# Air Quality Permitting
# Statement of Basis

**March 14, 2007**

## Permit to Construct No. P-060427

## Jerome Cheese Company
## Jerome, ID

## Facility ID No. 053-00003

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AIR QUALITY DIVISION

**FINAL**

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# Acronyms, Units, and Chemical Nomenclatures

| | |
|---|---|
| AIRS | Aerometric Information Retrieval System |
| AQCR | Air Quality Control Region |
| CO | carbon monoxide |
| DEQ | Department of Environmental Quality |
| EPA | U.S. Environmental Protection Agency |
| HAPs | Hazardous Air Pollutants |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| lb/hr | pound per hour |
| MMBtu/hr | million British thermal units per hour |
| NAAQS | National Ambient Air Quality Standards |
| NOx | nitrogen oxides |
| $PM_{10}$ | particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers |
| PSD | Prevention of Significant Deterioration |
| PTC | permit to construct |
| Rules | Rules for the Control of Air Pollution in Idaho |
| SIC | Standard Industrial Classification |
| SM | Synthetic Minor |
| $SO_2$ | sulfur dioxide |
| TAP | Toxic Air Pollutant |
| T/yr | tons per year |
| $\mu g/m^3$ | micrograms per cubic meter |
| UTM | Universal Transverse Mercator |
| VOC | volatile organic compound |

## 1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

## 2. FACILITY DESCRIPTION

Jerome Cheese is a cheese manufacturing facility that produces cheese from milk, with whey as a by-product. The whey is condensed in a vacuum evaporator. The moisture content of the whey (or other condensed food product) is reduced via three separate drying processes at the facility, the Stork Friesland dryer, the Coulter dryer, and the CPS dryer.

Heat is supplied to the Stork Friesland, Coulter, and CPS dryers from separate natural gas-fired burners. Air heated indirectly from stream supplies heat to the first stage of the CPS fluidized bed dryer.

## 3. FACILITY / AREA CLASSIFICATION

Jerome Cheese Company is classified as a synthetic minor facility because its potential to emit is greater than major source thresholds, but limits on its potential to emit limit emissions to less than major source thresholds. The AIRS classification is "SM".

The facility is located within AQCR 63 and UTM zone 11 The facility is located within Jerome County, which is classified as attainment or unclassifiable for all criteria air pollutants.

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at the facility. This required information is entered into the EPA AIRS database.

## 4. APPLICATION SCOPE

The facility has proposed to install a CPS dryer and a CPS fluid bed for the drying of condensed whey (or other condensed food product) at Jerome, Idaho. The facility is requesting a reduction of the $PM_{10}$ emission limits for the Stork Friesland dryer and the Coulter dryer listed in PTC No.P-030405 issued March 24, 2003. On July 12, 2006, Jerome Cheese and DEQ staff agreed to the removal of the emission limits for the SAPAC bagging machine, the Stork Friesland dry product storage bin, tote filler receiver, and the Coulter dry product handling stated in PTC No. P-030405 issued June 4, 2002, from this permit. The emissions from these sources were insignificant (two to three magnitudes smaller) in comparison to the emissions from each of the dryers. PTC No. 053-00003 issued on June 4, 2002 was consolidated into PTC No. P-030405 issued March 24, 2003.

### 4.1 Application Chronology

| | |
|---|---|
| August 9, 2006 | DEQ received 15-day application. |
| August 24, 2006 | DEQ approved the 15-day application. |
| December 12, 2006 | DEQ sent draft permit issued to facility and DEQ regional office. |
| January 8, 2007 | DEQ received facility's comments on the draft permit. |
| January 26, 2007 | DEQ received a revised modeling analysis. |

# 5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

## 5.1 Equipment Listing

Stork Friesland dryer
Coulter dryer
CPS dryer
CPS fluid bed
2 – 33.5 MMBtu/hr Johnson natural gas boilers
20 MMBtu/hr CPS natural gas burner

## 5.2 Emissions Inventory

The criteria pollutant from each of the dryers is $PM_{10}$. The combined $PM_{10}$ emissions from the Stork Friesland dryer, the Coulter dryer, the CPS dryer, and the CPS fluid bed is 7.43 lb/hr.

