

**COMMON WEALTH OF PENNSYLVANIA  
Department of Environmental Protection  
Southwest Regional Office**

**MEMO**

**TO** Air Quality Permit File TVOP-65-00028

**FROM** Jesse S. Parihar  
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**THROUGH** Thomas J. Joseph, P.E.  
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**DATE** February 01, 2018

**RE:** Review of Operating Permit Renewal Application  
Lehigh Specialty Melting, Inc.  
Latrobe Facility  
Latrobe Borough, Westmoreland County  
AUTH # 801660, APS # 699147, PFID # 280828

**BACKGROUND:**

The Latrobe facility is a steelmaking and specialty melting facility in Western Pennsylvania and was founded in 1888 as the Latrobe Steel Company. The facility was owned and operated by Standard Steel LLC until June 15, 2004. The melt shop ceased its operations in June 2004. On November 5, 2004, Lehigh Specialty Melting, Inc. ("LSM") a subsidiary of WHEMCO, Inc. purchased Latrobe facility from Standard Steel, LLC a division of Freedom Forge Corporation. On January 17, 2005, the melt shop went back into operations. The plant continued to manufacture carbon and medium alloy steel ingots. LSM facility has NAICS Code 331110 and SIC Code 3399, and is located approximately 40 miles east of Pittsburgh on 107 Gertrude Street, in the City of Latrobe, Westmoreland County. The LSM facility specializes in the melting of stream degassed, argon shrouded carbon and low alloy steel ingots for a variety of applications. The major emission unit at the facility is the Electric Arc Furnace (EAF) – Source 101. The 72-acre site has three (3) main shops: Melt Shop, Forge Shop, and Heat Treat Shop. Materials are received and shipped by both truck and rail.

LSM facility did not operate as a major source facility for any criteria or hazardous air pollutant and operated as a synthetic minor until 2008 when it became a major source of carbon monoxide (CO) emissions. CO emissions from the facility amounted to 173.6 tons, exceeding the emission limit prescribed in the permit Condition No. 009 of Section C of the Permit Number OP-65-

00028 that was issued on May 23, 2007, and expired on May 23, 2012. On February 12, 2009, LSM submitted its annual emissions inventory to the Department for the year 2008. As a result of stack test results, it was found that the facility has exceeded the CO emissions prescribed as permit limitation. On March 2, 2009, an NOV was issued to LSM for violating the permit conditions. In September 2009, a Consent Assessment of Civil Penalty (CACP) was executed between LSM and the Department. The Department imposed a civil penalty of \$21,670.00 which was paid in full by LSM. As a result of the CACP and their subsequent submittal of a TVOP application received on July 15, 2009, the case was resolved, and was closed in eFACTS on October 19, 2009.

On December 28, 2007, US EPA promulgated 40 CFR Part 63 Subpart YYYYYY – National Emission Standards for Hazardous Air Pollutants for Area Sources: Electric Arc Steelmaking Facilities. 40 CFR Section 63.10680 requires all sources under this category to have either a Title V operating permit (TVOP) or submit a TVOP application.

The Compliance Assurance Monitoring (CAM) provisions of 40 CFR 64 applies when all of the following are true:

1. The source is located at a Title V facility;
2. The source is subject to an emission standard;
3. The source uses a control device to achieve compliance with the emission standard; and
4. Emissions from the source, without the control device, exceed major source thresholds.

LSM has identified the following sources and associated control devices as subject to CAM:

- Source ID 101 EAF

On June 30, 2008, LSM facility submitted the following “Compliance Certification” for management and control of contaminants from scrap metal under 40 CFR Part 63 Subpart YYYYYY:

- The facility complies with the requirements of restricted metallic scrap use in accordance with §63.10685(a)(2);
- The facility complies with the requirements for scrap that does not contain motor vehicle scrap in accordance with §63.10685(b)(4);
- The facility operates a capture system for the EAF that will convey the collected emissions to a particulate control device in accordance with §63.10686(a);
- The facility certifies initial compliance with the applicable emission limit in §63.10686(a) or (b) based on the results of a previous performance test in accordance with §63.10686(d)(6); and
- The facility has developed and submitted the proposed monitoring information in accordance with 40 CFR Part 64.

