Statement of Basis

Permit to Construct No. P-2008.0168
Project ID 61615

Hilex Poly Company LLC
Jerome, Idaho

Facility ID 053-00011

Final

February 26, 2016
Darrin Pampaian, P.E.
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.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CBP	concrete batch plant
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
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

O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
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
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
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/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Hilex Poly Company LLC (Hilex Poly) manufactures plastic grocery bags. Polyethylene pellets are transported to the facility and stored in bins. The polyethylene pellets are transferred from the storage bins to extruders via a vacuum handling system. The extruders form the pellets into a tubular film which is then cooled and passed through a corona treater. A high voltage corona discharge ionizes the film surface to prepare it for printing. Ozone is generated during this process by the corona treater and is exhausted to the atmosphere. The film is wound onto rolls and stored until needed for conversion into bags. Prior to this proposed permit modification, production equipment at the facility consists of 14 extruders, with 14 associated corona treaters, and 19 bag machines (3 of which are kept in reserve).

To add print to the bags, the rolls of film pass through three bag machine lines. The film is printed, then formed into bags and packaged for shipment. The printing operation results in the emissions of volatile organic compounds (VOCs), ethanol, and ammonia.

Permitting History

The following 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).

March 6, 2009	P-2008.0168, Permit revision to allow the removal of ozone monitoring equipment at the facility that was required as a result of permit P-040408, Permit status (A, but will become S upon issuance of this permit)
June 23, 2005	P-050411, Permit modification to increase the number of corona treaters from 10 to 13 as well as set a facility-wide ozone emissions limit and a facility-wide power limit (kW) for the corona treaters, Permit status (S)
January 28, 2005	P-040408, Initial Permit to Construct for a plastic bag manufacturing facility, Permit status (S)

Application Scope

Hilex Poly has proposed the following permit modifications:

- Install 12 new extruders, with 12 associated corona treaters, and
- 6 new bag machines with 3 associated corona treaters.
- Also, the 3 existing bag machines that have been kept in reserve will be operated along with the 16 existing units.

Thus, following the proposed permit modification, a maximum of 26 extruders, 29 corona treaters, and 25 bag machines would be in use at any given time.

Application Chronology

October 28, 2015	DEQ received an application and an application fee.
Nov. 5 – Nov. 20, 2015	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
November 23, 2015	DEQ determined that the application was complete.
January 5, 2016	DEQ made available the draft permit and statement of basis for peer and regional office review.
January 14, 2016	DEQ made available the draft permit and statement of basis for applicant review.

Jan. 25 – Feb. 24, 2016	DEQ provided a public comment period on the proposed action.
January 25, 2016	DEQ received the permit processing fee.
February 26, 2016	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
Corona Treater Stack 1 Corona Treater Stack 2	Corona treaters: Manufacturer: Enercon and Pillar/Solo or equivalent* Model numbers: CS012SF-200/2 and P6000 Feed material: High density polyethylene Total installed corona treaters: 29	None	STACK1: Exit height: 69.89 ft (21.30 m) Exit diameter: 2.33 ft (0.71 m) Exit flow rate: 7,969.6 acfm Exit temperature: 86.0 °F (30.0 °C) STACK2: Exit height: 60.04 ft (18.30 m) Exit diameter: 2.33 ft (0.71 m) Exit flow rate: 7,969.6 acfm Exit temperature: 86.0 °F (30.0 °C)

*Or equivalent is defined as all emissions factors, exhaust flowrates, and toxics emissions for the alternative corona treaters are less than or equal to the corona treaters specified in the permit.

Emissions Inventories

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 corona treater and bag line operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant were based on emission factors provided by the equipment manufacturer and operation of 8,760 hours per year.

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 following table presents the uncontrolled Potential to Emit for regulated air pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For the corona treater and bag line operations uncontrolled Potential to Emit is the same as the Potential to Emit as there are no add-on controls or limits in annual operation proposed by the Applicant.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	Ozone	VOC
	T/yr	T/yr
Point Sources		
Existing Corona Treaters	22.4	0.00
Existing Bag Lines	0.00	2.80
Proposed New Corona Treaters	22.4	0.00
Proposed New Bag Lines	0.00	1.60
Total, Point Sources	**44.80**	**4.40**

There are no HAP emissions from the emissions units at this facility.