## 5.3 Modeling

$PM_{10}$ emissions were modeled as required by IDAPA 58.01.01.203. The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard. The modeling review is located in Appendix C. Table 5 provides a impact summary of the criteria pollutants.

**Table 5. FULL IMPACT ANALYSES**

| Pollutant | Averaging Period | Modeled Design Concentration ($\mu g/m^3$)[a] | Background Concentration ($\mu g/m^3$) | Total Impact ($\mu g/m^3$) | NAAQS[b] ($\mu g/m^3$) | Percent of NAAQS |
|---|---|---|---|---|---|---|
| $PM_{10}$[b] | 24-hour | 30[c] | 73 | 103 | 150 | 69 |
| | Annual | 15[d] | 26 | 41 | 50 | 82 |
| Carbon monoxide (CO) | 1-hour | 127[c] | 3,600 | 3,727 | 40,000 | 9 |
| | 8-hour | 62[c] | 2,300 | 2,362 | 10,000 | 24 |
| Sulfur dioxide ($SO_2$) | 3-hour | 0.64[c] | 34 | 35 | 1,300 | 3 |
| | 24-hour | 0.31[c] | 26 | 26 | 365 | 7 |
| | Annual | 0.11[d] | 8 | 8 | 80 | 10 |
| Nitrogen dioxide ($NO_2$) | Annual | 16[d] | 17 | 33 | 100 | 33 |

a. Maximum modeled concentration in micrograms per cubic meter
b. National Ambient Air Quality Standards
c. Maximum 2nd high modeled concentration for five years of meteorological data
d. Maximum modeled concentration for five years of meteorological data

## 5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203.....Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments. This satisfaction was demonstrated with the modeling submitted by the facility and DEQ's review verifying the modeling results.

IDAPA 58.01.01.210.....Demonstration of Preconstruction Compliance with Toxic Standards

The applicant is required to combust only natural gas.

IDAPA 58.01.01.213……...Pre-Permit Construction

The applicant has demonstrated compliance with eligibility and procedure requirements for pre-construction approval.

IDAPA 58.01.01.224.....Permit to Construct Application Fee

The applicant satisfied the PTC application fee requirement by submitting a fee of $1,000.00 at the time the original application was submitted, August 11, 2006.

IDAPA 58.01.01.225.....Permit to Construct Processing Fee

The total emissions from the proposed new permit indicate an overall reduction in emissions primarily in $PM_{10}$. The process fee is $500. No permit to construct can be issued without first paying the required processing fee.

## 5.5 Permit Conditions Review

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action.

**Permit Condition 2.3 and Table 2.2** have been designed to state the permitted limits of the criteria pollutant $PM_{10}$ for the dryer stacks and dust collection system baghouse stack.

Compliance demonstration for Permit Condition 2.3 and Table 2.2 is maintained in the monitoring of the maximum average of wet material being introduced to each drying process established in Permit Condition 2.5. Permit Condition 2.7 requires performance testing of the new CPS dryer and CPS fluid bed to ensure the $PM_{10}$ emissions meet the emission limits, specified in Permit Condition 2.3. The Coulter and Stork Friesland dryers have had their $PM_{10}$ tested, and the results of the test were used to establish the new reduced $PM_{10}$ emissions limits. The controlled $PM_{10}$ emissions establish the facility as a SM rated facility. Additional testing will continue to demonstrate compliance with Permit Condition 2.3.

**Permit Condition 2.4** is taken directly from IDAPA 58.01.01.625.02.

Compliance demonstration with the opacity standard is assumed as long as the air pollution control devices are working properly. Permit Condition 2.9 assists in the monitoring and recording of the opacity and fugitive emissions control.