**Compliance Assurance Monitoring (CAM) Requirements:**

The facility is obligated to meet the CAM requirements of 40 CFR 64 for the operation of the baghouse and associated dust collection system. 40 CFR Part 63 Subpart YYYYYY also requires CAM plans for all affected facilities. In accordance with the requirements, the facility shall monitor baghouse pressure differentials, evacuation system fan amperages, visible emissions from the melt shop and baghouse, and conduct a single performance test once every five years to demonstrate a reasonable assurance that the baghouse controls particulate matter to levels in compliance with the emissions restrictions of the Operating Permit Number OP-65-00028. When the EAF is in operation, observations are required to be taken in accordance with EPA Method 9 by a certified visible emissions observer for at least three 6-minute intervals. Visible emissions shall not exceed 6% for the EAF canopy and shall not exceed 3% for the baghouse. Excursions will trigger an internal inspection and corrective action as deemed necessary to re-establish compliance. The applicant has submitted the following CAM Plan to comply with the requirements of 40 CFR Part 64:

**A. Emission Unit**

Description: Source 101  
Identification: SOOP Permit No. 65-00028 conversion to TV Permit  
Facility: Lehigh Specialty Melting, Inc.  
107 Gertrude Street, Latrobe, PA 15650-0031

**B. Applicable Regulation, Emission Limits, and Monitoring Requirements**

Regulation No. 40 CFR Part 63 Subpart YYYYYY

Emission Limitations: Particulate matter emissions from the EAF fabric filter stack shall not exceed 0.81bs/ton or 0.0052gr/dscf. Opacity from the melt shop stack emission is limited to 6% by Subpart YYYYYY.

**C. Control Technology:**

Emission from EAF (Source 101) are controlled by a baghouse (C01). The baghouse is a Wheelabrator Frye., Inc. fabric filter that was installed in January 1971. The baghouse is a mechanical shaker unit that is rated at 88,667 SCFM or 110,000 ACFM @ 200°F. The stack gas exhaust temperature is estimated to be around 200° F. Potential PM<sub>10</sub> emissions from the EAF into the fabric filter are major thus requiring a Compliance Assurance Monitoring (CAM) Plan. LSM has proposed the use of existing testing, monitoring, and recordkeeping requirements as CAM. The EAF is subject to the requirements of a National Emissions Standards for Hazardous Air Pollutants (NESHAP) and LSM is required to follow the requirements of 40 CFR 63.9(b)(2). Appropriate conditions shall be added to the TVOP. There is only one source, EAF (Source 101), at the LSM facility which is subject to Compliance Assurance Monitoring (CAM) requirements of 40 CFR Part 64, and is presented below in Table 1:

**Table: 1**  
**Source 101 Monitoring Approach**

	<b>Indicator No. 1</b>	<b>Indicator No. 2</b>
I. <u>Indicator:</u> Measurement Approach	Pressure drop across fabric filter compartments	Visible emissions
	Manometer on each compartment	Visual observations
II. <u>Indicator Range:</u> Quality Improvement Plan (QIP) threshold	2" – 9"	0 – 3% opacity
	6 deviations in 6 months	6 deviations in 6 months
III. <u>Performance Criteria:</u>  A. Data Representativeness	Differential pressure monitoring on the inlet and outlet sides of this fabric filter would serve to confirm that the unit is operating correctly and that the fabric filter has no holes, blown bags, blinding bags, clogged bags or is otherwise not operating correctly.	Visual opacity is a good indicator of particulate emissions from the fabric filter. Although not covered by the NSPS requirements, visual opacity to achieve a grain loading of less than 0.0052 is limited to less than 3%. This corresponds nicely to the system being able to meet grain loading requirements or the lbs/ton limit of 0.81bs/ton.
	B. Verification of operational status	Equipment currently installed; calibrated/operational on installation.
	C. QA/QC Practices and Criteria	Annual calibration using an oil type manometer to confirm that the gauge is reading properly.
	D. Monitoring Frequency	Continuous
Data Collection Procedures	Data collected daily	Annual confirmation observation by an independent certified reader.
Averaging Period	Daily instantaneous reading	Daily visible observation using Method 22. These observations shall be for at least 3 six-minute periods
		Manual log entry on opacity log sheets
		Readings will be 3 six-minute averages per day. If opacity is observed a certified reader will be called to take Method 9 readings the following operating day.

**RFD:**

On May 19, 2008, the Department approved an RFD for the replacement of the previously installed Dracco fabric filter rated at 32,917 SCFM on Billet Grinder Operation (Source 104) with an American Air Filter rated at 9,137 SCFM. The outlet concentration of the new filter is designed to be 0.02 gr./dscf or 1.57 lbs/hr.

**TVOP Application:**

On July 15, 2009, TVOP-65-00028 application was received in the Department to obtain a Title V operating permit. On August 19, 2009, an administratively incompleteness letter was issued by the Department per 25 PA Code §127.411(a)(2). The applicant provided the requested information required for administrative completeness and on May 12, 2010, the application was determined to be administratively complete. The above application was assigned to another review engineer and was re-assigned to me in August 2017. During the review, it was realized that sources and controls were required to be updated as there were some changes at the facility since 2009. As such, the Department requested that the applicant to re-submit a TVOP application with all the updates. On January 2, 2018, a revised operating permit application was received by the Department. On January 9, 2018, additional technical information was requested. The complete requested information was received on January 22, 2018.

The applicant has noted that the following sources are no longer operated at the LSM facility:

- Residual waste processing
- Outside burning for scrap preparation
- Inert gas storage tanks
- Boilers
- Combustion Sources
- Shot Blast Unit
- Forge Heating Furnaces
- Car Bottom Heat Treat Furnace
- Pre-heat treatment to the scrap metal
- Metal forming shop.

