DEPARTMENT OF ECOLOGY
State of Washington

DRAFT TECHNICAL SUPPORT DOCUMENT FOR THE SGL AUTOMOTIVE CARBON FIBER FACILITY LINES 1–10 2015 REVISION, PSD 14-02, AMENDMENT 1 AND NOC APPROVAL 15AQ-E636

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1. EXECUTIVE SUMMARY

Below is the Technical Support Document (TSD) for the SGL Automotive Carbon Fiber (SGLACF) facility 2015 Lines 1–10 Permit Revision Project (application received September 25, 2015). The Washington State Department of Ecology (Ecology) has determined that all regulatory requirements have been satisfied and the project complies with the requirements for New Source Review (NSR) in the state of Washington.

2. INTRODUCTION

This TSD addresses the emissions increase from the 2015 modification of Lines 1–10. Two separate approvals are being issued for this facility. These approvals are modifications of existing approvals. One for the pollutants subject to Prevention of Significant Deterioration (PSD) program originally issued on April 13, 2015, (PSD 14-02) and one for the pollutants subject to Ecology's minor NSR program originally issued on April 20, 2015 (14AQ-586).

The rules require PSD review of all new or modified air pollution sources that meet certain criteria in an attainment or unclassifiable area with the National Ambient Air Quality Standards (NAAQS). The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere by a proposed new major source, or major modification to an existing major source. The program limits degradation of air quality to that which is not considered "significant." PSD rules require the utilization of Best Available Control Technology (BACT) for certain new or modified emission units, which is the most effective air pollution control equipment and procedures that are determined to be available after considering environmental, economic, and energy factors. Ecology now has our own State Implementation Plan (SIP) program for PSD. Therefore, the PSD permitting requirements are listed in Washington Administrative Code (WAC) 173-400-700 through 750.

The PSD rules must be addressed when a company is adding a new emission unit or modifying an existing emission unit in an attainment or unclassifiable area. PSD rules apply to pollutants for which the area is classified as attainment or unclassifiable with the NAAQS. PSD rules are designed to keep an area with "good" air in compliance with the NAAQS. The distinctive requirements of PSD are BACT, air quality analysis (allowable increments and comparison with the NAAQS), and analysis of impacts of the project on visibility, vegetations, and soils.

Ecology's minor NSR program is similar to the PSD program but it may address criteria pollutants that are not emitted in quantities great enough to trigger PSD and includes all toxic air pollutants (TAPs).

3. THE PROJECT

3.1. The Site

The existing facility is located on 110 acres of land in the city of Moses Lake, Washington, in Grant County. The site is within a Class II area that is in attainment or unclassified with regard

to all pollutants regulated by the NAAQS and state air quality standards. The physical address is 8781 Randolph Road NE in Moses Lake, Washington. The property borders Stratford Road NE to the west, Randolph Road NE to the east, and is approximately one-half mile east of the Grant County International Airport, Township 20 N Range 28 E Section 22. The bounding Universal Transverse Mercator coordinates are NAD83 Zone 11, 326705/5231086, 327498/5231054, 327488/5230395, 326697/5230457.

A map of the facility is shown in Figure 1 below. The building on the far left is administrative and warehouse, the buildings labeled Lines 1–2, Lines 3–4, and Lines 5–6 are existing structures. Production Lines1–5 are operational. The buildings labeled New Warehouse, Lines 7–8, and Lines 9–10 are part of a phased construction and are expected to be complete and operational by 2030.