**Permit Condition 2.5** limits the wet feed rate of each dryer, which inherently limits $PM_{10}$ emissions.

Compliance demonstration for these wet feed rates shall be the monitoring and recordkeeping required in Permit Condition 2.8.

**Permit Condition 2.6** requires the efficiency of the air pollution controls devices to be maintained as stated within the permit application.

Compliance demonstration for this permit condition requires the O & M manual have manufacturer data stating the performance of the air pollution control equipment can reach the efficiencies stated in the permit application.

**Permit Condition 3.3** requires the particulate matter emissions from combustion to meet a grain loading standard for natural gas.

Compliance demonstration is established by requiring all fuel burning equipment to burn natural gas exclusively as required in Permit Condition 3.4.

## 6. PERMIT FEES

Jerome Cheese Company is a non-major source with emissions less than 100 tons per year for combined criteria pollutants. The net reduction of emissions allows a process fee of $500.

**Table 6.1 PTC PROCESSING FEE TABLE**

| Emissions Inventory | | | |
|---|---|---|---|
| **Pollutant** | **Annual Emissions Increase (T/yr)** | **Annual Emissions Reduction (T/yr)** | **Annual Emissions Change (T/yr)** |
| $NO_X$ | 0.35 | 0 | 0.35 |
| $SO_2$ | 0.035 | 0 | 0.035 |
| CO | 7.0 | 0 | 7.0 |
| $PM_{10}$ | 18.7 | 39.7 | <21> |
| VOC | 0.5 | 0 | 0.5 |
| TAPS/HAPS | | 0 | |
| Total: | **26.58** | 0 | **<13.7>** |
| Fee Due | **$500** | | |

## 7. PERMIT REVIEW

### 7.1 Regional Review of Draft Permit

The draft permit was made available for regional office review on December 12, 2006. No comments were received during the draft review period.

### 7.2 Public Comment

The draft permit was made available for facility review on December 12, 2006. DEQ received the facility's comments on January 8, 2007.

### 7.3 Public Comment

An opportunity for public comment period on the PTC application was provided from September 14, 2006, to October 16, 2006 in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for a public comment period on DEQ's proposed action.

## 8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Jerome Cheese Company be issued the final PTC No. P-060427 for the modification to the facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

REB/bf Permit No. P-060427

# Appendix A

# AIRS Information

# P-060427

# AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

**Facility Name:** **Jerome Cheese Company**
**Facility Location:** **Jerome, Idaho**
**AIRS Number:** **053-00003**

| AIR PROGRAM POLLUTANT | SIP | PSD | NSPS (Part 60) | NESHAP (Part 61) | MACT (Part 63) | SM80 | TITLE V | AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment |
|---|---|---|---|---|---|---|---|---|
| $SO_2$ | B | | B | | | | | U |
| $NO_x$ | B | | | | | | | U |
| CO | B | | | | | | | U |
| $PM_{10}$ | SM | | B | | | | SM | U |
| PT (Particulate) | SM | | | | | | | U |
| VOC | B | | | | | | | U |
| THAP (Total HAPs) | B | | | | | | | U |
| | | | APPLICABLE SUBPART | | | | | |
| | | | Dc | | | | | |

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

# Appendix B

# Emissions Inventory

# P-060124

**POTENTIAL EMISSION INVENTORY WITH CONTROLS ON DRYERS**

| EMISSION UNITS | $PM_{10}$ | SOX | NOx | CO | VOC |
|---|---|---|---|---|---|
| | T/yr | T/yr | T/yr | T/yr | T/yr |
| 33 MMBtu/hr Boiler | 1.077 | .083 | 14.2 | 11.9 | 0.76 |
| 33 MMBtu/hr Boiler | 1.077 | .083 | 14.2 | 11.9 | 0.76 |
| 20 MM BTU/hr burner | * | 0.035 | 0.35 | 7.0 | 0.5 |
| Stork Friesland Dryer | 7.32 | | | | |
| Coulter Dryer | 1.67 | | | | |
| CPS Dryer | 12.9 | | | | |
| CPS fluid bed | 5.8 | | | | |

* $PM_{10}$ emissions generated from the burner are calculated in the CPS dryer $PM_{10}$ emissions.

# Appendix C

# Modeling

# P-060124

**M E M O R A N D U M**

**DATE:** March 20, 2007

**TO:** Bob Baldwin, Permit Writer, Air Program

**FROM:** Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

**PROJECT NUMBER:** P- 060427

**SUBJECT:** Modeling Review for the DAVISCO Foods International, Inc., Jerome Cheese Facility Permit to Construct Application for a new whey dryer at their facility in Jerome, Idaho

## 1.0 Summary

DAVISCO Foods International, Inc., submitted a Permit to Construct (PTC) application for a new whey dryer at their Jerome Cheese Facility (Jerome Cheese) in Jerome, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the proposed modification were submitted to demonstrate that the modification would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02). Millennium Science & Engineering (MSE), Jerome Cheese's consultant, conducted the ambient air quality analyses.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs); or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

**Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES**

| Criteria/Assumption/Result | Explanation/Consideration |
|---|---|
| Impacts of all pollutants are well below any applicable standards | Permit provisions, beyond typical provisions assuring operations are conducted as proposed, are not necessary to assure compliance with air quality standards. |

## 2.0 Background Information

## 2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

### 2.1.1 Area Classification

The Jerome Cheese facility is located in Jerome, Idaho. This area is designated as an attainment or unclassifiable for all criteria pollutants.

### 2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

**Table 2. APPLICABLE REGULATORY LIMITS**

| Pollutant | Averaging Period | Significant Contribution Levels[a] ($\mu g/m^3$)[b] | Regulatory Limit[c] ($\mu g/m^3$) | Modeled Value Used[d] |
|---|---|---|---|---|
| $PM_{10}$[e] | Annual | 1.0 | 50[f] | Maximum 1st highest[g] |
| | 24-hour | 5.0 | 150[h] | Maximum 6th highest[i] |
| Carbon monoxide (CO) | 8-hour | 500 | 10,000[j] | Maximum 2nd highest[g] |
| | 1-hour | 2,000 | 40,000[j] | Maximum 2nd highest[g] |
| Sulfur Dioxide ($SO_2$) | Annual | 1.0 | 80[f] | Maximum 1st highest[g] |
| | 24-hour | 5 | 365[j] | Maximum 2nd highest[g] |
| | 3-hour | 25 | 1,300[j] | Maximum 2nd highest[g] |
| Nitrogen Dioxide ($NO_2$) | Annual | 1.0 | 100[f] | Maximum 1st highest[g] |
| Lead (Pb) | Quarterly | NA | 1.5[h] | Maximum 1st highest[g] |

[a]IDAPA 58.01.01.006.90
[b]Micrograms per cubic meter
[c]IDAPA 58.01.01.577 for criteria pollutants
[d]The maximum 1st highest modeled value is always used for significant impact analyses
[e]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f]Never expected to be exceeded for any calendar year
[g]Concentration at any modeled receptor
[h]Never expected to be exceeded more than once in any calendar year
[i]Concentration at any modeled receptor when using five years of meteorological data
[j]Not to be exceeded more than once per year

### 2.1.3 Toxic Air Pollutant Analyses

Toxic Air Pollutant (TAP) requirements for PTCs are specified in IDAPA 58.01.01.210. If the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of IDAPA 58.01.01.585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of IDAPA 58.01.01.585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of IDAPA 58.01.01.586, then compliance with TAP requirements has been demonstrated.

