb/MMBtu.

[c] Utah County maintenance area provisions for PM_{10} National Ambient Air Quality Standards (NAAQS) requires offsets for $NO_X + SO_2 > 25$ tons per year.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating < 5 MMBtu/hr					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[a]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	7.79E-03	3.41E-02
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
PM_{10}[b]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
$PM_{2.5}$[b]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.11E-02	0.14
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.46E-03	1.08E-02
H_2SO_4[c]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.13E-03	4.95E-03
NO_X[d]	100.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	0.41	1.79
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.25E-02	0.10
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	0.34	1.51
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.05E-06	8.97E-06
Total CO_2e	-	-	-	489	2,144
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*489*	*2,142*
CH_4 CO_2e	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*0.23*	*1.01*
N_2O CO_2e	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*0.27*	*1.20*

[a] Potential emissions rates based on parameters identified below.

4.18	MMBtu/hr
1,000,000	Btu/MMBtu
1,020	Btu/scf
8,760	hrs/yr
2.20462	lb/kg
2,000	lbs/ton
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[b] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[c] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[d] Small combustion devices (i.e., < 20 MMBtu/hr) assume an uncontrolled NO_X emissions factor based on AP-42.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating > 5 MMBtu/hr and < 20 MMBtu/hr [h]					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[e]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.42E-01	2.12E-01
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
PM_{10}[f]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
$PM_{2.5}$[f]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	5.66E-01	0.85
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	4.47E-02	6.70E-02
H_2SO_4 [g]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.05E-02	3.08E-02
NO_X[h]	0.082	lb/MMBtu	See footnote (h)	6.23	9.35
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	4.10E-01	0.61
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	6.26	9.39
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	3.72E-05	5.59E-05
Total CO_2e	-	-	-	8,897	13,345
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*8,888*	*13,332*
CH_4 CO_2e	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*4.19*	*6.28*
N_2O CO_2e	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*4.99*	*7.49*

[e] Potential emissions rates based on parameters identified below.

75.98	MMBtu/hr
1,000,000	Btu/MMBtu
1,020	Btu/scf
3,000	***hrs/yr*** [i]
2.20462	lb/kg
2,000	lbs/ton
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[f] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[g] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[h] Combustion devices > 5 MMBtu/hr and < 20 MMBtu/hr assume an uncontrolled NO_X emissions factor based on vendor provided information. These devices consist of air handling units for facility operations.

[i] Hours for the air handling devices lowered to maintain facility operations combined emissions < 25 tpy NOx + SO_2 to avoid emissions offsets requirements.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Devices with rating ≥ 20 MMBtu/hr					
Pollutant	**Emissions Factor**	**Units**	**Emissions Factor Basis**	**Potential Emissions Rates[j]**	
				lb/hr	**tpy**
PM Filterable	1.9	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.09	0.41
PM	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
PM_{10}[k]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
$PM_{2.5}$[k]	7.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.37	1.63
SO_2	0.6	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.94E-02	0.13
H_2SO_4[l]	0.3	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	1.35E-02	5.92E-02
NO_X[m]	0.02	lb/MMBtu	Manufacturer Guarantee	1.02	4.45
VOC	5.5	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	0.27	1.18
CO	84.0	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-1	4.12	18.04
Pb	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-2	2.45E-05	1.07E-04
Total CO_2e	-	-	-	5,855	25,644
CO_2	*53*	*kg/MMBtu*	*40 CFR Part 98 Table C-1*	*5,849*	*25,618*
CH_4 CO_2e	2.50E-02	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*2.76*	*12.07*
N_2O CO_2e	*2.98E-02*	*kg/MMBtu*	*40 CFR Part 98 Table C-2*	*3.28*	*14.39*

[j] Potential emissions rates based on parameters identified below.

50.00	MMBtu/hr
14,000	ACFM
1,020	Btu/scf
8,760	hrs/yr
2.20462	lb/kg
2,000	lbs/ton
1,000,000	Btu/MMBtu
46.0	lb/lb*mol NO_2
25	CH_4 CO_2e conversion
298	N_2O CO_2e conversion

[k] PM_{10} and $PM_{2.5}$ include both filterable and condensable portions.

[l] Emissions factor for H_2SO_4 is a conversion from the SO_2 emissions. It was assumed that 30% of the Sulfur would convert to HSO_3 and 100% of the SO_3 would convert to H_2SO_4.

[m] Combustion devices ≥ 20 MMBtu/hr assumes emissions concentrations provided by the manufacturer.

Table C-2
Potential Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Total Potential Emissions from Natural Gas Combustion Devices	
	lb/hr	tpy
PM Filterable	2.42E-01	0.65
PM	0.97	2.62
PM_{10}	0.97	2.62
$PM_{2.5}$	0.97	2.62
SO_2	7.66E-02	0.21
H_2SO_4	3.52E-02	0.09
NO_X	7.66	15.59
VOC	0.70	1.89
CO	10.72	28.93
Pb	6.38E-05	1.72E-04
$NO_X + SO_2$	7.73	15.79
Total CO_2e	15,241	41,134
CO_2	15,226	41,091
CH_4 CO_2e	7.17	19.36
N_2O CO_2e	8.55	23.08

Table C-3
Potential HAP Emissions from Natural Gas Combustion Devices
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	CAS No.	Emissions Factor	Units	Emission Factor Basis	Potential Emissions Rates[(a)]	
					lb/hr	tpy
2-Methylnaphthalene	91-57-6	2.4E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.96E-06	1.30E-05
3-Methylcholanthrene	56-49-5	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
7,12-Dimethylbenz(a)anthracene	57-97-6	1.6E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	1.98E-06	8.66E-06
Acenaphthene	83-32-9	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Acenaphthylene	208-96-8	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Anthracene	120-12-7	2.4E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.96E-07	1.30E-06
Benz(a)anthracene	56-55-3	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Benzene	71-43-2	2.1E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.59E-04	1.14E-03
Benzo(a)pyrene	50-32-8	1.2E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	1.48E-07	6.49E-07
Benzo(b)fluoranthene	205-99-2	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Benzo(g,h,i)perylene	191-24-2	1.2E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	1.48E-07	6.49E-07
Benzo(k)fluoranthene	207-08-9	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Chrysene	218-01-9	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Dibenzo(a,h)anthracene	53-70-3	1.2E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	1.48E-07	6.49E-07
Dichlorobenzene	25321-22-6	1.2E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	1.48E-04	6.49E-04
Fluoranthene	206-44-0	3.0E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	3.71E-07	1.62E-06
Fluorene	86-73-7	2.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	3.46E-07	1.51E-06
Formaldehyde	50-00-0	7.5E-02	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	9.26E-03	4.06E-02
Hexane	110-54-3	1.8	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-01	9.74E-01
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.22E-07	9.74E-07
Naphthalene	91-20-3	6.1E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	7.53E-05	3.30E-04
Phenanathrene	85-01-8	1.7E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	2.10E-06	9.20E-06
Pyrene	129-00-0	5.0E-06	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	6.18E-07	2.70E-06
Toluene	108-88-3	3.4E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4, Table 1.4-3	4.20E-04	1.84E-03
Arsenic Compounds	7440-38-2	2.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	2.47E-05	1.08E-04
Beryllium Compounds	7440-41-7	1.2E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	1.48E-06	6.49E-06
Cadmium Compounds	7440-43-9	1.1E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	1.36E-04	5.95E-04
Chromium Compounds	7440-47-3	1.4E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	1.73E-04	7.57E-04
Cobalt Compounds	7440-48-4	8.4E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	1.04E-05	4.54E-05
Lead Compounds	7439-92-1	5.0E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-2	6.18E-05	2.70E-04
Manganese Compounds	7439-96-5	3.8E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	4.69E-05	2.06E-04
Mercury Compounds	7439-97-6	2.6E-04	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	3.21E-05	1.41E-04
Nickel Compounds	7440-02-0	2.1E-03	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	2.59E-04	1.14E-03
Selenium Compounds	7782-49-2	2.4E-05	lb/MMscf	U.S. EPA AP-42 Chapter 1.4 Table 1.4-4	2.96E-06	1.30E-05
Single Maximum HAP		--	--	--	2.22E-01	9.74E-01
Total HAPs		--	--	--	2.33E-01	1.02E+00

[(a)] Potential emissions rates based on parameters identified below.

125.98	MMBtu/hr
1,000,000	Btu/MMBtu
1,020	Btu/scf
8,760	hrs/yr
2,000	lbs/ton

Table C-4
Potential Fugitive Emissions from Roadways
Tyson Foods, Inc. - Eagle Mountain, UT

Segment	Potential Emissions					
	PM [(a)(b)(c)]	PM_{10} [(a)(b)(c)]	$PM_{2.5}$ [(a)(b)(c)]	PM [(a)(b)(c)]	PM_{10} [(a)(b)(c)]	$PM_{2.5}$ [(a)(b)(c)]
	lb/hr	lb/hr	lb/hr	tpy	tpy	tpy
Paved	0.52	0.05	0.01	6.03	0.61	6.12E-02
Unpaved	0.37	0.04	0.00	4.27	0.50	5.01E-02
Total	0.88	0.10	9.53E-03	10.29	1.11	1.11E-01

[(a)] Emissions were calculated based on the following parameters:

Paved Road

Length Paved Road (mi)[(e)]	1.18
Average Vehicle Weight (tons)[(f)]	31
Trips/day	125
Trips/yr	45,625
Total Annual VMT Paved (mi)	53,920

Unpaved Road

Length Unpaved Road (mi)[(g)]	0.64
Average Vehicle Weight (tons)[(h)]	18
Trips/yr	45,625
Total Annual VMT Unpaved (mi)	29,034

[(b)] Emissions from paved roadways were calculated according to State of Utah Department of Environmental Quality (UTDEQ) guidance "Emission Factors for Paved and Unpaved Haul Roads" which references AP-42, Chapter 13.2.2, Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2.

[(c)] Emissions from unpaved roadways were calculated according to AP-42, Chapter 13.2.2, Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2.

[(d)] The short term emissions were conservatively calculated by assuming truck traffic will occur evenly over two 4-hour shifts every day.

[(e)] Each truck travels 2,400 feet from the entrance to the receiving dock with a full load, then travels 2,640 feet to the shipping dock with empty load, and then travels 1,200 feet to exit the facility with a full load.

[(f)] Average vehicle weight per mile. Based on traveling 3,600 feet traveling with a full load (40 tons) and 2,640 feet with an empty load (18 tons) as described in footnote (d).

[(g)] The calculations conservatively assume that each truck travels a maximum distance on the gravel storage area to park, and then travels back, 1,680 feet and 3,360 feet round trip.

[(h)] Parked trailers are assumed to be empty.

Equation 1a and 2: $E = k(s/12)^a(W/3)^b[(365-P)/365]$

where:

s (paved)[(h)] =	4.8%	
s (unpaved)[(h)] =	10.0%	
k_{PM30} =	4.9	lb/VMT
k_{PM10} =	1.5	lb/VMT
$k_{PM2.5}$ =	0.15	lb/VMT
a_{PM30} =	0.7	
a_{PM10} =	0.9	
$a_{PM2.5}$ =	0.9	
b =	0.45	
P[(i)] =	86	wet days/year

[(h)] Surface material silt content (s) for paved roads is the default value of 4.8% according to UTDEQ Haul Road Guidance. For Unpaved roads, s is the mean value for stone quarrying and processing, from AP-42 Chapter 13.2.2, Table 13.2.2-1.

[(i)] Weather data from (https://www.bestplaces.net/climate/city/utah/eagle_mountain) which uses the same definition for precipitation as AP-42.

Table C-5
RICE Potential Non-HAP and Non-Air Toxics Emissions Summary for 225 kW Egen
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Emissions Factor	Units	Reference	PTE [f]	
				(lb/hr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	8.09E-02	g/hp-hr	(a), (b)	6.17E-02	3.09E-03
NO_X	2.79	g/hp-hr	(a)	2.13	0.11
VOC	3.68E-02	g/hp-hr	(a)	2.81E-02	1.40E-03
CO	0.66	g/hp-hr	(a)	0.50	2.52E-02
SO_2	2.05E-03	lb/hp-hr	(c)	0.71	3.55E-02
H_2SO_4	3.14E-04	lb/hp-hr	(d)	0.11	5.43E-03
Total CO2e	-	-	-	360	17.99
CO2	*73.96*	*kg/MMBtu*	*(e)*	*359.73*	*17.99*
CH4 CO2e	*3.00E-03*	*kg/MMBtu*	*(e)*	*1.46E-02*	*7.30E-04*
N2O CO2e	*6.00E-04*	*kg/MMBtu*	*(e)*	*2.92E-03*	*1.46E-04*

[a] Emissions factors for the 225 kW generators, other than for CO2 and SO2, reflect not to exceed emissions data provided by the manufacturer. These not to exceed rates were converted from g/kW-hr to lb/hr for 100%, 75%, 50%, and 25% loads. The highest lb/hr factors for each pollutant were selected, independent of the load.

[b] PM emissions are equivalent to PM_{10} and $PM_{2.5}$ emissions and include both filterable and condensable fractions.

[c] The SO_2 emissions factor was obtained from AP-42 Chapter 3.3 Table 3.3-1.

[d] The H_2SO_4 emissions factor is conservatively estimated based on 10% molar conversion of SO_2 to SO_3 and 100% conversion of SO_3 to H_2SO_4 based on engineering judgement.

[e] The CO_2e emissions were calculated based on guidance in 40 CFR Part 98 Table C-1 and C-2.