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 for all criteria pollutants from all emissions units at the facility presented in the previous permitting project, P-2008.0168 issued March 6, 2009.

Table 3 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	Ozone		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Existing Corona Treaters	5.11	22.4	0.00	0.00
Existing Bag Lines	0.00	0.00	0.64	2.80
Pre-Project Totals	**5.11**	**22.40**	**0.64**	**2.80**

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

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 all emissions units 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 4 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	Ozone		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Existing Corona Treaters	5.11	22.4	0.00	0.00
Existing Bag Lines	0.00	0.00	0.64	2.8
Proposed New Corona Treaters	5.11	22.4	0.00	0.00
Proposed New Bag Lines	0.00	0.00	0.36	1.6
Post Project Totals	**10.22**	**44.80**	**1.00**	**4.40**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) 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.

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	Ozone		VOC	
	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	5.11	22.4	0.64	2.80
Post Project Potential to Emit	10.22	44.80	1.00	4.40
Changes in Potential to Emit	**5.11**	**22.40**	**0.36**	**1.60**

Non-Carcinogenic TAP Emissions

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Ammonia	**3.52**	**5.50**	**1.98**	**1.2**	**Yes**
Ethyl alcohol	0.64	1.00	0.36	125	No

One of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for ammonia emissions because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.586 was exceeded.

Carcinogenic TAP Emissions

There are no carcinogenic TAP emissions from the emissions units at this facility.

Post Project HAP Emissions

As discussed previously there are no HAP emissions from the emissions units at this facility.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of O_3 (ozone) and TAP (ammonia) from this project were exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

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. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP).

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 Jerome 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 THAPs (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions $\geq$ 10 T/yr or if the aggregate of all HAPS (Total HAPs) has actual or potential emissions $\geq$ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits $\geq$ 8 T/yr of a single HAP or $\geq$ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are $\geq$ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are $\geq$ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 7 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	0	0	100	-
$PM_{10}/PM_{2.5}$	0	0	100	-
SO_2	0	0	100	-
NO_X	0	0	100	-
CO	0	0	100	-
VOC	4.40	4.40	100	B
HAP (single)	0	0	10	-
HAP (Total)	0	0	25	-

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 modified emissions sources. 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.

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.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of visible emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 2.5.

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 do not have a potential to emit greater than 100 tons per year for ozone and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAP combined (no HAPs are emitted at this facility) as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

Because the facility has a web coating operation for printing on the bags the following NSPS subpart may apply to this facility:

- 40 CFR 60, Subpart FFF - Standards of Performance for Flexible Vinyl and Urethane Coating and Printing

40 CFR 60, Subpart FFF - Standards of Performance for Flexible Vinyl and Urethane Coating and Printing

§ 60.580 Applicability and designation of affected facility.

Section (a) states that the affected facility to which the provisions of this subpart apply is each rotogravure printing line used to print or coat flexible vinyl or urethane products.

§ 60.581 Definitions and symbols.

Section (a) defines flexible vinyl and urethane products as those products, except for resilient floor coverings (1977 Standard Industry Code 3996) and flexible packaging, that are more than 50 micrometers (0.002 inches) thick, and that consist of or contain a vinyl or urethane sheet or a vinyl or urethane coated web.

This facility extrudes polyethylene plastic sheets, not flexible vinyl or urethane products, that are 14 to 17 micrometers thick. Therefore, the requirements of this subpart are not applicable to the facility and no further discussion is required.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

Because the facility has a web coating operation for printing on the bags the following NESHAP subpart may apply to this facility:

- 40 CFR 63, Subpart JJJJ - National Emission Standards for Hazardous Air Pollutants: Paper and Other Web Coating

40 CFR 63, Subpart JJJJ - National Emission Standards for Hazardous Air Pollutants: Paper and Other Web Coating

§ 63.3290 Does this subpart apply to me?

The provisions of this subpart apply to each new and existing facility that is a major source of HAP, as defined in §63.2, at which web coating lines are operated.

As discussed previously there are no HAPs emitted at this facility. Therefore, the requirements of this subpart are not applicable to the facility and no further discussion is required.

Permit Conditions Review

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

Permit Condition 1.1 describes the modifications to the existing processes at the facility process being permitted as a result of this project.

Permit Condition 1.3 explains which previous permit for the facility is being replaced as a result of this project.