## 2.2 Background Concentrations

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Default rural/agricultural

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

background concentrations were used for all criteria pollutants. Table 3 lists applicable background concentrations.

| Table 3. BACKGROUND CONCENTRATIONS | | |
|---|---|---|
| **Pollutant** | **Averaging Period** | **Background Concentration ($\mu g/m^3$)[a]** |
| $PM_{10}$[b] | 24-hour | 73 |
| | Annual | 26 |
| Carbon monoxide (CO) | 1-hour | 3,600 |
| | 8-hour | 2,300 |
| Sulfur dioxide ($SO_2$) | 3-hour | 34 |
| | 24-hour | 26 |
| | Annual | 8 |
| Nitrogen dioxide ($NO_2$) | Annual | 17 |
| Lead (Pb) | Quarterly | 0.08 |

a. Micrograms per cubic meter

b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

# 3.0 Modeling Impact Assessment

## 3.1 Modeling Methodology

Table 4 lists the modeling parameters used in DEQ's analyses.

| Table 4. REFINED MODELING PARAMETERS | | |
|---|---|---|
| **Parameter** | **Description/Values** | **Documentation/Addition Description** |
| Model | ISCST3-PRIME | ISCST3 with the PRIME downwash algorithm, version 04269 |
| Meteorological data | 1987 – 1991 | Pocatello, Idaho surface data<br>Boise, Idaho upper air data |
| Terrain | flat | Area of the facility and maximum impact area is effectively flat |
| Building downwash | Considered | The building profile input program (BPIP) for the PRIME downwash algorithm was used |
| Receptor Grid | Grid 1 | 10-meter spacing along the property boundary out to 100 meters |
| | Grid 2 | 50-meter spacing out to 200 meters |

### 3.1.1 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application. An incorrect facility layout was used in the initial submittal. This problem was corrected by a revised analysis submitted on January 26, 2007. Modeling was generally conducted using methods and data as discussed prior to resubmittal and those described in the *State of Idaho Air Quality Modeling Guideline*.

### 3.1.2 Model Selection

ISCST3 with the PRIME downwash algorithm was used for the modeling analyses. The PRIME downwash algorithm was necessary because of the close proximity of buildings to ambient air receptors.

### 3.1.3 Meteorological Data

Pocatello, Idaho, surface data and Boise, Idaho upper air meteorological data were used for the ISCST3 analyses. DEQ determined these data were appropriate for the analyses considering availability of meteorological data and the magnitude and location of modeled impacts.

### 3.1.4 Terrain Effects

Terrain effects on dispersion were not considered in the analyses. The area surrounding the facility is effectively flat for dispersion modeling purposes.

### 3.1.5 Facility Layout

The facility layout used in the modeling analyses, including the ambient air boundary, buildings, and emissions units, were checked against the proposed layout provided in the application and aerial photographs. The facility orientation was incorrect in the original submittal. Corrections to the facility layout were made and modeling results were revised. The layout used in the January 26, 2007 submittal was sufficiently representative of the proposed site layout.

### 3.1.6 Building Downwash

Downwash effects potentially caused by structures at the facility were accounted for in the dispersion modeling analyses. The Building Profile Input Program (BPIP) for the PRIME downwash algorithm was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters used for the ISCST3 analyses.

### 3.1.7 Ambient Air Boundary

Ambient air was considered as all areas outside of the property boundary. DEQ determined stated measures to preclude public access to areas inside the property boundary were adequate to establish the property boundary as an ambient air boundary.

### 3.1.8 Receptor Network

The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. The receptor grid only extends 200 meters from the facility boundary. Because of the characteristics of the emissions sources and the absence of elevated terrain, maximum impacts are essentially at the ambient air boundary. Therefore, DEQ determined the receptor grid used was adequate to reasonably resolve maximum modeled concentrations.

## 3.2 Emission Rates

Emissions rates used in the modeling analyses were equal to or somewhat greater than those presented in other sections of the permit application or the DEQ Statement of Basis.

