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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2894
Plant ID No.:	043-00031
Applicant:	Hobet Mining, LLC (Hobet)
Facility Name:	Selenium Treatment Plant
Location:	Lincoln County
NAICS Code:	212112
Application Type:	Construction
Received Date:	August 9, 2011
Engineer Assigned:	Joe Kessler
Fee Amount:	$2,000
Date Received:	August 11, 2011
Complete Date:	October 5, 2011
Due Date:	January 3, 2011
Applicant Ad Date:	March 31, 2011
Newspaper:	*The Lincoln Journal*
UTM's:	Easting: 415.6977 km Northing: 4,2188.572 km Zone: 17
Description:	Construction of a mine-water selenium treatment plant.

DESCRIPTION OF PROCESS/MODIFICATIONS

Hobet is proposing to take mine-water and biologically treat it to remove selenium. This will be effected by reducing selenate to elemental selenium where it can associate with biological solids and be removed by physical filtration. The recovered selenium will be entrained in a dewatered sludge cake that will have a dry solid concentration between 20 to 25 percent (75 to 80 percent by weight water). While the sludge cake is not expected to have any free liquids, it should be moist to the touch. Due to this high percentage of entrained water, it will not be expected to produce any fugitive particulate emissions. The cake solids will be collected in roll off containers and trucked offsite to a non-hazardous solid waste landfill for disposal.

The air emissions sources associated with this process include two (2) natural gas-fired 16.33 mmBtu/hr boilers (BO-1 and BO-2) and a diesel-fired 500 kw emergency generator (GEN-1: Kohler Model 500REOZVB). The boilers will be used to heat the wastewater to a minimum temperature of 55°F. The emergency generator will only be used to supply power to equipment when power from the grid is unavailable and during routine monthly reliability testing and maintenance activities. No emission controls have been proposed for the boilers or the generator.

SITE INSPECTION

On September 22, 2011, the writer conducted an inspection of the proposed location of the Hobet facility. The contact for the inspection was Mr. Jim Clements, Director - Environmental Special Projects for Patriot Coal Corporation. The proposed site is located in an isolated valley near an active surface mine off of County Route 46 (Upper Mud River Road) northwest of Madison, in Lincoln County, WV. No site preparation had begun at the site.

The proposed location of the source is in an isolated area and there are no occupied residences visible from the site (a trailer was visible approximately one quarter mile from the site but appeared unoccupied). The nearest occupied residence is estimated to be approximately one mile to the southeast. Any potential nuisance (odor, noise) from the proposed facility should be mitigated by the location.

Directions: Traveling south on Corridor G, turn right onto County Route 46 (Mud River Rd). Proceed approximately 10.5 miles on Route 46 until reaching the intersection of County Route 46 /2 (Berry Branch Rd.). The plant site is located on the right.

REVIEW OF APPLICANT'S EMISSIONS ESTIMATE

In the permit application, Hobet supplied an emissions estimate for the potential emission sources at the proposed facility. The following will discuss the methodology of Hobet's emissions estimate for each source.

Boilers

Potential emissions from the boilers were based on emission factors for natural gas combustion as given in AP-42 Section 1.4. Hourly emissions were based on the maximum design heat input (MDHI) of each furnace (16.33 mmBtu/hr) and annual emissions were based on an annual operation of 8,760 hours. A natural gas heat content value of 1,020 btu/ft^3 was used in the calculations.

Emergency Generator

Potential emissions from the emergency generator were based on emission factors for diesel-fired reciprocating engines as given in AP-42 Section 3.3 (Table 3.3-1). Hourly emissions, when using the AP-42 emission factors, were based on the maximum design heat input (MDHI) of the generator (4.69 mmBtu/hr) and annual emissions were based on an annual operation of 500 hours.

Greenhouse Gases

As part of this permitting action, the writer conducted a GHG PTE analysis of the proposed Selenium Treatment Plant. The results are presented in the following table:

Table 1: Selenium Treatment Plant Annual GHG Emissions in TPY

Source	CO_2	N_2O	CH_4	CO_2e
Boiler 1[(1)]	8,419.91	0.15	0.16	8,471.15
Boiler 2[(1)]	8,419.91	0.15	0.16	8,469.77
Emergency Generator[(2)]	192.29	no factor	no factor	192.29
Total	***16,839.82***	***0.30***	***0.32***	***17,131.83***

(1) As based on AP-42 Section 1.4.
(2) As based on AP-42 Section 3.3.

Selenium Treatment Plant Potential to Emit

Based on the above estimation methodology, which is determined to be appropriate, the annual PTE of the proposed Selenium Treatment Plant is given in the following table:

Table 2: Facility-Wide Annual PTE Summary in TPY

Source	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs	CO_2e
Boiler 1	5.89	7.01	0.53	0.53	0.53	0.04	0.39	8,471.15
Boiler 2	5.89	7.01	0.53	0.53	0.53	0.04	0.39	8,471.15
Emergency Generator	1.11	5.17	0.36	0.36	0.36	0.34	0.41	192.29
Facility-Wide Totals →	**12.89**	**19.19**	**1.42**	**1.42**	**1.42**	**0.42**	**1.19**	**17,103.57**

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to this permitting action.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.

The boilers have been determined to meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. Each substantive 45CSR2 requirement is discussed below.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, the boilers are subject to an opacity limit of 10%. Proper maintenance and operation of the boilers (and the use of natural gas as fuel) should keep the opacity of the units w ell below 10% during normal operations.

45CSR2 Weight Emission Standard - Section 4.1.b

The allowable particulate matter (non-condensable total PM) emission rate for the boilers, identified as Type "b" fuel burning units, per 45CSR2, Section 4.1.a, is the product of 0.09 and the

total design heat input of the boilers in million Btu per hour. The maximum aggregate design heat input (short-term) of the boilers will be 32.68 mmBtu/hr. Using the above equation, the 45CSR2 facility-wide PM emission limit of the boilers will be 2.94 lb/hr. The maximum potential hourly PM emissions (including condensables) from the boilers is estimated to be 0.24 lb/hr. This emission rate is 8.16% of the 45CSR2 limit.

45CSR2 Control of Fugitive Particulate Matter- Section 5

Section 5 of 45CSR2 requires a fugitive particulate matter control system for any source of fugitive particulate matter associated with the fuel burning units. Using natural gas as the fuel of the boilers will result in no potential for fugitive emissions from the boilers.

45CSR2 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 2 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and keeping records of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

45CSR2A Applicability - Section 3

Pursuant to §45-2A-3, as individual applicable "fuel burning units" under 45CSR2 with an MDHI less than 100 mmBtu/hr, the boilers are not subject to the Testing and MRR Requirements under 45CSR2A.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting H_2S concentrations in process gas streams. The proposed Hobet boilers are each defined as a "fuel burning unit" and subject to the applicable requirements discussed below.

45CSR10 Fuel Burning Units - Section 3

The allowable SO_2 emission rate for the boilers, identified as Type "b" fuel burning units, per 45CSR10, Section 3.2(c), is the product of 1.6 and the total design heat input of the boilers in million Btu per hour. The maximum aggregate design heat input (short-term) of the boilers will be 32.68 mmBtu/hr. Using the above equation, the 45CSR10 facility-wide SO_2 emission limit of the boilers will be 52.29 lb/hr. The maximum potential hourly SO_2 emissions from the boilers is estimated to be 0.08 lb/hr. This emission rate is only a trace of the 45CSR10 limit.

45CSR10 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 10 requires to test for initial compliance with the limits therein, monitor for continued compliance, and keep records of that compliance. The TMR&R requirements are clarified under 45CSR10A and discussed below.

45CSR10A Applicability - Section 3

Pursuant to §45-10A-3.1(b), as the boilers "combust natural gas, wood or distillate oil, alone or in combination," the boilers are not subject to the Testing and MRR Requirements under 45CSR10A.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed construction of the selenium treatment plant has a potential to increase emissions in excess of six (6) lbs/hour and ten (10) TPY of any regulated and, therefore, pursuant to §45-13-2.17a, the installation is defined as a "modification" under 45CSR13.

As required under §45-13-8.3 ("Notice Level A"), Hobet placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on March 4, 2011 in *The Lincoln Journal* and the affidavit of publication for this legal advertisement was submitted on May 2, 2011.

40 CFR 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The proposed boilers are subject to 40 CFR 60, Subpart Dc under the applicability requirements of §60.40c(a). Subpart Dc does not have any emission standards for combusting only natural gas. However, the boilers are subject to the record-keeping and reporting requirements given under §60.48c.

40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

Hobet's proposed emergency generator is defined under 40 CFR 60, Subpart JJJ as a stationary spark-ignition internal combustion engine (SI ICE) and is, pursuant to §60.4230(a)(4), defined as an "affected facility" under the rule. Pursuant to §60.4233(e): "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE." Therefore, as the proposed Hobet emergency generator is greater than 75 kw, it must meet the emission standards under Table 1: NO_x - 2.0 g/HP-hr, CO - 4.0 g/HP-hr, VOCs - 1.0 g/HP-hr.

Hobet has proposed to meet the emission standard under Table 1 pursuant to §60.4243(b)(1), by installing a certified engine. They will still have meet the monitoring and compliance demonstration requirements under §60.4237(a)(1) and §60.4243(a)(1) and the record-keeping and reporting requirements under §60.4245.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

The proposed emergency generator appears to be subject to the area source requirements of 40 CFR 63, Subpart ZZZZ. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. However, it is important to note, for the proposed engine in question, compliance with 40 CFR 60, Subpart JJJJ would ensure compliance with 40 CFR 63 Subpart ZZZZ.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed selenium treatment plant and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects.

The proposed facility has the potential to emit only trace amounts of HAPs from the natural gas combustion in the boilers and the generator. There is no indication that the process has the potential to produce any substantive air emissions of selenium compounds - which are defined as a HAP.

AIR QUALITY IMPACT ANALYSIS

The proposed modification does not meet the definition of a "major modification" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

Monitoring requirements for the boilers and the emergency generator are: (1) for compliance with annual emission limits, monitoring and recording of the amount of natural-gas combusted in

each unit [*4.2.1.*] and the hours of operation in the emergency generator, and (2), for compliance with hourly emission limits, limitation on the design capacities of the units [*4.1.1(b)*]. Additionally, the model of the emergency generator is specified as certain emissions were based on vendor information specific to this model.

Additional monitoring and compliance demonstrations are required for the emergency generator under 40 CFR 60, Subpart JJJJ and (the substantive portions) are given under 4.2.3. of the permit. Record-keeping and reporting requiremennts are limited to the boilerplate language and enforcement of all applicable requirements under 40 CFR 60, Subpart Dc and Subpart JJJJ.

TESTING OF OPERATIONS

Due to the small size of the natural gas-fired boilers and the limitation of only emergency use of the generator, no specific post-issuance performance testing was required in the permit.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2894 to Hobet Mining, LLC for the above discussed construction of a Selenium Treatment Plant proposed near Spurlockville, Lincoln County, WV.

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Joe Kessler, PE
Engineer

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Date