Table 1.1 was updated to reflect the new equipment being installed as a result of this project.

CORONA TREATERS

Permit Condition 2.2 was modified to describe the new and existing equipment being permitted as a result of this project.

Permit Condition 2.3 was modified to specify the new hourly and annual ozone emissions rates as requested by the Applicant.

Permit Condition 2.5 establishes that emissions shall not exceed 20% opacity as required by IDAPA 625.

Permit Condition 2.6 was modified to specify the new power rating to the corona treaters as requested by the Applicant.

Permit Condition 2.7 was modified to specify that the written assurance provided by the ozone treater manufacturer shall be submitted to DEQ. This change to the permit condition was requested by DEQ compliance staff.

Permit Condition 2.8 was modified to remove the requirement that records be maintained for two years. The general permit requirements state that records be maintained for five years (as was required in the previous permit). In addition, this permit condition was modified to ensure that the worst-case highest power supplied to the corona treaters on a daily basis was determined. The worst-case highest power supplied to the corona treaters was required to be determined as this is the basis for ozone emissions from the corona treaters and is the assurance that emissions remain at or below the levels applied for. This change to the permit condition was requested by DEQ compliance staff.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were comments on the application and there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.

APPENDIX A – EMISSIONS INVENTORIES

Hilex Poly Company, LLC
Jerome, ID
Existing and Proposed Units Emission Inventory

					Project Emissions		Existing Emission		Total	
Pollutant	**Emission Factor[a]**	**Source**	**New Capacity[b]**	**Existing Capacity**	**(lb/hr)**	**(tpy)[c]**	**(lb/hr)**	**(tpy)[c]**	**(lb/hr)**	**(tpy)[c]**
Ozone	0.073 lb/kW-hr	Corona Treaters	70 kW	70 kW	5.11	22.4	5.11	22.4	10.22	44.8
Ammonia	0.22 lb/hr per bag line	Bag Lines	9 bag lines	16 bag lines	1.98	8.7	3.52	15.4	5.50	24.1
Ethanol	0.04 lb/hr per bag line	Bag Lines	9 bag lines	16 bag lines	0.36	1.6	0.64	2.8	1.0	4.4

a- Emission factors from previous PTC. Ozone emission factor guarenteed by Enercon, manufacturer of the existing Corona Treaters. Ammonia and Ethanol Emission factors based on worst case monthly emission from similar Mount Olive, NC, Hilex Poly Facility.

b - Proposed permit limits

c - Annual emissions based on 8,760 hours/year of operation

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: **January 14**, 2016

TO: **Darrin Pampaian**, Permit Writer, Air Program

FROM: Thomas Swain, Air Quality Modeler, Analyst 3, Air Program

PROJECT: Hilex Poly Company LLC (Jerome, Idaho) facility, Permit to Construct (PTC), Facility No. 053-00011

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

1.0 Summary

Hilex Poly Company (HPC) submitted a Permit to Construct (PTC) application for modifications to their facility near Jerome, Idaho on October 26, 2015. This would be a modification to a PTC for an existing facility located at 540 W Nez Perce Avenue within the city limits of Jerome. The facility produces plastic bags and is proposing to increase production.

The facility manufactures polyethylene plastic bags. Devices called extruders are used to form polyethylene pellets into tubular film. This film is passed through corona treaters that prepare the film for printing. After printing the film is formed into bags and packaged for shipment. HPC is planning on increasing production by adding 12 new extruders with 12 associated corona treaters, and adding six new bag machines with three associated corona treaters. The proposed increase will enable the facility to operate at any given time a maximum of 26 extruders, 29 corona treaters, and 25 bag machines. The entire process is discussed in detail in the main body of the DEQ Statement of Basis supporting the issued PTC. This modeling review memorandum provides a summary and approval of the ambient air impact analyses submitted with the permit application. It also describes DEQ's review of those analyses, DEQ's verification analyses, additional clarifications, and conclusions.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed facility modification were submitted to DEQ to demonstrate that the modification would not cause or significantly contribute to a violation of any ambient air quality standard as required by (IDAPA 58.01.01.203.02 and 203.03 {Idaho Air Rules Section 203.02 and 03}).

Ramboll Environ (RE), on behalf of HPC, performed the ambient air impact analyses for this project, demonstrating compliance with applicable air quality standards. The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that the estimated emissions increases at the facility associated with the proposed project will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the Statement of Basis. Emissions estimates were not reviewed as part of the modeling review described in this modeling review memorandum.

A modeling protocol was submitted to DEQ for this project on September 1, 2015. On September 13, 2015, DEQ issued a conditional modeling protocol approval notification, with several comments. On September 21, 2015, RE submitted a revised modeling protocol to DEQ. This protocol revised the initial protocol to allow use of diurnal ozone background data collected at the onsite monitoring location for the years 2005-2007. DEQ conditionally approved this revision to the modeling protocol on September 25, 2015. On October 5, 2015, HPC electronically submitted a 15-day preconstruction application for the proposed modification. DEQ denied the 15-day pre-permit construction approval application because the applicant failed to meet a regulatory timeline. Several modeling issues were also identified during that review, including a question about revised building dimensions not matching existing building layouts. RE responded that the building layout as modeled reflected changes that will be made to the existing structures during the expansion. There were also questions about the derivation of flow data for several sources.

A PTC application was submitted on October 29, 2015. After that submittal and further DEQ review, RE submitted additional data that satisfied DEQ questions regarding the derivation of the exhaust flow parameters as presented in the modeling analyses.

DEQ deemed the application submittal to be complete on November 20, 2015. DEQ determined, after completing the review of the application, that the modeling analyses adequately demonstrated compliance with applicable air quality standards.

The final submitted air quality impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions 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 predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the project has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (*Guideline on Air Quality Models*). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department that operation of the proposed facility modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emissions Rates. Emissions rates used in the modeling analyses, as listed in this memorandum, represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses as provided in this memorandum.
Level I Modeling Thresholds for Criteria Pollutant Emissions. Maximum short-term and long-term emissions of all criteria pollutants other than ozone were assumed to be negligible (well below Level I Modeling Applicability Thresholds) and therefore were not addressed in the modeling analyses. Emissions of ozone were modeled to determine compliance with NAAQS.Project-specific air impact analyses are not necessary for projects with emissions increases below Level I Thresholds.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds. These thresholds are set to assure that impacts are below significant impact levels (SILs). Compliance with NAAQS has not demonstrated for emissions that exceed the emission estimates presented in the application.
Background Ozone Data: Background ozone data were taken from data monitored by the facility during the period 2005-2007. Diurnal values were calculated from this data and approved by DEQ.	The HPC collected ozone data are site-specific and should not be used for other permitting projects without specific DEQ approval.
TAPS Emissions: There is an increase in emission rates for the TAP ammonia as listed in Idaho Air Rules Sections 585 and 586 that exceed specific Emissions Screening Level (EL) rates.	Air impact analyses demonstrating compliance with TAPS, as required by Idaho Air Rules Section 203.03, was not required for pollutants having an emissions rate less than ELs.

2.0 Background Information

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

2.1 Project Description

The HPC facility accepts polyethylene plastic pellets that are used to create plastic bags of various types and sizes. Devices called extruders are used to form polyethylene pellets into tubular film. This film is passed through corona treaters that prepare the film for printing. After printing the film is formed into bags and packaged for shipment. HPC is planning on increasing throughput by adding 12 new extruders with 12 associated corona treaters, and adding six new bag machines with three associated corona treaters. The proposed increase will enable the facility to operate at any given time a maximum of 26 extruders, 29 corona treaters, and 25 bag machines. The entire process is discussed in detail in the main body of the DEQ Statement of Basis supporting the issued PTC. The only criteria pollutant emissions increase attributable to this process change is ozone.

2.2 Proposed Location and Area Classification

The HPC Jerome facility is located at 540 W Nez Perce Avenue in Jerome, Idaho. 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 ($PM_{2.5}$).

2.3 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in 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:

> ***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

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 according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). 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.

If modeled maximum pollutant impacts to ambient air from the emissions 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. HPC was requested to model with facility-wide emissions for ozone to demonstrate NAAQS compliance for this PTC since there is no ambient concentration level for the SIL.

DEQ has developed modeling applicability thresholds that effectively assure that project-related emissions increases below stated values will result in ambient air impacts below the applicable SILs. The threshold levels and dispersion modeling analyses supporting those levels are presented in the *State of Idaho Guideline for Performing Air Quality Impact Analyses*[1] (*Idaho Air Modeling Guideline*). Use of a modeling threshold represents the use of conservative modeling, performed in support of the threshold, as a project SIL analysis. Project-specific modeling applicability for this project is addressed in Section 3.1.1 of this memorandum.