[f] PTE rates are calculated assuming the following information and assumptions:

Operational Parameters

Parameter	Value
Fuel	ULSD
Standby Fuel Consumption at 100% load, gal/hr	16.1
Engine Rating, kW	225
Engine Rating, bhp	346
Fuel, MMBtu/gal	0.137
Heat Input, MMBtu/hr	2.2
Maximum Hours of Operation, hrs/yr	100

Table C-6
RICE Potential Air Toxics and HAPs Emissions Summary for 225 kW Egen
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Emissions Factor	Units	Reference	PTE for Engine[(a)]	
				(lb/hr)	(tpy)
Acenaphthene	1.42E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	3.13E-06	1.57E-07
Acenaphthylene	5.06E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.12E-05	5.58E-07
Anthracene	1.87E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	4.13E-06	2.06E-07
Benz(a)anthracene	1.68E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	3.71E-06	1.85E-07
Benzo(a)pyrene	1.88E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	4.15E-07	2.07E-08
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.19E-07	1.09E-08
Benzo(g,h,l)perylene	4.89E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.08E-06	5.39E-08
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	3.42E-07	1.71E-08
Chrysene	3.53E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	7.79E-07	3.89E-08
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.29E-06	6.43E-08
Fluoranthene	7.61E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.68E-05	8.39E-07
Fluorene	2.92E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	6.44E-05	3.22E-06
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	8.27E-07	4.14E-08
Phenanthrene	2.94E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	6.49E-05	3.24E-06
Pyrene	4.78E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.05E-05	5.27E-07
Acetaldehyde	7.67E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.69E-03	8.46E-05
Acrolein	9.25E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.04E-04	1.02E-05
Benzene	9.33E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.06E-03	1.03E-04
Formaldehyde	1.18E-03	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.60E-03	1.30E-04
Naphthalene	8.48E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.87E-04	9.35E-06
Toluene	4.09E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	9.02E-04	4.51E-05
Xylenes	2.85E-03	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	6.29E-03	3.14E-04
			Highest Individual HAP (tpy)		3.14E-04
			Total HAP (tpy)		6.97E-04

[(a)] PTE rates are calculated assuming the following information and assumptions:

Operational Parameters

Parameter	Value
Fuel	ULSD
Fuel, MMBtu/gal	0.137
Standby Fuel Consumption at 100% load, gal/hr	16.1
Heat Input, MMBtu/hr	2.2
Maximum Hours of Operation, hrs/yr	100

Table C-7

RICE Potential Non-HAP and Non-Air Toxics Emissions Summary for 154 kW Egen

Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Emissions Factor	Units	Reference	PTE [f]	
				(lb/hr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	8.83E-02	g/hp-hr	(a), (b)	4.61E-02	2.31E-03
NO_X	2.79	g/hp-hr	(a)	1.46	7.28E-02
VOC	8.83E-02	g/hp-hr	(a)	4.61E-02	2.31E-03
CO	0.88	g/hp-hr	(a)	0.46	2.31E-02
SO_2	2.05E-03	lb/hp-hr	(c)	0.49	2.43E-02
H_2SO_4	3.14E-04	lb/hp-hr	(d)	7.45E-02	3.72E-03
Total CO2e	-	-	-	261	13.07
CO2	*73.96*	*kg/MMBtu*	*(e)*	*261.42*	*13.07*
CH4 CO2e	*3.00E-03*	*kg/MMBtu*	*(e)*	*1.06E-02*	*5.30E-04*
N2O CO2e	*6.00E-04*	*kg/MMBtu*	*(e)*	*2.12E-03*	*1.06E-04*

[a] Emissions factors for the 225 kW generators, other than for CO2 and SO2, reflect not to exceed emissions data provided by the manufacturer. These not to exceed rates were converted from g/kW-hr to lb/hr for 100%, 75%, 50%, and 25% loads. The highest lb/hr factors for each pollutant were selected, independent of the load.

[b] PM emissions are equivalent to PM_{10} and $PM_{2.5}$ emissions and include both filterable and condensable fractions.

[c] The SO_2 emissions factor was obtained from AP-42 Chapter 3.3 Table 3.3-1.

[d] The H_2SO_4 emissions factor is conservatively estimated based on 10% molar conversion of SO_2 to SO_3 and 100% conversion of SO_3 to H_2SO_4 based on engineering judgement.

[e] The CO_2e emissions were calculated based on guidance in 40 CFR Part 98 Table C-1 and C-2.

[f] PTE rates are calculated assuming the following information and assumptions:

Operational Parameters

Parameter	Value
Fuel	ULSD
Standby Fuel Consumption at 100% load, gal/hr	11.7
Engine Rating, kW	154
Engine Rating, bhp	237
Fuel, MMBtu/gal	0.137
Heat Input, MMBtu/hr	1.6
Maximum Hours of Operation, hrs/yr	100

Table C-8
RICE Potential Air Toxics and HAPs Emissions Summary for 154 kW Egen
Tyson Foods, Inc. - Eagle Mountain, UT

Pollutant	Emissions Factor	Units	Reference	PTE for Engine[(a)]	
				(lb/hr)	(tpy)
Acenaphthene	1.42E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.28E-06	1.14E-07
Acenaphthylene	5.06E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	8.11E-06	4.06E-07
Anthracene	1.87E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	3.00E-06	1.50E-07
Benz(a)anthracene	1.68E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.69E-06	1.35E-07
Benzo(a)pyrene	1.88E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	3.01E-07	1.51E-08
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.59E-07	7.94E-09
Benzo(g,h,l)perylene	4.89E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	7.84E-07	3.92E-08
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	2.49E-07	1.24E-08
Chrysene	3.53E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	5.66E-07	2.83E-08
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	9.35E-07	4.67E-08
Fluoranthene	7.61E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.22E-05	6.10E-07
Fluorene	2.92E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	4.68E-05	2.34E-06
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	6.01E-07	3.01E-08
Phenanthrene	2.94E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	4.71E-05	2.36E-06
Pyrene	4.78E-06	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	7.66E-06	3.83E-07
Acetaldehyde	7.67E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.23E-03	6.15E-05
Acrolein	9.25E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.48E-04	7.42E-06
Benzene	9.33E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.50E-03	7.48E-05
Formaldehyde	1.18E-03	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.89E-03	9.46E-05
Naphthalene	8.48E-05	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	1.36E-04	6.80E-06
Toluene	4.09E-04	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	6.56E-04	3.28E-05
Xylenes	2.85E-03	lb/MMBtu	AP-42 Chapter 3.3 Table 3.3-2	4.57E-03	2.28E-04
			Highest Individual HAP (tpy)		2.28E-04
			Total HAP (tpy)		5.06E-04

[(a)] PTE rates are calculated assuming the following information and assumptions:

Operational Parameters

Parameter	Value
Fuel	ULSD
Fuel, MMBtu/gal	0.137
Standby Fuel Consumption at 100% load, gal/hr	11.7
Heat Input, MMBtu/hr	1.6
Maximum Hours of Operation, hrs/yr	100

Table C-9
Diesel Fuel Storage Tank Potential VOC Emissions
Tyson Foods, Inc. - Eagle Mountain, UT

Description	Reference Factor	Abbreviation	Unit	Diesel Storage Tanks	
General Tank Information					
Tank ID	-	-	-	TK-1	TK-2
Product Code	-	-	-	UL# 142 Double Wall	UL# 142 Double Wall
Material	-	-	-	Diesel	Diesel
Orientation	-	-	-	Horizontal	Horizontal
Vessel Shape	-	-	-	Rectangular	Rectangular
Roof Type	-	-	-	Horizonal Fixed Roof	Horizonal Fixed Roof
Emission Control	-	-	-	N/A	N/A
Tank Color	-	-	-	Black	Black
Tank Shade or Type	-	-	-	Medium	Medium
Tank Color Reflective Condition	-	-	-	New	New
Roof Construction	-	-	-	Welded	Welded
Shell Construction	-	-	-	Welded	Welded
Product Days	-	-	days	365	365
Capacity	-	-	bbl	7.52	13.21
Capacity	-	-	gal	316.00	555.00
Height	-	-	ft	1.58	2.08
Length	-	-	ft	14.48	16.43
Width	-	-	ft	3.79	6.18
Cylindrical Equivalent Diameter	(a)	D	ft	7.69	10.70
Emissions Factors for Fixed Roof Tanks (AP-42 Chapter 7.1, Organic Liquid Storage Tanks)					
Tank Roof Height	-	H_R	ft	1.58	2.08
Effective Diameter	(b)	D_E	ft	11.91	14.96
Effective Height	(c)	H_E	ft	1.24	1.64
Average Liquid Height	-	H_L	ft	Not Used	Not Used
Vapor Space Outage	(d)	H_{VO}	ft	0.62	0.82
Vapor Space Volume	(e)	V_V	ft^3	69.23	143.85
Paint Solar Absorptance For Fixed Roof Tank	(f)	α	-	0.97	0.97
Daily Maximum Ambient Temperature	(g)	T_{AX}	°R	523.12	523.12
Daily Minimum Ambient Temperature	(g)	T_{AN}	°R	505.87	505.87
Daily Average Ambient Temperature	(g)	T_{AA}	°F	54.79	54.79
Daily Average Ambient Temperature	(g)	T_{AA}	°R	514.49	514.49
Liquid Bulk Temperature	(h)	T_B	°R	518.69	518.69
Daily Total Solar Insolation Factor	(i)	I	$Btu/ft^2 \cdot d$	1,442.00	1,442.00
Daily Average Liquid Surface Temperature	(j)	T_{LA}	°R	524.34	524.38
Average Vapor Temperature	(k)	T_V	°R	529.99	530.07
Constant in Vapor Pressure Equation	(l)	A	-	12.10	12.10
Constant in Vapor Pressure Equation	(l)	B	°R	8,907.00	8,907.00
Vapor Pressure at Daily Average Liquid Surface Temperature	(m)	P_{VA}	psia	7.55E-03	7.56E-03
Average Vapor Molecular Weight	(l)	M_V	lb/lb-mole	130.00	130.00
Ideal Gas Constant	-	R	$psia \cdot ft^3$/ lb-mole·°R	10.73	10.73
Vapor Density	(n)	W_V	lb/ft^3	1.73E-04	1.73E-04
Atmospheric Pressure	(i)	P_A	psia	14.63	14.63
Breather Vent Vacuum Setting	(o)	P_{BV}	psig	-0.03	-0.03
Breather Vent Pressure Setting	(o)	P_{BP}	psig	0.03	0.03
Breather Vent Pressure Setting Range	-	ΔP_B	psig	6.00E-02	6.00E-02
Daily Ambient Temperature Range	-	ΔT_A	°R	17.25	17.25
Daily Vapor Temperature Range	(p)	ΔT_V	°R	39.53	39.60
Average Daily Maximum Liquid Surface Temperature	(q)	T_{LX}	°R	534.22	534.28
Average Daily Minimum Liquid Surface Temperature	(q)	T_{LN}	°R	514.46	514.48
Vapor Pressure at the Average Daily Max Liquid Surface Temperature	(m)	P_{VX}	psi	1.03E-02	1.04E-02
Vapor Pressure at the Average Daily Min Liquid Surface Temperature	(m)	P_{VN}	psi	5.45E-03	5.45E-03
Daily Vapor Pressure Range	(r)	ΔP_V	psi	4.89E-03	4.90E-03
Vapor Space Expansion Factor	(s)	K_E	-	7.16E-02	7.17E-02
Vented Vapor Saturation Factor	(t)	K_S	-	1.00	1.00
Vapor Molecular Weight	(l)	M_V	lb/lb-mole	130.00	130.00
Annual Throughput Rate	-	Q	gallons/yr	1,170.00	1,610.00
			bbl/yr	27.86	38.33
Maximum Liquid Height	(u)	H_{LX}	ft	6.04	8.40
Minimum Liquid Height	(u)	H_{LN}	ft	0.00E+00	0.00E+00
Annual Sum of the Increases in Liquid Level	(u)	$\sum H_{QI}$	ft/yr	1.40	1.22
Turnovers	(v)	N	-	3.70	1.45
Net Working Loss Turnover	(w)	V_Q	ft^3/yr	156.39	215.20

Table C-9
Diesel Fuel Storage Tank Potential VOC Emissions
Tyson Foods, Inc. - Eagle Mountain, UT

Description	Reference Factor	Abbreviation	Unit	Diesel Storage Tanks	
Turnover Factor	(x)	K_N	-	1.00	1.00
Working Loss Product Factor	(y)	K_P	-	1.00	1.00
Vent Setting Correction Factor	(z)	K_B	-	1.00	1.00
Standing Loss	(aa)	L_S	lb/yr	0.31	0.65
Working Loss	(bb)	L_W	lb/yr	2.70E-02	3.72E-02
Total Routine Losses (i.e., VOC PTE Rates for Diesel Tank)	(cc)		lb/hr	3.39E-03	6.88E-03
		L_T	tons/yr	1.70E-04	3.44E-04

(a) Huebscher Equation $D = \frac{1.30 \times (Length \times Width)^{0.625}}{(Length \times Width)^{0.25}}$

(b) AP-42 Chaper 7.1 Equation 1-14. $D_E = \sqrt{\frac{LD}{\frac{\pi}{4}}}$

(c) AP-42 Chapter 7.1 Equation 1-15. $H_E = \frac{\pi}{4} D$

(d) AP-42 Chapter 7.1 Equation 1-16. $H_{VO} = \frac{H_E}{2}$

(e) AP-42 Chapter 7.1 Equation 1-3. $V_V = \left(\frac{\pi}{4} D_E^2\right) H_{VO}$

(f) AP-42 Chapter 7.1 Table 7.1-6 for medium gray paint color in new condition.

(g) Annual average, minimum and maximum temperatures are for Salt Lake City, UT obtained from https://www.usclimatedata.com/climate/salt-lake-city/utah/united-states/usut0225. Equation 1-30 ((T_{AX}+T_{AN})/2) on page 7.1-26 of AP-42 Chapter 7.1 was used.

(h) AP-42 Chapter 7.1 Equation 1-31. $T_B = T_{AA} + 0.003\alpha I$

(i) Total solar insolation factor was obtained for Victoria, TX from AP-42 Chapter 7.1 Table 7.1-7.

(j) AP-42 Chapter 7.1 Equation 1-27. $T_{LA} = \left(0.5 - \frac{0.8}{4.4\left(\frac{L}{D}\right) + 3.8}\right) T_{AA} + \left(0.5 + \frac{0.8}{4.4\left(\frac{L}{D}\right) + 3.8}\right) T_B + \frac{0.021\alpha_R I + 0.013(\frac{L}{D})\alpha_S I}{4.4\left(\frac{L}{D}\right) + 3.8}$

(k) AP-42 Chapter 7.1 Equation 1-32. $T_V = \frac{\left[2.2\left(\frac{L}{D}\right) + 1.1\right] T_{AA} + 0.8T_B + 0.021\alpha_R I + 0.013(\frac{L}{D})\alpha_S I}{2.2\left(\frac{L}{D}\right) + 1.9}$

(l) AP-42 Chapter 7.1 Table 7.1-2 for No. 2 Fuel Oil (Diesel).

(m) AP-42 Chapter 7.1 Equation 1-25. P_{VX} and P_{VN} are calculated by substituting T_{LA} with T_{LX} and T_{LN}. $P_{VA} = \exp[A - (\frac{B}{T_{LA}})]$ $P_{VA} = \exp[A - (\frac{B}{T_{LA}})]$

(n) AP-42 Chapter 7.1 Equation 1-22. $W_V = \frac{M_V P_{VA}}{R T_V}$

(o) Specific information on the settings for the breather vent pressure setting and vacuum setting was not readily available; therefore, 0.03 psig for P_{BP} and -0.03 psig for P_{BV} were assumed as typical values, pursuant to guidance provided in AP-42 Chapter 7.1.

(p) AP-42 Chapter 7.1 Equation 1-6. $\Delta T_V = (1 - \frac{0.8}{2.2\left(\frac{L}{D}\right) + 1.9} \Delta T_A + \frac{0.042\alpha_R I + 0.026(\frac{L}{D})\alpha_S I}{2.2\left(\frac{L}{D}\right) + 1.9}$

(q) Derived from the equation in Figure 7.1-17.

(r) AP-42 Chapter 7.1 Equation 1-9. $\Delta P_V = P_{VX} - P_{VN}$

(s) AP-42 Chapter 7.1 Equation 1-5. $K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta P_V - \Delta P_B}{P_A - P_{VA}}$

(t) AP-42 Chapter 7.1 Equation 1-21. $K_S = \frac{1}{1 + 0.053 P_{VA} H_{VO}}$

(u) AP-42 Chapter 7.1 Equation 1-37. $\Sigma H_{QI} = (5.614Q)/(\left(\frac{\pi}{4}\right) D_E^2)$

(v) Turnovers calculated by dividing throughput by capacity.

(w) AP-42 Chapter 7.1 Equation 1-38. $V_Q = (\Sigma H_{QI})(\frac{\pi}{4}) D_E^2$

(x) When turnovers are less than or equal to 36, then K_N =1, pursuant to guidance provided in AP-42 Chapter 7.1.

(y) For all organic liquids except crude oils, K_P = 1, pursuant to guidance provided in AP-42 Chapter 7.1.

(z) For a vent setting range up to plus or minus 0.03 psig, K_B=1

(aa) AP-42 Chapter 7.1 Equation 1-2. $L_S = 365 V_V W_V K_E K_S$

(bb) AP-42 Chapter 7.1 Equation 1-35. $L_W = V_Q K_N K_P W_V K_B$

(cc) VOC PTE rates for the tank were annualized over the year and were calculated assuming that the breathing losses occur 8,760 hours per year, while the working losses occur 100 hours per year. It is assumed that fugitive emissions of HAPs are negligible.

Table C-10
Salt Silo Loading Potential Emissions [a]
Tyson Foods, Inc. - Eagle Mountain, UT

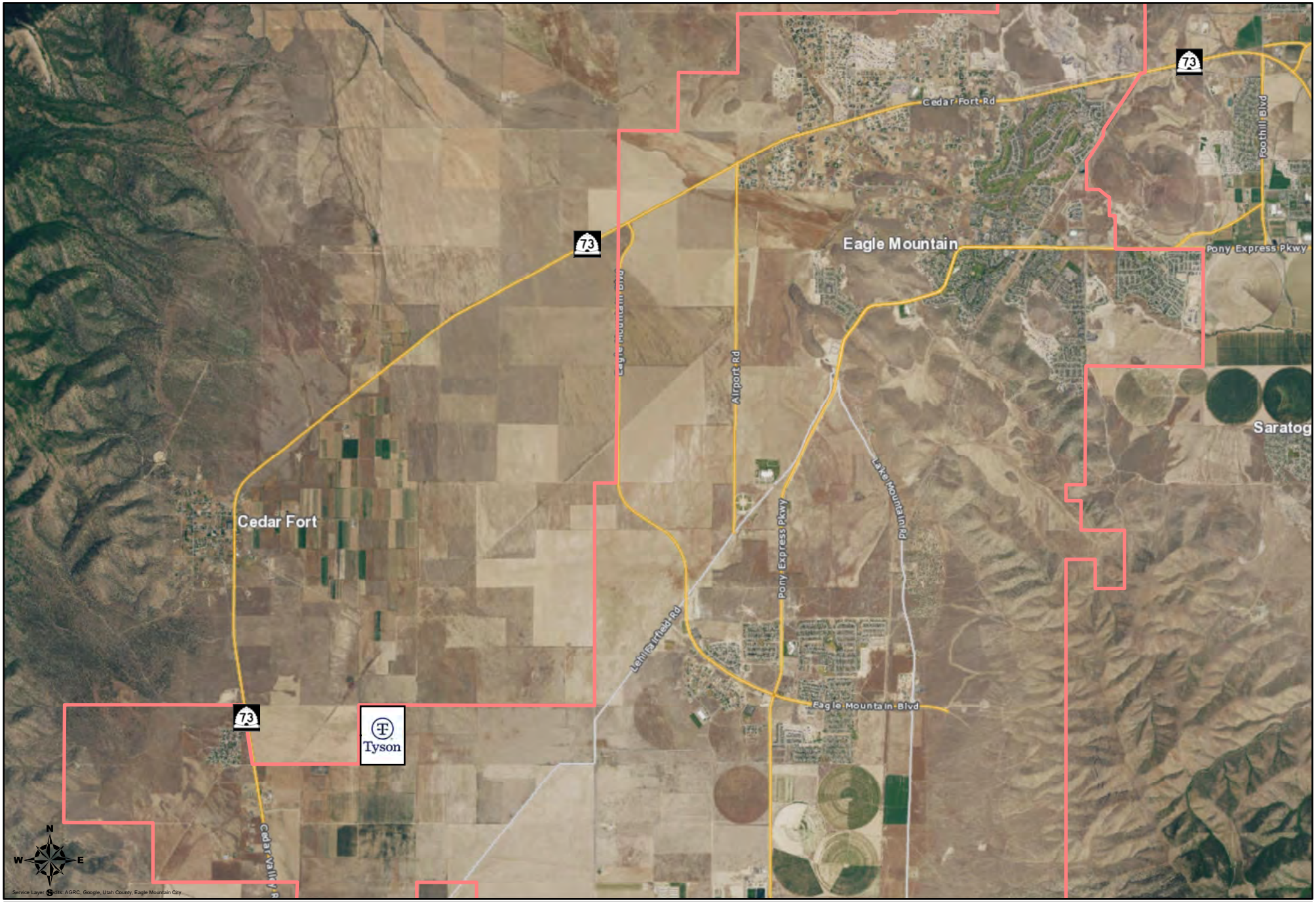
Pollutant	Potential Emissions[b]	
	(lb/hr)	(tpy)
PM	0.14	2.23E-03
PM_{10}	0.14	2.23E-03
$PM_{2.5}$	0.14	2.23E-03

(a) Emissions were calculated using the following vendor provided parameters:

Parameter	Value
Salt loading Frequency (Loads/yr)	26
Salt Loading Time (hrs)	1.25
Silo Outlet Grain Loading (gr/dscf)	0.02
Flow Rate (cfm)	800
lb/ton	2,000
grains/lb	7,000

(b) A typical industry standard outlet grain loading of 0.02 gr/dscf was assumed for the silo loading operations.

APPENDIX D – FIGURES



Eagle Mountain City Boundary

0 1.25 2.5 5 Miles

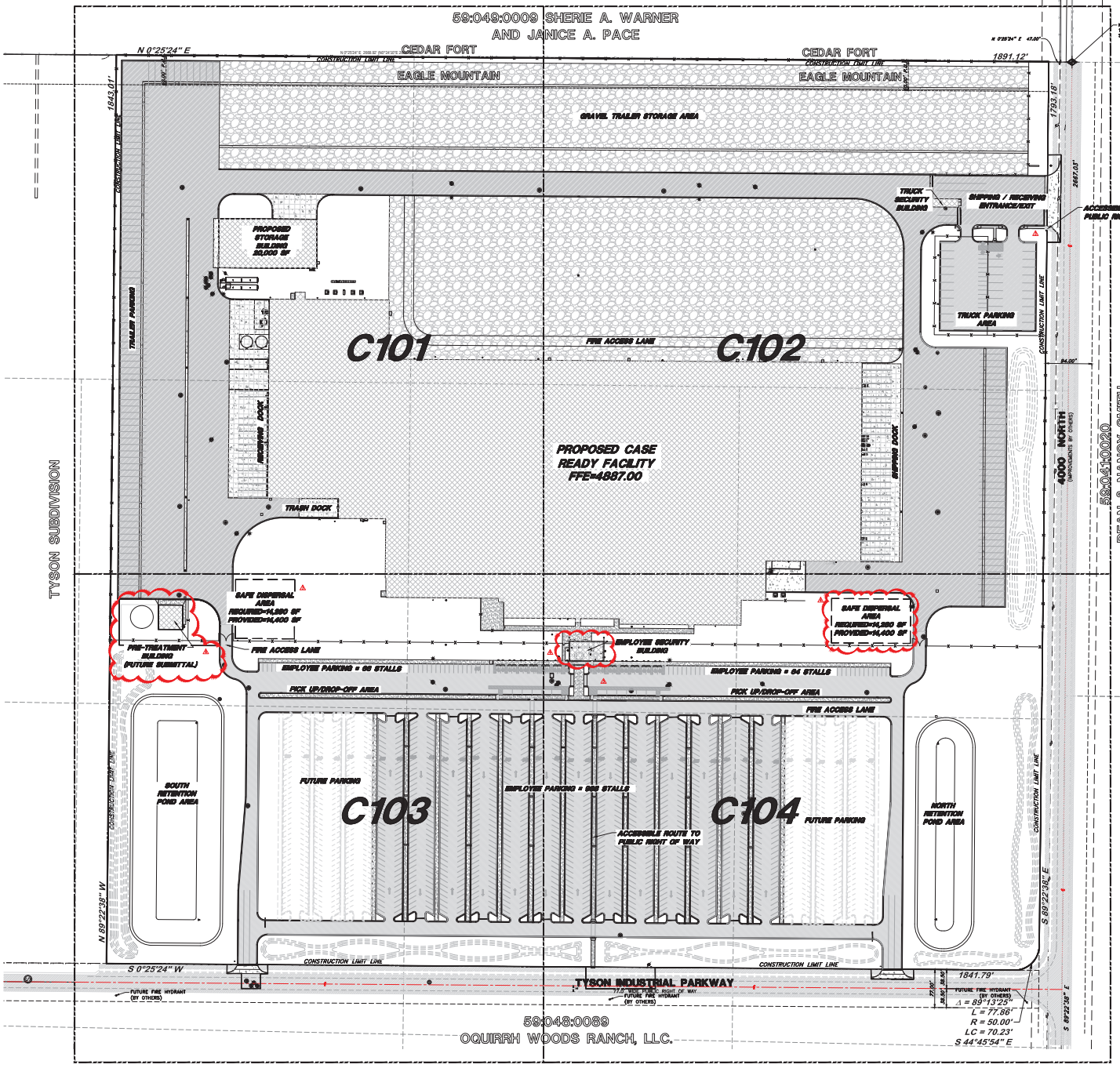
Figure D-1

Tyson Foods, Inc.
Eagle Mountain Facility Site Location

EAGLE MOUNTAIN

Contact Eagle Mountain City
Engineering/GIS Department
801-789-6662

Figure D-2
Facility Plot Plan
Tyson Foods, Inc. - Eagle Mountain Facility



Scale 1" = 60'

Graphic Scale

Legend

(Items M. have may not appear on drawing)

- San. Sewer Manhole
- Water Manhole
- Storm Drain Manhole
- Cleanout
- Electrical Manhole
- Catch Basins
- Fire Hydrant Hydrant
- Fire Department Connection
- Post Indicator Valve
- Culinary Water Valve
- Water Valve
- Sanitary Sewer
- Secondary Water
- Gas Line
- Irrigation Line
- Storm Drain
- Telephone Line
- Secondary Waterline
- Power Line
- Gas Line
- Land Drain
- Process Waste
- Power pole
- Power pole w/guy
- Light Pole
- Fence
- Flowline of ditch
- Overhead Power line
- Reinforced Concrete Pipe
- Concrete Pipe
- Reinforced Concrete Pipe
- Ductile Iron
- Polyvinyl Chloride
- Top of Asphalt
- Edge of Asphalt
- Flowline
- Flowline
- Flume Floor
- Top of Curb
- Top of Wall
- Top of Wall
- Top of Concrete
- Finish Ground
- Finish Grade
- Match Existing
- Fire Department Connection
- Finish Contour
- Finish Contour
- Finish Grade
- Finish Grade
- Ridge Line
- Direction of Flow

- Future Asphalt (By Others)
- New Asphalt
- Heavy Duty Asphalt
- Heavy Duty Concrete
- Light Duty Concrete
- Gravel Storage
- Spill Curb & Gutter
- Demo Tree
- Tree To Remain in Place

PARKING TABLE

EMPLOYEE PARKING AREA:

TOTAL STALLS REQUIRED	1,000 STALLS
TOTAL STALLS PROVIDED	1,118 STALLS
FUTURE STALLS	456 STALLS
TOTAL STALLS (CURRENT & FUTURE)	1,574 STALLS
TOTAL REQUIRED ACCESSIBLE STALLS	26 STALLS
(PER IBC 1106.1: 20 STALLS FOR THE 1ST 1,000 PLUS 1 STALL PER EACH 100 OR FRACTION THEREOF OVER 100	
TOTAL REQUIRED VAN STALLS (1 PER 6 ADA STALLS).....	5 STALLS

TRUCK PARKING AREA:

NORTH LOT TOTAL STALLS REQUIRED	21 STALLS
NORTH LOT TOTAL STALLS PROVIDED	21 STALLS
TOTAL REQUIRED ACCESSIBLE STALLS	1 STALLS
TOTAL PROVIDED ACCESSIBLE STALLS	1 STALLS
SOUTH LOT TOTAL STALLS REQUIRED	26 STALLS
SOUTH LOT TOTAL STALLS PROVIDED	26 STALLS
TOTAL REQUIRED ACCESSIBLE STALLS	2 STALLS
TOTAL PROVIDED ACCESSIBLE STALLS	2 STALLS

GENERAL SITE NOTES:
1. Stalls designated as accessible will require a painted accessible symbol and sign. (See Details)
2. Fire lane markings and signs to be installed as directed by the Fire Marshal.
3. Aisle markings, directional arrows and stop bars will be painted at each driveway as shown on the plans.
4. Building sidewalks, ramps, and bollards are building contractor responsible items. See architectural plans.
5. All dimensions are to back of curb unless otherwise noted.

ADA NOTES:
Contractor must maintain a running slope on Accessible routes no steeper than 5.0% (1:20). The cross slope for Accessible routs must be no steeper than 2.0% (1:50). All Accessible routes must have a minimum clear width of 36". If grades on plans do not meet this requirement notify Consultants immediately.
The Client, Contractor, and Subcontractor should immediately notify the Consultant of any conditions of the project that they believe do not comply with the current state of the ADA and/or FHAA.

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.

ALL CONSTRUCTION TO CONFORM TO CITY STANDARDS AND SPECIFICATIONS IN RIGHT OF WAY

- New Heavy Duty 6" HMA Over 8" Class II Aggregate Base Course Over 10" prepared Sub-Base ±497,696 SF
- New Light Duty 4" HMA Over 6" Class II Aggregate Base Course ±454,253 SF
- New Heavy Duty 8" PC Concrete Over 6" Class II Aggregate Base Course ±87,493 SF
- New Light Duty 4" Concrete Over 6" Class II Aggregate Base Course ±77,128 SF
- New Gravel Storage Area 4" Class II Aggregate Base Course over 8" Structural Fill ±704,526 SF
- New 8' Tall Chain Link Fence w/ Single Outrigger w/ (3) Strands Barbed Wire ±6,413 LF

GREAT BASIN ENGINEERING, INC.
5746 SOUTH 1475 EAST SUITE 200
OGDEN, UTAH 84403 (801) 394-4515
S.L.C. (801) 521-0222 FAX (801) 392-7544
WWW.GREATBASINENGINEERING.COM

REVISIONS:

1	09-23-2019	ADDENDUM #1
		CITY COMMENT RESPONSES
2	11-04-2019	90% REVIEW REVISIONS
3	11-19-2019	CITY COMMENT RESPONSES
4	12-05-2019	PLAN REVIEW COMMENTS 2

No. 7742907 ALBERT COURY MORRIS 11/04/2019 STATE OF UTAH

REVIEWED FOR CODE COMPLIANCE

BIG-D CONSTRUCTION

CORE & SHELL PERMIT SET

TYSON CASE READY FACILITY

3867 North Tyson Industrial Parkway
Eagle Mountain, Utah 84005

TYSON FOODS, INC

800 Stevens Port Dr.
Dakota Dunes, SD 57049

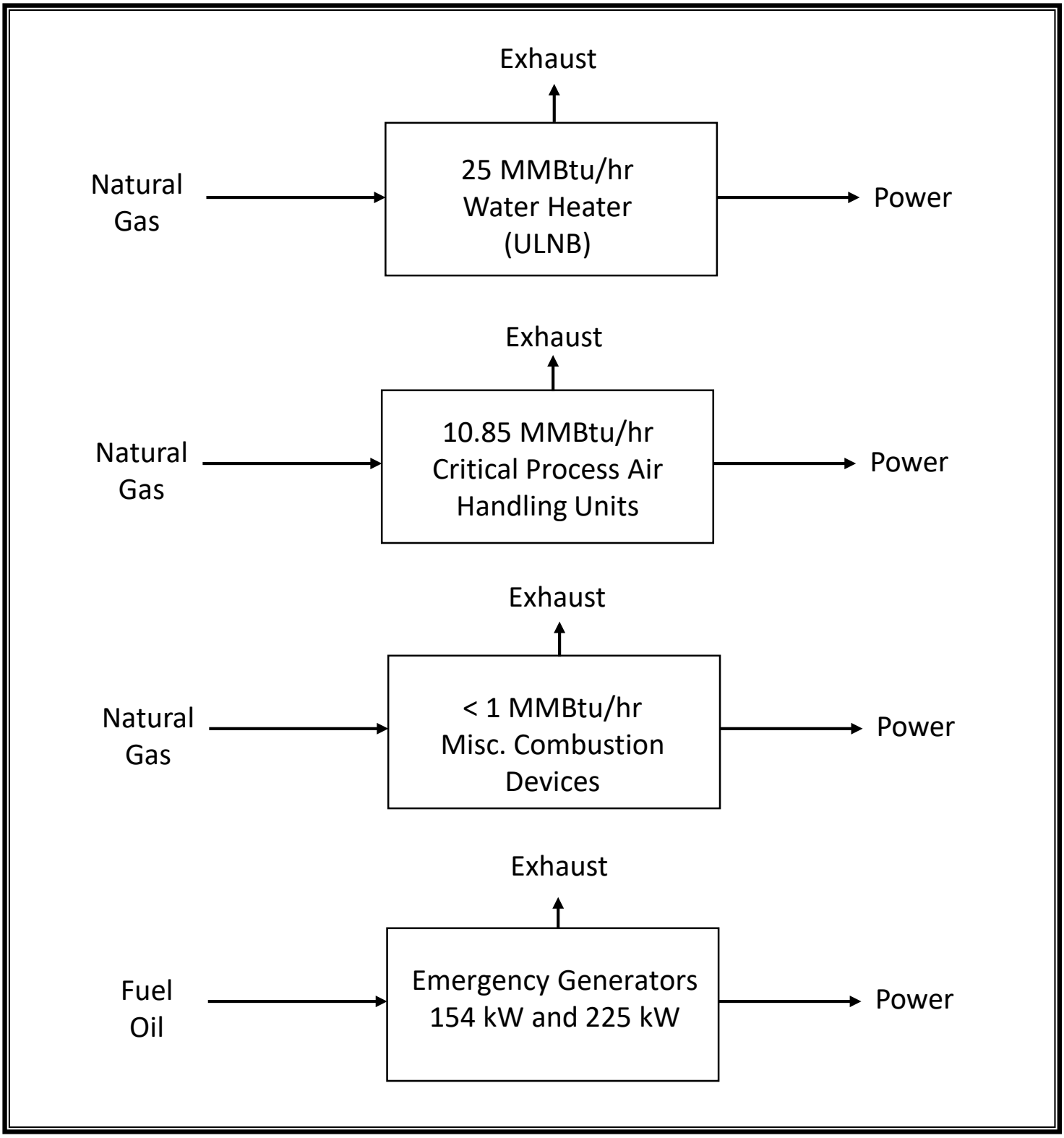
OWNER PROJECT NO.:
GBE PROJECT NO.: 19N910
ISSUED DATE: OCT. 18, 2019

OVERALL SITE PLAN

C-100 REV

W:\19N910 Tyson Food Processing\DWG\Tyson Foods S15.dwg, 12/13/2019 11:06:07 AM, RebeccaC, 1:1

Figure D-3
Process Flow Diagram
Air Emission Sources
Tyson Foods, Inc. – Eagle Mountain, Utah Facility



APPENDIX E – ADDITIONAL BACT INFORMATION

Table 1. BACT Review for Units Similar to Tyson's Proposed AHUs

State	Guidance	Unit Classification	Suggested NO_X BACT/Emission Limit
Utah	BACT for Various Emission Units at Stationary Sources (DAQ-2018-007161)	Space Heaters	- Good combustion practices
		Drying Oven	- Good combustion practices - Low-NOx Burner (LNB) -Ultra-low NOx Burner (ULNB)
U.S. EPA	RBLC 13.310	Inlet Air Heater 16.10 MMBtu/hr	- 0.012 lb/MMBtu (ULNB) (~10 ppm) - 0.2 lb/hr - 0.4 tpy (4,380 hr limit)
		2 Heaters 10 MMBtu/hr	- 0.10 lb/MMBtu
	RBLC 19.6	Air Heater 19 MMBtu/hr	- LNB - 0.012 lb/MMBtu (~10 ppm)
California - South Coast	Rule 1147 – NO_X Reductions from Miscellaneous Sources	Evaporator (≥325,000 Btu/hr)	- 60 ppm or 0.073 lb/MMBtu
		Dryer, Heater (≥325,000 Btu/hr)	- 30 ppm or 0.036 lb/MMBtu
		Makeup-Air Heater or other Air Heater located outside of building with temperature controlled zone inside building (≥325,000 Btu/hr)	- 30 ppm or 0.036 lb/MMBtu
	BACT Guidelines	Other Dryers and Ovens – Direct and Indirect	- 30 ppm @ 3% O_2
California - Sacramento	SMAQMD BACT Clearinghouse	Dryer (<2 MMBtu/hr)	- 60 ppm at 3% O_2 - LNB
California - San Joaquin	BACT Guideline for External Combustion	Flake Cereal Dryer - < 20 MMBtu/hr, Conveyor-fed	- 30 ppmv @ 3% O_2 - LNB, or equal
		Dryer - Seed Processing, < 20 MMBtu/hr	- 20 ppmv -LNB
		Mineral Products Spray Dryer - Natural Gas Fired, ≤ 20 MMBtu/hr	- 20 ppmv @ 3% O_2 - LNB
		Molded Paper Products Dryer - Natural Gas Fired, < 20 MMBtu/hr	- 80 ppmv @ 3% O2 (standard burner)
		Natural Gas Fired Dryer with High Turndown Ratio	- 8.9 ppmvd @ 19% O2 (0.1 lb/MMBtu) - LNB
Texas	Tier 1 BACT – Combustion	Heater ≤ 40 MMBtu/hr[1]	- Burners with the best NOx performance - Provide justification if NOx > 0.01 lb/MMBtu (~8.26 ppm)

[1]These are general Natural Gas combustion sources and are not specific to Air Handling Units.

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		Makeup-Air Heater or other Air Heater located outside of building with temperature controlled zone inside building (≥325,000 Btu/hr)	- 30 ppm or 0.036 lb/MMBtu
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		Molded Paper Products Dryer - Natural Gas Fired, < 20 MMBtu/hr	- 80 ppmv @ 3% O2 (standard burner)
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[1]These are general Natural Gas combustion sources and are not specific to Air Handling Units.

From:	Jeff Bluvas
To:	Ali Toloczko
Cc:	Faris Judeh; Cara Fox; Meierhenry, David
Subject:	RE: Evapco RMAU & Low NOx Burners
Date:	Wednesday, June 3, 2020 1:38:31 PM

Your summary is correct. You need (6) Midco lo NOx burners to facilitate the 100F temp rise for 100,000 CFM.

Sincerely,

Jeff Bluvas
Sales Engineer

Bluvas & Associates, Inc.
816.246.0903 ext. 12
816.916.1992 Cell
jeff@blufrig.com

From: Ali Toloczko <atoloczko@all4inc.com>
Sent: Wednesday, June 3, 2020 12:36 PM
To: Jeff Bluvas <jeff@blufrig.com>
Cc: Faris Judeh <faris@blufrig.com>; Cara Fox <cfox@ALL4INC.COM>; Meierhenry, David <david.meierhenry@tyson.com>
Subject: RE: Evapco RMAU & Low NOx Burners

Jeff,

Thank you for your note back. To confirm, EvapCo would recommend MidCo's direct fired conventional NO_X burner for this application and does not have an additional offering that would meet the engineering requirements of the Tyson Eagle Mountain project because the facility requires 100,000 cfm of air flow and a 100 degree temperature rise. Thank you so much.

Regards,

Ali Toloczko / Project Engineer
atoloczko@all4inc.com / 571-392-2592 x507 / Profile

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From: Jeff Bluvas <jeff@blufrig.com>
Sent: Wednesday, June 3, 2020 11:19 AM
To: Ali Toloczko <atoloczko@all4inc.com>

Cc: Faris Judeh <faris@blufrig.com>
Subject: Evapco RMAU & Low NOx Burners

Alley,

It was good speaking with you today regarding the Tyson Utah project. As discussed, we Evapco, utilize Midco burners as the direct fired burner of choice for our engineered/manufactured make-up & critical process rooftop mounted units. We don't run into Low NOx burner requirements to often, however this application came up in March for this project between myself and Tyson. What I found after some investigating is that Midco appeared to have the higher end capacity at around 18,000 CFM capability for a 100F rise (Called out as 2,000,000 BTU/HR). I have attached the Midco low NOx burner general information.

Let me know if you should need anything else from my side.

Sincerely,

Jeff Bluvas
Sales Engineer / Evapco Manufactuers Representative / Tyson Account Representative

Bluvas & Associates, Inc.
816.246.0903 ext. 12
816.916.1992 Cell
jeff@blufrig.com

From: Andrew Gregory
To: Ali Toloczko
Cc: Wiese, Sam; Cara Fox; Meierhenry, David
Subject: RE: Tyson Eagle Mountain AHU Request
Date: Friday, June 26, 2020 4:43:32 PM

The difference in cost for using 6 LNB2000's burners in place of 1 HMA-2A in these units on a new order from the factory would be approximately $210,500 per unit. Each burner would require individual gas trains, dampers, and controls which would result in larger footprint, more complicated operation and higher maintenance costs.

From buildability and practicality standpoint, I do not see a way to feasibly implement indirect fired burners in this application. Without going through a detail design review and engineering to see how this could even work – best I can do is roughly estimate approximately $450,000 additional per unit to try and make this work. This would result in much larger footprint and additional blowers, heat exchangers, etc and further complicate controls / maintenance requirements.

Andrew Gregory, PE
Innovative Refrigeration Systems, Inc.
Office: 540-941-1996
Cell: 336-978-4192

From: Ali Toloczko <atoloczko@all4inc.com>
Sent: Friday, June 19, 2020 4:52 PM
To: Andrew Gregory <agregory@r717.net>
Cc: Wiese, Sam <Sam.Wiese@tyson.com>; Cara Fox <cfox@ALL4INC.COM>; Meierhenry, David <david.meierhenry@tyson.com>
Subject: Tyson Eagle Mountain AHU Request

Good afternoon Andrew,

We are wrapping up the BACT (Best Available Control Technology) discussion for the Tyson Eagle Mountain Facility and are looking for a few additional pieces of information. Do you have some time on Monday or Tuesday next week to discuss budgetary cost information and the indirect fired burner case information?

It is ALL4's understanding that at this time Tyson plans to move ahead with the current burner design. However, in accordance with Utah requirements to conduct a BACT analysis, Tyson will be presenting two alternative AHU scenarios (6 2 MMBtu/hr burners and the indirect burner). We realize there are costs outside of the burners themselves that add to the practical and financial challenges of employing six -2 MMBtu/hr burners, but anticipate that the agency will still request the basic cost differential. Therefore, we are asking you to provide the budgetary cost differential between the HMA-2A, LNB2000, and indirect fired unit.

In addition to cost information, we are looking for the NOx lb/MMBtu rating for an indirect fired

burner for this application, so that we can make a numerical comparison of the NOx for the HMA-2A versus the NOx with an indirect fired burner (assume a low NOx burner for the indirect fired application).

Thank you so much in advanced and have great weekend!

Ali Toloczko / Project Engineer
atoloczko@all4inc.com / 571-392-2592 x507 / Profile

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From: Shaun Maloney
To: Ali Toloczko
Cc: Cara Fox; Meierhenry, David
Subject: RE: Tyson Eagle Mountain Generator Upgrade
Date: Wednesday, June 17, 2020 10:06:29 AM

That is correct.

Thanks!

Shaun Maloney

Senior Project Manager, Construction
Interstates
13326 B Street
Omaha, Nebraska 68144
402-657-1299
Shaun.Maloney@interstates.com

UNDERSTANDING NEEDS ► DELIVERING RESULTS

From: Ali Toloczko <atoloczko@all4inc.com>
Sent: Wednesday, June 17, 2020 8:18 AM
To: Shaun Maloney <Shaun.Maloney@interstates.com>
Cc: Cara Fox <cfox@ALL4INC.COM>; Meierhenry, David <david.meierhenry@tyson.com>
Subject: Tyson Eagle Mountain Generator Upgrade

Shaun,

It is ALL4's understanding that in order to upgrade the Tier 3 225 kW emergency generator to a Tier 4 emergency generator, Tyson would need to install two 125 kW emergency generators and cable them in parallel. This upgrade would add a cost $115,782. Additionally, in order to upgrade the Tier 3 154 kW emergency generator to a Tier 4 emergency generator, it would add a cost of $37,374.

Please respond to this email with a confirmation, so it can be included in Tyson's submission to UDEQ.

Thank you so much.

Regards,

Ali Toloczko / Project Engineer
atoloczko@all4inc.com / 571-392-2592 x507 / Profile

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From: Meierhenry, David
To: Ali Toloczko
Cc: Cara Fox
Subject: RE: Tyson BACT - Sanitation & Disinfection Question
Date: Wednesday, July 8, 2020 10:21:09 AM
Attachments: USDA 5000.1.pdf
10010.1.pdf

Hi Ali,
The USDA is the regulatory authority over the Eagle Mountain facility (CFR Title 9). The regulations are attached. 5000.1 are the general requirements. Chapter 2, Part 1, Section E mentions the daily requirement. 10010.1 applies specifically to ground beef and was targeting the Shiga-toxin producing bacteria such as E. coli and Salmonella. Basically, meat processing plants need to clean and sanitize at least once per day in order to produce an unadulterated product. The definition of adulterated is at 9 CFR 301.2. The 10010.1 directive expanded on that definition.

While there may be some cleaning occurring between the first and second production shifts, the basic plan is to clean, sanitize, and disinfect the entire facility once per day, after the 2nd production shift and before the first production shift of the following day. In general, we refer to this as the third shift or the sanitation shift.

The AHU specifications are based on what is necessary to get the production areas ready to produce unadulterated product. Following cleaning, the area needs to be dried to prevent condensation from dripping on the product and it needs to be done fairly quickly so the area can be returned to 40 degrees prior to the start of production.

Let me know if you need more.

David.

From: Ali Toloczko <atoloczko@all4inc.com>
Sent: Wednesday, July 8, 2020 8:08 AM
To: Meierhenry, David <david.meierhenry@tyson.com>
Cc: Cara Fox <cfox@ALL4INC.COM>
Subject: [EXTERNAL] - Tyson BACT - Sanitation & Disinfection Question

Hi David,

I hope you enjoyed your Fourth of July weekend. I am wrapping up the BACT analysis for Tyson and was hoping you might have the answer to a few questions regarding the sanitation and disinfection steps that the AHUs assist with.

As it stands, the BACT analysis explains that up to two times each day the facility undergoes a sanitation and disinfection step. Is that an FDA requirement? If so, is there a source that I can reference to support this? If not, can you provide supporting information as to why this frequency is used for sanitation and disinfection?

Similarly, is the need for an AHU with a design flowrate of 100,000 scfm and a required building temperature of 70 degrees an FDA requirement or an internal Tyson policy? It is ALL4's understanding that these specific parameters are needed to properly complete the sanitation and disinfection step, but would like to provide a reference for the agency that supports these numbers.

Thank you for your time and if you have any questions feel free to reach out.

Regards,

Ali Toloczko / Project Engineer
atoloczko@all4inc.com / 571-392-2592 x507 / Profile

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SCR Design Parameters

The following design parameters for the SCR were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Parameter	Equation	Calculated Value	Units	
Maximum Annual Heat Input Rate (Q_B) =	HHV x Max. Fuel Rate =	25	MMBtu/hour	
Maximum Annual fuel consumption (mfuel) =	(QB x 1.0E6 x 8760)/HHV =	212,003,872	scf/Year	
Actual Annual fuel consumption (Mactual) =		1,031	scf/Year	
Heat Rate Factor (HRF) =	NPHR/10 =	0.82		
Total System Capacity Factor (CF_{total}) =	(Mactual/Mfuel) x (tscr/tplant) =	0.000	fraction	
Total operating time for the SCR (t_{op}) =	CF_{total} x 8760 =	0	hours	
NOx Removal Efficiency (EF) =	(NOx_{in} - NOx_{out})/NOx_{in} =	90.0	percent	
NOx removed per hour =	NOx_{in} x EF x Q_B =	0.46	lb/hour	
Total NO_x removed per year =	(NOx_{in} x EF x Q_B x t_{op})/2000 =	0.00	tons/year	
NO_x removal factor (NRF) =	EF/80 =	1.13		
Volumetric flue gas flow rate ($q_{flue\ gas}$) =	Q_{fuel} x QB x (460 + T)/(460 + 700)n_{scr} =	10,901	acfm	
Space velocity (V_{space}) =	$q_{flue\ gas}$/$Vol_{catalyst}$ =	112.84	/hour	
Residence Time	1/V_{space}	0.01	hour	
Coal Factor (CoalF) =	1 for oil and natural gas; 1 for bituminous; 1.05 for sub-bituminous; 1.07 for lignite (weighted average is used for coal blends)	1.00		
SO_2 Emission rate =	(%S/100)x(64/32)*1x10^6)/HHV =			Not applicable; factor applies only to coal-fired boilers
Elevation Factor (ELEVF) =	14.7 psia/P =	1.20		
Atmospheric pressure at sea level (P) =	2116 x [(59-(0.00356xh)+459.7)/518.6]$^{5.256}$ x (1/144)* =	12.3	psia	
Retrofit Factor (RF)	New Construction	0.80		

* Equation is from the National Aeronautics and Space Administration (NASA), Earth Atmosphere Model. Available at https://spaceflightsystems.grc.nasa.gov/education/rocket/atmos.html.

Catalyst Data:

Parameter	Equation	Calculated Value	Units
Future worth factor (FWF) =	(interest rate)(1/((1+ interest rate)^Y -1) , where Y = $H_{catalyts}$/(t_{SCR} x 24 hours) rounded to the nearest integer	0.3157	Fraction
Catalyst volume ($Vol_{catalyst}$) =	2.81 x Q_B x EF_{adj} x Slipadj x NOx_{adj} x S_{adj} x (T_{adj}/N_{scr})	96.61	Cubic feet
Cross sectional area of the catalyst ($A_{catalyst}$) =	$q_{flue\ gas}$ /(16ft/sec x 60 sec/min)	11	ft^2
Height of each catalyst layer (H_{layer}) =	($Vol_{catalyst}$/(R_{layer} x $A_{catalyst}$)) + 1 (rounded to next highest integer)	4	feet

SCR Reactor Data:

Parameter	Equation	Calculated Value	Units
Cross sectional area of the reactor (A_{SCR}) =	1.15 x $A_{catalyst}$	13	ft^2
Reactor length and width dimensions for a square reactor =	$(A_{SCR})^{0.5}$	3.6	feet
Reactor height =	(R_{layer} + R_{empty}) x (7ft + h_{layer}) + 9ft	52	feet

Reagent Data:

Type of reagent used: Ammonia

Molecular Weight of Reagent (MW) = 17.03 g/mole

Density = 56 lb/ft^3

Parameter	Equation	Calculated Value	Units
Reagent consumption rate ($m_{reagent}$) =	(NOx_{in} x Q_B x EF x SRF x MW_R)/MW_{NOx} =	0	lb/hour
Reagent Usage Rate (m_{sol}) =	$m_{reagent}$/Csol =	1	lb/hour
	(m_{sol} x 7.4805)/Reagent Density	0	gal/hour
Estimated tank volume for reagent storage =	(m_{sol} x 7.4805 x $t_{storage}$ x 24)/Reagent Density =	100	gallons (storage needed to store a 14 day reagent supply rounded to th

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i (1+ i)^n/(1+ i)^n - 1$ = Where n = Equipment Life and i= Interest Rate	0.0745

Other parameters	Equation	Calculated Value	Units
Electricity Usage: Electricity Consumption (P) =	A x 1,000 x 0.0056 x (CoalF x HRF)$^{0.43}$ = where A = (0.1 x QB) for industrial boilers.	12.85	kW

Cost Estimate

Total Capital Investment (TCI)

TCI for Oil and Natural Gas Boilers

For Oil and Natural Gas-Fired Utility Boilers between 25MW and 500 MW:

$$TCI = 86{,}380 \times (200/B_{MW})^{0.35} \times B_{MW} \times ELEVF \times RF$$

For Oil and Natural Gas-Fired Utility Boilers >500 MW:

$$TCI = 62{,}680 \times B_{MW} \times ELEVF \times RF$$

For Oil-Fired Industrial Boilers between 275 and 5,500 MMBTU/hour :

$$TCI = 7{,}850 \times (2{,}200/Q_B)^{0.35} \times Q_B \times ELEVF \times RF$$

For Natural Gas-Fired Industrial Boilers between 205 and 4,100 MMBTU/hour :

$$TCI = 10{,}530 \times (1{,}640/Q_B)^{0.35} \times Q_B \times ELEVF \times RF$$

For Oil-Fired Industrial Boilers >5,500 MMBtu/hour:

$$TCI = 5{,}700 \times Q_B \times ELEVF \times RF$$

For Natural Gas-Fired Industrial Boilers >4,100 MMBtu/hour:

$$TCI = 7{,}640 \times Q_B \times ELEVF \times RF$$

Total Capital Investment (TCI) =	$1,762,930	in 2019 dollars

Annual Costs

Total Annual Cost (TAC)

TAC = Direct Annual Costs + Indirect Annual Costs

Direct Annual Costs (DAC) =	$11,122 in 2019 dollars
Indirect Annual Costs (IDAC) =	$134,072 in 2019 dollars
Total annual costs (TAC) = DAC + IDAC	$145,194 in 2019 dollars

Direct Annual Costs (DAC)

DAC = (Annual Maintenance Cost) + (Annual Reagent Cost) + (Annual Electricity Cost) + (Annual Catalyst Cost)

Annual Maintenance Cost =	0.005 x TCI =	$8,815 in 2019 dollars
Annual Reagent Cost =	m_{sol} x $Cost_{reag}$ x t_{op} =	$0 in 2019 dollars
Annual Electricity Cost =	P x $Cost_{elect}$ x t_{op} =	$0 in 2019 dollars
Annual Catalyst Replacement Cost =	n_{scr} x Vol_{cat} x ($CC_{replace}$/R_{layer}) x FWF	$2,308 in 2019 dollars
Direct Annual Cost =		$11,122 in 2019 dollars

Indirect Annual Cost (IDAC)

IDAC = Administrative Charges + Capital Recovery Costs

Administrative Charges (AC) =	0.03 x (Operator Cost + 0.4 x Annual Maintenance Cost) =	$2,734 in 2019 dollars
Capital Recovery Costs (CR)=	CRF x TCI =	$131,338 in 2019 dollars
Indirect Annual Cost (IDAC) =	AC + CR =	$134,072 in 2019 dollars

Cost Effectiveness

Cost Effectiveness = Total Annual Cost/ NOx Removed/year

Total Annual Cost (TAC) =	$145,194 per year in 2019 dollars
NOx Removed =	9.73E-06 tons/year
Cost Effectiveness =	$14,929,870,797 per ton of NOx removed in 2019 dollars

Midco INTERNATIONAL

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REGISTERED ISO 9001 COMPANY

Sunday, July 05, 2020

Dear Cara Fox:

Regarding the Eagle Mountain application that we discussed, I have prepared some information about the following burners that we have available.

HMA-2A

The HMA-2A is the typical burner that we use in direct-fired applications. We build them from 250 MBH to over 50,000 MBH. Customers like them for their reliability, modular nature, high turndown, and cost-effectiveness.

For this application we would recommend using a 11,700 MBH burner in order to heat 100,000 CFM with a temperature rise of 100 degrees F. Using a typical 550 MBH per ft design would result in a 21.5 ft burner.

Design specifications

Input rating	11,700,000 Btu/hr
Number of burners	1
Fuel	Natural gas
Unit location	Rooftop
Turndown ratio	Between 20:1 and 30:1
Minimum airflow	50,000 CFM
Maximum airflow	100,000 CFM
Minimum temperature rise	3-5 degrees F
Maximum temperature rise	100 degrees F
Recirculation ratio	100% fresh air

I understand that NOx emissions are critical for this application. Here is some additional information related to NOx emissions for the HMA-2A burner.

NOx emissions (lb/mmbtu)	0.06 - 0.082
NOx emissions (ppm at 3% O2)	63 – 93 ppm
Concentration of NOx in diluted airstream	1.8 ppm NOx or less
%Oxygen	20.7% or greater
Total NOx produced at 11,700 MBH	0.70 - 0.96 lb/hr

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Total NOx produced at 390 MBH	0.020 - 0.032 lb/hr

LNB2000

The LNB series burners are the burners that we use in direct-fired applications where low-NOx emissions are requested. Customers request them because they meet the 30 ppm NOx @3%O2 as required by SCAQMD rule 1147 in southern California. We only manufacture this burner up to an input rating of 2,000,000 btu/hr. 2,000,000 btu/hr is enough for the make-up air units used in the automotive refinishing industry, as well as many industrial ovens. We have not had requests for low-NOx burners outside of those applications.

In order to reach 100 degree F rise with 100,000 CFM, it would take 6 LNB 2000 burners. For the sake of comparison, I will write the information for both 1 burner as well as 6 burners. However, keep in mind that although 6 LNB 2000 burners may work theoretically, there are practical and financial challenges to this approach.

Design specifications

Input rating	2,000,000 Btu/hr	12,000,000 Btu/hr
Number of burners	1	6
Fuel	Natural gas	Natural gas
Unit location	Rooftop	Rooftop
Turndown ratio	5:1	5:1
Minimum airflow	50,000 CFM	50,000 CFM
Maximum airflow	100,000 CFM	100,000 CFM
Minimum temperature rise	3-4 degrees F	18-24 degrees F
Maximum temperature rise	16 degrees F	100 degrees F
Recirculation ratio	100% fresh air	100% fresh air

Here is the information related to NOx emissions for the LNB2000 burner.

NOx emissions (lb/mmbtu)	0.027	0.027
NOx emissions (ppm at 3% O2)	30 ppm	30 ppm
Concentration of NOx in diluted airstream	0.6 ppm NOx or less	0.6 ppm NOx or less
%Oxygen	20.8% or greater	20.7% or greater
Total NOx produced at high fire (2,000 MBH/12,000 MBH)	0.054 lb/hr	0.32 lb/hr

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Total NOx produced at low fire (400 MBH/2,400 MBH)	0.011 lb/hr	0.066 lb/hr

Sincerely,

Eugene Sandona
Director of Engineering

APPENDIX F – NO_2 EMISSIONS IMPACT ANALYSIS

Appendix F –NO_2 Emissions Impact Analysis

In support of the Notice of Intent (NOI) Application for the proposed greenfield Eagle Mountain, Utah Facility (Facility) located in Utah County, Tyson Foods, Inc. (Tyson) Fresh Meats Division has completed a 1-hour nitrogen dioxide (NO_2) National Ambient Air Quality Standards (NAAQS) air quality modeling demonstration. Pursuant to R307-410-4, new sources in an attainment area with emissions above those listed in the rule, are required to conduct air quality modeling. The Facility emissions and the R307-410-4 emissions thresholds are provided in Table 1.

Table 1
Facility Emissions Compared to the Air Quality Modeling Emissions Thresholds

Pollutant[(a)]	Facility-Wide Maximum Annual Emissions (tons/yr)	Emission Threshold Value[(a)] (tons/yr)	Modeling Requirement
PM_{10} - fugitive emissions	1.11	5	No
PM_{10} - non-fugitive emissions	2.62	15	No
CO	28.98	100	No
SO_2	0.27	40	No
NO_2 [(b)]	15.77	40	No
Lead	1.72E-04	0.6	No

[(a)] Emissions thresholds displayed pursuant to R307-410-4, which assumes Utah County is considered in attainment with respect to the relevant criteria pollutant National Ambient Air Quality Standard (NAAQS). UTDEQ indicated to ALL4 that Utah County will be re-designated to attainment for PM_{10} as of March 27, 2020.

[(b)] Facility-wide emissions represented as NOx. Additionally, UTDEQ represented that the state will conduct modeling for NOx emissions > 10 lb/hr or the facility can choose to conduct themselves.

Facility-wide Maximum NOx Hourly (lb/hr)	4
UTDEQ Hourly Modeling Evaluation Threshold (lb/hr)	10
Modeling Requirement	NO

Table 1 reveals that the Facility is exempt from air quality modeling based on the facility-wide emissions. Tyson conducted the 1-hour NO_2 analysis to confirm the proposed Facility will not cause or contribute to violations of the 1-hour NO_2 NAAQS, with the understanding that the Utah Department of Environmental Quality (DEQ) would perform this analysis if it were not submitted with the application.

The remainder of this appendix re-summarizes the project emission inventory, outlines the air quality modeling approach and technical information that were used to evaluate ambient concentration levels resulting from the proposed project emissions, and provides a summary of the modeled concentrations.

SITE DESCRIPTION

The proposed Facility, consisting of two 25 million British thermal units per hour (MMBtu/hr) natural gas fired hot water heaters, seven 10.85 MMBtu/hr Critical Process Air (CPA) handling units (AHUs), and 24 small natural gas fired units (less than 1 MMBtu/hr each) will be located in the Wasatch Front Intrastate Air Quality Control Region of Utah County, Nevada. The Facility will be located at 3867 N. Tyson Industrial Parkway, Eagle Mountain, UT 84005 in Utah County.

EMISSIONS INVENTORY AND STACK PARAMETERS

The emissions inventory and stack parameters developed for this air quality modeling demonstration are provided in Table F-1. The emissions rates for the natural gas combustion sources presented in the NOI are based on AP-42 emissions factors and vendor information. The proposed emergency generators are operated intermittently [100 hours per year (hr/yr)]. Based on United States Environmental Protection Agency (U.S. EPA) Guidance[1] for modeling intermittent emissions units, the emission rate for modeling 1-hour NO_2 was adjusted. Specifically, a ratio of 100/8,760 for the emergency generator was applied to the calculated annual emissions rates. Due to the relatively small emissions rate associated with the 24 small natural gas fired units (less than 1 MMBtu/hr each) these sources were combined into a single area source.

[1] U.S. EPA 2011 – "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard" March 1, 2011.

Table F-1
Tyson Foods, Inc. - Eagle Mountain, UT
Summary of Emissions Rates and Stack Characteristics

Point Sources

Source ID	Source Description	UTM Easting	UTM Northing	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter	1-Hour NO_2
		(m)	(m)	(m)	(m)	(K)	(m/s)	(m)	(g/s)
CPA1	Air Handling Unit 1	408,216.00	4,461,796.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA2	Air Handling Unit 2	408,227.00	4,461,796.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA3	Air Handling Unit 3	408,257.00	4,461,806.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA4	Air Handling Unit 4	408,271.00	4,461,806.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA5	Air Handling Unit 5	408,283.00	4,461,806.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA6	Air Handling Unit 6	408,305.00	4,461,801.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
CPA7	Air Handling Unit 7	408,317.00	4,461,801.00	1,493.02	11.89	294.3	10.37	2.41	1.12E-01
WH1	Water Heater 1	408,204.00	4,461,730.00	1,493.02	10.06	294.3	5.03	0.91	6.40E-02
WH2	Water Heater 2	408,204.00	4,461,720.00	1,493.02	10.06	294.3	5.03	0.91	6.40E-02
EGEN1	150kW egen	408,337.00	4,462,050.00	1,493.02	2.22	783.2	74.67	0.10	2.09E-03
EGEN2	230kW egen	408,167.00	4,461,756.00	1,493.02	2.79	907.2	99.28	0.10	3.07E-03

Area Sources

Source ID	Source Description	UTM Easting	UTM Northing	Base Elevation	Release Height	Length of the X Side	Length of the Y side	Orientation Angle from North	1-Hour NO_2
		(m)	(m)	(m)	(m)	(m)	(m)	(deg)	(g/s-m^2)
AREA1	Small process burners	408,208.00	4,461,786.00	1,493.02	10.0584	116.0	230.0	0.0	1.94E-06

AIR QUALITY MODELING APPROACH AND TECHNICAL INFORMATION

Air Dispersion Model Selection

The AERMOD (**AER**MIC **MOD**el) air dispersion model was used to predict ambient air concentrations from the proposed Facility. It is an Appendix W[2] air dispersion model approved for regulatory modeling applications. The current regulatory version of AERMOD is 19191. The AERMOD modeling system consists of two pre-processors and the dispersion model. AERMAP (Version 18081) is the terrain pre-processor component and AERMET (Version 19191) is the meteorological pre-processor component. The AERMAP pre-processor characterizes the surrounding terrain and generates receptor elevations. The AERMET pre-processor is used to generate an hourly profile of the atmosphere and uses a pre-processor, AERSURFACE, to process land use data for determining micrometeorological variables that are inputs to AERMET.

The AERMOD air dispersion model has various user selectable options that must be considered. U.S. EPA has recommended that certain options be selected when performing air quality modeling studies for regulatory purposes. The following regulatory default options were used in the AERMOD air quality modeling study:

- Stack-Tip Downwash (default)
- Elevated Terrain Effects (default)
- Calms Processing (default)
- No Exponential Decay for Rural Mode (default)
- Missing Data Processing (default)
- Ambient Ratio Method 2 (ARM2, default)
- Adjust U* (ADJ_U*, default)

Receptor Grid

The receptor grid for the AERMOD analysis covers a 20 kilometer (km) square area that is centered on the proposed Facility. Receptors are referenced to the UTM coordinate system, Zone

[2] U.S. EPA 2017 – 40 CFR Part 51 Appendix W "Guideline on Air Quality Models" (Revised) January 2017.

12, and using NAD 1983 datum. Rectangular coordinates will be used to identify each receptor location. The rectangular receptor grid will have the following grid spacing:

- 25 meters (m) out to ± 500 m,
- 100 m out to ± 1 km,
- 500 m out to ± 5 km and
- 1,000 m out to ± 10 km.

In addition to the main rectangular Cartesian coordinate receptor grid, property line receptors were used in the air quality modeling analysis. The property line receptors were spaced approximately every 25 meters. The entire property line will either be fenced or posted with no trespassing signs to restrict public access to the property.

Terrain elevations were assigned to the receptors. The AERMAP terrain pre-processor (Version 18081) and USGS 1/3 arc-second National Elevation Dataset (NED) files was used to determine representative terrain elevations for all of the receptors. The horizontal resolution of the NED data is every 10 m.

Meteorological Data

The meteorological database for the AERMOD air dispersion modeling study consisted of five-years (2004-2008) of meteorological data from the Spanish Fork Airport Utah DAQ monitoring station. The meteorological data were processed with the AERMET pre-processor by Utah DAQ. The Spanish Fork DAQ monitoring station is located approximately 40 km southwest of the proposed Facility. The Spanish Fork DAQ monitoring station is considered representative of the meteorological conditions at the proposed Facility due to similar topographic settings, rural location, and proximity to the proposed Facility (the closest Utah DAQ pre-processed dataset to the proposed facility). Due to these similarities the micro-meteorological conditions (i.e., surface roughness, albedo, and Bowen Ratio) at the Spanish Fork DAQ monitoring station are also similar to those at the proposed Facility.

Good Engineering Practice Stack Height Analysis

The stacks at the proposed Facility were analyzed for the potential influence of downwash on emissions and their resulting ambient concentrations. Guidance contained in U.S. EPA's Good Engineering Practices (GEP) guidance document[3] and **B**uilding **P**rofile **I**nput **P**rogram for **PRIME** (BPIPPRM) was followed. To perform the building downwash analysis, a Facility plot plan showing the proposed Facility buildings was digitized using modeling software. The building dimensions were obtained from engineering drawings and incorporated into the building downwash analysis.

Background Ambient Air Data

Ambient background 1-hour NO_2 concentrations were considered for the NAAQS demonstration. Tyson added the monitored design value concentration to the cumulative modeled concentration resulting from the Facility. The 1-hour NO_2 monitored design concentrations represents the 3-year average of the 98th percentile of daily maximum 1-hour NO_2 concentration from the Price, UT ambient monitor (AirData Monitoring Site ID: 49-007-1003). The Price, UT ambient monitoring site is 135 km southwest and is was utilized as a representative rural ambient monitor similar to the Facility. The 3-year average of the 98th percentile of daily maximum 1-hour NO_2 concentrations from 2017 through 2019 from the Herriman, UT ambient monitor is 17.3 parts per billion (ppb).

AIR QUALITY MODELING ANALYSIS RESULTS

The air quality modeling results are presented in Table F-2. The modeled results demonstrate compliance with the 1-hour NO_2 NAAQS. Electronic copies of the air quality modeling input and output files, as well as supporting files (e.g., meteorological data, building downwash analysis, etc.), will be supplied to Utah DAQ.

[3] U.S. EPA 1985 – "Guideline for Determination of Good Engineering Practice (GEP) Stack Height (Technical Support Document for Stack Height Regulations) Revised" EPA-450:4-80-023R, June 1985.

Table F-2
Tyson Foods, Inc. - Eagle Mountain, UT
Modeling Analysis Results

Pollutant	Averaging Period	Maximum Impact	UTM Easting	UTM Northing	Receptor Elevation	Group	Background [a]	Maximum Impact[a]	NAAQS
		($\mu g/m^3$)	(m)	(m)	(m)		($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	1-hour	144.75207	408,048.78	4,461,884.50	1490.55	ALL	32.5	144.8	188

[a] Background concentrations included in modeling - not added post-processing.

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

September 22, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers. The facility is sanitized daily between processing shifts in accordance with USDA regulations.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson
Site: Eagle Mountain Meat Packaging Plant

Results TBD [Last updated September 22, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- SCR
- SNCR

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered technically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated September 22, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated September 22, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated September 22, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. Emissions from the silo, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$. The silo will be equipped with a baghouse.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated September 22, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. All other sources - 20% opacity [R307-201, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]
II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]

II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 [R307-401-8, 40 CFR 63 Subpart ZZZZ]
II.B.3.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install an emergency engine that is certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm. [Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah

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Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQE-MN160320001-20

M E M O R A N D U M

TO: Catherine Wyffels, NSR Engineer CW

FROM: Dave Prey, Air Quality Modeler DP

DATE: September 25, 2020

SUBJECT: Modeling Analysis Review for the Notice of Intent for Tyson Foods, Inc. - Eagle Mountain Meat Packaging Plant, Utah County, Utah

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This is not a Major Prevention of Significant Deterioration (PSD) Source.

I. OBJECTIVE

Tyson Foods, Inc. (Tyson Foods) (Applicant) is seeking a new approval order for their Eagle Mountain Meat Packaging Plant, located in Utah County, Utah.

Tyson Foods has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist of natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

This report, prepared by the Staff of the New Source Review Section (NSR), contains a review of the air quality impact analysis (AQIA) including the information, data, assumptions and modeling results used to determine if the facility would be in compliance with State and Federal concentration standards.

II. APPLICABLE RULE(S)

Utah Air Quality Rules:

R307-401-6	Condition for Issuing an Approval Order
R307-410-3	Use of Dispersion Models
R307-410-4	Modeling of Criteria Pollutants in Attainment Areas

III. MODELING METHODOLOGY

A. Applicability

Emissions from the facility include PM_{10}, NO_x, CO, SO_2, and HAPs. This modeling is part of a new approval order. The emission rate for NO_x warranted a modeling review to demonstrate compliance with the one-hour NO_2 NAAQS. Modeling was performed by the applicant.

B. Assumptions

1. Topography/Terrain

   The Plant is at an elevation 4898 feet with terrain features that have little affect on concentration predictions.

   a. Zone: 12

   b. Approximate Location:

   UTM (NAD83): 408216 meters East
   4461796 meters North

2. Urban or Rural Area Designation

   After a review of the appropriate 7.5 minute quadrangles, it was concluded the area is "rural" for air modeling purposes.

3. Ambient Air

   It was determined the Plant boundary used in the AQIA meets the State's definition of ambient air.

4. Building Downwash

   The source was modeled with the AERMOD model. All structures at the plant were used in the model to account for their influence on downwash.

5. Meteorology

   Five years of surface and upper air data were used in the analysis consisting of the following:

   Surface – Salt Lake Airport, UT NWS: 2008-2012
   Upper Air – Salt Lake Airport, UT NWS: 2008-2012

6. Background

   The background concentrations were based on NO_2 concentrations measured in Herriman, Utah.

7. Receptor and Terrain Elevations

The modeling domain used consisted of receptors including property boundary receptors. This area of the state contains mountainous terrain and the modeling domain has simple and complex terrain features in the near and far fields. Therefore, receptor points representing actual terrain elevations from the area were used in the analysis.

8. Model and Options

The State-accepted AERMOD model was used to predict air pollutant concentrations under a simple/complex terrain/wake effect situation. In quantifying concentrations, the regulatory default option was selected.

9. Air Pollutant Emission Rates

Source	UTM Coordinates		Modeled Emission Rates		
	Easting (m)	Northing (m)	No_x (lb/hr)	No_x (tons/yr)	hrs/year
CPA1	408216	4461796	0.8900	3.898	8760
CPA2	408227	4461796	0.8900	3.898	8760
CPA3	408257	4461806	0.8900	3.898	8760
CPA4	408271	4461806	0.8900	3.898	8760
CPA5	408283	4461806	0.8900	3.898	8760
CPA6	408305	4461801	0.8900	3.898	8760
CPA7	408317	4461801	0.8900	3.898	8760
WH1	408204	4461730	0.5080	2.225	8760
WH2	408204	4461720	0.5080	2.225	8760
AREA1	408208	4461786	0.4100	1.796	8760
EGEN1	408337	4462050	0.0166	0.073	8760
EGEN2	408167	4461756	0.0244	0.107	8760
Total			7.6970	33.7128	

10. Source Location and Parameters

Source	Type	Source Parameters					
		Elev (ft)	Ht (m)	Ht (ft)	Temp (K)	Flow (m/s)	Dia (ft)
CPA1	POINT	4898.4	11.9	39.0	294	10.37	2.41
CPA2	POINT	4898.4	11.9	39.0	294	10.37	2.41
CPA3	POINT	4898.4	11.9	39.0	294	10.37	2.41
CPA4	POINT	4898.4	11.9	39.0	294	10.37	2.41

CPA5	POINT	4898.4	11.9	39.0	294	10.37	2.41
CPA6	POINT	4898.4	11.9	39.0	294	10.37	2.41
CPA7	POINT	4898.4	11.9	39.0	294	10.37	2.41
WH1	POINT	4898.4	10.1	33.0	294	5.03	0.91
WH2	POINT	4898.4	10.1	33.0	294	5.03	0.91
AREA1	AREA	4898.4	10.1	33.0			
EGEN1	POINT	4898.4	2.2	7.3	783	74.67	0.10
EGEN2	POINT	4898.4	2.8	9.1	907	99.28	0.10

IV. RESULTS AND CONCLUSIONS

A. National Ambient Air Quality Standards

The below table provides a comparison of the predicted total air quality concentrations with the NAAQS. The predicted total concentrations are less than the NAAQS.

Air Pollutant	Period	Prediction ($\mu g/m^3$)	Class II Significant Impact Level ($\mu g/m^3$)	Background ($\mu g/m^3$)	Nearby Sources* ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent NAAQS
NO_2	1-Hour	108.8	7.5	64.0	0.0	172.8	188	91.91%
	Annual	7.3	1.0	9.2	0.0	16.5	100	16.51%

DP:sa

Signature: Catherine Wyffels
Catherine Wyffels (Sep 28, 2020 13:17 MDT)
Email: cwyffels@utah.gov

Signature: Dave Prey (Sep 29, 2020 14:33 MDT)
Email: dprey@utah.gov

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

September 22, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers. The facility is sanitized daily between processing shifts in accordance with USDA regulations.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- SCR
- SNCR

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered technically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated September 22, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated September 22, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated September 22, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. Emissions from the silo, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$. The silo will be equipped with a baghouse.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated September 22, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. All other sources - 20% opacity [R307-201, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]
II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]

II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 [R307-401-8, 40 CFR 63 Subpart ZZZZ]
II.B.3.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install an emergency engine that is certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm. [Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

October 23, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA,
Utah 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
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- SCR
- SNCR

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated October 16, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation for each unit to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated October 16, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated September 22, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. The silo will be equipped with a baghouse. Emissions from the silo with a baghouse, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated October 16, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. Baghouses - 10% opacity D. Haul Roads and Storage Areas - 20% opacity on site and 10% opacity at the property boundary E. All other sources - 20% opacity [R307-201, R307-309, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]

II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install an emergency engine that is certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm.

[Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

November 3, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist of natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
Title V (Part 70) Area Source

Project Proposal
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 F. NO_x reduction in SNCR is only effective at high temperatures (1600 F to 2100 F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated October 16, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- SCR
- SNCR

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated September 22, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation for each unit to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated October 16, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use of Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated November 2, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. The silo will be equipped with a baghouse. Emissions from the silo with a baghouse, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouses, maintaining baghouses in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated October 16, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. Baghouses - 10% opacity D. Haul Roads and Storage Areas - 20% opacity on site and 10% opacity at the property boundary E. All other sources - 20% opacity [R307-201, R307-309, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]

II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [40 CFR 60 Subpart III, 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 each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install emergency engines that are certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 9 ppmvd (equivalent to 0.012 lb/MMBtu). Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm.

[Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

November 10, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist of natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
Title V (Part 70) Area Source

Project Proposal
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59, and CO = 9.02.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 degrees F. NO_x reduction in SNCR is only effective at high temperatures (1600 degrees F to 2100 degrees F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated November 10, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09, and CO = 1.34.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- SCR
- SNCR

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated November 10, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation for each unit to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated October 16, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use of Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated November 2, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. The silo will be equipped with a baghouse. Emissions from the silo with a baghouse, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouse, maintaining the baghouse in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated November 10, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. Baghouses - 10% opacity D. Haul Roads and Storage Areas - 20% opacity on site and 10% opacity at the property boundary E. All other sources - 20% opacity. [R307-201, R307-309, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]

II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [40 CFR 60 Subpart III, 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 each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install emergency engines that are certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm.

[Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

November 10, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160320001
Owner Name	Tyson Foods, Inc.
Mailing Address	800 Stevens Point Drive Dakota Dunes, SD, 57049
Source Name	Tyson Foods, Inc.- Eagle Mountain Meat Packaging Plant
Source Location	3817 North Tyson Industrial Parkway Eagle Mountain, UT 84005
UTM Projection	408051 m Easting, 4462061 m Northing
UTM Datum	NAD27
UTM Zone	UTM Zone 12
SIC Code	2013 (Sausages & Other Prepared Meats)
Source Contact	Adam Konopasek
Phone Number	(605) 235-4801
Email	adam.konopasek@tyson.com
Project Engineer	Ms. Catherine Wyffels, Engineer
Phone Number	(385) 306-6531
Email	cwyffels@utah.gov
Notice of Intent (NOI) Submitted	July 16, 2020
Date of Accepted Application	July 30, 2020

SOURCE DESCRIPTION

General Description
Tyson Foods, Inc. (Tyson) has proposed to construct the Eagle Mountain Meat Packaging Plant. This facility will produce case-ready packages of beef and pork for consumer sale. Operations at the facility will include case-ready meat-cutting and packaging to produce steaks, chops, roasts, and ground beef from raw material received from packing plants in the region. Emission sources at the facility will consist of natural gas combustion equipment (water heaters, air handling units [AHU], small heaters), emergency generators, a salt silo, and truck trailer traffic.

NSR Classification:
New Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah 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
Title V (Part 70) Area Source

Project Proposal
New Tyson Meat Cutting and Packaging Plant

Project Description
Tyson will operate a case-ready meat cutting and packaging facility in Eagle Mountain. The facility will receive larger cuts of fresh beef and pork from packing plants in the region and will produce steaks, chops, roasts, and ground beef. The products are weighed, packaged, labeled, and shipped to retailers.

Combustion Units
The facility will operate the following combustion units:
-Two 25 MMBtu/hr natural gas-fired hot water heaters used primarily for cleaning the production areas.
- Seven 10.85 MMBtu/hr critical process AHUs used primarily for daily sanitation
- 23 small natural gas-fired heaters with an input capacity of less than 1 MMBtu/hr

Emergency Generator Engines
The facility will install two diesel-fired emergency generator engines (225 kW and 154 kW). Diesel for the engines will be stored in two subbase fuel tanks.

Salt Silo
A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly and will be equipped with a baghouse.

Truck Traffic
Emissions will be generated from traffic in paved roadways.

EMISSION IMPACT ANALYSIS

A dispersion modeling analysis was performed for the following source:
Company: Tyson Foods, Inc.
Site: Eagle Mountain Meat Packing Plant

The individual criteria emission increases triggered the need to evaluate the impacts as required under R307-401-8 for the following pollutants:
-NO_2

The following table provides a comparison of the predicted impact plus background (total) with the National Ambient Air Quality Standards (NAAQS). The predicted total concentrations are less than their respective NAAQS.

Pollutant	Average	Impact ug/cu.m	Total ug/cu.m	NAAQS ug/cu.m	Percent NAAQS
NO_2	1-Hour	108.8	172.8	188	91.91%
NO_2	Annual	7.3	16.5	100	16.51%

[Last updated October 2, 2020]

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		41165.00
Carbon Monoxide		28.98
Nitrogen Oxides		13.99
Particulate Matter - PM_{10}		3.74
Particulate Matter - $PM_{2.5}$		2.74
Sulfur Dioxide		0.27
Volatile Organic Compounds		1.98

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)		2040
	Change (TPY)	**Total (TPY)**
Total HAPs		1.02

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 Hot Water Heaters**

Tyson has proposed to install two 25 MMBtu/hr natural gas-fired hot water heaters to provide hot water for cleaning and production areas. The hot water heaters will be equipped with ultra-low NO_x burners (ULNB) rated at 9 ppmvd at 3% oxygen, which is equivalent to 0.02 lb/MMBtu.

Emissions, in tpy, from each heater are as follows: PM_{10} = 0.82, $PM_{2.5}$ = 0.82, SO_2 = 0.07, NO_x = 1.33, VOC = 0.59, and CO = 9.02.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x burners
- ultra-low NO_x burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)

Tyson has proposed to install ultra-low NO_x burners rated at 9 ppmvd, so low-NO_x burners were not further evaluated.

The SCR process works by chemically reducing the NO_x molecule in an emission stream into molecular nitrogen and water vapor. A reagent such as ammonia or urea is injected into the ductwork downstream of the combustion unit, which mixes with the waste gas, and the mixture enters a catalyst. The mixture diffuses through the catalyst and reacts selectively with the NO_x to reduce emissions. SCR systems are estimated to reduce NO_x emissions by up to 90%. This option is considered technically feasible and would remove 2 tpy of NO_x based on the typical 90% reduction. The annual cost of an SCR system was estimated at $145,194, which would result in a cost effectiveness of $120,844 per ton of NO_x removed. This option is, therefore, not considered economically feasible.

SNCR is similar to SCR in the use of ammonia as a reductant to reduce NO_x compounds to molecular N2 and water but the technology does not utilize a catalyst. The ammonia is injected directly into the primary combustion zone where temperatures reach 1,400 to 2,000 degrees F. NO_x reduction in SNCR is only effective at high temperatures (1600 degrees F to 2100 degrees F), so additional heating of the emission stream may be required to meet optimal operating temperatures. SNCR NO_x removal efficiencies vary between 30% and 50%. Similarly to SCR, this option is not considered cost effective based on the high annual cost of this technology and the relatively low NO_x emissions from the hot water heaters.

Good combustion practices refer to the operation of heaters at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the hot water heaters:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit visible emissions to 10% opacity
4) Installation of ultra-low NO_x burners rated at 9 ppmvd

[Last updated November 10, 2020]

2. **BACT review regarding Air Handling Units**

Tyson has proposed to install seven AHUs. Each unit will have a single direct-fired natural gas burner rated at 10.85 MMBtu/hr. The burners will achieve 90 ppmvd at 3% oxygen, which is equivalent to 0.082 lb of NO_x/MMBtu. Per USDA regulations, the sanitation and disinfection step is required once per day for four hours and the drying step is required twice a day for two hours each time. Tyson has proposed to operate each AHU for 3,000 hours per year for sanitation and disinfection.

Emissions from each AHU, in tpy, are as follows: PM_{10} = 0.12, $PM_{2.5}$ = 0.12, SO_2 = 0.01, NO_x = 1.34, VOC = 0.09, and CO = 1.34.

NO_x

Available control options include:
- Good combustion practices
- Fuel options
- low NO_x direct-fired burners
- Indirect-fired low NO_x and ultra-low NO_x burners
- SCR
- SNCR

AHUs are designed to quickly dry equipment and surfaces and eliminate fogging that occurs as a result of the temperature change between operations and sanitation. During the drying process, the fresh air introduced into the building is required to be at 70 degrees F to prevent condensation and humidification and to properly dry the building. During the sanitation and disinfection step, the AHU must be able to quickly bring the room to the required temperature. The AHUs will have a design flow rate of 100,000 scf and capability to provide a 100 degrees F temperature rise. In order to achieve the required flow rates and temperature rise, the proposed AHUs are designed with a 30:1 turndown ratio. Typically, ultra-low NO_x burners are capable of a turndown ratio of 5:1, while a low NO_x burner is capable of 13:1 turndown ratio. Turndown is a ratio of maximum heat input rate to the minimum heat input rate and determines how a burner can modulate before shut-down. At each cycle, air is purged through the unit to remove any explosive gases. Purge cycles remove heat from the burner and increases the number of startups. The lower the turndown ratio, the more sensitive the burner is to low firing points, and more purge cycles are required. Lower turn down ratios are common in burners requiring a lower temperature and lower air volumes. High turndown burners are capable of meeting quickly changing firing rates to match load requirements within the same purge cycle. A burner with a high turndown ratio is required to meet the high air flow rate and temperature requirements of this facility. Due to the high turndown ratio required, ultra-low and low NO_x burners are not considered technically feasible for this application.

Although low NO_x burners are not capable to achieving the high turndown ration required for this application, Tyson evaluated a different system configuration consisting of six direct-fired low-NO_x burners instead of the proposed AHUs. This option would require additional blowers and increased process control complexity in order to achieve the same operating parameters as the AHU. This option would add at a minimum $210,500 per AHU for the burners alone. This cost is for the burners alone and does not include other cost related the increased system complexity, such as additional controls and equipment (blowers, heat exchangers) and higher maintenance. Low NO_x burners typically achieve 0.03 MMBtu/hr emission rate, which would result in NO_x emissions of 0.5 tpy for each burner, or a decrease in NO_x emissions of 0.85 tpy from the proposed AHUs. This would result in a cost per ton of NO_x removed of $248,730. This option is not considered economically feasible.

[Last updated November 10, 2020]

3. **BACT review regarding Air Handling Units (cont'd)**

Another burner alternative evaluated were indirect-fired burners. In indirect-fired burners, the burner is fired into a heat exchanger and the air is heated over the heat exchanger. There is some heat loss through the heat exchanger, which increases the need for fuel. These units are also more expensive due to higher equipment costs, additional fuel needs, and more controls. This option would add at a minimum of $450,000 per AHU. This cost is higher than the direct-fired low-NO_x burners previously evaluated and is, therefore, not cost effective.

Add-on controls such as SCR and SNCR are not technically feasible due to the low emissions and intermittent operations of the AHUs.

Good combustion practices refer to the operation of AHUs at high combustion efficiency, which reduces the products of incomplete combustion. The manufacturer will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency making good combustion practices technically feasible.

PM_{10}, $PM_{2.5}$, VOC, SO_2, CO

Due to the relatively low emissions of other criteria pollutants, additional controls were not evaluated. DAQ considers good combustion practices and the use of pipeline quality natural gas as the technical and economical feasible options to control other criteria pollutants.

BACT Determination

Based on the information provided above, DAQ considers the following measures BACT for the AHUs:

1) Good combustion practices
2) Use of pipeline quality natural gas
3) Limit hours of operation for each unit to 3,000 hours per rolling 12-month period
4) Limit visible emissions to 10% opacity

[Last updated October 16, 2020]

4. **BACT review regarding Emergency Generator Engines**

Tyson has proposed to install two emergency generators with a maximum power rating of 225 kW and 154 kW. The proposed diesel-fired emergency generators will be certified to meet Tier 3 emission standards found in 40 CFR 89.112 as specified in NSPS Subpart IIII. These standards are 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM.

The emergency generator engines will be limited to 100 hours of use for maintenance and testing, in accordance with requirements of 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII.

Available add-on control technologies include selective catalytic reduction, non-selective catalytic reduction, NO_x adsorption, diesel fuel particulate filters, and diesel oxidation catalysts. Due to the intermittent operations of these engines, these add-on technologies are not technically or economically feasible.

Tyson also evaluated the use of Tier 4 certified engines. Upgrading the engines from Tier 3 to Tier 4 would reduce NO_x emissions by 40%, or 0.06 tpy. The cost to upgrade the engines to Tier 4 is estimated at $153,156 for both engines, which would result in a cost effectiveness of $2,415,710 per ton of NO_x removed. Therefore, upgrading to Tier 4 engines is not considered cost effective.

BACT Determination
The BACT determination for the emergency generator engines is:
1. Use ultra-low sulfur diesel fuel (15 ppm by weight or less).
2. Conduct manufacturer recommended maintenance and testing.
3. Limit visible emissions to 20 % opacity.
4. Compliance with applicable MACT/NSPS requirements.

[Last updated November 2, 2020]

5. **BACT review regarding Haul Roads**

Fugitive dust emissions will be generated from haul road traffic. Tyson will have paved haul roads and an unpaved truck trailer storage area. Haul roads have the potential to emit 1.11 tpy of PM_{10} and 0.11 tpy of $PM_{2.5}$.

Available options for PM control include watering, application of a chemical suppressant, sweeping/vacuum sweeping, and paving.

Tyson has proposed to place well graded gravel in the unpaved storage area to minimize emissions. Speed limit signs will be posted. Tyson will also maintain vegetation and trees on the perimeter of the facility to minimize windblown particulate emissions from the facility. Tyson has submitted a Fugitive Dust Control Plan as required by R307-309.

Other control options were not further evaluated given the low potential emissions from the roads and storage area.

BACT Determination
Based on the analysis above, DAQ considers BACT as limiting visible emissions to 20% opacity onsite and 10% opacity by the property boundary, as per R307-309

[Last updated September 22, 2020]

6. **BACT review regarding Salt Silo**

A salt silo will be used to feed an industrial brine maker. The silo will be loaded bimonthly. The silo will be equipped with a baghouse. Emissions from the silo with a baghouse, in tpy, are estimated as 0.002 tpy of PM_{10} and $PM_{2.5}$.

Other options to control PM emissions include cyclones, mechanically aided wet scrubbers, venturi scrubbers, and electrostatic precipitators (ESP). Baghouses are the most effective options with control efficiencies ranging from 99 to 99.99%, so the other control options were not further

evaluated.

BACT Determination
DAQ considers BACT for $PM_{10}/PM_{2.5}$ for the salt silo as the use of a baghouse, maintaining the baghouse in accordance with manufacturer specifications, and limiting visible emissions limited to 10% opacity.

[Last updated November 10, 2020]

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 NEW	**Eagle Mountain, Utah Facility**
II.A.2 NEW	**Water Heaters** Quantity: 2 Rating: 25 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: 40 CFR 60 Subpart Dc
II.A.3 NEW	**Critical Process AHU** Quantity: 7 Rating: 10.85 MMBtu/hr Fuel: Natural Gas NSPS/MACT Applicability: None
II.A.4 NEW	**Emergency Generator Engine 1** Rating: 225 kW (302 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.5 NEW	**Emergency Generator Engine 2** Rating: 154 kW (206 hp) Fuel: Diesel Manufacture Date: post-2020 NSPS Applicability: 40 CFR 60 Subpart IIII MACT Applicability: 40 CFR 63 Subpart ZZZZ
II.A.6 NEW	**Small Heaters/Boilers** Several small heaters and boilers rated at less than 5 MMBtu/hr each. Listed for information purposes only.
II.A.7 NEW	**Salt Silo** Salt silo equipped with a baghouse.

II.A.8 NEW	**Storage Tanks** Contents: Diesel Capacity: 316 and 555 gallons

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	**Facility Wide Requirements**
II.B.1.a NEW	Visible emissions shall not exceed the following limits: A. Natural gas-fired equipment - 10% opacity B. Diesel-fired emergency generators - 20% opacity C. Baghouses - 10% opacity D. Haul Roads and Storage Areas - 20% opacity on site and 10% opacity at the property boundary E. All other sources - 20% opacity. [R307-201, R307-309, R307-401-8]
II.B.1.a.1 NEW	Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. [R307-201]
II.B.2 NEW	**Combustion Equipment**
II.B.2.a NEW	Each AHU shall be limited to 3,000 hours per rolling 12-month period. [R307-401-8]
II.B.2.a.1 NEW	To determine compliance with the rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Compliance with the hours of operations shall be determined by the installation of an hour meter or by recording hours of operation in an operations log. Records documenting the operation of the AHUs shall be kept for all periods the plant is in operation. [R307-401-8]
II.B.2.b NEW	The owner operator shall only utilize natural gas as a fuel source in the boilers and heaters on site. [R307-401-8]
II.B.2.c NEW	The water heaters shall be equipped with ultra-low NO_x burners that shall emit no more than 9 ppmvd of NO_x. [R307-401-8]

II.B.2.c.1 NEW	To determine compliance with the ultra-low NO_x burner, the owner/operator shall obtain a manufacturer certification of compliance with the 9 ppm NO_x limit. The owner/operator shall maintain records of the burner NO_x rating certification for the life of the equipment. [R307-401-8]
II.B.3 NEW	**Emergency Engine Requirements**
II.B.3.a NEW	The owner/operator shall not operate each 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 engines during emergencies. [40 CFR 60 Subpart III, 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 each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
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 each 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]
II.B.3.c NEW	The owner/operator shall install emergency engines that are certified to meet the following emission rates: 4.0 g/kW-hr of NMHC + NO_x, 3.5 g/kW-hr for CO, and 0.20 g/kW-hr for PM. [R307-401-8]
II.B.3.c.1 NEW	To demonstrate compliance with the emission rate, the owner/operator shall keep a record of the manufacturer's certification of the emission rate. The record shall be kept for the life of the equipment. [R307-401-8]

PERMIT HISTORY

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

Incorporates	Additional Information dated September 17, 2020
Is Derived From	NOI dated July 22, 2020

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**

Emissions were estimated for the following sources: 23 small heaters, seven AHUs, two hot water heaters, truck traffic, emergency engines, storage tanks, and salt silo.

Emissions from the small heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs, and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. Emissions were based on 8,760 hrs/yr and the combined heat input rating of 4.18 MMBtu/hr, which includes 23 heaters ranging from 0.06 MMBtu/hr to 0.75 MMBtu/hr.

Emissions from the AHUs were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of 90 ppmvd (equivalent to 0.082 lb/MMBtu). Emissions were based on 3,000 hrs/yr per AHU and the combined heat input rating of 75.95 MMBtu/hr, which includes seven AHUs rated at 10.85 MMBtu/hr each.

Emissions from the water heaters were estimated using the emission factors in *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2* for all criteria pollutants, except NO_x; *AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-3* for HAPs; and 40 CFR 98 Tables C-1 and C-2 for greenhouse gases. NO_x emissions were based on manufacturer guarantee of *9 ppmvd (equivalent to 0.012 lb/MMBtu)*. Emissions were based on 8,760 hrs/yr per water heater and the combined heat input rating of 50 MMBtu/hr, which includes two heaters at 25 MMBtu/hr each.

Truck traffic emissions were estimated for both paved roads and an unpaved storage area. Emissions from paved roadways were calculated according to DAQ's guidance "Emission Factors for Paved and Unpaved Haul Roads". Emissions from unpaved roadways were calculated according to *AP-42, Chapter 13.2.2 (Unpaved Roads), Equations 1a and 2, Figure 13.2.2-1, and Tables 13.2.2-1 and 13.2.2-2*. Haul road lengths of 1.18 miles of paved roads and 0.64 of unpaved roads were used.

Emissions from the emergency generator engines were based on manufacturer-provided not-to-exceed emission data for NO_x, VOC, CO, and $PM/PM_{10}/PM_{2.5}$. The highest lb/hr emission rates for 100%, 75%, 50%, and 25% loads were used. SO_2 emissions were based on *AP-42 Chapter 3.3, Table 3.3-1*. HAPs emissions were based on *AP-42 Chapter 3.3, Table 3.3-2.* Greenhouse gas emissions were based on 40 CFR 98 Tables C-1 and C-2. Emissions were based on 100 hrs/yr.

Emissions from the diesel storage tanks were estimated according to *AP-42 Chapter 7.1 Organic Liquids Storage Tanks* methodology. Emissions were estimated for two horizontal fixed roof tanks with a storage capacity of 316 and 555 gallons.

Salt silo emissions were estimated based on an outlet grain loading of 0.02 gr/dscf, 26 loads/yr, and a flow rate of 800 cfm.

[Last updated September 22, 2020]

2. **Comment regarding Engine NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the CI ICE were manufactured after April 1, 2006, or owners and operators of stationary CI ICE that are modified or reconstructed after July 11, 2005. NSPS Subpart IIII contains requirements for emergency engines based on the maximum engine power, displacement, and model year of the engine. The proposed emergency generator engines must comply with the Tier 2 emission standards found in 40 CFR 89.112 and 40 CFR 89.113. In addition, NSPS Subpart IIII contains other monitoring, recordkeeping, and reporting requirements. The proposed emergency generator engines will meet Tier 3 emission standards and will be subject to the monitoring, recordkeeping, and reporting requirements in this Subpart.

40 CFR 63 MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. Because the new engines are stationary RICE at an area source of HAP emissions, MACT Subpart ZZZZ will apply to this facility. A new or reconstructed stationary CI RICE located at an area source must meet the requirements of MACT Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for such engines under MACT Subpart ZZZZ.

[Last updated September 22, 2020]

3. **Comment regarding Other NSPS/MACT Applicability:**

40 CFR 60 NSPS Subpart Dc (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984 and has a maximum design heat input capacity of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. Steam generating unit means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. The proposed water heaters will have a heat input capacity of 25 MMBtu/hr each and will be subject to 40 CFR 60 NSPS Subpart Dc.

40 CFR 63 MACT Subpart JJJJJJ (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources) applies to industrial, commercial, or institutional boilers located at an area source of HAP emissions. Gas-fired boilers are defined in 40 CFR 63.11237 as a boiler that burns only gaseous fuels during normal operation and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. 40 CFR 63.11195 exempts gas-fired boilers from the applicability and requirements of MACT Subpart JJJJJJ. The proposed heaters will only burn natural gas and meet the definition of a gas-fired boiler in this rule; therefore, MACT Subpart JJJJJJ will not apply.

40 CFR 60 Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) applies to fuel storage tanks greater than 75 cubic meters (m3) under 40 CFR §60.110b. The proposed two diesel fuel storage tanks will have capacities of 316 and 555 gallons (1.2 and 2.1 m3, respectively). The tanks are less than 75 m3; therefore, Subpart Kb does not apply to the Project.

[Last updated September 17, 2020]

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.

The source is subject to 40 CFR 60 Subparts Dc and IIII under Section 111 and 40 CFR 63 Subpart ZZZZ under Section 112. 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ exempt sources from the obligation to obtain a permit under 40 CFR part 70 (Title V permit) if the source is not otherwise required by law to obtain a permit. 40 CFR 60 Subpart Dc includes standards for SO_2 and PM limitations that apply to the water heaters at this source. Therefore, Title V will apply and the source will be subject to Title V for area sources as specified in R307-415-5a.

[Last updated September 22, 2020]

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

State of Utah
GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality
L. Scott Baird
Executive Director
DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160320001

November 10, 2020

Adam Konopasek
Tyson Foods, Inc.
800 Stevens Point Drive
Dakota Dunes, SD 57049

Dear Adam Konopasek,

Re: Engineer Review:
New Tyson Meat Cutting and Packaging Plant
Project Number: N160320001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Tyson Foods, Inc. should complete this review within **10 business days** of receipt.

Tyson Foods, Inc. should contact **Ms. Catherine Wyffels** at (385) 306-6531 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email cwyffels@utah.gov the signed cover letter to Ms. Catherine Wyffels. 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 Tyson Foods, Inc. does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Tyson Foods, Inc. has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____ 11-12-20
(Signature & Date)

☐ By (Title V responsible official) initialing this box and signing this document, this document serves as an enhanced application and the public comment period will serve as the required comment period for Title V purposes.

The Title V responsible official certifies: based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.