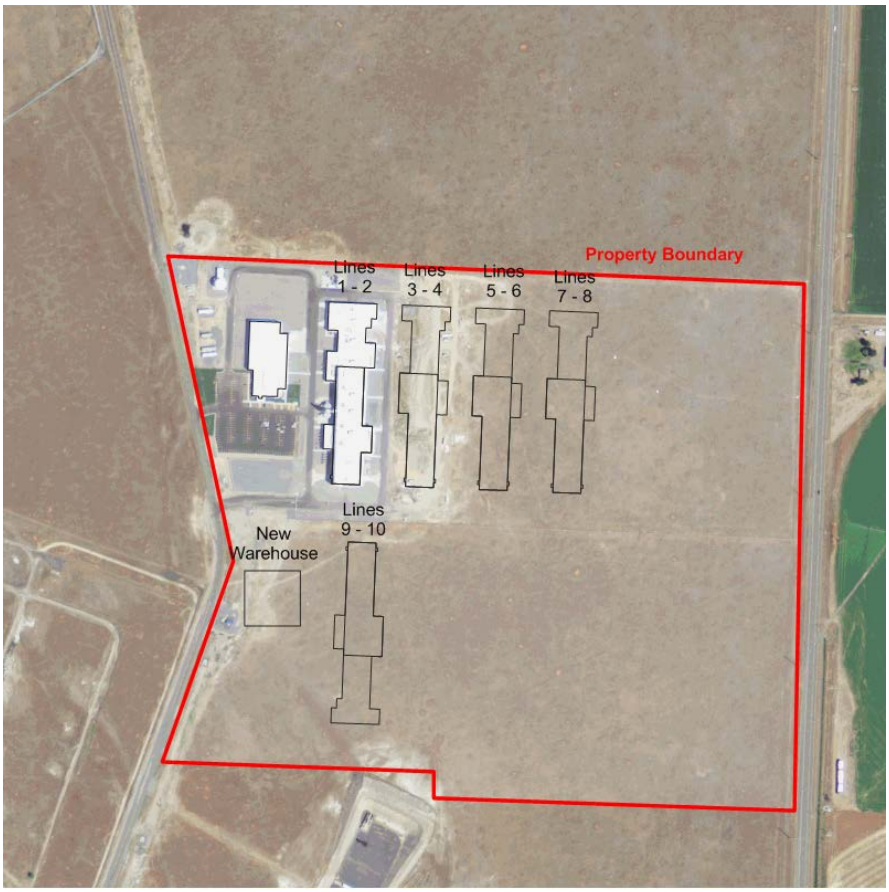

Figure 1. Facility Map

3.2. The Existing Facility

On March 23, 2010, SGLACF applied to install and operate two polyacrylonitrile carbon fiber production lines. Each line had the capacity to produce up to 1,500 tons of carbon fiber per year. In order to stay below 100 tons per year (tpy) limit, SGLACF requested and received a federally

enforceable limit of 99 tpy on nitrogen oxides (NO_X). Permit Number 10AQ-E362 was issued on July 13, 2010.

On January 31, 2011, SGLACF applied to install seven natural gas-fired reciprocating engines. Six of the engines were intended to provide power to safely shut down Line 1 should a grid power failure occur. The seventh engine was to provide power to an emergency power water pump for fire suppression. Permit Number 10AQ-E362 was rescinded and replaced by 11AQ-E408 on April 14, 2011.

On July 25, 2012, SGLACF applied to install and operate four natural gas-fired emergency power reciprocating engines. These engines were installed to provide emergency backup power to safely shut down Line 2. Permit Number 11AQ-E408 was rescinded and replaced by Permit Number 12AQ-E465 on February 21, 2013.

On June 28, 2013, SGLACF applied to double the size of the facility from two lines to four lines. Each of the four lines is designed to produce up to 1,760 tons of carbon fiber per year. In order to stay below the 100 tpy limit, SGLACF installed controls to ensure NO_X emissions would not exceed 100 tpy thus meeting their federally enforceable limit of 99 tpy on NO_X in the original permit. Permit Number 12AQ-E465 was rescinded and replaced by Permit Number 13AQ-E525 on January 24, 2014.

On March 26, 2014, SGLACF applied to change the emergency backup power for Lines 3 and 4 allowed in Permit Number 13AQ-E525 from natural gas internal combustion engines to diesel compression ignition engines. Permit number 14AQ-E558 issued on September 9, 2014.

On March 4, 2014, SGLACF submitted an application to increase the size of the facility from four lines to eight lines. The proposed Lines 5–8 Project was identical to Lines 1–4 Project authorized by Permit Number 13AQ-E525 with three exceptions. SGLACF proposed to generate backup emergency power from diesel engines instead of natural gas engines, furnace emissions are no longer routed through a selective catalytic reduction (SCR) control device due to plugging problems, and a new mode of operation (Standby Mode) has been requested. The furnace emissions are still routed through a thermal oxidizer (TO) but water injection is proposed to reduce the formation of NO_X. During the public comment period for the preliminary Order of Approval, EPA expressed its position that the approval process for Lines 5–8 should have been aggregated with the existing Approval Order. Under the terms of Settlement Agreement and Agreed Order No. 10768 signed June 16, 2014, Ecology acknowledged that Lines 1 and 2 were appropriately permitted as minor sources, and SGLACF agreed to submit new minor and major source permit applications addressing Lines 3–8, and the Lines 5–8 Project was never approved.

On August 15, 2014, SCLACF applied to increase the size of the facility to 10 lines. Each of the additional lines is expected to produce 1,760 tons of carbon fiber each year and include a regenerative thermal oxidizer (RTO) and a TO to combust organic compounds in the exhaust from the oxidation ovens and carbonization furnaces, respectively. An SCR will be installed on Lines 3–6 but is not proposed for Lines 7–10. Additionally, eight diesel-fuelled backup emergency power generators and a fire water pump engine will be installed. PSD 14-02 was

issued April 13, 2015, for Lines 3–10 (criteria pollutants) and Order 14AQ-E586 was issued April 20, 2015, for Lines 1–10.

3.3. The Proposed Project

On September 25, 2015, SCLACF submitted an application to change the emission limits on eight 2,937 diesel-fuelled emergency generators due to their inability to meet the manufacture estimated load specific emission rates. Additionally, SGLACF did not identify the portable oxidation ovens during the last permitting cycle.

Since 2011, SGLACF has used portable electric ovens in the Feed and Pretension step to splice together polyacrylonitrile from one creel box to another. Polyacrylonitrile is oxidized in these portable ovens, at temperatures similar to the main ovens, to attach the end of one box to the beginning of another so that a continuous campaign may be run. SGLACF refers to these ovens as pre-oxidation portable electric ovens and will have up to 50 portable ovens on-site. No other changes have been proposed for the facility.

There are six process steps associated with producing carbon fiber. They are:

1. Feed and Pretension: This step involves feeding filaments of polyacrylonitrile from spools or bobbins through a series of rollers to apply uniform tension. The polyacrylonitrile is spliced together by joining the end of one box to the beginning of another with heat applied by the portable electric ovens at temperatures greater than 220˚C. Emissions from the feed and pretension phase of production are vented to the room and are quantified below.

2. Oxidation: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1–2 or Lines 3–10 TSD's for information about this process step.