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 facility-wide emissions, and emissions from any nearby co-contributing sources, 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 lists SILs and 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 a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. As an example, consider a hypothetical case where the SIL analysis indicates the project (new source or modification) has impacts exceeding the SIL and the cumulative impact analysis indicates a violation of the NAAQS. If project-specific impacts are below the SIL at the specific receptors showing the violations during the time periods when modeled violations occurred, then the facility does not have a significant contribution to the specific violations.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**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	0.3	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 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	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]	75 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. The O_3 standard was revised (the notice was signed by the EPA Administrator on October 1, 2015) to 70 ppb. However, this standard will not be applicable for permitting purposes until it is incorporated by reference *sine die* into Idaho Air Rules.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or b) 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 c) 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 Idaho Air Rules Section 210, if the total project-wide emissions 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 emissions 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.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions rates of criteria pollutants for the proposed project at the HPC facility were provided by RE. Review and approval of estimated emissions was the responsibility of the DEQ permit writer and is not addressed in this modeling memorandum. DEQ modeling review included verification that the application's potential emissions rates were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses submitted by RE should be reviewed by the DEQ permit writer against those in the emissions inventory of the permit application. All modeled criteria air pollutant and TAP emissions rates should be equal to or greater than the facility's emissions calculated in other sections of the PTC application or requested permit allowable emission rates.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

If project-related potential to emit (PTE) values would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for some pollutants exceeding BRC thresholds, then an air impact analysis may not be required for those criteria pollutants with project emissions below BRC. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules (Policy on NAAQS Compliance Demonstration Requirements, DEQ policy memorandum, July 11, 2014) 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." The interpretation policy also states that the exemption criteria of uncontrolled 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.

Table 3 lists results of the criteria pollutant NAAQS compliance demonstration applicability assessment. Excluding pollutants from air impact analyses on the basis of the BRC interpretation was not evaluated for the HPC project. An impact analysis must be performed for pollutant increases that would not qualify for an exclusion such as BRC. Modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*. Modeling applicability emissions thresholds published in the *Idaho Air Modeling Guideline* were based on assuring an ambient impact of less than established SIL for that specific pollutant and averaging period. HPC has no emission increases for any criteria pollutants except ozone. Because ozone does not have a defined SIL, ozone must be modeled to determine compliance with the NAAQS.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Level I Modeling Thresholds (lb/hr)	Applicable Facility Wide PTE Emissions (ton/year)	Air Impact Analyses Required?
PM_{10}[a] (24-hour)	1.5	0.22	0.0	No
$PM_{2.5}$[b] (24-hour)	1.0	0.054	0.0	No
$PM_{2.5}$[b] (annual)	1.0	0.35 ton/year	0.0	No
Carbon Monoxide (CO)	10.0	15	0.0	No
Sulfur Dioxide (SO_2) (1-hour)	4.0	0.21	0.0	No
Nitrogen Oxides (NOx) (24-hour)	4.0	0.20	0.0	No
Nitrogen Oxides (NOx) (annual)	4.0	1.2 ton/year	0.0	No
Lead (Pb)	0.06	14 lbs/month	0.0	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

If project-specific total emissions rates are below Level I thresholds, project-specific air impact analyses are generally not necessary for permitting. Use of Level II Modeling Thresholds are conditional, requiring DEQ approval. There are no increases for any of the other criteria pollutants (CO, NO_X, SO_2, PM_{10}, $PM_{2.5}$, and Lead) other than ozone attributable to this project. All short term periods were modeled with the maximum short term emission rates for ozone as listed in Table 4.

Table 4. MODELED EMISSION RATES FOR CRITERIA POLLUTANTS		
Source ID	**Description**	**Ozone (lb/hr)**
STCK1	Corona Treatment Stack 1	5.11
STCK2	Corona Treatment Stack 2	5.11

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is typically formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) 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.