These sources have either been removed or no longer operate at the facility. The updated inventory includes existing sources and controls at the LSM facility and are presented below in Table 2.

**Table: 2**  
**Sources and Controls**

Unit ID	Company Designation	Unit Type
101	Electric Arc Furnace – Rated at 40.0 tph	Process
102	Teeming Steel – Rated at 77,894 tpy	Process
103	Torch cutting exhaust volume 28,256 SCFM	Process
104	Billet Grinder exhaust volume 9,500 SCFM	Process
105	4-Ladle Preheat furnaces @ 8.5 MMBtu/hr.	Process
106	6-Heating Furnaces @ 133.24 MMBtu/hr.	Process
107	2-Heat Treat Furnaces @ 17.3 MMBtu/hr.	Process
	3-Hood Furnaces; each @ 7.35 MMBtu/hr.	Process
109	Facility-wide Miscellaneous Combustion	Process
110	Cold Degreaser (Parts Washer)	Process
111	Caterpillar emergency generator @ 545 bhp	Process
112	3-Cooling Towers	Process
113	Roadway Traffic	Process
C01	Mechanical shaker baghouse – Wheelabrator	Control Device on 101
C03	Mechanical shaker baghouse – Wheelabrator	Control Device on 103
C04	Grinder baghouse – American Air Filter	Control Device on 104
S01	Single common stack for Source 101 & 102	Exhaust – 88,667 SCFM
Z02	Fugitives from Teeming Operations	Fugitives
S03	Torch cutting baghouse stack – Source 103	Exhaust – 28,256 SCFM
S04	Billet Grinder baghouse stack – Source 104	Exhaust – 9,500 SCFM
Z05	Fugitives from Ladle Preheat Furnaces	Fugitives
Z06	Fugitives from Forge Heating Furnaces	Fugitives
Z07	Fugitives from Heat Treat and Hood Furnaces	Fugitives
Z09	Fugitives from Facility-wide Miscellaneous Combustions	Fugitives
Z10	Fugitives from Parts Washer	Fugitives
S11	Emergency diesel generator Stack	Exhaust
Z12	Fugitives from Cooling Towers	Fugitives
Z13	Fugitives from Roadways	Fugitives

1. There are 3 new hood furnaces; each rated at 7.35 MMBtu/hr; and are exempt from plan approval being less than 10 MMBtu/hr.
2. Natural gas-fired boilers 031 and 033 have been removed from site.
3. As noted, source 109 used 2,748 MCF of gas in 2016, about 3% of total facility-wide gas usage.
4. On May 31, 2005, a maintenance plan was submitted for many furnaces which did not operate for the last 10 years and the maintenance plan has expired.
5. Source 108 (shot blast operations) has been removed from the facility.

The sources 101 through 111 except source 108 are discussed briefly below:

**1. Electric Arc Furnace (Source 101):**

An Electric Arc Furnace (EAF) is a furnace that heats charged material by means of an electric arc. The EAF in general are used to produce carbon steels and alloy steels primarily by recycling ferrous scrap. CO<sub>2</sub> emissions are generated during the smelting and refining processes, which

removes carbon as CO and CO<sub>2</sub> from the charge materials and carbon electrodes. The current EAF has a rated capacity of 40.0 tons per hour and is operated at 9 – 10 tons per hour at the facility. It is used to melt and produce carbon and medium alloy steel. Typically, the facility gets two to three melts per shift. The EAF and the Melt Shop's 3-roof monitors are controlled by a large Wheelabrator-Frye baghouse rated at 88,667 SCFM and has the Model No. 168. The unit is a seven-compartment mechanical shaker type unit. Fines from the baghouse are shipped to Horsehead Resources in Palmerton, PA. The water pressure drop range is 2 to 8-inches.

In 2016, the EAF was operated for 2,300 hours and this furnace consumed 98,318 MCF of natural gas. Scrap metal is delivered to a scrap bay, located next to the melt shop. The scrap is loaded into the scrap baskets passes to a scrap pre-heater, which uses hot furnace off-gases to heat the scrap and recover energy, increasing plant efficiency. The scrap basket is then taken to the melt shop, the roof is swung off the furnace, and the furnace is charged with scrap from the basket. After charging, the roof is swung back over the furnace and meltdown commences.