### 3.2.1 Criteria Pollutant Emissions Rates

Table 5 provides criteria pollutant emissions rates used in the modeling analyses for both long-term and short-term averaging periods.

| Table 5. CRITERIA POLLUTANT EMISSIONS RATES USED FOR AIR IMPACT MODELING | | | | | |
|---|---|---|---|---|---|
| **Emissions Point** | **Description** | **Emissions Rates[a] (lb/hr)** | | | |
| | | **$PM_{10}$[b]** | **$SO_2$[c]** | **CO[d]** | **NOx[e]** |
| B1 | Johnston Boiler #1 | 0.246 | 0.019 | 2.72 | 3.24 |
| B2 | Johnston Boiler #2 | 0.246 | 0.019 | 2.72 | 3.24 |
| B3 | Boiler #3 | 0.111 | 0.0087 | 1.23 | 1.46 |
| D1 | Stork Friesland Dryer | 1.67 | 0.0087 | 0.23 | 0.064 |
| D2 | Coulter Dryer Primary Baghouse | 0.381 | 0.0050 | 0.13 | 0.035 |
| D3 | Coulter Secondary Baghouse | 0.0198 | | | |
| D4 | New Dryer – Primary | 2.94 | 0.0079 | 0.29 | 0.079 |
| D5 | New Dryer – Secondary | 1.33 | | | |
| P1 | SAPAC Dry Product | 0.0302 | | | |
| P2 | Powder Bins | 0.00103 | | | |
| P3 | Tote Fill | 0.0198 | | | |
| P4 | Powder Bin (New) #1 | 0.0159 | | | |
| P5 | Powder Bin (New) #2 | 0.0159 | | | |
| P6 | Powder Bulk Tote Filler | 0.032 | | | |

a. Long term rates assume 8760 hours/year of operation
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
c. Sulfur dioxide
d. Carbon monoxide
e. Oxides of nitrogen

### 3.2.2 TAP Emissions Rates

Table 6 lists applicable TAP emissions associated with the facility that are in excess of the screening emissions level (EL). Emissions of all other TAPs were below applicable ELs and modeling was not required.

| Table 6. TAPS EMISSIONS RATES USED FOR AIR IMPACT MODELING | | | | | |
|---|---|---|---|---|---|
| **Emissions Point** | **Description** | **Emissions Rates[a] (lb/hr)** | | | |
| | | **As[b]** | **Cd[c]** | **CH2O[d]** | **Ni[e]** |
| B1 | Johnston Boiler #1 | 6.5E-6 | 3.6E-5 | 2.5E-3 | 6.8E-5 |
| B2 | Johnston Boiler #2 | 6.5E-7 | 3.6E-5 | 2.5E-3 | 6.8E-5 |
| B3 | Boiler #3 | 2.9E-6 | 1.6E-5 | 1.1E-3 | 3.1E-5 |
| D1 | Stork Friesland Dryer | 3.2E-6 | 1.7E-5 | 1.2E-3 | 3.3E-5 |
| D2 | Coulter Dryer Primary Baghouse | 1.7E-6 | 9.5E-6 | 6.6E-4 | 1.8E-5 |
| D3 | Coulter Secondary Baghouse | | | | |
| D4 | New Dryer – Primary | 3.89E-6 | 2.1E-5 | 1.4E-3 | 4.0E-5 |
| D5 | New Dryer – Secondary | | | | |
| P1 | SAPAC Dry Product | | | | |
| P2 | Powder Bins | | | | |
| P3 | Tote Fill | | | | |
| P4 | Powder Bin (New) #1 | | | | |
| P5 | Powder Bin (New) #2 | | | | |
| P6 | Powder Bulk Tote Filler | | | | |

a. Pounds per hour. Long term rates assume 8760 hours/year of operation
b. Arsenic
c. Cadmium
d. Formaldehyde
e. Nickel

## 3.3 Emission Release Parameters

Table 7 provides emissions release parameters for the analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity.

**Table 7. EMISSIONS AND STACK PARAMETERS**

| ***Release Point /Location*** | *Source Type* | *Stack Height (m)*[a] | *Modeled Diameter (m)* | *Stack Gas Temp. (K)*[b] | *Stack Gas Flow Velocity (m/sec)*[c] |
|---|---|---|---|---|---|
| B1 | Point | 10.1 | 0.91 | 469 | 7.79 |
| B2 | Point | 10.1 | 0.91 | 469 | 7.79 |
| B3 | Point | 9.04 | 0.51 | 400 | 10.57 |
| D1 | Point | 28.8 | 1.35 | 318 | 20.5 |
| D2 | Point | 27.7 | 0.60 | 351 | 28.61 |
| D3 | Point | 10.8 | 0.001[d] | 308 | 0.001 |
| D4 | Point | 45.0 | 1.98 | 306 | 13.44 |
| D5 | Point | 32.0 | 1.40 | 305 | 12.81 |
| P1 | Point | 16.5 | 0.001 | 304 | 0.001 |
| P2 | Point | 22.6 | 0.001 | 309 | 0.001 |
| P3 | Point | 14.2 | 0.001 | 308 | 0.001 |
| P4 | Point | 25.3 | 0.25 | 297 | 4.19 |
| P5 | Point | 25.3 | 0.25 | 297 | 4.19 |
| P6 | Point | 10.2 | 0.25 | 297 | 32.6 |

a. Meters
b. Kelvin
c. Meters per second
d. Set to 0.001 to account for a horizontal release

## 3.4 Results for Significant and Full Impact Analyses

MSE elected to conduct full impact analyses for all criteria pollutants, rather than conduct significant impact analyses to evaluate the need for full impact analyses. Results for the full impact analyses are shown in Table 8. DEQ did not conduct verification analyses involving rerunning of the model.

**Table 8. FULL IMPACT ANALYSES**

| **Pollutant** | **Averaging Period** | **Modeled Design Concentration ($\mu g/m^3$)**[a] | **Background Concentration ($\mu g/m^3$)** | **Total Impact ($\mu g/m^3$)** | **NAAQS**[b] **($\mu g/m^3$)** | **Percent of NAAQS** |
|---|---|---|---|---|---|---|
| $PM_{10}$[b] | 24-hour | 30[c] | 73 | 103 | 150 | 69 |
| | Annual | 15[d] | 26 | 41 | 50 | 82 |
| Carbon monoxide (CO) | 1-hour | 127[c] | 3,600 | 3,727 | 40,000 | 9 |
| | 8-hour | 62[c] | 2,300 | 2,362 | 10,000 | 24 |
| Sulfur dioxide ($SO_2$) | 3-hour | 0.64[c] | 34 | 35 | 1,300 | 3 |
| | 24-hour | 0.31[c] | 26 | 26 | 365 | 7 |
| | Annual | 0.11[d] | 8 | 8 | 80 | 10 |
| Nitrogen dioxide ($NO_2$) | Annual | 16[d] | 17 | 33 | 100 | 33 |

a. Maximum modeled concentration in micrograms per cubic meter
b. National Ambient Air Quality Standards
c. Maximum 2nd high modeled concentration for five years of meteorological data.
d. Maximum modeled concentration for five years of meteorological data.

## 3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by conservatively modeling facility-wide TAP emissions (those TAPs with emissions exceeding the ELs). Table 9 summarizes the ambient TAP analyses. DEQ did not conduct verification analyses involving rerunning of the model.

***Table 9. RESULTS OF TAP ANALYSES***

| TAP | Averaging Period | Maximum Modeled Concentration ($\mu g/m^3$)[a] | AAC or AACC[b] ($\mu g/m^3$) | Percent of AAC or AACC |
|---|---|---|---|---|
| Arsenic | Annual | 4.0E-5 | 2.3E-4 | 17 |
| Cadmium | Annual | 2.0E-4 | 5.6E-4 | 36 |
| Formaldehyde | Annual | 1.4E-2 | 7.7E-2 | 18 |
| Nickel | Annual | 3.8E-4 | 4.2E-3 | 9 |

[a] Micrograms per cubic meter

[b] Acceptable Ambient Concentration or Acceptable Ambient Concentration for a Carcinogen

## 4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.