This project is very unique in that the facility directly emits ozone into the atmosphere. Therefore, AERMOD, EPA's preferred model for assessing atmospheric dispersion of pollutants emitted from point sources, was chosen to evaluate potential impacts from the facility.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. Emission increases for ammonia exceeded the screening emissions level (EL) of Idaho Air Rules Section 585, thereby requiring site specific modeling. The submitted application did not identify any other TAP emissions that exceeded ELs and would require modeling analysis. Table 5 provides a summary of the TAP modeling applicability assessment for those TAPS potentially emitted as a result of the proposed project. Table 6 provides source-specific emission rates used in the TAP impact modeling analysis.

Table 5. TAPS EMISSIONS APPLICABILITY				
TAP	**Screening Level EL (lb/hr)**	**AAC ($\mu g/m^3$)**	**Emissions**	**Modeling Required**
Ammonia	1.2	900	1.98	Y
Ethanol	125	94,000	0.4	N

Table 6. MODELED EMISSION RATES FOR TAPS		
Source ID	**Description**	**Ammonia (lb/hr)**
VENT1	Bag Line Exhaust Line 1	5.5
VENT2	Bag Line Exhaust Line 2	5.5
VENT3	Bag Line Exhaust Line 3	5.5

3.1.3 Emissions Release Parameters

Table 7 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources as used in the final modeling assessment.

Stack parameters used in the modeling analyses were generally based on well documented data, including source tests and engine certifications. RE was contacted for supplemental information to support the documentation referenced in the modeling report, and responded in kind. Documents and references for some of these derivations are provided in the appendices to the report submitted with the application. DEQ determined that the documentation and justification of release parameters was adequate considering the sources that were modeled. In some instances, information was provided from the manufacturer and DEQ staff from the Technical Services Division reviewed the information and affirmed its accuracy and appropriateness for use in the analyses.

Table 7. SOURCE RELEASE PARAMETERS USED IN MODELING

Source ID	Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (ft)	Temp (K)	Exit Velocity (fps)	Stack Diameter (ft)
STCK1	Existing Corona Stack	702459	4731717	1133	70.0	+30[a]	31.2	2.3
STCK2	New Corona Stack	702429	4731776	1133	65.0	+30[a]	31.2	2,3
VENT1	Bag Line Vent1	702389	4731742	1133	25	Ambient	6.36	2.00
VENT2	Bag Line Vent2	702418	4731664	1133	25	Ambient	6.36	2.00
VENT3	Bag Line Vent3	702462	4731633	1133	25	Ambient	6.36	2.00

[a] Exhaust release temperature for these sources was modeled as 30 degrees C (or K) above ambient temperature.

3.2 Background Concentrations

Background concentrations were originally provided by DEQ and obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) *Lookup 2009-2011 Design Values of Criteria Pollutants*[2]. These design value air pollutant levels are based on regional scale air pollution modeling of Washington, Oregon, and Idaho, with values influenced by monitoring data as a function of distance from the monitor. DEQ has determined that the NW AIRQUEST background values are reasonably representative of the Jerome, Idaho area. The addendum to the modeling protocol, as noted in Section 1, requested that diurnal background data be calculated from the onsite monitored data from the period 2005-2007. In the protocol, RE proposed that "hourly average concentrations will be calculated for each hour using the data collected by the monitor at 15-min intervals during the Idaho ozone season for the years 2005, 2006, & 2007. For each hour of the day, an hourly design concentration will be calculated by identifying the 4th highest hourly concentration for each year, and then averaging across the 3-year ozone season dataset. These calculated hourly average background concentrations will be included as inputs to AERMOD using the BACKGRND and HROFDY keywords. AERMOD will add these values to the calculated hourly average ozone concentrations before calculating the total eight-hour average ozone concentrations used to assess compliance with the ambient standard."

DEQ accepted this proposal on the basis that the ozone monitoring data was previously reviewed and accepted by DEQ for permit-related purposes at the HPC facility, and DEQ confirmed the calculations and data results with provided spreadsheets. DEQ has since performed further review of the HPC-site ozone data sets. This was done to evaluate its suitability for use in AERMOD modeling where NO_X chemical transformations are considered. There currently are two non-guideline methods in the model AERMOD to address NO_X and chemical transformation of NO to NO_2: OLM (Ozone Limiting Method) and PVMRM (Plume Volume Molar Ratio Method). Both of these methods use ambient ozone data to calculate the quantity of the emitted NO component of NOx that can realistically be transformed into NO_2. DEQ concluded that the HPC-site ozone data, while acceptable for the current HPC permitting action, may not be acceptable for other permitting projects in the region. Unique characteristics of the monitoring site and design of the monitoring program, with the purpose of evaluating ozone NAAQS compliance as affected by ozone emissions from the HPC facility, may result in data that are not representative of other areas. Monitored peak ozone values were lower than DEQ scientists expect for the region and what was observed at other rural monitoring locations in Washington, Oregon, and Idaho. However, DEQ asserts that these data are acceptable to evaluate impacts from direct ozone emissions for this permitting project based on the following: 1) monitoring was performed using a rigorous quality assurance/control program with DEQ oversight; 2) DEQ does not have conclusive evidence that data collected are not reasonably accurate; 3) monitoring was designed to evaluate impacts from the HPC facility, and the absence of any elevated concentrations suggests that either emissions were substantially less than anticipated or ozone was depleted through chemical reactions between the point of emission and the monitor.

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 Analyses

HPC performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the facility and proposed modification as described in the application. Results of the submitted 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 8 provides a brief description of parameters used in the modeling analyses.

3.3.2 Modeling protocol and Methodology

RE submitted a modeling protocol to DEQ for this project on September 1, 2015. DEQ conditionally approved the protocol on September 14, with several comments. RE amended the protocol on September 21, 2015, and DEQ approved the addendum on September 25, 2015. HPC submitted a PTC application on October 5, 2015. Because of a failure to meet certain regulatory deadlines for the 15-day pre-permit construction approval, this application was denied by DEQ on October 13, 2015. A new PTC application was submitted on October 29, 2015, and DEQ deemed this application complete on November 20, 2015.

Project-specific modeling and other required impact analyses were generally conducted using data and methods proposed in the protocol, discussed in post-application correspondence and as specified in the *Idaho Air Quality Modeling Guideline*[1].

Table 8. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Jerome, ID	The facility is located in an area that is attainment or unclassified for all criteria air pollutants
Model	AERMOD	AERMOD version 15181 with the PRIME downwash algorithm,.
Meteorological Data	Jerome surface data and Boise upper air data	The meteorological model input files for this project were provided by and recommended as most representative for this project by IDEQ, as described in the IDEQ modeling protocol and verified by IDEQ's approval of that protocol.
Terrain	Considered	See section 3.3.5 below
Building Downwash	Considered	BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	10-meter spacing along the ambient air boundary out to 600 meters
	Grid 2	25-meter spacing for at least 2000 meters from the grid centered on the facility
	Grid 3	50-meter spacing for at least 3,000 meters from the grid centered on the facility
	Grid 4	200-meter spacing out to 5,000 meters from grid centered on the facility
	Grid 5	500-meter spacing out to 10,000 meters from grid centered on the facility

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). 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 includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 15181 was used by RE 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.

3.3.4 Meteorological Data

DEQ provided five years of model-ready meteorological data from the Jerome County Airport (KJER) airport for the years 2008-2012. This data included both surface data from Jerome and upper air data from Boise. DEQ determined that these data are adequately representative of the meteorology in the Jerome area for minor source permitting.

3.3.5 Effects of Terrain on Modeled Impacts

Terrain data were extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files in the WGS84 datum (approximately equal to the NAD83 datum). RE used 1/3 arc second data files (about 10-meter resolution), which is sufficient to adequately resolve terrain in the area for evaluating air pollution impacts resulting from emissions.

The terrain preprocessor AERMAP Version 11103 was used 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 emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

DEQ reviewed the area surrounding the facility by using the web-based mapping program Google Earth, which uses the WGS84 datum. DEQ also overlaid modeling files with a digital photograph background images acquired from the 2013 ARCGIS NAIP (National Agriculture Imagery Program) data base. The immediate area is effectively flat with regard to dispersion modeling affects. Elevations in the modeling domain matched those indicated by the background images

3.3.6 Facility Layout

DEQ verified proper identification of buildings on the site by comparing a graphical representation of the modeling input file to aerial photographs on Google Earth. The modeled layout matched well with aerial photographs in Google Earth as well as from those in the ARCGIS 2013 NAIP database.

3.3.7 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions 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) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

3.3.8 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." HPC has fence-lines, no-trespassing signs, and security guards; the existence of these features clearly precludes public access to the facility and defines the ambient boundary for the facility.