Oxygen is blown into the scrap, combusting or cutting the steel, and extra chemical heat is provided by wall-mounted oxygen-fuel burners. The EAF melts steel scrap to produce liquid steel. Both processes accelerate scrap meltdown. Supersonic nozzles enable oxygen jets to penetrate foaming slag and reach the liquid bath. An important part of steelmaking is the formation of slag, which floats on the surface of the molten steel. The slag is blown into the furnace during meltdown. Once the temperature and chemistry are correct, the steel is tapped out into a preheated ladle through tilting the furnace. For some special steel grades, including stainless steel, the slag is poured into the ladle as well, to be treated at the ladle furnace to recover valuable alloying elements. During tapping some alloy additions are introduced into the metal stream, and more lime is added on top of the ladle to begin building a new slag layer. During and after tapping, the furnace is "turned around": the slag door is cleaned of solidified slag, the visible refractories are inspected and water-cooled components checked for leaks, and electrodes are inspected for damage or lengthened through the addition of new segments; the tap hole is filled with sand at the completion of tapping. The heat times vary based on the type of steel being melted. As noted, charge to tap time may be longer and could be up to four hours because all alloying is done in the furnace.

Fumes and dusts generated by this process are captured by a hood system and routed to a positive pressure Wheelabrator baghouse, for removal of particulate matter (PM) and metallic HAPs such as Arsenic, Cadmium, Chromium, Cobalt, Lead, Manganese & Nickel. The Wheelabrator baghouse is a mechanical shaker which was installed on January 01, 1971. The capture efficiency of the baghouse is rated at 99% for particulate matter and 98% for Chromium and Nickel.

### **Stack Testing:**

On June 20, 2008, LSM performed a stack test on the EAF for PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, and CO through Blue Mountain Environmental Management Corporation ("Blue Mountain") per Condition 003 of Section D (Testing Requirement) of the SOOP. The recorded results were as follows:

$PM_{10} = 0.0052 \text{ gr/dscf} \times 88,667 \text{ SCFM} \times 60 \text{ min/hr.} / 7,000 \text{ gr/lb.}$   
 $= 3.95 \text{ lbs/hr.} = 0.48 \text{ lbs/ton}$   
 $NO_x = 3.2 \text{ ppm, } 1.96 \text{ lbs/hr, and } 0.229 \text{ lbs/ton;}$   
 $SO_x = 1.0 \text{ ppm, } 0.83 \text{ lbs/hr, and } 0.095 \text{ lbs/ton; and}$   
 $CO = 131.9 \text{ ppm, } 48.05 \text{ lbs/hr, and } 5.76 \text{ lbs/ton}$

Following the test, Blue Mountain used their test data to prepare the annual emission report. As a result, it was determined that LSM has exceeded the permit limit for CO. Blue Mountain's CO emissions were based on their test data at 5.76 lbs/ton of steel produced (224.33 tpy). As noted, prior to the stack test, LSM's used an AP-42 emission factor to compute facility-wide CO (2.1 lbs/ton of steel produced) emissions amounting to 77.89 tpy, and the facility was considered as a minor facility. The LSM facility exceeded the CO permit limits which was a violation of the permit conditions. On March 02, 2009, a notice of violation (NOV) was issued. On October 19, 2009, the case was resolved after the LSM facility entered into a Consent Order and Agreement (COA) with the Department. A civil penalty amounting to \$21,670 was imposed on the LSM facility which was paid in full and the case was closed out in eFACTS.

The facility is only major for CO, and minor for the remaining pollutants. The facility has taken the voluntary limits for natural gas and steel production. The facility-wide limit of 77,894 tons of steel production per year allows the facility to remain a minor source for all other pollutants except CO.

The applicant has submitted the following emission estimate for the EAF based on the stack test results as presented below in Table: 3

**Table: 3**  
**EAF Emission Estimate**

Pollutants	Emission Factor (lbs/ton)	Steel Production Limit (tpy)	Emission Estimate (tpy)
PM <sub>10</sub>	0.48	77,894	18.69
NO <sub>x</sub>	0.229	77,894	8.92
CO	5.76	77,894	224.34
SO <sub>x</sub>	0.095	77,894	3.70

1. The emissions are based on a steel production rate of 77,894 tons per year.
2. The EAF emissions are based on 8,760 hours of operation per year.
3. Values may be slightly off due to rounding.

**Metallic HAPs:**

The exhaust containing metallic HAPs such as Arsenic, Cadmium, Chromium, Cobalt, Lead, Manganese & Nickel goes to a mechanical shaker Wheelabrator baghouse (C01). The capture efficiency per manufacturer for these HAPs is 98%. The combined emissions of these HAPs are less than two tons per year. Metallic HAPs estimated from the process are presented in Table 4.



**Table: 4**  
**Metallic HAPs from Electric Arc Furnace**

MFHAPs	Emission Factor (lb/ton steel)	Reduction Efficiency %	Steel Production (tpy)	Emissions (tpy)
Cadmium	0.000005	0.0	77,894	0.0002
Chromium	1.94	98.0	77,894	1.51
Lead	0.00056	0.0	77,894	0.022
Manganese	0.0003	0.0	77,894	0.011
Nickel	0.025	98.0	77,894	0.019
<b>Total HAPs</b>				<b>1.56</b>

1. Emission factor (E.F.) for un-controlled Chromium and Nickel based on EPA's WebFire SCC 3-03-009-04 (2009).
2. E.F. for Manganese and Cadmium are taken for controlled emissions from AP-42 Table 12.5.1-9.
3. E.F. for Lead is taken for controlled emissions from AP-42 Table 12.5.1-7.
4. E.F. includes emissions from charging, melting, slagging, tapping, ladle transfer etc.
5. Values may be slightly different due to rounding.