3. Low-Temperature Carbonization: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1-2 or Lines 3-10 TSD's for information about this process step.

4. High-Temperature Carbonization: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1–2 or Lines 3–10 TSDs for information about this process step.

5. Surface Treatment: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1–2 or Lines 3–10 TSDs for information about this process step.

6. Sizing: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1–2 or Lines 3–10 TSDs for information about this process step.

7. Winding and Packaging: This process is not being modified as part of this modification. Please refer to the April 13, 2015, Lines 1–2 or Lines 3–10 TSDs for information about this process step.

3.4. Operational Modes

Lines 1–6 each have six operational modes. Lines 7–10 have five operational modes. Each mode is explained below.

3.4.1. Start-up Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.2. Normal Operation Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.3. Shutdown Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.4. RTO Bypass Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.5. SCR Bypass Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.6. Standby Mode

This mode of operation is not being modified as a part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of this mode.

3.4.7. Emergency Power Generation

SGLACF has been approved to install and operate eight diesel-fuelled 2,937 brake horsepower (bhp) engines for quick cool down fans, lighting, and conveyor engines; one for each of Lines 3-10. Each of the eight emergency power generators (L3EG, L4EG, L5EG, L6EG, L7EG, L8EG, L9EG, and L10EG) is expected to operate no more than 16 hours in any 12-month rolling period.

The 16 hours of operation are based upon four 2-hr reliability tests and one 8-hr emergency operational period. However, the permit will not differentiate between testing and emergency operation. It takes approximately 10 minutes to start-up the CO, NO_X, and VOC control equipment (SCR). Therefore, the engines will be in Start-up Mode approximately one hr/yr and in normal operation the other 15 hr/yr. In addition, the permit requires performance testing of a representative engine within 12 months of start-up and every five years thereafter. Therefore, annual engine emissions calculations account for a single engine to operate for one 8-hr performance test in addition to the 16 hr/yr discussed above.

Source testing demonstrated that the emergency power generators did not meet the manufacture estimated load specific emission rates for diesel engine exhaust particulate (DEEP). Therefore, SGLACF has requested the emission limits in the two approvals (PSD-14-02 and 14AQ-E586) be revised to reflect the manufactures guarentees for emissions of NO_X, particulate matter smaller than 10 microns in diameter (PM_{10}), PM smaller than 2.5 microns in diameter ($PM_{2.5}$), CO, VOC's and DEEP from the eight diesel-fuelled emergency generators in the two approvals. No other emission factors for the emergency power generators are being changed.

4. LAWS AND RULES

In the spring of 2015, the state of Washington received approval from the U.S. Environmental Protection Agency Region 10 to operate our own PSD program. Once the state rules (WAC 173-400-700 through 750) were included into the state of Washington SIP, Ecology no longer used the federal rules as the basis for issuing and modifying PSD permits. Ecology, however, continues to follow EPA policy and guidance when issuing PSD permits.

The Washington State Clean Air Act (Chapter 70.94 RCW) grants Ecology the authority to issue NSR Orders of Approval. The implementing regulation (Chapter 173-400 WAC), describes a set of procedures to use when performing NSR. The majority of the requirements are contained in, but not limited to, WAC 173-400-091, WAC 173-400-110, WAC 173-400-111, WAC 173-400-113, and WAC 173-400-114. There are several general requirements or emission standards that apply to this source. One emission standard is a grain loading standard from combustion units of 0.1 grains/dry standard cubic foot (g/dscf) (see WAC 173-400-050(1)). There is also a maximum opacity standard of 20 percent listed in WAC 173-400-040(1).

4.1. WAC 173-400-110

This section of the rule addresses applicability of NSR to new and modified sources. The two proposed changes should have been included in the origianl approvals therefore they are being treated as a modification to the facility.

4.2. WAC 173-400-111

This section of the rule addresses the processing of NOC applications for sources, stationary sources, and portable sources. SGLACF stated that Section 8 (Changes of conditions or revisions to orders of approvals) should be used to process this modification. SGLACF has

already emitted the emissions from 30 of the 50 portable oxidation ovens as well as the higher emissions from the three of the eight diesel-fulled emergency backup geneators as part of its current operation. Ecology will process this change as a minor amendment and will evaluate the ambient air quality impacts associated with the total emissions from Lines 1–10.

4.3. WAC 173-400-113

This section of the rule requires a proposed source of modification in an attainment or unclassifiable area to comply with the federal rules, employ BACT for new or modified units, and ensure that the project does not cause or contribute to a violation of ambient air quality standards.

4.4. New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP)

NSPS applies to certain types of equipment that are newly constructed, modified, or reconstructed after a given applicability date. NESHAP applies to categories of equipment with hazardous air pollutant (HAP) emissions. The applicability of the following NSPS and NESHAPs are presented below:

- New Source Performance Standard 40 CFR 60, Subpart A
- New Source Performance Standard 40 CFR 60, Subpart IIII
- New Source Performance Standard 40 CFR 60, Subpart JJJJ
- National Emission Standards for Hazardous Air Pollutants 40 CFR 63, Subpart A
- National Emission Standards for Hazardous Air Pollutants 40 CFR 63, Subpart FFFF
- National Emission Standards for Hazardous Air Pollutants 40 CFR 63, Subpart ZZZZ

4.4.1. NSPS

4.4.1.1. NSPS Subpart A (General Provisions)

40 CFR 60.1 through 60.19, otherwise known as Subpart A, sets forth the general provisions that a stationary source must comply with. Most notable are the notification, monitoring, and performance testing requirements.

4.4.1.2. NSPS Subpart IIII (Standards of Performance for Compression Ignition Internal Combustion Engines)

40 CFR 60.4200 through 60.4219, otherwise known as Subpart IIII, sets forth standards that owners and operators of stationary compression ignition engines must comply with. Including non-emergency engines, emergency (non-fire pump) engines, emergency (fire pump) engines, and reconstructed engines. In order to be considered emergency engines per Subpart IIII, the

engines must operate in accordance to the following requirements as specified in Section 60.4211(f).

There are several other provisions that allow for additional use of the emergency engines but SGLACF proposed using their Reciprocating Internal Combustion Engines (RICE) only for readiness testing, during power outages and emergencies, and for performance testing due to permit requirements.

Pursuant to Sections 60.4205(b), 60.4202(a)(2), and 60.4211(c), SGLACF must comply with the subpart by purchasing engines certified to the applicable emission standards in Table 1 copied from 40 CFR 89.112 below:

Table 1. Subpart IIII Emission Standards

Rated Power (kW)	Tier	Model Year	Emission Standards		
			NMHC+NO_X	CO	PM
kW > 560	Tier 2	2006	6.4 g/kW-hr	3.5 g/kW-hr	0.2 g/kW-hr
			4.8 g/hp-hr	2.62 g/hp-hr	0.15 g/hp-hr

Additionally, SGLACF must use diesel fuel with a sulfur content of 15 parts per million maximum and a maximum cetane index of 40 or aromatic content of 35 volume percent.

Emissions from the emergency generators will continue to meet the emissions limits contained in Subpart IIII. For additional information about the applicability of Subpart IIII to this facility, please refer to the April 13, 2015, TSD for the Lines 3–10 project.

4.4.1.3. NSPS Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

Emissions units subject to Subpart JJJJ are not being changed as part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of the applicability of this rule.

4.5. NESHAP

4.5.1. NESHAP Subpart A (General Provisions)

The provisions of Subpart A apply to each affected facility under any Part 63 NESHAP rule. Subpart A contains general requirements for notifications, monitoring, performance testing, reporting, recordkeeping, and operation and maintenance. These general requirements will apply to the proposed project as referenced in the applicable NESHAP subparts.

4.5.2. NESHAP Subpart FFFF (NESHAP for Miscellaneous Organic Chemical Manufacturing)

Emissions units subject to Subpart FFFF are not being changed as part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of the applicability of this rule.

4.5.3. NESHAP Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)

Emissions units subject to Subpart ZZZZ are not being changed as part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of the applicability of this rule.

5. EMISSIONS

WAC 1730400-030 (53) defines "New Source" as:

(a) The construction or modification of a stationary source that increases the amount of any air contaminant emitted by such source or that results in the emission of any air contaminant not previously emitted; and

(b) Any other project that constitutes a new source under the Federal Clean Air Act.

Ecology uses the formula potential minus actual (in tpy) to determine if a source has undergone an emissions increase and would be subject to NSR.

Potential emissions or a sources "potential to emit" are defined by WAC 173-400-030(73), where "potential to emit" means the maximum capacity of a source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a 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 only if the limitation or the effect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a source.

Actual emissions are defined in WAC 173-400-030(1) where "actual emissions" means the actual rate of emissions of a pollutant from an emission unit, as determined in accordance with (a) through (c) of this subsection.

(a) In general, actual emissions as of a particular date shall equal the average rate, in tpy, at which the emissions unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Ecology or an authority shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions

shall be calculated using the emissions unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

(b) Ecology or an authority may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the emissions unit.

(c) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the emissions unit on that date.

For this approval, potential minus actual will be used to determine the emissions increase. For the emission units that have begun normal operation, actual emissions will be set as zero.

5.1. Existing Allowable Emissions

For the 2015 revision project the changes will be treated as a modification to an existing facility because the facility should have included these emissions when it was originally permitted. Existing emissions units that are not changing will not be evaluated. Only the increase in NO_X, PM_{10}, $PM_{2.5}$, VOC, CO, and DEEP will be evaluated for the eight diesel-fuelled engines. Additionally, the above pollutants as well as TAPs will be evaluated for the 50 portable pre-oxidation ovens.

5.2. Proposed Emissions

Table 2 presents the facility's criteria pollutant emissions after the project.

Table 2. Proposed Emissions

Pollutant	April 13, 2015 Proposed Emissions (tpy)	Diesel-Fuelled Emergency Generators Change (tpy)	Pre-Oxidation Portable Electric Ovens (50) (tpy)	Total Proposed Emissions (tpy)
CO	46	0.2	2.63E-03	46.2
NO_X	467	0.1	2.63E-03	467.1
PM (filterable)	39	0.01	1.30E-04	39.0
$PM_{10}/PM_{2.5}$	88	0.01	3.70E-04	88.0
SO_2	25	0	2.10E-04	25.0
VOC	60	0.04	2.23E-03	60.0

Table 3 presents the facility's TAP emissions after the project.

