Statement of Basis

Permit to Construct No. P-2012.0055
Project ID 62391

P4 Production LLC
Soda Springs, Idaho

Facility ID 029-00001

Final

September 30, 2020

Dan Pitman, PE
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

TABLE OF CONTENTS

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
Btu	British thermal units
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
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
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

P4 Production operates a phosphorus production facility in Soda Springs. Coke, quartzite, and phosphate ore are brought to the site by truck or railcar. The coke and quartzite are dried, if needed, and screened. Nodules are generated by processing phosphate ore in a rotary kiln. The kiln's exhaust is routed through four parallel hydrosonic scrubbing systems. The coke, quartzite, and nodules are then combined and heated in three electric furnaces. Particulate emissions from the furnaces are controlled by electrostatic precipitators. The cleaned gases are sent through water spray condensers where the gases are cooled, condensing the phosphorus, which is then pumped to settling/storage tanks. The stored phosphorus is loaded into water-sealed railroad cars for shipment. Slag and ferrophosphorus from the furnaces are stockpiled on site.

Permitting History

Tier I Operating Permit History - Current 5-year permit term February 11, 2016 to February 11, 2021

The following information is the permitting history of this Tier I facility during the current five-year permit term which is from February 11, 2016 to February 11, 2021. This information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

- November 5, 2019 T1-2014.0001, added Federal requirements for engines (S by this permit action that includes a Tier I permit issuance concurrent with a PTC)

Underlying Permit History - Includes every underlying permit issued to this facility

DEQ permit processing procedures[1] require a permit history review at the time of renewal of the Tier I operating permit which expires February 11, 2021.

Application Scope

This PTC is for a minor modification at an existing major facility. The applicant has requested to co-process the PTC and Tier I operating permit in accordance with IDAPA 58.01.01.209.05.b.

The applicant has proposed to:

- Add three new CO baghouses at the furnaces with updated ventilation systems to replace the existing three CO baghouses
- Add three new furnace burden dust handling baghouses and remove the existing main furnace baghouse

All changes to the facility that are part of this project are to the furnace burden dust control equipment. None of the actual emissions units change. Three existing CO baghouses will be replaced over time with three new CO baghouses and associated ventilation systems and the main furnace baghouse will be replaced over time by three new baghouses and ventilation systems that will serve each furnace instead of having one main furnace baghouse for all furnaces. Systems will be replaced during maintenance on each furnace. All affected emissions units shall be controlled by a baghouse before and after the upgrades as required by Permit Condition 3.4.

This permit will replace Permit to Construct P-2012.0055 Project 62010, issued March 30, 2018.

Application Chronology

February 13, 2020	DEQ received an application.
February 21, 2020	DEQ received an application fee.
March 24, 2020	DEQ determined that the application was incomplete.

1 Instructions from the permit history log (2009AAF411)

April 24, 2020	DEQ received supplemental information from the applicant.
May 21, 2020	DEQ determined that the application was complete.
July 20, 2020	DEQ made available the draft permit and statement of basis for peer and regional office review.
July 22, 2020	DEQ made available the draft permit and statement of basis for applicant review.
July 23, 2020	DEQ received the permit processing fee.
Aug. 13 – Sept. 14, 2020	DEQ provided a public comment period on the proposed action.
September 16, 2020	DEQ provided the proposed permit and statement of basis for EPA review.
September 30, 2020	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment
Furnace No. 7 Burden Handling	No. 7 CO Baghouse No. 7 Furnace Stocking Baghouse
Furnace No. 8 Burden Handling	No. 8 CO Baghouse No. 8 Furnace Stocking Baghouse
Furnace No. 9 Burden Handling	No. 9 CO Baghouse No. 9 Furnace Stocking Baghouse

Furnace burden material is fed from 11 scaleroom bins (1 containing quartzite, 6 containing phosphate ore nodules, and 4 containing coke) to 11 weigh bins which proportion material onto belt 416 in the scaleroom. Material is carried by this belt to the top of (north) furnace building 7 and falls by way of rotary distributor 421 to one of three belts (belt 417 for furnace 7, belt 418 for furnace 8, and belt 419 for furnace 9). Material falls from belt 417 to rotary stock diverter 672 which feeds belt 713, feeds belt 714, or fills four stock bins. Belt 713 and belt 714 each fill one other stock bin. Material falls from belt 418 to furnace 8 stock diverter 824 which feeds belt 824W or belt 824E. Belts 824W and 824E each fill six hoppers which in turn fill six stock bins. Material falls from belt 419 to furnace 9 stock diverter 420 which feeds belt 420W or 420E. Belts 420W and 420E each fill six stock bins. The material in each bin is gravity fed to the furnaces. Dust collection from all stock bins is controlled by #7, #8, and #9 CO baghouses. Dust collection from all other transfer points in the furnace stocking area is controlled respectively by #7, #8, and #9 Stocking Baghouses, with #8 Stocking Baghouse also collecting PM from the unloading-end of belt 416, the loading-end of belt 417 and belt 419, and the rotary distributor 421.

Emissions Inventories

This project is to improve the furnace burden dust collection systems and to dilute existing carbon monoxide concentrations to below the lower explosive level. These changes are not related to any other changes at the facility so the “project” for the major modification purposes is solely the changes the dust control system for the furnace burden handling equipment. The furnace stocking tubes penetrate into the furnace and dust emissions from them are controlled by the CO baghouses. The static pressure at the stocking tubes will not decrease so the fundamental design of the furnace stocking tubes does not change and there will be no increase of carbon monoxide emissions from the furnace. Particulate matter emissions are assessed in this major modification determination. All emissions changes are from point sources of emissions; fugitive emissions do not change or are decreased and are not part of this analysis.

The facility-wide potential to emit for this designated facility exceeds 100 T/yr. Therefore, a PSD applicability analysis is required for this project.

Projected Actual Emissions

The procedure used by P4 Production for calculating Projected Actual emissions was the calculation approach for existing units set forth in 40 CFR 52.21, beginning with definitions in 52.21(b)(41). Using these procedures, Projected Actual criteria pollutant emissions were calculated. Projected Actual emissions are presented in the following table.

Table 2 PROJECTED ACTUAL EMISSIONS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources Affected by this Permitting Action						
CO Baghouse No. 7	0.46	NA	NA	NA	NA	NA
CO Baghouse No. 8	0.91	NA	NA	NA	NA	NA
CO Baghouse No. 9	0.91	NA	NA	NA	NA	NA
Furnace Stocking Baghouse No.7	1.47	NA	NA	NA	NA	NA
Furnace Stocking Baghouse No.8	2.69	NA	NA	NA	NA	NA
Furnace Stocking Baghouse No.9	1.42	NA	NA	NA	NA	NA
Total, Projected Actual Emissions	**7.86**	NA	NA	NA	NA	NA

Baseline Actual Emissions

P4 Production did not calculate baseline actual emissions. However, it did not affect the outcome of the major modification analysis. It was assumed that baseline actual emissions were zero and since the projects projected actual emissions themselves do not exceed the significant threshold the project is not significant or a major modification.

Project Emissions Increase

The project emissions increase is presented in the following table:

Table 3 PROJECT EMISSIONS INCREASE

Emissions	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources						
Projected Actual Emissions	7.86	NA	NA	NA	NA	NA
Baseline Actual Emissions	0.0	NA	NA	NA	NA	NA
Project Emissions Increase	**7.86**	NA	NA	NA	NA	NA

Comparison of the Project Emissions Increase to the PSD Significance Thresholds

The comparison of the change in projected actual emissions from baseline actual emissions to the PSD significance thresholds is presented in the following table.