3.3.9 Receptor Network

Table 8 describes the receptor grid used in the submitted analyses. The receptor grid met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[1]. DEQ determined this grid assured maximum impacts were reasonably resolved by the model considering: 1) types of sources modeled; 2) modeled impacts and the modeled concentration gradient; 3) conservatism of the methods and data used as inputs to the analyses; 4) potential for continual exposures or exposure to sensitive receptors.

3.3.10 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.

All point sources were below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 Impact Modeling Results

4.1 Results for Cumulative NAAQS Analyses

Ozone emissions from the HPC facility were modeled to evaluate compliance with the NAAQS. There were no other criteria pollutants whose emission increases associated with the proposed project were above the Level I Modeling Applicability Thresholds. Therefore, modeling was done with facility-wide emissions of ozone only to show compliance with the NAAQS. Because there is no SIL for ozone, modeling was not performed to determine whether impacts were above the SIL. Results of the NAAQS modeling analyses are listed in Table 9 and show that compliance has been demonstrated with the NAAQS for ozone.

Table 9. RESULTS FOR NAAQS ANALYSES

Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Ozone	8-hour	142.7	--[(b)]	142.7	147

a. Micrograms per cubic meter.
b. Background values included in the modeling analyses.

4.2 Results for TAPs Impact Analyses

Dispersion modeling is required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with project-specific emission increases exceeding emissions screening levels (ELs). The application identified ammonia as the only TAPs that required air impact modeling analysis, and a modeling assessment was done to demonstrate compliance with the ammonia AAC. TAP modeled impacts, as shown in Table 10, demonstrate that the predicted impact from the increase in ammonia emissions do not exceed the AAC.

Table 10. RESULTS FOR TAP IMPACTS

TAP	Averaging Period	Maximum Modeled Impact (ug/m^3)	AAC (ug/m^3)
Ammonia	24-hour	424	900

5.0 Conclusions

The ambient air impact analyses and other air quality analyses submitted with the HPC Jerome application demonstrated to DEQ's satisfaction that emissions from the proposed project will not cause or significantly contribute to a violation of any ambient air quality standard.

References:

1. *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.
2. Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) *Lookup 2009-2011 Design Values of Criteria Pollutants*.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on January 18, 2016:

Facility Comment: Statement of Basis, Table 1 - Under the header Corona Treaters, remove the words Alpine Extruder and model Number HS75. This is the make and model for an extruder and not a treater. If DEQ wishes to list this equipment it should be listed as an extruder. Furthermore, we ask that DEQ include the words "Or Equivalent" after Enercon and Pillar/Solo. These corona treaters are a fairly standardized design and have the same emission factors (based on kW input). Hilex Poly understands that if they purchase a corona treater from a vendor not listed in the PTC it must have equivalent (or lower) emission factors. Otherwise, DEQ must be notified and consulted to ensure that facility emission limits are not exceeded.

DEQ Response: The requested change will be made to the Statement of Basis with a definition of what "or equivalent" means for air permitting purposes.

Facility Comment: Permit, Section 1, Table 1.1 – Same as previous comment.

DEQ Response: As discussed previously the requested change will be made to the Permit.

Facility Comment: Permit, Section 2, Table 2.1 - Same as previous comment.

DEQ Response: As discussed previously the requested change will be made to the Permit.

Facility Comment: Permit Section 3, General Provisions, Permit Condition 3.5 - Hilex Poly expects that a select number of new corona treaters will be brought on-line shortly after finalization of the PTC. However, it is expected that additional treaters will be purchased, configured and brought on-line over time. At this time, Hilex Poly cannot specify the time period or duration necessary to bring the facility to full capacity. Furthermore, Hilex Poly may require more than one year and may encounter delays. Please clarify that this build-out approach will impact the validity of the PTC.

DEQ Response: This is a General Permit requirement placed in all DEQ Permits to Construct and is taken from the Rules. Therefore, the requested change will not be made to the Permit.

APPENDIX D – PROCESSING FEE

PTC Fee Calculation

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: Hilex Poly Company LLC
Address: 540 W. Nez Perce Ave.
City: Jerome
State: ID
Zip Code: 83338
Facility Contact: Mike Schutz
Title: Regional Manufacturing Manager
AIRS No.: 053-00011

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	0.0	0	0.0
VOC	24.0	0	24.0
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**24.0**
Fee Due	**$ 5,000.00**		

Comments: