Statement of Basis

Permit to Construct No. P-2014.0040
Project ID 61445

Alternative Environmental Systems, LLC
Mayfield, Idaho

Facility ID 039-00029

Final

September 18 2015
Randy Stegen RS
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

Btu	British thermal units
CAA	Clean Air Act
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
HAP	hazardous air pollutants
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
lb/hr	pounds per hour
lb/qtr	pound per quarter
MMBtu	million British thermal units
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O&M	operation and maintenance
O_2	oxygen
PC	permit condition
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
PTC	permit to construct
PTE	potential to emit
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
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
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Alternative Environmental Systems (AES) operates a pyrolysis facility in Mayfield under an existing pilot plant exemption. The facility operates two retorts to pyrolize waste tires or other carbon-based offal into recoverable materials that may include oil (synoil), gas (syngas), reclaimed steel, and char material. The pyrolysis system is a batch process that is operated as a two-chambered retort. Waste tires are washed to remove dirt and other debris and cut into pieces before being batch loaded into the retort. Other carbon-based offal may not require washing or sizing prior to loading into the retort. At this time the applicant anticipates that other carbon-based offal may include trimmings, flashings, or other waste from rubber manufacturing processes or organic material such as walnut shells.

The retort is sealed and purged with nitrogen gas to provide an inert atmosphere for the pyrolysis process. The nitrogen purge is continued throughout the process to ensure the atmosphere within the retort remains inert. The retorts are heated with burners fueled with diesel #2. The burners are external to the retorts but fully contained within a refractory lining.

The facility includes a wire separation unit, where steel wire from tire belts and beads is removed from the process following the pyrolysis of the tires. The wire separation unit is vented to a baghouse for control of particulate matter emissions. The remaining material is then sent through a primary crusher, which is also vented to the baghouse for control of particulate matter emissions. The material is then conveyed to the jet mill for further milling to specification. The jet mill is vented to the jet mill baghouse for control of particulate matter emissions and product recovery.

Synoil that is produced in the retorts is collected in a series of condensers and stored in 55 gallon drums onsite while awaiting shipment offsite. Syngas that is produced in the retorts passes through the condensers and is sent through a proprietary desulfurization scrubber and then on to a flare for destruction. Propane is used as a pilot fuel and as an auxiliary fuel for the flare.

The facility maintains an emergency generator powered by a 197 hp diesel engine to provide electric power in the event of a power interruption.

Permitting History

This is the initial PTC for an existing facility that was constructed in 2014 under a pilot plant exemption. The pilot plant exemption was to allow for limited operation and source testing of flare emissions.

Application Scope

This permit is the initial PTC for this facility. The facility is currently operating under a pilot plant exemption. Because the facility has been operating under the pilot plant exemption, all of the proposed equipment has been installed and is in operation.

Application Chronology

November 12, 2014	DEQ received an application and an application fee.
Nov. 26 – Dec. 11, 2014	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 11, 2014	DEQ determined that the application was incomplete.
January 7, 2015	DEQ received supplemental information from the applicant.
February 4, 2015	DEQ determined that the application was complete.
June 29, 2015	DEQ made available the draft permit and statement of basis for peer and regional office review.

July 14, 2015	DEQ made available the draft permit and statement of basis for applicant review.
August 5 – Sept, 4, 2015	DEQ provided a public comment period on the proposed action.
July 24, 2015	DEQ received the permit processing fee.
September 18, 2015	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	Emission Point ID No.
Pyrolysis Retorts (two) Manufacturer: Industrial Fabrication Company Manufacture Date: 2013 Max. Production: 3,000 lb/batch Fuel: Diesel #2 Fuel Consumption: 15 gal/hr (each)	None	Stack Height: 41 ft Exit Diameter: 1.0 ft
Syngas Flare Manufacturer: Hero Manufacture Date: 2014 Aux. Fuel: Propane Fuel Consumption: 250 scf/hr	Sulfur Scrubber Manufacturer: Proprietary	Stack Height: 60 ft Exit Diameter: 0.5 ft Exit Flow Rate: 2,000 acfm
Dust Control Baghouse Manufacturer: UAS Model: SFC 16 Type: Cartridge Cartridges: 16 PM_{10} Control Efficiency: 99.9%	None	Stack Height: 31 ft Exit Diameter: 1.0 ft
Jet Mill Baghouse Manufacturer: MAC Process Model: 24SER4 Style III Type: Cartridge Cartridges: 4 PM_{10} Control Efficiency: 99.99%	None	Stack Height: 30 ft Exit Diameter: 0.5 ft
Emergency Engine Manufacturer: John Deere Model: 6068HF285 Manufacture Date: 2005 Horsepower: 197 Fuel: Diesel	None	Stack Height: 10 ft Exit Diameter: 0.33 ft Exit Flow rate: 1165 acfm Exit Temperature: 916 °F

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 two pyrolysis retorts, syngas flare, dust control baghouse, Jet Mill baghouse, and emergency engine (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutants, GHG, and HAP PTE were based on emission factors from AP-42 and source testing, operation of 6,570 hours per year (450 hours per year for the emergency engine), and process information specific to the facility for this proposed project.

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.

This is an existing facility operating under a pilot plant exemption. However, since this is the first time the facility is receiving a permit, pre-project emissions are set to zero for all pollutants.

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 and GHG 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 2 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Pyrolysis Retorts	0.072	0.32	1.065	1.94	0.72	1.31	0.15	0.27	0.017	0.073	316.7	669
Syngas Flare	0.9	3.94	0.003	0.036	2.13	9.32	2.25	9.86	0.164	0.717	2,045	8,957
Dust Control Baghouse	0.013	0.103	--	--	--	--	--	--	--	--	--	--
Jet Mill Baghouse	0.011	0.049	--	--	--	--	--	--	--	--	--	--
Emergency Engine	0.024	<0.01	0.358	0.08	0.24	0.05	0.05	0.01	0.006	0.001	228	51
Post Project Totals	**1.02**	**4.42**	**1.43**	**2.02**	**3.09**	**10.68**	**2.45**	**10.14**	**0.187**	**0.791**	**2,590**	**9,677**

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 emissionrate 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 3 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post Project Potential to Emit	1.02	4.42	1.43	2.02	3.09	10.68	2.45	10.14	0.187	0.791	2,590	9,677
Changes in Potential to Emit	**1.02**	**4.42**	**1.43**	**2.02**	**3.09**	**10.68**	**2.45**	**10.14**	**0.19**	**0.79**	**2590**	**9677**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 4 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)
Ethyl benzene	0.0	5.92E-04	5.92E-04	29	No
Naphthalene	0.0	1.51E-04	1.51E-04	3.33	No
Toluene	0.0	1.86E-04	1.86E-04	25	No
o-Xylene	0.0	3.27E-06	3.27E-06	29	No
Chromium	0.0	1.25E-05	1.25E-05	0.033	No
Copper	0.0	2.50E-05	2.50E-05	0.013	No
Manganese	0.0	2.59E-05	2.59E-05	0.067	No
Selenium	0.0	6.34E-05	6.34E-05	0.013	No
Zinc	0.0	1.86E-05	1.86E-05	0.667	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAPs because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Benzene	0.0	7.03E-02	7.03E-02	8.0E-04	Yes
Formaldehyde	0.0	1.54E-03	1.54E-03	5.1E-04	Yes
Arsenic	0.0	1.67E-05	1.67E-05	1.5E-06	Yes
Beryllium	0.0	1.25E-05	1.25E-05	2.8E-05	No
Cadmium	0.0	1.25E-05	1.25E-05	3.7E-06	Yes
Nickel	0.0	1.34E-05	1.34E-05	2.7E-05	No

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for benzene, cadmium, formaldehyde, and arsenic because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 6 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
Benzene	7.03E-02	0.31
Ethyl benzene	5.92E-04	0.00
Formaldehyde	1.54E-03	0.01
Naphthalene	4.14E-05	0.00
Toluene	1.86E-04	0.00
o-Xylene	3.27E-06	0.00
Arsenic	1.67E-05	0.00
Beryllium	1.25E-05	0.00
Cadmium	1.25E-05	0.00
Chromium	1.25E-05	0.00
Lead	3.75E-05	0.00
Mercury	1.38E-05	0.00
Manganese	2.59E-05	0.00
Nickel	1.34E-05	0.00
Selenium	6.34E-05	0.00
Totals	**0.07**	**0.32**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, NO_2, and TAP from this project 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.

The applicant has demonstrated 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 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). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

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 Elmore 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.

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 pyrolysis retorts, syngas flare, baghouses, and emergency engine that have been operating under a pilot plant exemption. 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 PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4, 3.4, 4.3, and 5.3.

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

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 any criteria pollutant or 10 tons per year for any one HAP or 25 tons per year for all HAPs combined 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)

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

§60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

The emergency IC engine was installed at the facility after July 11, 2005, thus the provisions of this subpart are applicable.

§60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in Table 1 to this subpart. Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards in 40 CFR 94.8(a)(1).

(f) Owners and operators of any modified or reconstructed emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed CI ICE that are specified in paragraphs (a) through (e) of this section.

The emergency IC engine has a displacement of 1.1 liters per cylinder. The engine must comply with the emission standards in Table 1 of this subpart.

§60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

§60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted.

The facility may only use low sulfur diesel with a maximum sulfur content of 15 ppm.

§60.4208 What is the deadline for importing or installing stationary CI ICE produced in previous model years?

(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.

(i) The requirements of this section do not apply to owners or operators of stationary CI ICE that have been modified, reconstructed, and do not apply to engines that were removed from one existing location and reinstalled at a new location.

While this is a 2005 model year engine, it was purchased used from a supplier and reinstalled at the new location so the requirements of this section do not apply.

§60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

The emergency IC engine must have a non-resettable hour meter.

§60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in §§60.4204(a) or 60.4205(a), or if you are an owner or operator of a CI fire pump engine that is manufactured prior to the model years in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

(1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

(2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.

(3) Keeping records of engine manufacturer data indicating compliance with the standards.

(4) Keeping records of control device vendor data indicating compliance with the standards.

(5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

(e) If you are an owner or operator of a modified or reconstructed stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(e) or §60.4205(f), you must demonstrate compliance according to one of the methods specified in paragraphs (e)(1) or (2) of this section.

(1) Purchasing, or otherwise owning or operating, an engine certified to the emission standards in §60.4204(e) or §60.4205(f), as applicable.

(2) Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in §60.4212 or §60.4213, as appropriate. The test must be conducted within 60 days after the engine commences operation after the modification or reconstruction.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(g) If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(2) If you are an owner or operator of a stationary CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer.

The facility must limit maintenance and testing hours of operation to no more than 100 hours per year.

§60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

The facility must maintain records of the operation of the emergency IC engine, including the date and length of the operation and the reason (non-emergency or emergency) for the operation.

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 an emergency IC engine the following requirements apply to this facility:

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

§63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§ 63.6585 Am I subject to this subpart?

You are subject to this Subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.

The facility operates a 197 HP emergency diesel IC engine which is used periodically throughout the year for maintenance and testing and may be used in the event of a power interruption. The facility is classified as an area source for HAPs because the PTE is less than 10 tons per year for any single HAP and less than 25 tons per year for all HAPs combined.

§ 63.6590 What parts of my plant does this subpart cover?

This subpart applies to each affected source.

(a) Affected source. An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) Existing stationary RICE.

(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

(iv) A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.

(2) New stationary RICE. (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

(iii) A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(b) Stationary RICE subject to limited requirements. (1) An affected source which meets either of the criteria in paragraphs (b)(1)(i) through (ii) of this section does not have to meet the requirements of this subpart and of subpart A of this part except for the initial notification requirements of §63.6645(f).

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;

> The emergency IC engine was manufactured in 2005 and installed at the facility after June 12, 2006, thus it is classified as a new area source and must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII. No further requirements apply for the emergency IC engine under part 63.

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 SCOPE

Initial Permit Condition 1.1 describes the existing processes at the facility that are being permitted under this action.

Table 1.1 describes all emission sources and any control equipment at the facility.

PYROLYSIS RETORTS

Initial Permit Condition 2.1 details the process description for the emission unit permitted in this section of the permit.

Initial Permit Condition 2.2 describes the equipment being permitted and the emissions control equipment (if applicable) being employed to control emissions from each unit.

Initial Permit Condition 2.3 lists the criteria pollutant emission limits for the emission unit permitted in this section of the permit.

Initial Permit Condition 2.4 establishes that visible emissions shall not exceed 20% opacity as required by IDAPA 58.01.01.625.

Initial Permit Condition 2.5 establishes that PM emissions shall not exceed the grain loading limits as required by IDAPA 58.01.01.676.

Initial Permit Condition 2.6 limits maximum operation of each retort to two batches per day and total material processed to 6,000 pounds per day for each retort and 30 gallons of fuel per hour in the retort burners.

Initial Permit Condition 2.7 specifies that the pyrolysis retorts may only be fueled with ULSD.

Initial Permit Condition 2.8 specifies the sulfur content requirement of ULSD.

Initial Permit Condition 2.9 requires that the permittee record the number of batches of operation per day for each retort.

Initial Permit Condition 2.10 specifies recordkeeping to monitor the sulfur content of the diesel fuel delivered for use in the retorts.

SYNGAS FLARE

Initial Permit Condition 3.1 details the process description for the emission unit permitted in this section of the permit.

Initial Permit Condition 3.2 describes the equipment being permitted and the emissions control equipment (if applicable) being employed to control emissions from the unit.

Initial Permit Condition 3.3 establishes that visible emissions shall not exceed 20% opacity as required by IDAPA 58.01.01.625.

Initial Permit Condition 3.4 requires the permittee to develop, maintain, and follow an operations and maintenance manual for the flare and sulfur scrubber.

Initial Permit Condition 3.5 requires the flare ignition system to be in operation at all times while syngas is being sent to the flare.

Initial Permit Condition 3.6 requires the permittee to conduct quarterly VE inspections of the flare and specifies the conditions under which the VE inspections shall be conducted. This permit condition also specifies recordkeeping requirements for the VE inspections.

Initial Permit Condition 3.7 requires the permittee to install, maintain, and operate a flare ignition monitoring system, and to record the applicable parameters of the heat sensing device on a daily basis. The facility currently maintains a thermocouple at the top of the flare.

BAGHOUSES

Initial Permit Condition 4.1 details the process description for the emission units permitted in this section of the permit.

Initial Permit Condition 4.2 describes the equipment being permitted and the emissions control equipment (if applicable) being permitted in this section.

Initial Permit Condition 4.3 establishes that visible emissions shall not exceed 20% opacity as required by IDAPA 58.01.01.625.

Initial Permit Condition 4.4 requires the permittee to develop, maintain, and follow an operations and maintenance manual for the baghouses.

Initial Permit Condition 4.5 specifies that the dust control baghouse shall be fitted with filter cartridges having a control efficiency of 99.9% or greater for PM_{10}.

Initial Permit Condition 4.6 specifies that the Jet Mill baghouse shall be fitted with filter cartridges having a control efficiency of 99.99% or greater for PM_{10}.

Initial Permit Condition 4.7 requires the permittee to comply with the Monitoring and Recordkeeping General Provisions.

EMERGENCY ENGINE

Initial Permit Condition 5.1 details the process description for the emission unit permitted in this section of the permit.

Initial Permit Condition 5.2 describes the equipment being permitted and the emissions control equipment (if applicable) being permitted in this section.

Initial Permit Condition 5.3 establishes that visible emissions shall not exceed 20% opacity as required by IDAPA 58.01.01.625.

Initial Permit Condition 5.4 establishes that NOx, CO, PM, and HC emissions shall comply with the emission standards from Table 1 of subpart IIII of Part 60.

Initial Permit Condition 5.5 establishes that only ULSD fuel may be used in the engine.

Initial Permit Condition 5.6 specifies the sulfur content requirement of ULSD.

Initial Permit Condition 5.7 establishes that a non-resettable hour meter must be installed on the engine prior to startup.

Initial Permit Condition 5.8 establishes hours of operation limits as specified in 40 CFR 60.4211(f).

Initial Permit Condition 5.9 establishes emergency IC engine compliance requirements as specified in 40 CFR 60.4211(a) and 40 CFR 60.4211(b).

Initial Permit Condition 5.10 establishes recordkeeping requirements regarding the sulfur content of the emergency IC engine fuel.

Initial Permit Condition 5.11 establishes recordkeeping requirements regarding the hours of operation of the emergency IC engine.

Initial Permit Condition 5.12 establishes the incorporation of federal requirements by reference.

GENERAL PROVISIONS

Initial Permit Condition 6.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Initial Permit Condition 6.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 6.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Initial Permit Condition 6.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Initial Permit Condition 6.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Initial Permit Condition 6.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03.

Initial Permit Condition 6.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Initial Permit Condition 6.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Initial Permit Condition 6.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Initial Permit Condition 6.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 6.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Initial Permit Condition 6.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Initial Permit Condition 6.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Initial Permit Condition 6.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Initial Permit Condition 6.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Initial Permit Condition 6.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

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 no 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 not submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

APPENDIX A – EMISSIONS INVENTORIES

	Emission Factor lb/1000 gallons		Retort emissions lb/hr	Retort emissions tons/yr	IDAPA EL or IDEQ Level II2 Modeling Threshold (lbs/hr)	Flare emissions (tons/yr)	Baghouse emissions (tons/yr)	Emergency generator emissions (tons/yr)	Facility-wide emissions (tons/yr)	Facility-wide emissions (lbs/hr)	Emissions reach modeling threshold?		Idaho DEQ BRC modeling thresholds		AES emissions exceed, trigger
Criteria Pollutants						propane component									
SO2 S=0.0015	142S	0	1.06500	1.94	0.21	0.04		0.08	2.06	1.426178					
SO3	5.7S	0	0.04275	0.08				0.00	0.08				4	tons/yr	no
NOX	24		0.72000	1.31	0.2/2.4	9.32		0.05	10.68	#######					
CO	5		0.15000	0.27	15	9.86		0.01	10.14	#######			4	tons/yr	yes
Filterable PM	2	[illegible]	0.06000	0.11				0.00	0.11				10	tons/yr	yes
Condensable Particulate Matter						SWCAA (WA) Conrad Industries									
CPM-TOT	1.3		0.03900	0.17		Chehalis 12/2 W2011		0.00	0.17377						
CPM-IOR	0.845		0.02535	0.11				0.00	0.11295						
CPM-ORG	0.455		0.01365	0.06				0.00	0.06082						
			0.00000	0											
Total PM			0.03900	0.43		3.94	0.103556	0.01	4.48666	1.032268					
PM10	55% of filterable PM fro		0.07200	0.32	0.22/2.6	3.94	0.103556	0.01	4.36636	0.996195			1.5	tons/yr	yes
PM2.5	42% of filterable PM fro		0.06420	0.28	0.054/0.63	3.94	0.103556	0.00	4.33161	#######			1.0	tons/yr	yes
Organic Compounds															
TOC	0.556		0.01668	0.07306		0.72		0.00	0.79092						
Methane	0.216		0.00648	0.02838				0.00	0.02887				4	tons/yr VOC	no
NMTOC	0.34		0.01020	0.04468				0.00	0.04545						
N2O	0.26		0.00780	0.03416				0.00	0.03475						
Poly Cyclic Organic Matter (POM)	0.0033		0.00010	0.00043				0.00	0.00044						
Formaldehyde (HCOH)	0.035		0.00105	0.00460	0.00051			0.00	0.00468	1.54E-03	yes	0.077	A		
Speciated Organic Compounds lb/1000 gallons															
Benzene	0.0002		6.42E-06	2.81E-05	0.0008		0	4.85E-07	2.86E-05	7.03E-02	yes	0.12	A		
Ethylbenzene	6E-05		1.91E-06	8.36E-06	29		0	1.44E-07	8.50E-06	5.92E-04	no	21750	24		
Naphthalene	0.0011		3.39E-05	1.48E-04	3.33			2.56E-06	1.51E-04	4.14E-05	no	2500	24		
1,1,1-Trichloroenthane.	0.0002		7.08E-06	3.10E-05				5.35E-07	3.15E-05	8.65E-05					
Toluene	0.0062		1.86E-04	8.15E-04	25		0	1.41E-05	8.29E-04	1.86E-04	no	18750	24		
o-Xylene	0.0001		3.27E-06	1.43E-05	29		0	2.47E-07	1.46E-05	3.27E-06	no	21750	24		
Acenaphthene	2E-05		6.33E-07	2.77E-06				4.79E-08	2.82E-06	1.12E-06					
Acenaphthylene	3E-07		7.59E-09	3.32E-08				5.74E-10	3.38E-08	1.52E-07					
Benz[]anthracene	4E-06		1.20E-07	5.27E-07				9.10E-09	5.36E-07	2.68E-06					
Benzo(b,k)fluoranthene	1E-06		4.44E-08	1.94E-07				3.36E-09	1.98E-07	5.60E-07					
Benzo(g,h,i)perylene	2E-06		6.78E-08	2.97E-07				5.13E-09	3.02E-07	1.41E-05					
Chrysne	4E-06		1.14E-07	4.99E-07				8.62E-09	5.08E-07	3.61E-07					
Dibenzo(a,h)anthracene	2E-06		5.01E-08	2.19E-07				3.79E-09	2.23E-07	9.80E-08					
Fluoranthene	5E-06		1.45E-07	6.36E-07				1.10E-08	6.47E-07	1.46E-07					
Fluorene	4E-06		1.34E-07	5.87E-07				1.01E-08	5.97E-07	1.43E-07					
Indol(1,2,3-cd)pyrene	2E-06		6.42E-08	2.81E-07				4.85E-09	2.86E-07	6.76E-08					
Phenanthrene	1E-05		3.15E-07	1.38E-06				2.38E-08	1.40E-06	3.20E-07					
Pyrene	4E-06		1.28E-07	5.58E-07	6.67			9.64E-09	5.68E-07	1.36E-07	no	1000	24		
OCDD	3E-09		9.30E-11	4.07E-10				7.03E-12	4.14E-10	3.88E-09					

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: June 19, 2015

TO: Randy Stegen, Permit Writer, Air Program

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

PROJECT: Alternative Environmental Systems (AES), Mayfield, ID Permit to Construct (PTC), Facility No. 039-00029

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

Alternative Environmental Systems (AES), submitted an application for a Permit to Construct (PTC) for a facility in Mayfield, ID. The facility has an existing Pilot Plant Exemption and is requesting a Federal Enforceable Emissions Limit so that it be classified as a Synthetic Minor.

AES will recycle tires and other carbon based offal using a pyrolysis system. The process will utilize two chambered retorts. The materials will be prepared from a manual process using a Side Wall and a Tread Cutter. The entire process is discussed in detail in the main body of the DEQ Statement of Basis supporting the issued PTC. This modeling review 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 facility were submitted to DEQ to demonstrate that the facility 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}).

Spidell and Associates, on behalf of AES, performed the ambient air impact analyses for this project in order to demonstrate compliance with 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 on September 11, 2014. DEQ approved the protocol on October 22,2014, with a list of items that needed to be resolved with the final modeling application. The application was originally received by DEQ on October 30, 2014. DEQ responded with comments on the modeling analyses report on December 11, 2014, requesting further refinement on several modeling issues. AES responded with an application on January 2015 that was later deemed still insufficient with respect to modeling issues. DEQ again responded with comments in late April 2015. Mr. Chris Johnson, working with Spidell Associates, replied with a report and modeling files in early May that satisfied the requests by DEQ. 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 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.
Tier II Modeling Thresholds for Criteria Pollutant Emissions. Maximum short-term and long-term emissions of $PM_{2.5}$, PM_{10}, oxides of nitrogen (NOx), and carbon monoxide (CO), associated with the proposed project are above Tier II modeling applicability thresholds as found in State of Idaho Modeling Guidelines.	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 Tier II level 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.
TAPS Modeling : Maximum emission rates (as presented in January 2015 application) of several TAPS per Idaho Air Rules Sections 585 and 586 exceeded Emissions Screening Level (EL) rates. Subsequently presented emission rates (May 2015) showed all TAPS to be less than all Sections 585 and 586 EL rates.	Air impact analyses demonstrating compliance with TAPS, as required by Idaho Air Rules Section 203.03, is required for pollutants having an emissions rate greater 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 AES facility converts waste tires into re-usable products. Harvested products include steel, char, and oil. These products are then packaged and sold to various consumers. The facility sits on 120 acres and actively maintains 5 acres. The project facility includes five potential emission sources: a stack that exhausts two retort furnaces, a flare that burns off syngas and propane, an emergency generator, and two baghouses that process particulate matter and by-products from the grinding process.

2.2 Proposed Location and Area Classification

The AES facility is located in Mayfield , 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 ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

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.

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. If the SIL analysis indicates the facility/modification has an impact exceeding the SIL, the facility might not have a significant contribution to a violation if impacts are below the SIL at the specific receptor showing the violation during the time periods when a modeled violation occurred.

1. **Table 2. APPLICABLE REGULATORY LIMITS**

2. 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.

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 and TAPs for the proposed project at the AES facility were provided by Mr. Johnson and Spidell Associates for various applicable averaging periods. 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 Spidell Associates 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

Facility-wide potential to emit (PTE) values for all criteria pollutants would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for potential uncontrolled emissions of some criteria pollutants exceeding 100 ton/year or emissions of some pollutants exceeding BRC thresholds. 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.

An impact analysis must be performed for pollutant increases that would not qualify for an exclusion 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.

If project-specific total emissions rates are below Level I thresholds, project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Thresholds are conditional, requiring DEQ approval. Table 3 provides the emissions-based modeling applicability summary. AES selected to do air quality modeling analyses for all pollutants having emissions greater than BRC. Facility-wide project emissions of criteria pollutants were below BRC for SO_2 only, as listed in Table 3. Table 4 lists the source specific criteria pollutant emission rates as used in the modeling analyses. All annual periods were modeled with maximum short term emission rates as listed in Table 4.

Table 3. Modeling Applicability Analysis Results

Pollutant	Averaging Period	Emissions	BRC Threshold TPY	Level I Modeling Thresholds	Level II Modeling Thresholds	Modeling Required
$PM_{2.5}$	24-hour	0.99 lb/hr		0.054	0.63	Yes
	Annual	4.3 ton/yr	1	0.35	4.1	Yes
PM_{10}	24-hour	1.00 lb/hr		0.22	2.6	Yes
NOx	1-hour	3.09 lb/hr		0.2	2.4	Yes
	Annual	10.7 ton/yr	4	1.2	14	Yes
SO_2	1-hour, 3-hour	1.43 lb/hr	4	0.21	2.5	No
	24-hour	1.43 lb/hr		0.21	2.5	No
	Annual	2.1 ton/yr	4	1.2	14	No
CO	1-hour, 8-hour	2.45 lb/hr		15	175	No
	annual	10.14	10			
Pb	monthly	0.03 lbs/month		14		No

Table 4 Criteria Emission Rates (lbs/hr) per source

SOURCE	NO_2	SO_2	PM_{10}	$PM_{2.5}$	CO
Retort	0.72	0.043	0.072	0.064	0.15
Flare	2.123	2.25	0.90	0.90	2.25
DCBHS			0.091	0.091	
JMBHS			0.011	0.011	

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 (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.

Addressing secondary formation of O_3 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."*

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

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

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. The submitted emissions inventory in the January 2015 application identified 4 TAPs that potential increases of the Idaho Air Rules Section 586 could exceed screening emissions levels (ELs). Potential increases in emissions of other TAPs were all less than applicable ELs. Table 5 lists emission increases for these TAPs and compares them to the EL, and Table 6 provides source-specific TAP emission rates used in the air impact analyses. It should be noted that these emissions conservatively included emissions from the emergency generator. Typically, DEQ does not require that TAPS emissions be included for emergency generators as they are already under jurisdiction of NSPS Subparts JJJJ.

Table 5. MODELED TAP EMISSIONS RATES

Pollutant	CAS No.	Total Emissions Increase (lbs/hr)	EL (lbs/hr)
Arsenic	7440-38-2	2.23E-05	1.50E-06
Benzene	71-43-2	7.03E-02	8.00E-04
Cadmium	7440-43-9	1.67E-05	3.70E-06
Formaldehyde	50-00-0	1.14E-03	5.10E-04

Table 6. TAPS Emission Rates (lbs/hr)				
Source Description	**Arsenic**	**Benzene**	**Cadmium**	**Formaldehyde**
Retorts	1.67E-05	6.42E-06	1.25E-05	1.05E-03
Flare		7.03E-02		
Baghouse (Dust collection)				
Baghouse (Jet Milll)				
Emergency Generator	5.50E-06	2.16E-06	4.20E-06	3.53E-04

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 not documented/justified in the originally submitted application, as was requested in the DEQ-issued protocol approval notification. A description of release parameters was later provided with the submitted revised analyses. The flare source was modeled with enhanced dispersion characteristics as recommended by EPA guidance. Exhaust flow from the dust baghouse was correctly treated as having a horizontal release. Emissions were calculated from an onsite assessment of exit flow from the baghouse of 45 feet/second.

TABLE 7 Stack Parameters used in Modeling								
Source ID	**Source Description**	**Easting (X)**	**Northing (Y)**	**Base Elevation**	**Stack Height**	**Temperature**	**Exit Velocity**	**Stack Diameter**
		(m)	(m)	(m)	(ft)	(°F)	(fps)	(ft)
RETORT	Retort Furnaces	584191.7	4793615	966.89	41	849.99	37.78	1.00
FLARE	Flare	584189.7	4793628	966.92	60	1400.00	95.48	0.67
DCBGHS	dust collector baghouse	584206.5	4793628	967.01	31	70.00	95.49	1.00
JMBGHS	jet mill baghouse	584216.1	4793620	966.89	30	69.91	0.00	0.50
EMGEN	emergency generator	584223.7	4793617	966.89	10	916.00	0.00	0.33

3.2 Background Concentrations

Background concentrations were provided by DEQ and obtained from NWQUEST, and are deemed representative of the area around Mayfield, Idaho. These values are listed in Table 9.

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

AES performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed 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

AES submitted a modeling protocol to DEQ on September 14, 2014. DEQ provided a conditional protocol approval notice on November 11, 2014. Project-specific modeling and other required impact analyses were generally conducted using data and methods discussed in pre-application correspondence and in the *Idaho Air Quality Modeling Guideline*[1].

Table 8. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Mayfield, ID	The facility is located in an area that is attainment or unclassified for all criteria air pollutants
Model	AERMOD	AERMOD with the PRIME downwash algorithm,.
Meteorological Data	Boise surface data and 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 5.3 below
Building Downwash	Considered	BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
NOx Chemistry	None	.
Receptor Grid	**Significant Impact Analyses**	
	Grid 1	20-meter spacing along the ambient air boundary
	Grid 2	25-meter spacing for at least 100 meters from the ambient air boundary
	Grid 3	50-meter spacing for at least 300 meters from the ambient air boundary
	Grid 4	100-meter spacing for at least 500 meters from the ambient air boundary
	Grid 5	250-meter spacing for at least 1500 meters from the ambient air boundary

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 14134 was used by AES for the modeling analyses to evaluate impacts of the facility. This version is the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

DEQ provided five years of data from the Boise, Idaho airport for the years 2008-2012 . This data included both surface and upper air data, and is deemed adequately representative of the meteorology in the Mayfield 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). AES used 1 second data files (about 30-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." AES has a fenceline which 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 NAAQS Significant Impact Level Analyses

All criteria pollutant emission increases associated with the proposed project above the Level II Modeling Applicability Thresholds were modeled to show compliance with the NAAQS. All modeled impacts were below NAAQS . These thresholds, based on modeling of a single emissions stack with specified release parameters, were established to assure that impacts of projects with emissions equal to or less than these levels will not cause impacts exceeding the SILs. Since the emission increases associated with the proposed project are below these threshold values, a project-specific air impact analysis is not required to demonstrate NAAQS compliance for issuance of the PTC.

Table 9. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
$PM_{2.5}$[b]	24-hour	3.32 [a]	27	30.81	35
	Annual	0.57 [b]	6.2	6.77	12
PM_{10}[c]	24-hour	3.35	70	73.84	150
NO_2[d]	1-hour	27.0 [g]	32	59.0	188
	Annual	1.63	3.2	4.83	100

a. Highest second max any year

b. Highest annual average any year..

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

d. Nitrogen dioxide.

e. Sulfur dioxide.

f. Carbon Monoxide.

g. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 8th highest modeled concentrations for each year modeled.

h. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of maximum modeled concentrations for each year modeled.

i. Maximum of 6th highest modeled concentrations for a 5-year period (or the maximum of the 2nd highest modeled concentrations if only 1 year of meteorological data are modeled).

j. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 4th highest modeled concentrations for each year modeled.

k. Maximum of 2nd highest modeled concentrations for each year modeled.

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 586for those TAPs with project-specific emission increases exceeding emissions screening levels (ELs). The October 2014 application identified 4 TAPs that required modeling analysis. The results of the TAPs analyses are listed in Table 10. The predicted ambient TAPs impacts were considerably below any TAPs increments. The TAP emission rates as modeled are listed in Tables 5 and 6.

Table 10. TAP MODELING RESULTS

Pollutant	CAS No.	Average	Modeled Conc. ($\mu g/m^3$)[a]	AAC/AAAC ($\mu g/m^3$)[a]	%AAC/AAAC
Arsenic	7440-38-2	Annual	4.00E-05	2.3E-04	17%
Benzene	71-43-2	Annual	2.43E-03	1.2E-01	2%
Cadmium	7440-43-9	Annual	3.00E-05	5.6E-04	5%
Formaldehyde	50-00-0	Annual	2.34E-03	7.7E-02	3%

5.0 Conclusions

The ambient air impact analyses and other air quality analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions from the proposed AES 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.

APPENDIX C – FACILITY DRAFT COMMENTS

No facility draft comments were received.

APPENDIX D – PROCESSING FEE

Company: Alternative Environmental Systems, LLC
Address: 350 NW Recycle Drive
City: Mayfield
State: ID
Zip Code: 83716
Facility Contact: Rocky Warner
Title: Manager
AIRS No.: 039-00029

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	10.0	0	10.0
SO_2	2.0	0	2.0
CO	10.0	0	10.0
PM10	4.0	0	4.0
VOC	1.0	0	1.0
TAPS/HAPS	1.0	0	1.0
Total:	28.0	0	**28.0**
Fee Due	$ 5,000.00		