Table 4 COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE PSD MAJOR MODIFICATION THRESHOLDS

Emissions	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources						
Project Emissions Increase	7.86/7.86	NA	NA	NA	NA	NA
PSD Significance Threshold	**15/10**	**40**	**40**	**100**	**40**	**100,000**
Does the Project Emissions Increase Exceed the PSD Major Modification Threshold?	No	No	No	No	No	No

As presented in the preceding table this project does not constitute a PSD Major Modification and is not subject to PSD permitting requirements.

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the furnace burden handling operations at the facility (see Appendix A) associated with this proposed project.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The facility did not provide the uncontrolled potential to emit, nor could an uncontrolled potential to emit be found in DEQs permitting records. However, it can be determined whether the facility is a "Synthetic Minor" source by the facilities Potential to Emit considering federally enforceable permit conditions. The facility has a potential to emit of 698 tons per year of CO[2], therefore the uncontrolled potential to emit of the facility is greater than 100 tons per year and the facility is not a "Synthetic Minor" source.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit particulate matter from the units being modified.

Table 5 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$[(a)] T/yr
Furnace No. 7 CO Baghouse	0.0186
Furnace No. 7 CO Baghouse	0.0437
Furnace No. 7 CO Baghouse	0.0296
Main Furnace Baghouse	0.408
Pre-project Totals	**0.4999**

a) Controlled average emission rate in tons per year is an annual average, based on the February 11, 2016 Statement of Basis for project 61319.

These emissions rates are not emission rate limits included in the existing permit and the calculation methodology for the pre-project potential to emit and the post project potential to emit are different, allowable emissions changes are not expected to increase as all sources continue to be controlled by baghouses. Pre-project emissions were calculated using an emission factor and the control efficiency of the existing baghouses and the post-project potential to emit was calculated using manufacturer's warrantied grain loading emission concentrations and the flow rate from the new baghouses.

2 See the February 11, 2016 Statement of Basis for project 61319.

The applicant did not provide the pre-project potential to emit in the application for this permit action. The pre-project potential to emit was obtained from the DEQ February 11, 2016 Statement of Basis for project 61319. Page 18 of the application includes actual emissions, not pre-project potential to emit. The actual emissions rates on page 18 of the application were used for modeling purposes and do not reflect the potential to emit of the sources.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from those emissions units associated with the project at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 6 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$[a] T/yr
Furnace No. 7 CO Baghouse	0.46
Furnace No. 8 CO Baghouse	0.91
Furnace No. 9 CO Baghouse	0.91
Furnace Stocking Baghouse No.7	1.47
Furnace Stocking Baghouse No.8	2.69
Furnace Stocking Baghouse No.9	1.42
Pre-project Totals	**7.86**

a) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants based on calculations provided by the facility.

Table 7 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$ T/yr
Pre-Project Potential to Emit	0.5
Post Project Potential to Emit	7.86
Changes in Potential to Emit	**7.36**

TAP Emissions

The project will not result in an increase of allowable emissions of toxic air pollutants. All point sources of emissions continue to be controlled by baghouses.

The existing system allows furnace burden dust emissions to be emitted inside of the building and not be captured by the existing system and then they are vented to the atmosphere through openings in the building. The new systems will collect more of these building emissions and send them to the new baghouses for control. It is not believed there is an increase of allowable toxic air pollutant emissions from this change. The actual emissions units are not changed.

Ambient Air Quality Impact Analyses.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Caribou County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 8 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	>100	89.4	**100**	SM80
PM_{10}	>100	89.4	**100**	SM80
$PM_{2.5}$	>100	78.5	**100**	SM
SO_2	UNK	129	**100**	A
NO_X	UNK	35	**100**	UNK
CO	.>100	698	**100**	A
VOC	UNK	0.21	**100**	B
HAP (single)	UNK	UNK	**10**	UNK
Total HAPs	UNK	18.5	**25**	UNK

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ....Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

P4 requested that the permit to construct and Tier I operating permit be co-processed in accordance with IDAPA 58.01.01.209.05.b.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ....Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ....Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility have a potential to emit greater than 100 tons per year for SO_2, and CO as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10.

A permit to construct and Tier I operating permit are being co-processed in accordance with IDAPA 58.01.01.209.05.b.

PSD Classification (40 CFR 52.21)

40 CFR 52.21..Prevention of Significant Deterioration of Air Quality

The facility is classified as an existing major stationary source, because the estimated emissions of SO_2 and CO have the potential to exceed 100 tons per year. The facility is a designated facility (phosphate rock processing plant) as defined in 40 CFR 52.21(b)(1)(i)(a).

The modification at the facility is not significant and does not constitute a major modification as demonstrated previously.

NSPS/NESHAP/MACT/GACT Applicability (40 CFR 60, 61, 63)

The modification at the facility is not subject to any NSPS, NESHAP, MACT or GACT requirement.

Permit Conditions Review

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

Table 1.1 has been updated to add three furnace stocking baghouses and remove the main stock baghouse to reflect the changes to be made by the facility.

Section 3.1, the process description for *Scaleroom processing and furnace stocking* has been updated to remove the main stock baghouse and add three new furnace stocking baghouses.

Table 3.1 has been updated to accurately describe which emissions units vent to which baghouse.

Permit Condition 3.3 and Table 3.2 have been updated to include the new baghouse emissions limits. The emissions limits are based the emission inventory provided by the applicant and used in the air pollution dispersion model.

Permit Condition 3.6 has been divided into two sections, 3.6.1 and 3.6.2. Permit Condition 3.6.1 was updated to clarify that the existing requirements only apply to the coke handling baghouse and the scaleroom baghouse. Permit Condition 3.6.2 is a new permit condition and only applies to the 3 new CO baghouses and 3 new furnace stocking baghouses. The new requirement is DEQ standard permit condition for baghouses.

Permit Conditions 3.9, 3.10, 3.11, 3.14 and 3.15. These new permit conditions are intended to assure that there is no additional air flow, and therefore no additional CO emissions, from the furnace stocking tubes to the new CO baghouses. The static pressure at the tubes shall not be less than the static pressure that existed prior to the addition of the new ventilation system as required to be monitored by this permit. The existing pressure at the stock tubes is currently unknown as there is not a static pressure gauge installed. These permit conditions require the installation of pressure gauges and monitoring of the pressure prior to the systems being modified. After the systems are modified the pressure at the tubes shall not be less than the average monitored prior to the change. The permit requires monitoring of the pressure during furnace feed operations to assure consistency in the measurement and to reflect existing pressures when the burden is introduced to the furnace. The permit conditions require that the diameter of the stocking tubes remain the same before and after the upgrades and that the source monitor the static pressure before and after the upgrades. Keeping the tube diameter and pressure equal to or greater than conditions prior to the modification assures that there is not a physical or operational change that affects CO emissions. The permittee requested that the static pressure limitation be based on an average value, this request was granted. Pre and post project emissions testing for CO at the baghouses is not warranted because no additional flow from the furnace stocking tubes will occur as assured by limiting the static pressure at the stocking tubes to equal to or greater than the existing static pressure. Additionally, source testing would only give results in terms of pounds per hour whereas the major modification test is on a ton per year basis, and the new ventilation system will have dampers to adjust flow (which could result in a different setting, and flow rate and therefore CO emissions before and after any source test). Further, the threshold for regulatory concern is 100 tons per year (the significant emission increase threshold for CO or 22.8 pounds per hour annual average). Assuring the static pressure does not decrease at the stocking tubes reasonably assures CO emissions will not increase, let alone increase by 100 tons per year. The source was opposed to source testing and it was determined by DEQ that source testing for CO is not required to provide a reasonable assurance that a major modification is not occurring if pressure monitoring is in place which P4 was not opposed to.

Permit Condition 3.16 requires an initial source test on each new baghouse within 180 days of startup. The source tests are warranted as the emission concentration (0.002 grains per dscf) used to calculate emissions rates is very low. Future testing can be required by the Tier I permit considering the results of the initial performance tests and the compliance assurance monitoring provisions that are incorporated into the Tier I permit at the time of renewal.

PUBLIC REVIEW

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.05.b. During this time, comments were not submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

APPENDIX A – EMISSIONS INVENTORIES

Table 2. MODELED EMISSIONS RATES FOR SIL ANALYSES – PROPOSED BAGHOUSES					
Source ID	Flow Rate (dscfm)	Dust Loading (gr/dscfm)[a]	PM Potential to Emit		
			(g/s)	(lb/hr)	(tpy)
F7DustBH	19,600	0.002	0.04	0.34	1.47
F7COBH	6,100	0.002	0.01	0.10	0.46
F8DustBH	35,900	0.002	0.08	0.61	2.69
F8COBH	12,200	0.002	0.03	0.21	0.91
F9DustBH	18,900	0.002	0.04	0.32	1.42
F9COBH	12,200	0.002	0.03	0.21	0.91
				Total	

a. From filter vendor warranty statement (Schenck Process LLC)

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: July 20, 2020

TO: Daniel Pitman, Permit Writer, Air Program

FROM: Pao Baylon, Modeling Review Analyst, Air Program

PROJECT: P-2012.0055 PROJ 62391, Permit Modification for an Existing Elemental Phosphorus Manufacturing Facility located near Soda Springs, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
FFG	Flexo-folder-glue Unit
GEP	Good Engineering Practice
hr	Hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
LEL	Lower Explosive Limit
m	Meters
m/sec	Meters per second
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
O_3	Ozone
P4	P4 Production, LLC (permittee)
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion

PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
ºF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

P4 Production, LLC (P4) submitted a Permit to Construct (PTC) application for its existing elemental phosphorus manufacturing facility located near Soda Springs, Idaho. The project involves replacing three CO dust collector baghouses with new units and replacing the main furnace baghouse with three independent system baghouses that will have greater capacity than the existing units. Overall, the project modification is expected to reduce emissions and improve air quality. Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Ramboll, on behalf of P4, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
General Emission Rates. Emission rates used in the air impact analyses, as listed in Table 4 of this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Air Impact Analyses for Criteria Pollutant Emissions. Short-term project emission increase of $PM_{2.5}$[a] and PM_{10}[b] and long-term emission increase of $PM_{2.5}$ are greater than DEQ Level I modeling thresholds. Therefore, 24-hour and annual $PM_{2.5}$ and 24-hour PM_{10} were subject to NAAQS Compliance Demonstration requirements.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above BRC thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for TAP Emissions. No TAP emission increases were associated with the project. Therefore, modeling of TAPs was not required.	A TAP increment compliance demonstration would be required for any TAPs with emissions above screening emission levels.
Modeled $PM_{2.5}$/PM_{10} Emission Rates for Baghouses. All emitted particulates from the baghouse were assumed to be less than 2.5 microns in diameter.	As is commonly done when permitting baghouses, all emitted particulates were assumed to be $PM_{2.5}$. Hence the $PM_{2.5}$ and PM_{10} emission rates were equivalent.
Modeled $PM_{2.5}$/PM_{10} Emission Rates for Existing Baghouses in Significant Impact Level Analysis. Modeled emission rates for the existing baghouses that would be removed as a result of the project were based on the results of three separate stack tests, which were conducted in March 2003, October 2008, and June 2013. Modeled emissions were calculated as the mean of the three test results for each baghouse, plus three standard deviations.	Removed units are modeled as negative emissions in a Significant Impact Level (SIL) Analysis. This way, the model results reflect the net change in emissions as a result of the baghouse upgrade project. The use of the mean plus three standard deviations for the decommissioned baghouses was approved for the project because overall, the net effect of the project is a general improvement in air quality.
Modeled Stack Height for New Baghouses. New baghouses were modeled with the following stack heights: F7DUSTBH = 45.1 m (148 ft)[c] F7COBH = 45.1 m (148 ft) F8DUSTBH = 24.4 m (80.1 ft) F8COBH = 47.2 m (154.9 ft) F9DUSTBH = 53.6 m (175.9 ft) F9COBH = 53.6 m (175.9 ft) These values must be verified upon final construction.	The exhaust stacks for the new baghouses should be built to the height used in the dispersion model or greater. Compliance has not been demonstrated for stack heights that are lower than those used in the air impact analyses.

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. m: meters; f: feet.

Summary of Submittals and Actions

February 22, 2020 Regulatory start date.

March 24, 2020 Application deemed incomplete.

April 24, 2020 DEQ received revised application.

May 21, 2020 Application deemed complete by DEQ.

2.0 Background Information

This section provides background information applicable to the project and the site proposed for the facility. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

P4 owns and operates an elemental phosphorous manufacturing facility located near Soda Springs, Idaho. Coke, quartzite, and phosphate ore are delivered to the site by truck or railcar. The coke and quartzite are dried, if needed, and screened. The phosphate ore is fed to a rotary kiln to form heat-hardened nodules. The nodules produced by the kiln are combined with coke and quartzite and heated in a reducing environment in one of three electric arc furnaces.

The phosphate ore-coke-quartzite mixture (the "furnace burden") is gravity-fed continuously into each furnace through stock tubes supplied from stock bins located above each furnace. In addition to the stock tubes discharging burden into the furnace, each stock bin includes the following components at the top of the bin: a feed chute connected to the stocking system, an equalizing line that accommodates air displacement during stocking and a pickup point for the CO Dust Collector Baghouse. The CO Dust Collector Baghouses capture and remove dust from the stock bins as they are loaded by the stocking system. Although the stock tubes are continuously filled by the stock bins, relatively small quantities of gases percolate up through the furnace burden and are captured by the CO Dust Collector Baghouses. The concentration of CO in these gases from the furnace sometimes exceed the lower explosive limit (LEL), which can result in a rapid combustion or deflagration. This situation presents a significant threat to the safety of anyone working in the area. P4 proposes to replace the three existing CO Dust Collector Baghouses with three new, increased capacity baghouses that will each draw sufficient ambient air to dilute the captured furnace gases and reduce CO concentrations to less than the LEL. P4 proposes to upgrade the Furnace No. 7 CO Dust Collector Baghouse, followed by the Furnace Nos. 8 and 9 CO Dust Collector Baghouses, with the exact timing based on future facility shutdown schedules.

The existing Main Furnace Baghouse is located at the north end of the furnace building, and knife gates are used to direct the negative pressure induced by the associated fan to the various pickup points on each of the three furnaces. The long duct runs and inconsistent performance of the knife gates prevent the existing baghouse from performing up to its potential. P4 proposes to replace the Main Furnace Baghouse with three new baghouses, one dedicated to the stocking system for each of the three furnaces. Since each new baghouse will be dedicated to a particular furnace and located closer to pickup points, the effects of inconsistent knife gate operation will be mitigated. Additional pickup points will be added to each new stocking system baghouse along with belt sweeps to clean off and collect fugitives that currently fall to the floor from the belts at the first return idler. P4 proposes to install each new stocking system baghouse as the new furnace CO Dust Collector Baghouses are installed.

Once all three new stocking system baghouses are added, the Main Furnace Baghouse will be removed. The project will not allow increased utilization of any existing process equipment, higher throughput of any raw material, or production of elemental phosphorous above the plant's current capacity under existing permit limits.

The PTC addresses all air pollutant-emitting activities associated with the facility.

2.2 Facility Location and Area Classification

The P4 facility is located in the Bear Lake Valley about two miles north of downtown Soda Springs, within Caribou County (Northing: 4,726,084 m; Easting: 452,135 m; UTM Zone 12). This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS****. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.*** *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations****. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

Table 2. APPLICABLE REGULATORY LIMITS.				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] (μg/m³)[b]**	**Regulatory Limit [c] (μg/m³)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates an exceedance of NAAQS, a culpability analysis can determine if this exceedance is due to emissions from the proposed project. The permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section

210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the P4 facility were estimated by Ramboll for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds is conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

Table 3 provides a comparison between project-specific emission increases and modeling applicability thresholds. Emission decreases associated with removal of existing units were not included in the project emission increase calculation for modeling applicability.

Table 3. SITE-SPECIFIC CRITERIA POLLUTANT MODELING APPLICABILITY.

Pollutant	Averaging Period	Emission Increase	Level I Modeling Thresholds	Level II Modeling Thresholds[a]	Site-Specific Modeling Required?
PM_{10}[b]	24-hour	1.80 lb/hr[c]	0.22	2.6	Yes
$PM_{2.5}$[d]	24-hour	1.80 lb/hr	0.054	0.63	Yes
	Annual	7.88 tpy[e]	0.35	4.1	Yes
Carbon Monoxide (CO)	1-hour, 8-hour	0 lb/hr	15	175	No
Sulfur Dioxide (SO_2)	1-hour, 3-hour,	0 lb/hr	0.21	2.5	No
Nitrogen Oxides (NOx)	1-hour	0 lb/hr	0.20	2.4	No
	Annual	0 tpy	1.2	14	No

a. Level II Modeling Thresholds were not evaluated or approved for use with this project.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Pounds per hour.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Tons per year.

As indicated in Table 3, air impact modeling is required for 24-hour PM_{10} and 24-hour and annual $PM_{2.5}$ based on the Level I modeling thresholds. The use of Level II modeling thresholds was not approved by DEQ for this project.

Table 4 lists criteria pollutant emission rates used in the SIL analysis. As is commonly done when permitting baghouses, all emitted particulates were assumed to be less than 2.5 microns in diameter (i.e., $PM_{2.5}$), so PM, PM_{10}, and $PM_{2.5}$ emission rates are all equivalent. The proposed baghouses were included in the model with emission rates equal to the maximum calculated potential to emit. The modeled emission total in Table 4 for the new units (1.80 lb/hr for 24-hour $PM_{2.5}$ and 24-hour PM_{10}, and 7.88 tpy for annual $PM_{2.5}$) matches the project-specific emission increase listed in Table 3.

Table 4. MODELED EMISSION RATES FOR SIL ANALYSIS.

Source ID	24-hour $PM_{2.5}$ (lb/hr)[a]	Annual $PM_{2.5}$ (tpy)[b]	24-hour PM_{10} (lb/hr)
F7DUSTBH	0.337	1.474	0.337
F7COBH	0.105	0.458	0.105
F8DUSTBH	0.615	2.692	0.615
F8COBH	0.209	0.916	0.209
F9DUSTBH	0.325	1.422	0.325
F9COBH	0.209	0.916	0.209

MS_OLD	-0.264	-1.158	-0.264
F7CO_OLD	-0.041	-0.180	-0.041
F8CO_OLD	-0.076	-0.335	-0.076
F9CO_OLD	-0.130	-0.567	-0.130

a. Pounds per hour.
b. Tons per year.

To reflect the decrease in emissions that will occur when the existing baghouses (denoted with the suffix "_Old" in Table 4) are removed, negative emissions associated with those baghouses were also included in the SIL analysis. This way, the model results reflect the net change in emissions as a result of the baghouse upgrade project. Emissions from the existing baghouses were based on the results of three separate stack tests, which were conducted in March 2003, October 2008, and June 2013. Modeled emissions from the existing baghouses were calculated as the mean of the three test results for each baghouse, plus three standard deviations (Table 5). This was accepted by DEQ during the pre-application phase as a fair but conservative way of representing existing baghouses in the SIL analysis. All modeled criteria pollutant concentrations were below applicable SILs. Therefore, no cumulative analysis was required.

Table 5. MODELED PARTICULATE MATTER EMISSION RATES FOR EXISTING BAGHOUSES.

Source ID	March 2003	October 2008	January 2013	Average (lb/hr)[a]	Standard Deviation (lb/hr)	Modeled (lb/hr)
MS_Old	0.100	0.150	0.038	0.096	0.056	0.264
F7CO_Old	0.030	0.024	0.019	0.024	0.006	0.041
F8CO_Old	0.064	0.052	0.059	0.058	0.006	0.076
F9CO_Old	0.076	0.027	0.024	0.042	0.029	0.130

a. Pounds per hour.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource-intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 within the context of permitting a new stationary source has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

DEQ determined it was not appropriate or necessary to require a quantitative source-specific O_3 impact analysis because allowable emission estimates of VOCs and NOx are below the 100 tons/year threshold.

3.1.2 TAPs Modeling Applicability

No TAP emission increases will be associated with the project. Therefore, no modeling of TAPs was required.

3.1.3 Emission Release Parameters

Table 6 lists the emission release parameters, including stack height, exhaust temperature, exhaust velocity, and stack diameter for the P4 facility's emission sources in metric units (English units are in parentheses). Emission point release parameters were based on information provided in the application. Justification for emission release parameters is summarized in the next section.

Table 6. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).

Release Point	Description	UTM[a] Coordinates		Stack Height in m (ft)[c]	Stack Exhaust Temp. in K (°F)[d]	Stack Exhaust Velocity in m/sec (fps)[e]	Stack Diameter in m (ft)	Orient. Of Release[f]
		Easting-X in m[b]	Northing-Y in m					
F7DUSTBH	Furnace 7 Dust Baghouse	451,870.00	4,726,166.00	45.1 (148.0)	313.7 (105.0)	25.1 (82.5)	0.81 (2.67)	V
F7COBH	Furnace 7 CO Baghouse	451,870.00	4,726,169.00	45.1 (148.0)	324.8 (125.0)	24.7 (81.0)	0.46 (1.50)	V
F8DUSTBH	Furnace 8 Dust Baghouse	451,846.00	4,726,198.00	24.4 (80.1)	313.7 (105.0)	29.4 (96.4)	1.02 (3.33)	V
F8COBH	Furnace 8 CO Baghouse	451,865.00	4,726,136.00	47.2 (154.9)	324.8 (125.0)	27.7 (91.0)	0.61 (2.00)	V
F9DUSTBH	Furnace 9 Dust Baghouse	451,853.00	4,726,097.20	53.6 (175.9)	313.7 (105.0)	27.6 (90.6)	0.76 (2.50)	V
F9COBH	Furnace 9 CO Baghouse	451,853.00	4,726,092.00	53.6 (175.9)	324.8 (125.0)	27.7 (91.0)	0.61 (2.00)	V
MS_OLD	Old Main Baghouse	451,846.00	4,726,198.00	24.4 (80.1)	295.2 (71.7)	18.6 (61.0)	0.76 (2.50)	V
F7CO_OLD	Old Furnace 7 CO Baghouse	451,870.00	4,726,169.00	45.1 (148.0)	322.1 (120.0)	13.0 (42.8)	0.33 (1.08)	V
F8CO_OLD	Old Furnace 8 CO Baghouse	451,865.00	4,726,136.00	47.2 (154.9)	308.9 (96.4)	17.3 (56.6)	0.45 (1.48)	V
F9CO_OLD	Old Furnace 9 CO Baghouse	451,853.00	4,726,092.00	53.6 (175.9)	312.8 (103.0)	15.1 (49.7)	0.45 (1.48)	V

a. Universal Transverse Mercator.
b. m: meters.
c. ft: feet.
d. K: Kelvin; °F: degrees Fahrenheit.
e. m/sec: meters per second; fps: feet per second.
f. V: vertical, uninterrupted release.

3.1.4 Emission Release Parameter Justification

New Dust and CO Baghouses

Model IDs: F7DUSTBH, F7COBH, F8DUSTBH, F8COBH, F9DUSTBH, and F9COBH

Stack parameters for the proposed new baghouses were provided by the project design team. All modeled exhaust parameters were based on facility design values. Modeled exhaust heights were based on facility design stack discharge height. These values must be verified upon final construction. Modeled exit temperatures were based on facility design minimum stack exit temperature. Modeled diameters at the point of exhaust to the atmosphere were based on facility design stack exit diameter. Facility design maximum air flow rates were used to calculate the stack exit velocity (Table 7). All modeled parameters for the proposed new baghouses were adequately documented. Exhaust flow rates were based on maximum design air flow rates. Although DEQ recommends the use of typical flows rather than non-conservative maximum rates, other parameters used in the air impact modeling analyses are very conservative, and DEQ concluded that modeled results will likely overestimate impacts.

Table 7. CALCULATION OF EXIT VELOCITY FOR THE NEW BAGHOUSES.

	Facility Design Maximum Air Flow Rate, *FR* (acfm)[a]	Facility Design Stack Exit Diameter, *D* (ft)[b]	Stack Exit Velocity (m/sec)[c] $= FR \times \frac{4}{\pi(D)^2} \times \frac{1meter}{3.28ft} \times \frac{1minute}{60seconds}$
F7DUSTBH	27,654	2.67	25.1
F7COBH	8,587	1.50	24.7
F8DUSTBH	50,493	3.33	29.4
F8COBH	17,174	2.00	27.7
F9DUSTBH	26,685	2.50	27.6
F9COBH	17,174	2.00	27.7

a. Actual cubic feet per minute.
b. Feet.
c. Meters per second.

Existing Dust and CO Baghouses

Model IDs: MS_OLD, F7CO_OLD, F8CO_OLD, and F9CO_OLD

Exit velocities and temperatures for the existing baghouses were based on averages of parameters reported for the three source tests (March 2003, October 2008, and January 2013) from which the existing baghouse emissions were calculated. Table 8 presents a summary of the exit temperature calculations. Table 9 presents a summary of the exit velocity calculation. Modeled stack heights were based on actual construction values. Exhaust parameters for existing baghouses were adequately justified.

Table 8. CALCULATION OF EXIT TEMPERATURE FOR EXISTING BAGHOUSES.

Source ID	March 2003 (°F)[a]	October 2008 (°F)	January 2013 (°F)	Average (°F)
MS_Old	59.2	62.0	94.0	71.7
F7CO_Old	120.1	97.0	143.0	120.0
F8CO_Old	89.3	83.0	117.0	96.4
F9CO_Old	103.0	92.0	115.0	103.3

a. Degrees Fahrenheit.

Table 9. CALCULATION OF EXIT VELOCITY FOR EXISTING BAGHOUSES.						
Source ID	Gas Flow Rate (acfm)[a]			Average Gas Flow Rate, FR (acfm)	Exit Diameter, D (ft)[b]	Stack Exit Velocity (m/sec)[c] $= FR \times \frac{4}{\pi(D)^2} \times \frac{1meter}{3.28ft} \times \frac{1minute}{60seconds}$
	March 2003	October 2008	January 2013			
MS_Old	17,300	17,679	18,939	17,972.7	2.50	18.6
F7CO_Old	1,610	2,875	2,607	2,364.0	1.08	13.1
F8CO_Old	6,360	5,901	5,259	5,840.0	1.48	17.2
F9CO_Old	5,210	5,187	4,979	5,125.3	1.48	15.1

a. Actual cubic feet per minute.
b. Feet.
c. Meters per second.

3.2 Background Concentrations

All modeled criteria pollutants were below applicable SILs. Therefore, no cumulative analysis was required.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

Ramboll performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 10 provides a brief description of parameters used in the modeling analyses.

Table 10. MODELING PARAMETERS.		
Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Caribou County, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Onsite surface data; KPIH surface station; KSLC upper air station	Ramboll processed the meteorological data used in the modeling analysis. See Section 3.3.5 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1/3 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.6 for more details.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD. See Section 3.3.7.
Receptor Grid	**SIL Analysis** The selection of receptors for use in the SIL analysis is as follows (see Section 3.3.11):	
	Grid 1	10-meter spacing along the ambient air boundary.
	Grid 2	50-meter spacing to 300 meters from the ambient air boundary.
	Grid 3	100-meter spacing to 1,000 meters from the ambient air boundary.
	Grid 4	200-meter spacing to 2,000 meters from the ambient air boundary.
	Grid 5	500-meter spacing to 5,000 meters from the ambient air boundary.

	Cumulative NAAQS Impact Analysis All modeled impacts were below applicable SILs. Therefore, a cumulative NAAQS impact analysis was not required.
	TAPs Analysis No TAPs were modeled for this project.

3.3.2 Modeling Protocol

No modeling protocol was submitted to DEQ.

3.3.3 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*[2].

3.3.4 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 19191 was used by Ramboll for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.5 Meteorological Data

The EPA's meteorological program, AERMET, was used by Ramboll to process meteorological data for use with AERMOD. AERMET combines surface meteorological observations with twice-daily upper air soundings to calculate the meteorological variables and profiles required by AERMOD. AERMET (version 19191) was used for the modeling analysis, and the option to adjust the surface friction velocity (U*) for low-wind or stable conditions was used.

P4 currently owns and operates a 10-meter meteorological tower onsite, in operation since 2016. However, a 65-meter surface meteorological station located at the north end of the facility was operated by P4 from 2002 to 2008. This tower allowed for measurement of temperature and wind speed at multiple heights. The station collected hourly wind speed, wind direction, lateral wind turbulence, vertical wind turbulence, and temperature at three levels above grade (10 meters, 37 meters, and 65 meters), as well as solar radiation, temperature, and relative humidity at 2 meters above grade, and precipitation. Due to the quality and completeness of data recorded at the 65-meter tower, the most recent five-year period of meteorological data collected (January 1, 2004 to December 31, 2008) were processed within AERMET as onsite data.

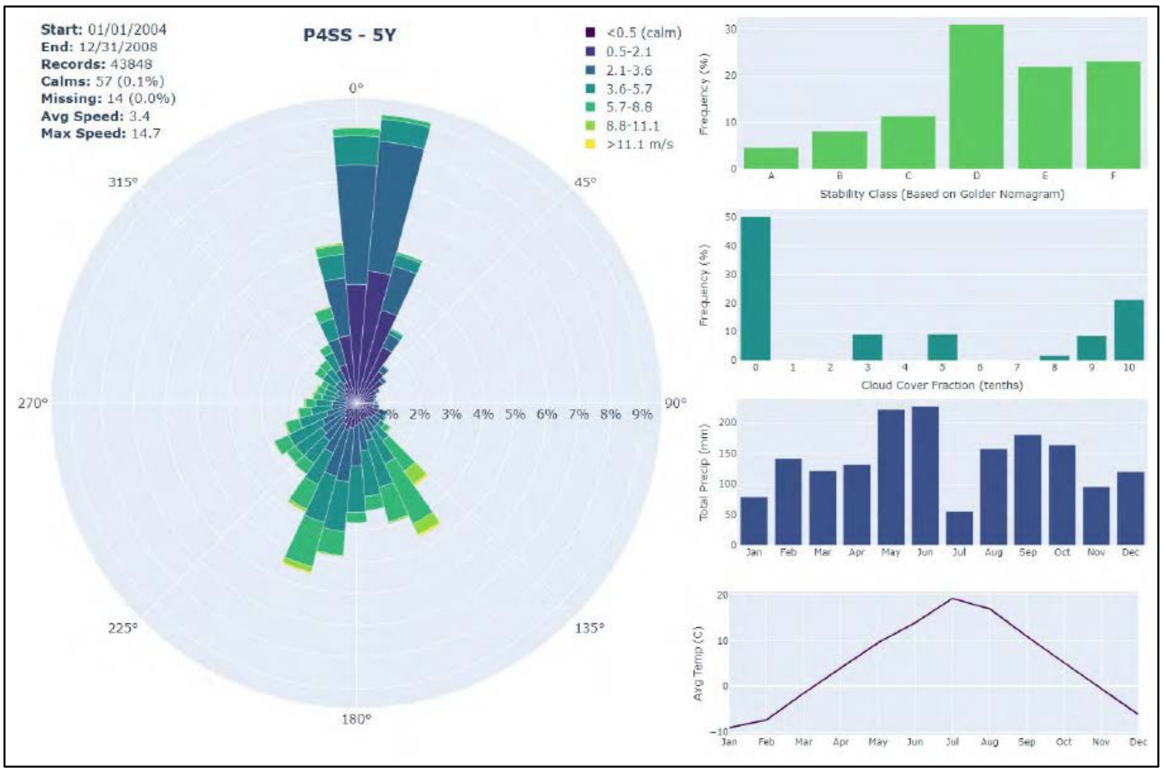
To supplement available onsite data, a representative meteorological data set was prepared using surface meteorological data from the National Weather Service (NWS) station at Pocatello Regional Airport (station KPIH), 85 kilometers northwest of the facility.

Upper air observations were obtained from the NWS site in Salt Lake City, Utah (station KSLC) for the selected period. The upper air data were collected from the National Oceanic and Atmospheric Administration (NOAA) Forecast Systems Laboratory Radiosonde Database (http://raob.fsl.noaa.gov).

Upper air data collected by the Salt Lake City NWS station were used due to its proximity to the P4 meteorological station and is located in more similar terrain than the next closest alternative located in Boise, Idaho.

A windrose summarizing the wind speed and wind direction data from the data set along with wind data statistics and plots of other meteorological variables is provided in Figure 1. Additional meteorological variables and geophysical parameters are required for the AERMOD dispersion model to estimate surface energy fluxes and construct boundary layer profiles. Surface characteristics including albedo, Bowen ratio, and surface roughness length were determined for the area surrounding the facility and the Centralia-Chehalis Airport meteorological station using the AERMET surface characteristics pre-processor, AERSURFACE (version 13061), and USGS National Land Cover Dataset (NLCD) land use data. DEQ determined that these data are adequately representative of the meteorology at the P4 facility.

Figure 1. WIND DATA STATISTICS AT P4 FACILITY (2004-2008).

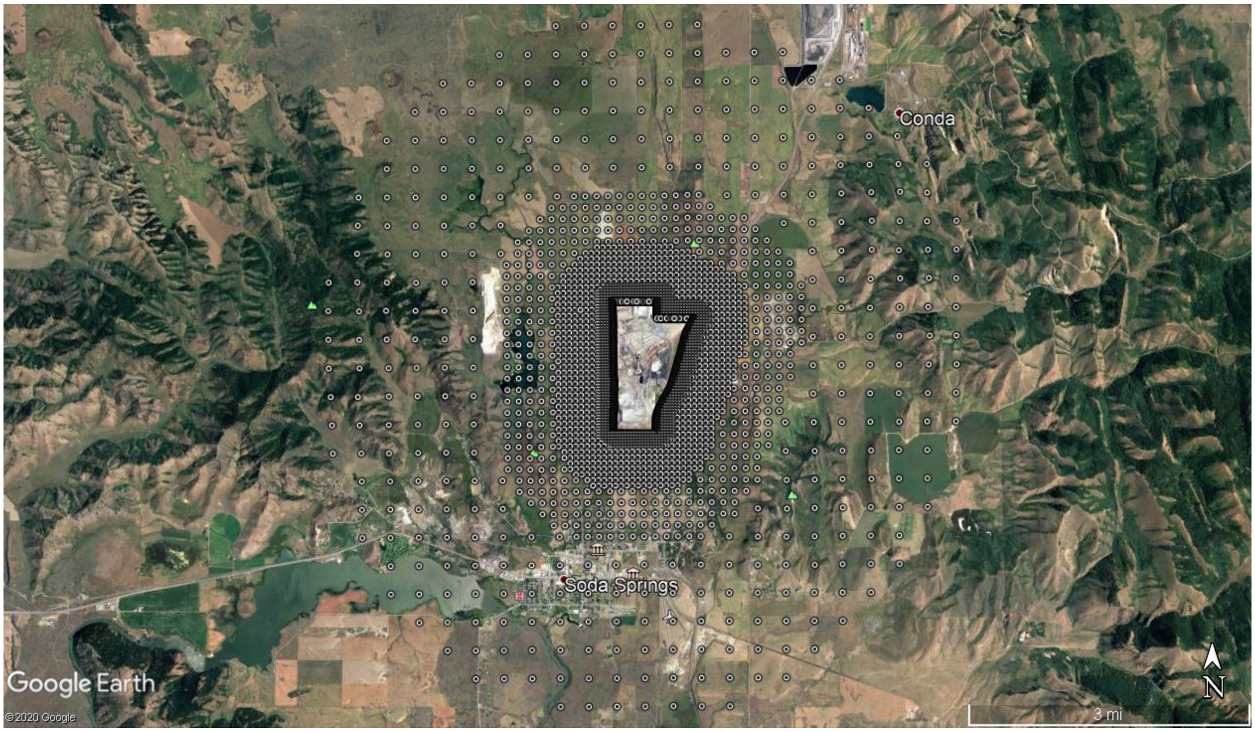


3.3.6 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used by Ramboll to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emission plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 2 depicts the full receptor grid used in the analyses, overlaid on a terrain image from Google Earth.

Figure 2. THE FULL RECEPTOR GRID CENTERED AT THE P4 FACILITY NEAR SODA SPRINGS, IDAHO.



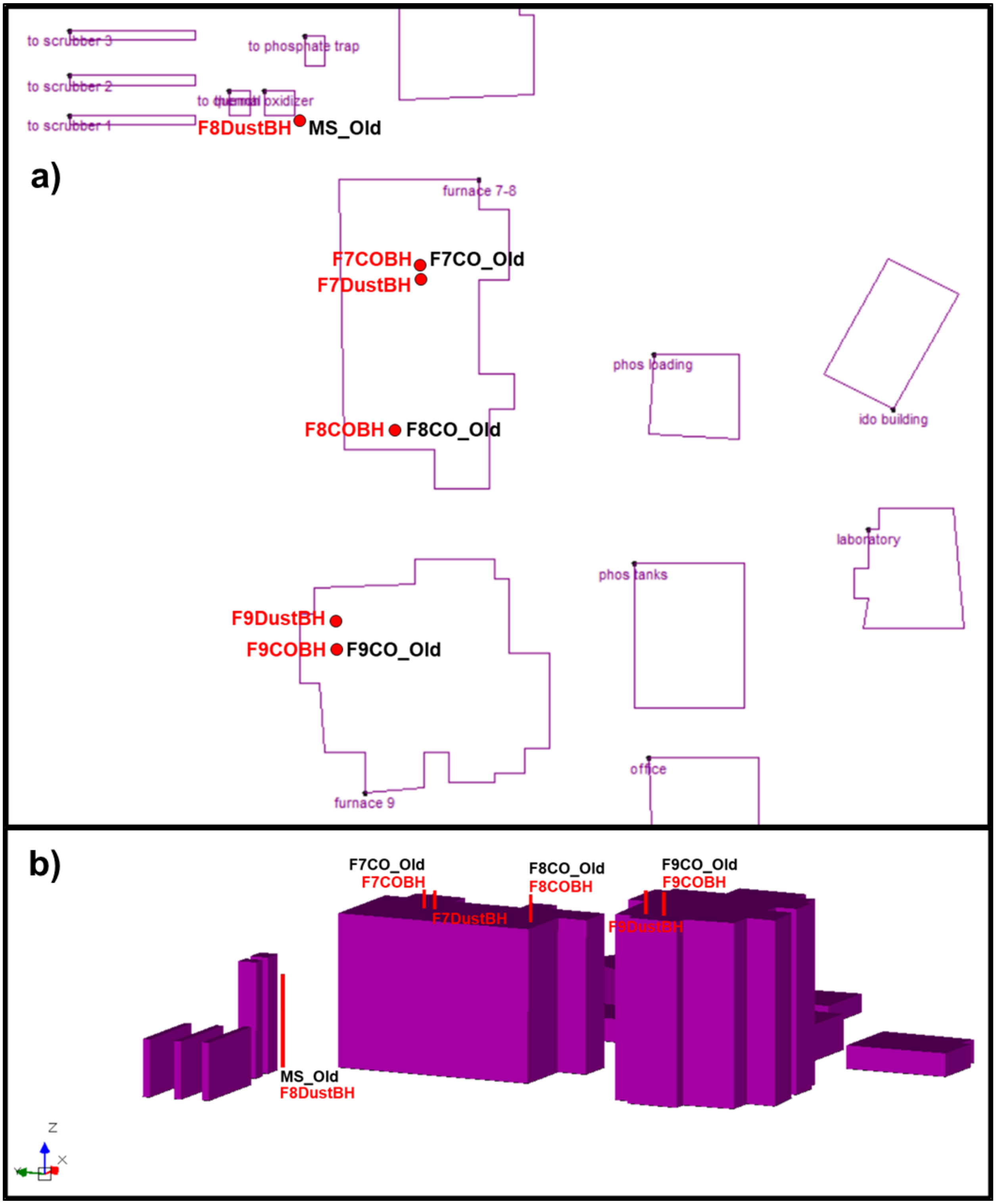
3.3.7 Facility Layout and Downwash

Figure 3 shows the facility's structures and emission sources near the vicinity of project-related emission units. Red dots in Figure 3a represent point sources. Figure 3b depicts a three-dimensional view of Figure 3a, as viewed from the southwest. Black font represents existing units that would be removed as a result of the project while red font represents new emission units.

P4 is proposing to construct two baghouses for each of Furnaces 7, 8 and 9. One baghouse will control fugitive emissions from material movement and loading (denoted Dust baghouses in the modeling), and one will control PM releases from the furnaces (denoted CO in the modeling). The Dust baghouses for Furnaces 7 and 9 are located near their respective CO baghouses. The Dust baghouse for Furnace 8 will be located at the main stack baghouse, which currently treats fugitive dust emissions from all three furnaces.

To characterize the net impact of the project, currently installed baghouses are included in the modeling. These sources were denoted with the suffix "_Old", and were modeled with negative emission rates based on previous stack testing.

Figure 3. (a) P4 FACILITY'S MODEL SETUP SHOWING STRUCTURES AND EMISSION SOURCES NEAR THE VICINITY OF THE PROJECT EMISSION UNITS, AND (b) THREE-DIMENSIONAL VIEW OF (a) AS VIEWED FROM THE SOUTHWEST.



DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application. Aerial photographs on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application.

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

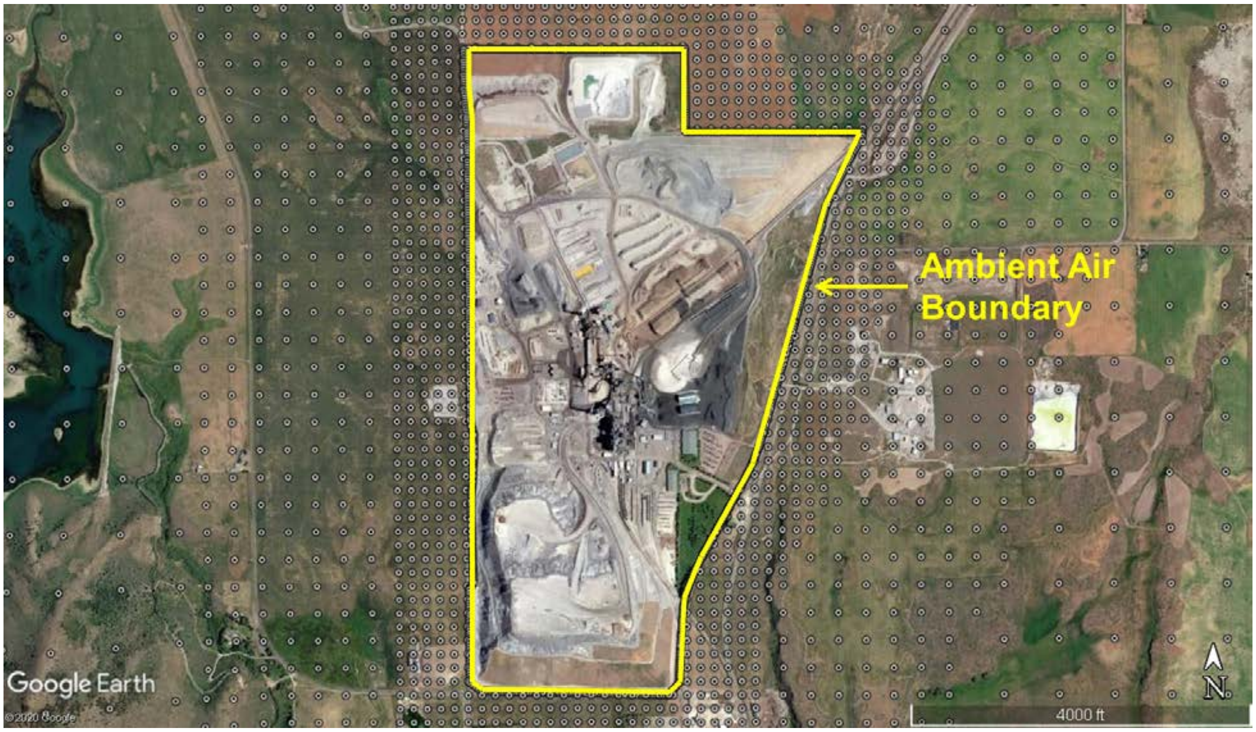
3.3.8 NOx Chemistry

Since the project will not result in increased NOx emissions, NOx to NO_2 conversion methods were not considered.

3.3.9 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as “that portion of the atmosphere, external to buildings, to which the general public has access.” The ambient air boundary was determined using the fenceline around the P4 property. The public does not have access to any portion of the facility, with a fence enclosing all facility operations. The ambient boundary is illustrated below in Figure 4. DEQ determined that the facility is adequately able to preclude public access to areas excluded from the air impact assessment.

Figure 4. P4 FACILITY’S AMBIENT AIR BOUNDARY.



3.3.10 Nearby Co-Contributing Sources

If impacts of neighboring emission sources on receptors showing a significant impact from the sources subject to the permitting action are not adequately accounted for by the background concentration used, then emissions from those sources must be modeled. All modeled criteria pollutant concentrations were below applicable SILs. Therefore, a cumulative impact analysis was not required.

3.3.11 Receptor Network

Table 10 describes the receptor network used in the submitted modeling analyses. The receptor network included receptors spaced 500 meters apart covering the outermost portion of the domain, which extends to 5-kilometers from the property boundary. Nested grids of 50-meter, 100-meter, and 200-meter spaced receptors covered 300 meters, 1 kilometer, and 2 kilometer from the property boundary, respectively. Receptors were also located at 10-meter intervals along the north and south facility property boundaries. The full grid, along with the fenceline receptors, includes a total of 3,175 receptors and is illustrated in Figure 2. DEQ determined that the receptor grid used in the submitted modeling analyses was adequate to resolve maximum modeled impacts.

The receptor grid used in the submitted modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], and DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.12 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

Sources from the P4 facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

4.1.1 Significant Impact Level Analysis

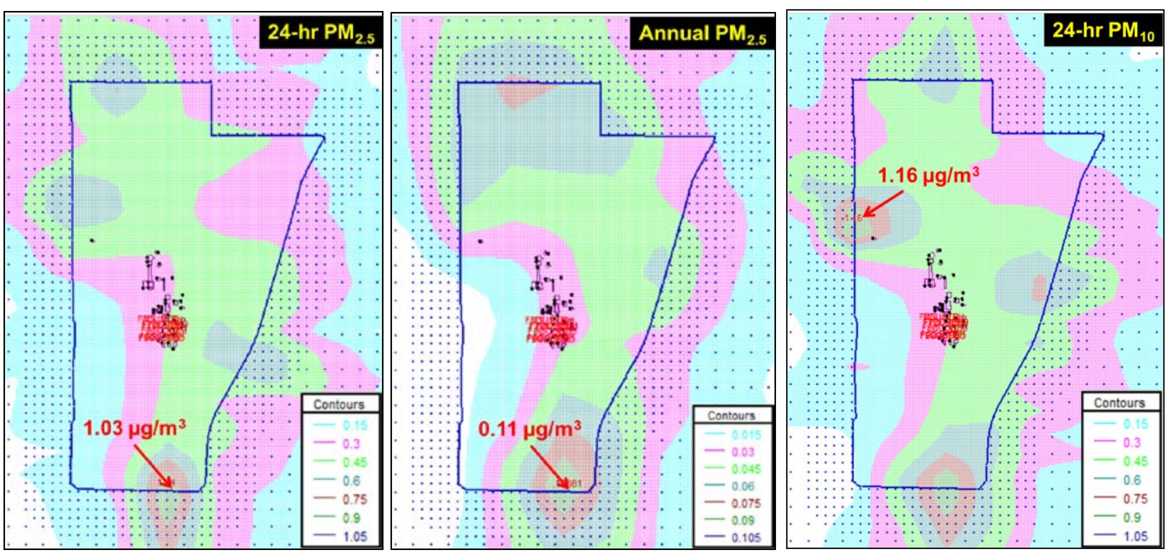
Table 11 provides results for the significant impact level (SIL) analysis. The SIL analysis shows that the maximum predicted impacts from the facility are below the SIL for all criteria pollutants. Therefore, a cumulative NAAQS impact analysis was not performed.

Table 11. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSIS.					
Pollutant	**Averaging Period**	**Maximum Modeled Concentration ($\mu g/m^3$)[a]**	**Significant Impact Level ($\mu g/m^3$)**	**Impact Percentage of Significant Impact Level**	**Cumulative NAAQS Analysis Required?**
$PM_{2.5}$[b]	24-hour	1.03	1.2	85.8%	No
	Annual	0.11	0.2	55.0%	No
PM_{10}[c]	24-hour	1.16	5.0	23.3%	No

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers

Figure 5 shows plots of maximum modeled concentrations. High modeled values are located west and south of the facility.

Figure 5. MAXIMUM MODELED CONCENTRATIONS FOR SIL ANALYSIS.



4.1.2 Cumulative NAAQS Impact Analysis

A cumulative NAAQS impact analysis was not performed because the maximum modeled concentration for all criteria pollutants did not exceed the SIL.

4.2 Results for TAPs Impact Analyses

Since the project will not result in a change in TAP emissions, no TAPs were included in the air impact analysis.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ's air impact analyses, demonstrated to DEQ’s satisfaction that emissions from the P4 facility near Soda Springs, ID will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses*. Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on July 31, 2020:

Facility Comment: Section 3.1: P4 requests inclusion of a heading above the paragraph on quartzite handling titled "Undried quartzite handling to screening and storage" to eliminate confusion associated with having a section on quartzite handling under a heading on coke handling.

DEQ Response: DEQ made this suggested change.

Facility Comment: Section 3.3: Previously provided baseline actual and potential to emit emissions were based on previous testing specific to Method 5 only. P4 has no stack test results for particulate emissions from the baghouses that include condensable particulate, as measured by Method 202. Consequently, P4 requests the inclusion of a conditional compliance schedule that clarifies that in the event the measured emissions from the compliance test performed in accordance with Section 3.16 exceed the limits in Section 3.3 due to the use of Method 202, P4 will be permitted to submit an application for an amendment to this permit based on the data gained from the compliance test.

DEQ Response: Appendix C of P4's April 23, 2020 application, which includes the most recent emissions data provided by P4, includes back half emissions data. That data was used for air pollution dispersion modeling. The emissions rate limits for PM_{10} and $P_{2.5}$ include back half emissions by definition and during the source test that is required by the permit back half emissions will be required to be measured. If P4 violates the emission rate limits a permit amendment application may be submitted to change the allowable emissions rates to those measured during the test. That submittal will be required to have updated air pollution dispersion modeling that shows that the source does not cause or significantly contribute to a violation. DEQ does not include conditional compliance schedule language in permits describing that the permit may be amended at future date based on a permit violation and has not included that language in this permit.

Facility Comment: Table 3.2: It appears that DEQ accidentally inserted the ton/year values for PM_{10}. The emissions limits for PM_{10} should be the same as the emissions limits for $PM_{2.5}$.

DEQ Response: DEQ has made the corrections to the PM_{10} emissions rate limits.

Facility Comment: Section 3.9: P4 requests the addition of a heading titled "Furnace CO Baghouse Operation" to increase clarity.

DEQ Response: This heading has been added to the permit as requested.

Facility Comment: Section 3.14: P4 requests the addition of a heading titled "Furnace CO Baghouse Monitoring" to increase clarity.

DEQ Response: This heading has been added to the permit as requested.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**P4 Production LLC**
Address:	**1853 Highway 34 North**
City:	**Soda Springs**
State:	**Idaho**
Zip Code:	**83276**
Facility Contact:	**Jim McCulloch**
Title:	**Permiting Contact**
AIRS No.:	**029-00001**

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM10	7.9	0	7.9
VOC	0.0	0	0.0
Total:	0.0	0	**7.9**
Fee Due	**$ 2,500.00**		

Comments: