

**TECHNICAL SUPPORT DOCUMENT  
FOR THE  
MCCAIN FOODS, USA INC.  
OTHELLO, WASHINGTON**

**Prepared by**

**Washington State Department of Ecology  
Air Quality Program**

**August, 2019**

## TABLE OF CONTENTS

Section	Description	Page
1.	Executive Summary	3
2.	Introduction	3
2.1.	The Permitting Process	3
2.2.	The Project	3
2.2.1.	The Site	3
2.2.2.	The Proposed Project	3
2.2.3.	SEPA Review	4
2.3.	Federal Standards	4
2.3.1	New Source Performance Standards	4
2.3.2.	National Emission Standards for Hazardous Air Pollutants	4
2.4.	State Laws and Rules	4
2.5.	The NOC Application	4
2.5.1.	NSR Applicability	5
3.	EMISSIONS	5
3.1.	Emissions and Emission Controls	5
	Table 1: Criteria Pollutant Emission Estimates	5
3.2.	Operational Limitations	6
3.3.	Adequacy of Emissions Estimates	6
4.	Determination of Best Available Control Technology	6
4.1.	Definitions	6
4.2.	Regulatory Requirements	6
4.3.	Best Available Control Technology	6
4.3.1.	BACT for the dual fuel Boiler	7
4.3.2.	BACT for Reducing H <sub>2</sub> S from Anaerobic Digester	7
5.	Ambient Air Quality Analysis	7
5.1.	Modeling Methodology	7
5.2.	NAAQS Analysis	7
5.3.	Toxic Air Pollutants	8
6.	Conclusion	8
7.	List of Acronyms and Abbreviations	8

## EXECUTIVE SUMMARY

This document is the Technical Support Document (TSD) for the McCain Foods, USA facility in Othello, Washington. This TSD is written to support the Approval Order based on the application materials submitted July 19<sup>th</sup>, 2019. The Washington State Department of Ecology (Ecology) has determined that all regulatory requirements have been satisfied and the project complies with the requirements for New Source Review (NSR) in the State of Washington.

### 1. INTRODUCTION

#### 1.1. The Permitting Process

The Washington State Clean Air Act and its supporting regulation the General Regulation for Air Pollution Sources requires all new or modified sources of air pollution to submit notice before constructing and operating any new source of air pollution except single family and duplex dwellings or de minimis sources. This process is referred to as NSR. NSR includes a verification that the new or modified source will not cause or contribute to a violation of any ambient air quality standard, that the new source will employ Best Available Control Technology (BACT), and that the new source will comply with all federal and state rules. After the analysis, an order of approval is issued that sets forth those requirements and conditions to ensure those requirements are met.

#### 1.2. The Project

##### 1.2.1. The Site

McCain Foods is proposing to construct and operate an expansion of its potato processing facility in Othello, Washington, in Adams County. The proposed site is within a Class II area that is in attainment or unclassified with regard to all National Ambient Air Quality Standards (NAAQS) and state ambient air quality standards. The facility mailing address is 100 Lee Street, Othello, Washington, 99344.

##### 1.2.2. The Proposed Project

McCain proposes to expand the production capacity of the Othello facility by adding a production line and a wastewater treatment plant (the Line 4 Project). This project will include a new Boiler, Wet ESP, Sulfur Scrubber, Flare, Anaerobic Digester, and new Air Handling Units.

##### 1.2.3. SEPA Review

To be done by City of Othello. The City of Othello Planning Department issued a Optional Determination of Non-Significance (ODNS) to McCain Foods on August 2, 2019.

#### 1.3. Federal Standards

### **1.3.1. New Source Performance Standards**

The boiler proposed for this project is subject to the NSPS for small boilers (40 CFR 60 Subpart Dc). Subpart Dc, however, establishes only notification and recordkeeping requirements for the device due to it being fired exclusively on natural gas.

Ecology did not identify any other New Source Performance Standards (NSPS) applicable to the equipment proposed for the facility.

### **1.3.2. National Emission Standards for Hazardous Air Pollutants**

Ecology was unable to identify any NESHAPs or MACT Standards that are applicable to the equipment proposed for this facility.

## **1.4. State Laws and Rules**

The Washington State Clean Air Act codified in Chapter 70.94 Revised Code of Washington (RCW) grants Ecology the authority to issue NSR Orders of Approval. The implementing regulation Chapter 173-400 Washington Administrative Code (WAC), describes a set of procedures to use when performing NSR. The majority of the requirements are contained in but not limited to WAC 173-400-110, WAC 173-400-113, and WAC 173-400-091. There are several general requirements or emission standards that apply to any emission points at this facility. One emission standard is a grain loading standard from combustion units of 0.1 grains/dscf (see WAC 173-400-050(1)). There is also a maximum opacity standard of 20 percent contained in WAC 173-400-040(1).

## **1.5. The NOC Application**

In July of 2019, the Notice of Construction (NOC) application was received by Ecology. The application was determined to be complete on August X, 2019. The 15 day web notice period does not apply as the Potential to Emit (PTE) of the facility's new project exceeds thresholds that trigger a 30-day comment period. This TSD and Order of Approval are based upon the information submitted by the applicant, McCain Foods, USA Inc. and its consultant, Trinity Consultants.

### **1.5.1. NSR Applicability**

NSR applicability is an analysis of what requirements and what permits apply to a new or modified source. Sources or emission units that are listed in WAC 173-400-110 (4) are categorically exempt from NSR. Projects can also avoid NSR if the project emissions increase is kept below the numerical limits contained in WAC 173-400-110 (5). If a source cannot be exempt from the categorical list or the numerical list, they must undergo NSR. This project is subject to NSR as a new source with BACT, t-BACT and impacts analyses required.

The next evaluation is a comparison of the source's emissions to the major source thresholds. For Title V purposes, the threshold is 100 tons of a criteria pollutant, 10 tons of any hazardous air pollutant, or 25 tons of any combination of a hazardous air pollutant. If this project has the potential to emit more than 100 tons of criteria air pollutants, it might also be subject to Prevention of Significant Deterioration (PSD) review as required under 40 CFR 52.21(b)(1)(i)(a).

If a source has potential emissions high enough to exceed the major source thresholds, but is willing to accept a federally enforceable limit, it may be eligible to receive a permit limit or regulatory order to avoid major new source review. This concept is sometimes referred to as a synthetic minor or a "091" source. The reference of 091 is to the section in the rule that allows for the limitation: WAC 173-400-091.

McCain Foods' consultant has submitted emission estimates indicating that the facility total potential to emit is below thresholds triggering major source status, however, the combined emissions of the existing emissions and the new emissions exceed the threshold for major source status. McCain will be required to submit an application for an Air Operating Permit (AOP) within a year from startup of the new Line 4 project.

## 2. EMISSIONS

### 2.1. Emissions and Emission Controls

Criteria Pollutant Potential to emit (PTE) emissions estimated by the project consultant for the proposed project (Equipment Totals) are presented in the Table below in pounds per 24-hour day and tons per 365-day year.

**Table 1**

<b>Pollutant</b>	<b>Pounds per Day</b>	<b>Tons per Year</b>
PM10	55.18	10.07
PM2.5	55.18	10.07
NOx	107.22	19.57
SO2	32.49	5.93
CO	112.21	20.48
VOC	309.29	56.45

### 2.2. Operational Limitations

The facility approval order will contain limits to the production values on which the NOC application and emission estimates were based (59,300 pounds of finished product per hour).

### 2.3. Adequacy of Emissions Estimates

Ecology has evaluated the emission estimates included in the application materials and, while finding they are adequate for preparing a preliminary determination, found that confirming

modeling results may be necessary for most of the important estimates. McCain Food's Consultant was asked to verify wind speed threshold for 1-min ASOS data and what the percentage of calms will be without the 0.5m/s threshold set in AERMET.

### **3. DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY**

#### **3.1. Definitions**

Best Available Control Technology (BACT) means an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under Chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification.

#### **3.2. Regulatory Requirements**

BACT is required at each emission point for each pollutant subject to NSR under WAC 173-400-113. This project triggers NSR for SO<sub>x</sub>, NO<sub>x</sub>, CO, VOC, PM<sub>2.5</sub>, and PM<sub>10</sub>. Practically, this means that all equipment at the facility is subject to NSR.

#### **3.3. Best Available Control Technology**

##### **3.3.1. BACT for the duel fuel Boiler**

The applicant will construct the boiler to accept either full natural gas or a duel fuel of biogas and natural gas. BACT is typically 9 and 30 for NO<sub>x</sub> and CO for new boilers, however, in McCain's scenario they plan to use the biogas generated from their anaerobic digester as a partial fuel source for the boiler. Due to steam demand, reduced ramp time of the boiler, and the reduced chemical efficiency of biogas, the proposed BACT is 30 and 50 for NO<sub>x</sub> and CO. The measures proposed may be considered BACT due to the scenario, as well as effort to recycle gases generated by another operation from the potato process.

##### **3.3.2. BACT for Reducing H<sub>2</sub>S from Anaerobic Digester**

The application proposes to collect the H<sub>2</sub>S gases from the anaerobic digester that will either, go to the boiler for fuel, or to the flare, and then vent these gases through a sulfur scrubber that results in 98% DRE. Ecology accepts the emission level resulting from this 98% DRE as BACT for the sources ducted to this scrubber. Stack testing may be required to verify this performance.

### **4. AMBIENT AIR QUALITY ANALYSIS**

#### **4.1. Modeling Methodology**

McCain Foods used the EPA recommended AERMOD (version 18081) air dispersion model with Plume Rise Model Enhancements (PRIME) advanced downwash algorithms. The AERMET dataset was based upon the U.S. National Climate Data Center surface observations from the Grant County International Airport, for the period 2014-2018. Upper air data was collected from Spokane, Washington, and five years (2014-2018) of metrological data were used for the analysis.

#### 4.2. NAAQS Analysis

**Table 6-5**

Pollutant	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ )	SIL ( $\mu\text{g}/\text{m}^3$ )	% of SIL
PM <sub>10</sub>	24-hr	1.39	5	28%
	Annual	0.08	1	8%
PM <sub>2.5</sub>	24-hr	0.79	1.2 <sup>b</sup>	66%
	Annual	0.07	0.2 <sup>b</sup>	37%
NO <sub>2</sub>	1-hr	5.96	7.5	80%
	Annual	0.16	1	16%
SO <sub>2</sub> <sup>a</sup>	1-hr	6.35	7.8	81%
	3-hr	6.93	25	28%
	24-hr	2.74	5	55%
	Annual	0.11	1	11%

<sup>a</sup> SO<sub>2</sub> results include the Boiler 3 firing dual fuel and the flare operations. When the Boiler 3 is firing dual fuel, the flare would not be operated in order to destruct the remaining biogas generated. Therefore, the model results shown here are conservative compared to the actual operations.

<sup>b</sup> EPA allows states to use alternative SILs if properly justified, but does not allow a value higher than 0.3  $\mu\text{g}/\text{m}^3$  (annual) or 1.2  $\mu\text{g}/\text{m}^3$  (24-hr). The recommended SIL values from the EPA memo, *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program* (April 17, 2018), are listed here.

#### 5. Toxic Air Pollutants

McCain Foods modeled the ambient concentration of toxic air pollutants including Benzene, Formaldehyde, Acrolein, Ethyl Benzene, H<sub>2</sub>S, and SO<sub>2</sub>. The TAP emissions were the significant toxic exceeding the SQER. Table 6-7 below shows that TAP emissions will result in ambient concentrations less than the ASIL.

**Table 6-7**

Pollutant	Averaging Period	Modeled Concentration <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ )	ASIL ( $\mu\text{g}/\text{m}^3$ )	% of ASIL
Benzene	Year	0.0005	0.0345	1%
Formaldehyde	Year	0.003	0.167	2%
Acrolein	24-hr	0.001	0.06	1%
Ethyl Benzene	Year	0.004	0.4	1%
H <sub>2</sub> S	24-hr	0.03	2	1%
SO <sub>2</sub>	1-hr	8	660	1%
<sup>a</sup> Maximum value out of the five-year modeled period. The modeled concentration represents the total impact from the Boiler 3 (firing dual fuel) and the flare (including pilot gas). The results are conservative, because the flare would not be operated if all biogas generated is fired at Boiler 3.				

## 6. CONSOLIDATION OF PREVIOUS PERMITS

With the issuance of this new Approval Order (19AQ-E056), the two existing Approval Orders (DE 95AQ-E125, 1<sup>st</sup> Amendment and DE 98AQ-E121) will be rescinded. The operating and emission limits, including a reporting requirements, will be consolidated and moved to the new approval order. Below are some background information and “findings” taken from the previous approval orders.

### From Permit 95AQ-E125

The Department of Ecology makes the following Findings of Fact.

- III.1 McCain Foods USA, Inc. is the owner and operator of a food processing plant that has three potato product frying lines, and natural gas fired boilers, dryers, and air make-up units that collectively are rated at 294.4 million BTUs per hour heat input, located in Othello, Washington in Adams County. The potato product frying lines are controlled by either a scrubber or a wet electrostatic precipitator (wet ESP).
- III.2 The fryers, boilers, dryers, and air make-up units have the potential to emit particulate matter (PM) and nitrogen oxides (NO<sub>x</sub>) that exceed the thresholds given in WAC 173-401-300, Applicability, and therefore would be required to obtain an Operating Permit in accordance with Chapter 173-401 WAC, Operating Permit Regulation.
- III.3 McCain Foods USA, Inc. has requested that Ecology limit the above described fryers' production of finished product and the natural gas combustion units' use of natural gas for a potential to emit particulate matter and nitrogen oxide to a level agreed to by McCain Foods USA, Inc. and Ecology.

### From Permit 98AQ-E121

On May 29, 1998, McCain Foods, USA, submitted a Notice of Construction for Replacement of the Line III Fryer with a new, steam-heated, co-product fryer and installation and operation of a wet electrostatic precipitator (ESP) with a pre-quench section as air pollution control devices for

the new co-product fryer and an existing batter fryer, for use at a potato processing facility, located at Broadway & Lee, Othello, Washington, in Adams County.

#### ADDITIONAL FINDINGS:

##### BACT

As required by WAC 173-400-113, this project shall use Best Available Control Technology (BACT) to control emissions. The project will use the following technologies and procedures to attain BACT for emissions:

PM – Use of a Beltran BTP 8x8 type wet ESP with a pre-quench section, with a guaranteed control efficiency of 90%, to achieve a maximum grain loading of 0.0262 grains pre dry standard cubic foot of non-organic and condensable PM.

#### 4. ADDITIONAL FINDINGS

- 4.1 The new co-product fryer has a maximum rate of 10,000 pounds of finished product per hour.
- 4.2 The existing batter fryer is has a maximum rate of 50,000 pounds of finished product per hour.
- 4.3 The new co-product fryer is heated via an existing steam-heat source, hence there are no new combustion emissions related to heating the fryer.
- 4.4 The emissions from the new, steam-heated co-product fryer and the existing batter fryer will be routed through the wet ESP with pre-quench section are calculated to be under Prevention of Significant Deterioration (PSD) thresholds (40 CFR 52.21) and the ambient air quality standards (Ch. 173-470 WAC) for PM using the information known at the time of permit issuance.

#### 7. CONCLUSION

The project will have no significant adverse impact on air quality. The Washington State Department of Ecology finds that the applicant, McCain Foods, has satisfied all requirements for NSR and the project results in acceptable impacts in accordance with the WA Clean Air Act. For more information please contact Andy Kruse at (509) 329-3528 or [akru461@ecy.wa.gov](mailto:akru461@ecy.wa.gov).

## 8. LIST OF ACRONYMS AND ABBREVIATIONS

acfm	Actual Cubic Feet per Minute
AERMOD	AMS/EPA Regulatory Model-EPA approved air dispersion model
ASIL	Acceptable source Impact Level
BACT	Best Available Control Technology
CEM	Continuous Emission Monitor
CFR	Code of Federal Regulations
CO	Carbon Monoxide
Ecology	Washington State Department of Ecology
HCN	Hydrogen Cyanide
lb/hr	pounds per hour
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH <sub>3</sub>	Ammonia
NO <sub>2</sub>	nitrogen dioxide
NOC	Notice of Construction
NO <sub>x</sub>	Nitrogen Oxides
O <sub>2</sub>	Oxygen
NSPS	New Source Performance Standard
NSR	New source Review
PM <sub>2.5</sub>	particulate matter smaller than 2.5 microns in diameter
PM <sub>10</sub>	particulate matter smaller than 10 microns in diameter
PSD	Prevention of Significant Deterioration
RCW	Revised Code of Washington
SO <sub>2</sub>	sulfur dioxide
SQER	Small Quantity Emission Rate
TAP	Toxic Air Pollutant
tBACT	Best Available Control Technology for Toxics
TO	Thermal Oxidizer
TSD	Technical Support Document
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code

## 9. RESPONSE TO COMMENTS