**2. Teeming Operations (Source 102):**

Teeming is pouring of molten metal (after refining) from a ladle furnace into an ingot mold. Emissions from this process are shown in the following Table 5.

**Table: 5**  
**Teeming Operation Emissions**

Operation	PM <sub>10</sub>	
	(lbs/ton)	(tpy)
Teeming	0.07	2.73

1. Particulate emission is based upon a Steel production of 77,894 tpy.
2. Emission factor of PM<sub>10</sub> are taken from AP-42 Chapter 12.5.1.
3. Values may be slightly off due to rounding.

**3. Torch Cutting Operations (Source 103):**

The Ingot Cutting/Torch Cutting is a natural gas-fired source; Make: Union Carbide Corporation; Model No. C-60; and is located on the end of the Forging section of the facility. Steel ingots are brought here and cut to specified lengths. A hand-held natural gas fired torch is used for the cutting operation. During the cutting process, sparks, particulates, and gas are drawn into a spark pit, and then vented to a baghouse. The torch operates during the daylight shift only and not on a continuous basis. This source is connected to a baghouse rated at 28,256 SCFM; Make: Wheelabrator Frye; Model No.1220 F-171-55; Serial No. B-96341; and was installed in 1975. It has two (2) compartments and each compartment has 240 bags. The pressure drop range is 5 to 14-inches.

Particulate matter (PM<sub>10</sub>) emissions are associated with the torch cutting of steel. The PM<sub>10</sub> emissions from natural gas combustion and the PM emissions from torch cutting are represented as PM<sub>10</sub> and are included with the emission calculations. The emission estimate from the torch cutting operation is based on the allowable emission rate in 25 Pa Code §123.13.  $PM_{10} = 0.04 \text{ gr/dscf} \times 28,256 \text{ dscfm} \times 60 \text{ min/hr.} / 7000 \text{ gr/lb} = 9.69 \text{ lbs/hr.}$  As noted, the actual emissions are expected to be significantly less based on current baghouse parameters.

**Table: 6**  
**Estimated Emissions from Torch Cutting Operations**

Operation	PM <sub>10</sub>	
	(lbs/hr.)	(tpy)
Torch Cutting	9.69	42.43

1. Emissions are based on 8,760 hours of operations.
2. Values may be slightly off due to rounding.

**4. Billet Grinder Operations (Source 104):**

The Billet Grinder is located in the Open Die Machine Shop. The grinder's vent hood has evenly spaced pickup parts located along the hood's length. Dust and grindings are drawn outside and then into a baghouse. On May 19, 2008, the previously installed baghouse was replaced with an American Air Filter baghouse which is a Mechanical Shaker. The American Air Filter has Model No. 1-96L, No. of bags: 216, Fabric material: Polyester/Dacron, Air to cloth ratio: 2.5:1, and have greater than 99% control efficiency. This baghouse was approved by the Department via an RFD. The baghouse is required to be cleaned on a regular basis, otherwise the shavings will collect and rust together in the hoppers. The dust is disposed of in the plant's slag dump. Emission estimate from torch cutting operation is based on the allowable emission rate in 25 Pa Code §123.13. Emissions from this operation goes to a baghouse rated at 9,137 SCFM. The dust is disposed of in the plant's slag dump. The pressure drop range is 5 to 14-inches. As noted, the actual emissions are expected to be significantly less based on current baghouse parameters.

$$PM_{10} = 0.04 \text{ gr/dscf} \times 9,137 \text{ dscfm} \times 60 \text{ min/hr.} / 7000 \text{ gr/lb.} = 3.13 \text{ lbs/hr.}$$

**Table: 7**  
**Estimated Emissions from Billet Grinder Operations**

Operation	PM <sub>10</sub>	
	(lbs/hr.)	(tpy)
Grinding Operations	3.13	13.72

1. Emissions are based on 8,760 hours of operations.
2. Values may be slightly off due to rounding.

## **5. Emissions from Natural gas-fired Other Furnaces:**

The other furnaces include: ladle furnaces (Source 105), heating furnaces (Source 106), heat treat and hood furnaces (Source 107), and Miscellaneous combustion sources (Source 109) are natural gas-fired sources. There are four (4) ladle furnaces at site and are used to carry molten steel from the melting furnace to the ladle refining station or to the casting operation. In a mini-mill, scrap metal is melted and refined in an electric arc furnace to make steel products. Generally, molten steel is produced in an EAF and then tapped from the EAF to a ladle. The molten steel is then usually further refined with the addition of alloys.

There are six (6) heating furnaces and used for heating steel to an appropriate temperature immediately prior to austenitizing when hardening high hardenability constructional steels, many of the tool steels, and heavy sections. Austenitizing is a process in which a metal is heated to a critical temperature and the cooled in a particular manner to alter its internal structure for obtaining desired degree of physical and mechanical properties such as brittleness, hardness, and softness.

The facility has two (2) heat treat furnaces and four (4) hood furnaces. A combination of heating and cooling operations applied to a metal or alloy in the solid state to obtain desired conditions or properties. A treatment in which an alloy is heated to a suitable temperature and held at this temperature for a sufficient length of time to allow a desired constituent to enter into solid solution, followed by rapid cooling to hold the constituent in solution. The material is then supersaturated and subsequently exhibits hardening.

The emissions from all the above operations include criteria pollutants; particulate matter (PM), both filterable and condensable, carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>x</sub>), and volatile organic compounds (VOC). The applicant has submitted the following estimate based upon the consumption of natural gas. The applicant has noted that all the existing furnaces are seldom used and has opted a way to determine the potential to emit based on the total consumption of natural gas for heat treatment under the full production. The Department concurs with the applicant's estimate which is based on AP-42 factors. Source 109 is associated with the miscellaneous plant-wide combustion sources at site.

In 2016, total natural gas usage at the facility was approximately  $100 \times 10^6$  cubic feet and produced approximately 18,879 tons of the steel. The steel production allowed by the permit was limited to 77,894 tons. The steel production in 2016 was approximately 25% of the total allowable production. To this extent under maximum plant operations the total gas usage would approach  $400 \times 10^6$  cubic feet.

Estimated emissions from all the above furnaces (Source 105, 106,107, and 109) are presented below in Table 8.

**Table: 8**  
**Estimated Emissions from the Other Furnaces**

Pollutants	Natural gas Consumption (MMscf/yr.)	Emission Factor (lbs/MMscf)	Estimated Emission	
			(lbs/yr)	(tpy)
PM <sub>10</sub>	400	7.6	3,040	1.52
NO <sub>x</sub>	400	100	40,000	20.0
CO	400	84	33,600	16.8
SO <sub>x</sub>	400	0.6	240	0.12
HAP	400	1.80	720	0.36
VOC	400	5.5	2,200	1.1

1. The other furnaces include ladle, heating, heat treatment and hood Furnaces, and miscellaneous combustion sources.
2. The emissions are based on emission factors from AP-42; Table 1.4-1 and 1.4-2.
3. The emissions are estimated for 400 MMscf natural gas consumption on an annual basis.
4. As noted, hexane is the only HAP in the natural gas.
5. Values may be slightly off due to rounding.

**Source 110 (Parts Washer):**

The applicant has submitted the Material Safety Data Sheet (MSDS) for the Part Washer Solvent with the application and noted that the Parts Washer/Cold Degreaser utilizes light petroleum distillates and is used sparingly. The solvent contains VOC greater than 99.6%. The density of the solvent is given as 6.86 lbs per gallon. According to the MSDS there is no HAP in solvent. Parts Washer is subject to the work practice requirements of 25 Pa Code §129.63(a). The approximate VOC emissions are estimated by the applicant is as follows:

VOC ~1.0 tpy

**Source 111 (Emergency Generator):**

The Caterpillar 3412 emergency diesel generator rated at 545 bhp was manufactured prior to 1972, and is operated for testing only. The emergency diesel generator is limited to 500 hours of operation. Potential emissions are included in the following Table 9.

**Table: 9**  
**Emission Estimate for Emergency Diesel Generator**

Pollutants	Emission Factor		Estimate Emissions (tpy)
	(lbs/hp-hr)	(lbs/hr)	
PM <sub>10</sub>	0.0022	1.20	0.30
NO <sub>x</sub>	0.031	16.9	4.22
CO	0.0067	3.65	0.91
VOC	0.0025	1.36	0.34

1. Emission estimate is based on AP-42; Table 3.3-1 emission factors.
2. The emissions are based on 500 hours of operation per year.
3. Values may be slightly off due to rounding.

**Other Minor Emission Sources:**

**1. Cooling Towers:**

Lehigh operates three (3) cooling towers at its LSM facility, which are potential sources of particulate mist emissions. The largest cooling tower is rated at 12,000 gallons and attached to the EAF. The others are small units. The chemicals are added to only to the EAF cooling tower which include sodium hydroxide, sodium hypochlorite. The chemicals are identified as:

- PCT 3026 – Stabilized Bromine
- PCT6400B – Blended chemical treatment for cooling towers

Cooling water absorbs heat from process streams in noncontact heat exchangers. Before the water can be reused, it must be cooled. Cooling towers are used to transfer waste heat from the cooling water to the atmosphere by allowing water to cascade through a series of decks and slat-type grids. During evaporative cooling, some water is lost by evaporation and some is lost as entrained water in the air stream. Since there are dissolved solids in the circulating water to minimize corrosion and scale buildup in the piping, the entrained water, after evaporation, results in TSP and PM<sub>10</sub> emissions.

The PM<sub>10</sub> emissions using emission factors from AP-42, Section 13.4, Wet Cooling Towers based on TDS (total dissolved solids) content of 12,000 ppm.

Potential PM<sub>10</sub> = 0.65 tpy

**2. Storage Tanks:**

There are a total of three storage tanks at the facility:

- Two (2) diesel tanks; each less than 500 gallons; and
- One (1) gasoline tank less than 1000 gallons.

As noted, the emissions from these tanks are negligible and not included in facility-wide emission estimate.

### 3. Roadway Traffic:

As noted, the roads past the gate are all paved. Trucks travel in the slag area, etc. The applicant has provided a roadway fugitive emission estimate from the following sources:

- Trucks (Delivery and Pickup)
- Scrap Yard Delivery Trucks
- Baghouse Waste Removal
- Lime Silo Fill
- Shipping Storage Area
- Shipping Press Furnace Area
- Slag Area
- Fork Lift; and
- Employees Vehicles

Maximum fugitive emissions from all the above sources, PM<sub>10</sub> = 4.39 tpy

**Note:** The applicant has submitted that there are no welding activities and no oil quenching at the facility; however, the facility has a few 55-gallon lube-oil drums.

Facility-wide emission estimate from all the sources is presented below in the following Table 10

**Table: 10**  
**Facility wide Estimates Emission**

Source ID	Source Name	PM <sub>10</sub>	NO <sub>x</sub>	CO	SO <sub>x</sub>	VOC	MFHAPs
101	EAF	18.69	8.92	224.34	3.70	-	1.56
102	Teeming	2.73	-	-	-	-	-
103	Torch Cutting	42.43	-	-	-	-	-
104	Billet Grinder	13.72	-	-	-	-	-
105 to 107, 109	Other Furnaces	1.52	20.0	16.80	0.12	1.1	0.36
110	Parts Washer	-	-	-	-	1.0	-
111	Emergency Gen.	0.30	4.22	0.91	0.27	0.34	-
112	Cooling Tower	0.65	-	-	-	-	-
113	Roadways Traffic	4.39	-	-	-	-	-
<b>Total</b>		<b>84.43</b>	<b>33.14</b>	<b>242.05</b>	<b>4.09</b>	<b>2.44</b>	<b>1.92</b>

1. EAF emission estimate is based on 8,760 hours of operation per year.
2. The scrap material shall be free from grease, paint, or other contaminants.
3. The facility is limited to 77,894 tons of steel production per year.
4. The facility is limited to natural gas consumption of 400,000 Mscf/yr.

**Prevention of significant deterioration of air quality (PSD) Applicability:**

Although the facility is one of the 28 listed source categories defined as major with a potential to emit of greater than 100 tons of a regulated NSR pollutant, this facility was constructed and commenced operation prior to June 19, 1978, effective date of the PSD regulations.

Additionally, as part of the review for this permit, the Department evaluated the reported emission change for CO in 2008 and subsequent years. A review of our records indicates that no physical change, or change in method operation occurred to the EAF during that period. A review of production indicates that yearly fluctuations were within historical ranges and those fluctuations were not due to process changes.

According to 40 CFR Part 52 §52.21(a)(2) applicability procedures "The requirements of this section apply to the construction of any new major stationary source or the major modification of any existing major stationary source, except as this section otherwise provides", and "Major Modification" means any physical change or change in method of operation of a major source that would result in: a significant emission increase (as defined in paragraph (b)(40) of this section) of a regulated NSR pollutant (as defined in paragraph (b)(50) of this section); and a significant net emissions increase of that pollutant from the major stationary source".

Because there have been no physical changes or changes in methods of operation, the facility is not subject to the requirements of this Section. The increase in CO emissions are not subject to PSD. There have been no changes to the EAF rated at 40 tph since it was taken over by Lehigh in November 2004. The change in reverted emissions from the EAF are due to using source test data instead of AP-42 emission factors.

**RACT II Applicability:**

The applicability of RACT II (25 Pa Code §129) was also considered for this facility. This facility is a Title V facility as required by regulation (40 CFR 63.1068(d), but not a major source of NO<sub>x</sub> or VOC emissions, and therefore, not subject to the requirements of RACT II.

**REGULATORY ANALYSIS:**

**State Regulations:**

The facility is subject to all the previously established regulations in State Only Operating Permit Number SOOP-65-00028. However, the following additional regulations, that were not a part of the previous approvals; are being incorporated in the proposed permit:

- 25 Pa Code §121.7.
- 25 Pa Code §129.63(a).
- The existing malfunctioning conditions are being replaced with the most recent

established conditions in the proposed permit.

**NSPS Requirements:**

The New Source Performance Standards (NSPS) for Steel Plants: Electric Arc Furnaces and Argon Oxygen Decarburization Vessels were proposed on October 21, 1974, promulgated on September 23, 1975, and most-recently amended on February 22, 2005. The requirement of this Subpart does not apply to the LSM facility as explained below:

**40 CFR Part 60, Subparts AA:** The provision of this Subpart does not apply to the SLM facility as it was constructed in 1888, i.e. prior to October 21, 1974, as described below:

- (a) The provisions of this subpart are applicable to the affected facilities in steel plants that produce carbon, alloy, or specialty steels: electric arc furnaces and dust-handling systems.
- (b) The provisions of this subpart apply to each affected facility identified in paragraph (a) of this section that commenced construction, modification, or reconstruction after October 21, 1974, and on or before August 17, 1983.

**40 CFR Part 60, Subparts AAa:** The provision of this Subpart does not apply to the SLM facility as it was constructed in 1888, i.e. prior to August 17, 1983, as described below:

- (a) The provisions of this subpart are applicable to the following affected facilities in steel plants that produce carbon, alloy, or specialty steels: electric arc furnaces, argon-oxygen decarburization vessels, and dust-handling systems.
- (b) The provisions of this subpart apply to each affected facility identified in paragraph (a) of this section that commences construction, modification, or reconstruction after August 17, 1983.

**NESHAP Requirements:**

**40 CFR Part 63 Subpart ZZZZ:**

40 CFR Part 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines; this Subpart applies to the existing Caterpillar emergency diesel generator rated at 545 bhp. The emergency generator located at area source of HAP emissions and is subject to the following requirements per §63.6603 and §63.6640:

- Change oil and filter every 500 hours of operation or annually, whichever comes first;
- Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.



**Note:** The above Caterpillar emergency generator rated at 545 bhp shall be equipped with a non-resettable hour meter.

The existing facility is subject to the following additional federal regulations which were not included in the Operating Permit # OP-65-00028 issued on May 23, 2007, because 40 CFR Part 63 Subpart YYYYYY and Subpart XXXXXX was promulgated on December 28, 2007, i.e. after the issuance of the operating permit. On June 30, 2008, LSM established that the facility is subject to 40 CFR Part 63 Subpart YYYYYY requirements as explained below:

**40 CFR Part 63 Subpart YYYYYY:**

National Emission Standards for Hazardous Air Pollutants for Area Sources: §63.10680(b)(1) applies to each new or existing affected source. The affected source is each EAF steelmaking facility. An affected source is an existing source if you commenced construction or reconstruction of the affected source before September 20, 2007. LSM is an existing affected area source as it commenced construction in 1888 i.e. before September 20, 2007, and is subject to this subpart.

According to §63.10685(c)(3) Electric Arc Furnace Steelmaking Facilities are subject to recordkeeping and reporting requirements. LSM must keep records documenting compliance with paragraph (b)(4) of this section for scrap that does not contain motor vehicle scrap and must submit semiannual compliance reports to the Administrator for the control of contaminants from scrap according to the requirements in §63.10(e). The report must clearly identify any deviation from the requirements in paragraphs (a) and (b) of this section and the corrective action taken. You must identify which compliance option in paragraph (b) of this section applies to each scrap provider, contract, or shipment.

The facility is not subject to the requirements of 40 CFR Part 63 Subpart XXXXXX which is explained below:

**40 CFR Part 63 Subpart XXXXXX:**

National emission standards for hazardous air pollutants area source standards for nine metal fabrication and finishing source categories. The facility is not subject to the requirements of Subpart XXXXXX because both these codes i.e. NAICS Code 331110 and SIC Code 3399 are not available in the "9 Metal Fabrication Applicability List" and none of the following activities are performed at LSM facility:

- (1) Electrical and Electronic Equipment Finishing Operations;
- (2) Fabricated Metal Products;
- (3) Fabricated Plate Work (Boiler Shops);
- (4) Fabricated Structural Metal Manufacturing;
- (5) Heating Equipment, except Electric;

- (6) Industrial Machinery and Equipment Finishing Operations;
- (7) Iron and Steel Forging;
- (8) Primary Metal Products Manufacturing; and
- (9) Valves and Pipe Fittings.

**RECOMMENDATIONS:**

Lehigh Specialty Melting Inc. has met the appropriate maintenance, monitoring, record keeping, stack testing, and work practice standards associated with the Title V permit application number TVOP-65-00028 to continue to operate the previously installed sources at the facility. The facility was last inspected on September 19, 2017, by Air Quality Specialist, Phil Sapala and found that the facility complied with all the applicable permit conditions. The intent to issue notice will be published in Pa Bulletin. The copy of the approved review memo, and draft permit will be distributed to the applicant, EPA, and AQDS Tom Norris for comments.

I recommend issuance of Title V Operating Permit number TV-65-00028 for a five-year term from the date of issuance subject to the standard conditions in Section B and other conditions previously established in the operating permit along with the other conditions mentioned in this memo.