Table 3. TAP Emissions

Pollutant	Averaging Period	April 13, 2015 Proposed Emissions (lb/avg. period)	Diesel-Fuelled Emergency Generators (lb/hr)	Pre-Oxidation Portable Electric Ovens (50) (lb/avg. period)	Total Proposed Emissions (lb/avg. period)
NO_2	1-hr	84.5	6	4.80E-04	100.0**
CO	1-hr	23.6	4.5	6.00E-04	28.1
SO_2	1-hr	5.6	---	4.80E-05	5.6
Acetalydehyde	annual	0.47	---	0	0.47
Acrolein	24-hr	0.048	---	0	0.048
Acrylonitrile	annual	408.5	---	1.07E-01	408.6
Ammonia	24-hr	594	---	1.61E-02	594
Ammonium sulfate	1-hr	12	---	0	12
Ammonium bisulfate	1-hr	12	---	0	12
Arsenic	annual	0.26	---	1.26E-06	0.26
Benzene	annual	14.23	---	1.33E-05	14.23
Beryllium	annual	1.5E-02	---	7.58E-08	1.5E-02
Bromomethane	24-hr	3.5E-02	---	0	3.5E-02
1,3-Butadiene	annual	0.11	---	0	0.11
Cadmium	annual	1.47	---	6.96E-06	1.47
Carbon disulfide	24-hr	0.52	---	3.72E-06	0.52
Chloromethane	lb/day	1.19E-02	---	0	1.19E-02
Chromium VI	annual	7.0E-02	---	3.53E-07	7.0E-02
Cobalt	24-hr	3.07E-04	---	1.45E-09	3.07E-04
Copper	1-hr	1.28E-04	---	6.10E-10	1.28E-04
DEEP	annual	5.74	20.7	0	20.7
Dichlorobenzene	annual	1.54	---	7.58E-06	1.54
Dichloromethane	annual	4.14E-02	---	0	4.14E-02
Formaldehyde	annual	101.6	---	4.73E-04	101.6
Hexane	day	5.38	---	3.12E-05	5.38
Hydrogen cyanide	24-hr	316.5	---	5.02E-02	316.6
Manganese	24-hr	1.36E-03	---	6.54E-09	1.36E-03
Mercury	24-hr	9.41E-04	---	4.50E-09	9.41E-04
Naphthalene	annual	1.15	---	3.85E-06	1.15
Nickel	annual	2.73	---	1.33E-05	2.73
Propylene	24-hr	1.30	---	0	1.30
Selenium	24-hr	8.64E-05	---	4.15E-10	8.64E-05
Toluene	24-hr	0.198	---	5.88E-08	0.198

Table 3. TAP Emissions					
Pollutant	**Averaging Period**	**April 13, 2015 Proposed Emissions (lb/avg. period)**	**Diesel-Fuelled Emergency Generators (lb/hr)**	**Pre-Oxidation Portable Electric Ovens (50) (lb/avg. period)**	**Total Proposed Emissions (lb/avg. period)**
Vanadium	24-hr	8.26E-03	---	3.98E-08	8.26E-03
Vinyl acetate	24-hr	0.98	---	8.34E-06	0.98
Benz(a)anthracene	annual	4.00E-03	---	1.14E-08	4.00-03
Benzo(a)pyrene	annual	2.21E-03	---	7.58E-09	2.21E-03
Benzo(b)fluoranthene	annual	5.28E-03	---	1.14E-08	5.28E-03
Benzo(k)fluoranthene	annual	2.95E-03	---	1.14E-08	2.95E-03
Chrysene	annual	6.37E-03	---	1.14E-08	6.37E-03
Dibenzo(a,h)anthrancene	annual	2.45E-03	---	7.58E-09	2.45E-03
Indeno(1,2,3-cd)pyrene	annual	1.35E-02	---	1.14E-08	1.35E-02
3-Methylcholanthrene	annual	2.38E-03	---	1.14E-08	2.38E-03
7,12-Dimethylbenz[a]anthracene	annual	2.60E-02	---	1.07E-07	2.60E-02
** The April 13, 2015 value was incorrect. It should have read 101 lb/hr. Due to the changes in testing duration and the increases due to this project the total proposed emissions are 100 lb/hr.					

Greenhouse gases are not being changed as part of this modification. Please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of the greenhouse gases at this facility.

5.3. Operational Limitations

SGLACF has estimated its operational hours in each mode. Those limits are:

- RTO Bypass Mode limited to aggregate 1½ hr/day for Lines 3–10 and 4½ hr/line/yr.
- Shutdown Mode will be limited to 365 ninety-second events per year for a total of 9.13 hours for each line.
- SCR Bypass Mode limited to 100 hr/yr for each line.
- Operation of the eight 2,937 bhp emergency generators is limited to aggregate 136 hours of operation per year. The 136 hours of operation is expected to consist of eight hours of maintenance and testing and eight hours of emergency operation, per engine, as well as an additional eight hr/yr for performance/source testing of one representative engine. This approval however will not restrict how the engines are operated only the total hours of operation.
- Operation of the fire water pump engine is limited to 38 hr/yr. Originally, there was a plan to use 30 hours for maintenance and testing and eight hr/yr for emergency operation,

but there will be no restriction on how the fire water pump engine is operated, just the total hours of operation.

5.4. Emissions Increase

Table 4 presents the project's diesel-fuelled backup emergency engine emission factors.

Table 4. Backup Engine Emission Factors

Pollutant	Avg. Period	Engines (lb/avg. period)
CO	1-hr	4.5
NO_X	1-hr	8.0
PM	1-hr	0.15
$PM_{10}/PM_{2.5}$	1-hr	0.15
VOC	1-hr	0.9
DEEP	1-hr	0.15

6. NSR APPLICABILITY

This action is a minor modification of an existing facility becausethe emissions changes being authorized under this action should have been included in previous permits. Therefore, please refer to the April 13, 2015, Lines 3–10 TSD for a discussion of NSR applicability for this facility.

6.1. The Application

The pre-application meeting for this project was held on August 24, 2015. The NOC application and PSD application were submitted on September 25, 2015. The application was determined to be complete on October 21, 2015. This TSD and Order of Approval are based upon the information submitted by the applicant, SGLACF, and its consultant, Ramboll Environ.

6.2. HAPs

The increases in HAPs have been identified in Table 3 above. Please refer to the April 13, 2015, Lines 3–10 TSD for an additional discussion of HAPs from this facility.

6.3. PSD

PSD applicability was determined in the April 13, 2015, Lines 3–10 TSD. Today's action is a revision to the existing permit.

7. DETERMINATION OF BACT

BACT means an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under Chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of the "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under the definition of BACT in the Federal Clean Air Act as it existed prior to enactment of the Clean Air Act Amendments of 1990.

This BACT analysis is consistent with general EPA guidance (EPA, 1990). The steps involved are briefly described below. The EPA BACT guidance document details a "top-down" approach for selecting the appropriate control technology. The steps are as follows:

Step 1. Identify all available control alternatives with practical potential for application to the specific emission unit for the regulated pollutant under evaluation.

Step 2. Eliminate all technically infeasible alternatives. If any of the control techniques identified in Step 1 cannot be successfully used on the emission units due to technical difficulties, such techniques are removed from further consideration.

Step 3. Rank the remaining alternatives by control effectiveness. Assess the performance of each technically feasible control technique, and rank them beginning with the most effective.

Step 4. Evaluate the cost-effectiveness, energy impacts, and environmental impacts of the most cost-effective control alternative.

Step 5. Select BACT, which will be the most effective alternative not rejected based on economic, energy, and/or environmental impacts.

7.1. Regulatory Requirements

BACT is required at each emission point for each pollutant subject to regulation. Because this project addresses changes at an existing facility, BACT was limited to the emission units that were either added to the permit(s) or units whose emissions increased as a result of the new emission factors.

7.2. Clearinghouse Review

No clearinghouse review was performed for this project.

7.3. Emission Units Subject to BACT

There are 58 emission points associated with this change. Fifty of them are the portable pre-oxidation ovens and the other eight are the 2937 bhp diesel-fuelled emergency generators.

7.3.1. BACT for the pre-oxidation portable electric ovens

The pre-oxidation ovenso splice the polyacrylonitrile feedstock together. The pollutants emitted from the ovens and furnaces include NO_X, PM, PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), VOCs, CO, and TAPs. Add-on controles are infeesable given the emissions increase from the 50 combined ovens. BACT for the ovens is proper operation.

7.4. Summary of BACT

Table 5 is a summary of the BACT determination for this project.

Table 5. BACT Summary For Each Line

Process	Pollutant	BACT	Emission Limit
Pre-oxidation portable electric ovens (each oven)	CO	Proper operation	1.20E-5 lb/hr
	NO_X	Proper operation	1.20E-5 lb/hr
	Acrynitrile	Proper operation	2.44E-7 lb/hr
	Hydrogen Cynaide	Proper operation	4.18E-5 lb/hr
Diesel engines	NO_X	Proper Operation and use of ULSD. Since engine emission limits are intentionally low, they are considered to be other.	0.75 g/hp-hr
	CO	Proper Operation. Since engine emission limits are intentionally low, they are considered to be other.	0.54 g/hp-hr
	$PM_{10}/PM_{2.5}$	Proper Operation and use of ULSD. Since engine emission limits are intentionally low, they are considered to be other.	0.034 g/hp-hr
	DEEP	Proper Operation	0.034 g/hp-hr

8. AMBIENT AIR QUALITY ANALYSIS

8.1. Modeling Methodology

SGLACF's consultant, Ramboll Environ, used the EPA recommended AERMOD (Version 15181) air dispersion model. AERMET (Version 15181) was based upon the meteorological data available from the National Weather Service (NWS) surface station located at the Grant County International Airport and a NWS upper air station located in Spokane, Washington. The dispersion modeling techniques used to simulate transport and diffusion require an hourly meteorological database. Therefore, in addition to using the hourly NWS meteorological data, 1-minute wind speed and wind direction data from the Grant County International Airport, Ramboll Environ used using the AERMINUTE preprocessor (Version 11325) to resolve calm and variable wind conditions.

8.2. Criteria Pollutant Concentrations

Table 6 presents the criteria pollutants against the modeling Significant Impact Levels (SILs). This modeling included all the emission from the original permit as well as this modification.

Table 6. SIL Analysis

Criteria Pollutant	Avg. Period	Max Project Concentration ($\mu g/m^3$)	SIL ($\mu g/m^3$)
CO	1-hr	363.4	2,000
	8-hr	186.3	500
NO_2	1-hr	137.5	7.5
	annual	5.5	1
PM_{10}	24-hr	10.7	5
$PM_{2.5}$	24-hr	9.6	1.2
	annual	1.9	0.3
SO_2	1-hr	6.6	7.8
	3-hr	5.5	25
	24-hr	3.3	5
	annual	0.5	1

The emissions of NO_2, PM_{10}, and $PM_{2.5}$ exceed the SIL. Therefore, the emissions will undergo a NAAQS analysis.

8.3. Increment

On September 15, 2014, the $PM_{2.5}$ minor source baseline date for the Eastern Washington-Northern Idaho Interstate Air Quality Control Region was triggered. The Eastern Washington-

Northern Idaho Interstate Air Quality Control Region (AQCR 230) encompasses Adams, Asotin, Columbia, Garfield, Grant, Lincoln, Spokane, Whitman Benewah, Kootenai, Latah, Nez Perce, and Shoshone counties.

As indicated in Table 7, The NO_2 minor source baseline date was established in 1992. Although actual emissions are appropriate when evaluating increment consumption, SGLACF included potential annual NO_X emissions from industrial sources within 50 kilometers of the facility to evaluate annual NO_2 increment consumption. An additional conservative measure was to assume all regional sources consume NO_2 increment even though some of them were constructed prior to 1992 and would therefore not consume NO_2 increment. NO_X emissions do not result in concentrations that exceed the annual NO_2 increment.

Table 7. Increment Analysis

Pollutant	Avg. Period	Maximum Modeled Concentration (µg/m³)	Class II PSD Increment (µg/m³)
NO_2	annual	5.50	25
PM_{10}	24-hr	9.02	30
$PM_{2.5}$	24-hr	7.95	9.0
	annual	1.86	4.0

Project emissions do not result in concentrations that exceed allowable PSD increments.

8.4. NAAQS Analysis

Facility-wide modeling results and background concentrations presented in Table 8 indicate NO_2, PM_{10}, and $PM_{2.5}$ design concentrations plus background concentrations are below the applicable NAAQS at all receptor locations.

Table 8. NAAQS Analysis

Criteria Pollutant	Avg. Period	Maximum Concentration (Facility) (µg/m³)	Background (µg/m³)	Total (µg/m³)	Standard (µg/m³)
NO_2	1-hr	151.1	16.0	167.1	188
	annual	6.4	2.8	9.2	100
PM_{10}	24-hr	10.2	92	102.2	150
$PM_{2.5}$	24-hr	8.1	19.4	27.5	35
	annual	2.2	6.5	8.7	12

Emissions of all pollutants are below their NAAQs and no further analysis is necessary.

8.5. TAP Analysis

8.5.1. SQER Analysis

An SQER analysis was not performed. However, based upon the April 13, 2015, Lines 1–8 TSD emissions of SO_2, NO_2, acrolein, acrylonitrile, ammonia, ammonium sulfate, ammonium bisulfate, arsenic, benzene, cadmium, chromiumVI, DEEP, formaldehyde, and hydrogen cyanide exceed the SQER. Therefore, they were modeled and evaluated against their ASILs below.

8.5.2. ASIL Analysis

Table 9 compares the pollutants that exceeded the SQER to their ASILs.

Table 9. ASIL Analysis

Pollutant	Avg. Period	Max Modeled Concentration (µg/m³)	ASIL (µg/m³)	Emissions Above ASIL (Yes or No?)
SO_2	1-hr	6.69	660	No
NO_2	1-hr	145.70	470	No
Acrolein	24-hr	0.02	0.06	No
Acrylonitrile	lb/yr	0.00436	0.00345	Yes
Ammonia	24-hr	13.7	70.8	No
Ammonium sulfate	1-hr	16.17	120	No
Ammonium bisulfate	1-hr	16.17	120	No
Arsenic	annual	2.73×10^{-6}	3.03×10^{-4}	No
Benzene	annual	2.40×10^{-4}	0.0345	No
Cadmium	annual	2.00×10^{-5}	0.000238	No
Chromium VI	annual	7.65×10^{-7}	6.67×10^{-6}	No
DEEP	annual	0.00152	0.0033	No
Formaldehyde	annual	0.0011	0.167	No
Hydrogen cyanide	24-hr	8.05	9	No
7,12 dimethylbenz(a)anthrecene	annual	2.19×10^{-7}	1.41×10^{-5}	No

All toxics except acrylonitrile are below their appropriate ASILs. If the project were only to include Lines 3–7, the maximum model-predicted concentration of acrylonitrile would be 0.00314 µg/m^3, which is below the 0.00345 µg/m^3 ASIL. The exceedance of acrylonitrile will occur once Line 8 is operational. SGLACF intends to purchase the impacted property. The application also notes that SGLACF has no Board of Directors authorization for expansion beyond Line 5; Lines 6–10 are included in the application to prevent the question of aggregation of projects should they be approved in the next few years. The Approval Order requires SGLACF to purchase the land where the exceedance has been modeled to occur as shown in the figures below for each project as shown in the Table 10.

Table 10. Property Coordinates						
UTM Property Corners (Meters)					Property Dimensions (Feet)	
North of Site						
	Northwest	Northeast	Southeast	Southwest	North-South	East-West
With Line 8	327168, 5231092	327218, 5231090	327217, 5231066	327166, 5231068	83	164
With Lines 8 & 9	327093, 5231125	327292, 5231125	327292, 5231062	327092, 5231071	204	656
With Lines 8–10	327042, 5231175	327366, 5231175	327367, 5231060	327042, 5231073	379	1065
South of Site						
With Line 8	N/A	N/A	N/A	N/A	N/A	N/A
With Lines 8 & 9	N/A	N/A	N/A	N/A	N/A	N/A
With Lines 8–10	326949, 5230448	327049, 5230445	327048, 5230420	326948, 5230423	82	328

Figure 2. Land needed for Line 8 due to the exceedance of acrylonitrile

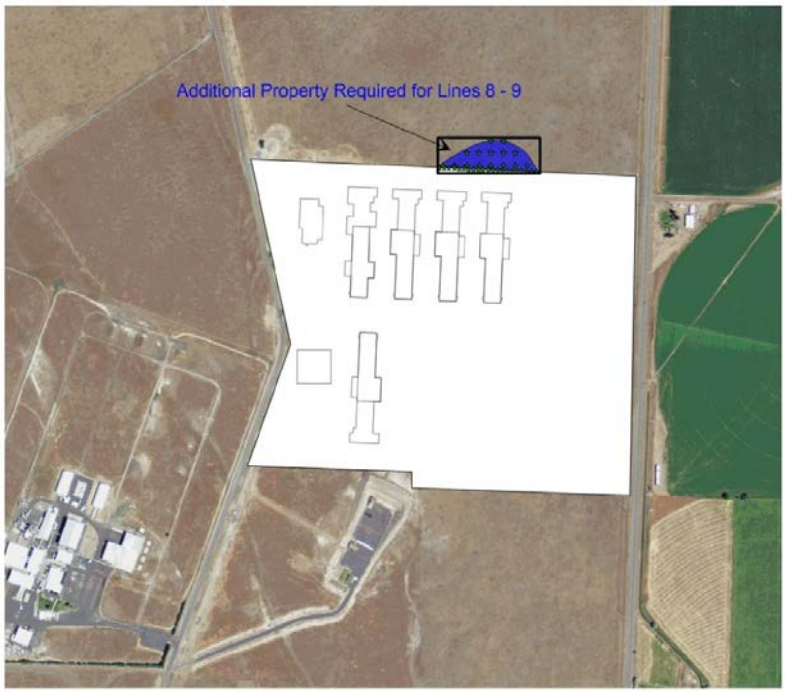

Figure 3. Land needed for Lines 8–9 due to the exceedance of acrylonitrile

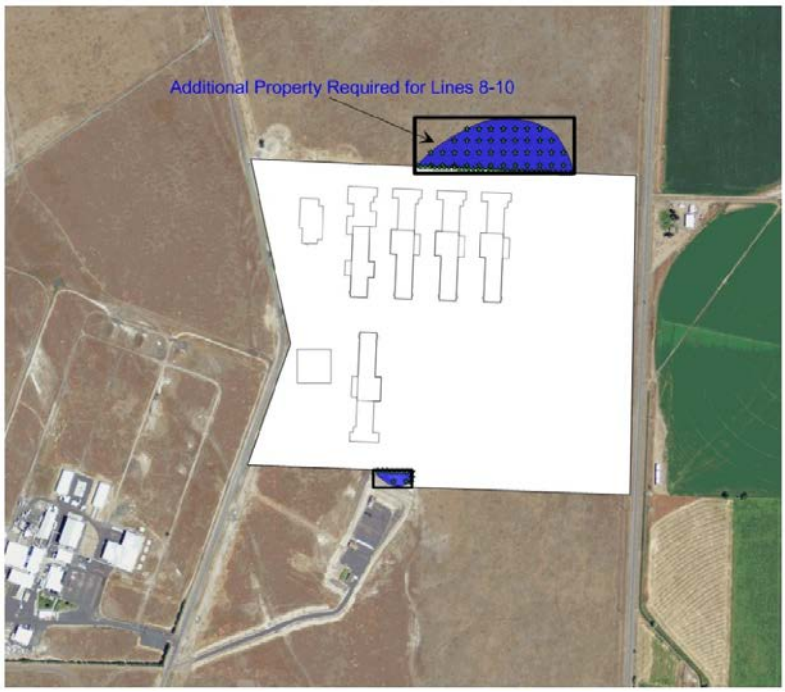

Figure 4. Land needed for Lines 8–10 due to the exceedance of acrylonitrile

9. CONCLUSION

The project will have no significant adverse impact on air quality. The Washington State Department of Ecology finds that the applicant, SGLACF, has satisfied all requirements for NSR.

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10. LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
µg/m^3	micrograms per cubic meter
ASIL	Acceptable Source Impact Level
BACT	Best Available Control Technology
bhp	brake horsepower
CO	carbon monoxide
DEEP	diesel engine exhaust particulate
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
g/dscf	grains per dry standard cubic foot
HAP	hazardous air pollutant
HCN	hydrogen cyanide
hp	horsepower
hr	hour(s)
lb	pound(s)
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
NWS	National Weather Service
PM	particulate matter
PM_{10}	particulate matter smaller than 10 microns in diameter
$PM_{2.5}$	particulate matter smaller than 2.5 microns in diameter
PSD	Prevention of Significant Deterioration
RCW	Revised Code of Washington
RICE	Reciprocating Internal Combustion Engines
RTO	regenerative thermal oxidizer

SCR	selective catalytic reduction
SIL	Significant Impact Level
SGLACF	SGL Automotive Carbon Fiber
SO_2	sulfur dioxide
TAP	toxic air pollutant
TO	thermal oxidizer
tpy	tons per year
TSD	Technical Support Document
WAC	Washington Administrative Code