west virginia department of environmental protection

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# ENGINEERING EVALUATION / FACT SHEET

## BACKGROUND INFORMATION

| | |
|---|---|
| Application No.: | R13-2117E |
| Plant ID No.: | 057-00003 |
| Applicant: | Kingsford Manufacturing Company |
| Facility Name: | Beryl Plant |
| Location: | Near Piedmont, Mineral County |
| SIC/NAICS Code: | 2861/325191 |
| Application Type: | Modification |
| Received Date: | June 24, 2016 |
| Engineer Assigned: | Joe Kessler |
| Fee Amount: | $1,000 |
| Date Received: | June 27, 2016 |
| Complete Date: | July 21, 2016 |
| Due Date: | October 9, 2016 |
| Applicant's Ad Date: | June 25, 2016 |
| Newspaper: | *News Tribune* |
| UTM's: | 666.00 km Easting • 4,371.00 km Northing • Zone 17 |
| Latitude/Longitude: | 39.47729/-79.06650 |
| Description: | Modification to increase the char production limits to 5.0 tons per hour (TPH) and 32,000 tons per year (TPY). |

Kingsford Manufacturing Company's (KMC) Beryl Plant was originally constructed in the 1963 by Westvaco. At some point after construction, KMC took ownership of the facility and began operating. However, KMC leased the land where the facility sits until purchasing the site in 2012.

On June 18, 1997, the facility was issued Permit Number R13-2117 as a result of a Consent Order (CO-R7-97-6). The Consent Order required KMC to remove the existing scrubber system and to install high-efficeint cyclones and an After Combustion Chamber (ACC) to control emissions from both the rotary wood dryer and the retort furnace. Additionally, an annual char production cap of 22,500 TPY was established to ensure the project emissions increases did not exceed "major modification" significant levels given under 45CSR14. The permit does not appear to have covered all equipment and processes at the facility; some remained grandfathered under 45CSR13. Subsequently, the permit was modified as described below:

- On June 21, 1999, Permit Number R13-2117A was issued to KMC to revise the $SO_2$ limit and to increase the maximum hourly char production rate from 3.5 to 4.5 TPH;

- On June 21, 1999, Permit Number R13-2117B was issued to KMC as an Administrative Update to increase the maximum annual char production rate from 22,500 to 28,000 TPY. This production increase did not increase emissions as the $NO_x$ emission factor was revised downward based on recent stack testing;

- On October 2, 2002, Permit Number R13-2117C was issued to KMC as a Class I Administrative Update to authorize less frequent visible emission checks;

- On December 10, 2002, Permit Number R13-2117D was issued to KMC as a Class I Administrative Update to authorize clarifying changes to the Title V permit; and

- On October 1, 2012, General Permit Number G60-C047 was issued to KMC for the replacement of the facility emergency generator.

## DESCRIPTION OF PROCESS/MODIFICATIONS

### *Existing Facility*

Kingsford's Beryl Plant produces "char" from a feedstock of raw bark chips. Bark chips are received via belt conveyer from a neighboring paper mill and stored outside in piles before being screened, sized, and dried in a rotary wood dryer (03-001). The sized and dried feedstock is then charred in an oxygen starved environment (a process known as pyrolizing) in the multi-hearth retort furnace (03-002). Heat for the furnace is supplied by six (6) 4 mmBtu/hr natural-gas fired retort burners. The produced char is quenched with water and conveyed to trailers for transport to Kingsford's Parsons Plant as the main ingredient in charcoal manufacturing.

The dryer and the furnace air emissions are controlled by cyclone collectors which are exhausted to a common After Combustion Chamber (ACC) for oxidation (C-8). The ACC uses a 40 mmBtu/hr propane-gas fired burner. The hot exhaust gases from the ACC are recirculated and used as the heat source in the wood dryer. Currently the facility is permitted to produce a maximum of 4.5 TPH of wood char and 28,000 TPY of wood char.

### *Proposed Modifications*

Kingsford is now proposing to modify the Beryl Plant by increasing the permitted limit of wood char production to 5.0 TPH and 32,000 TPY. While this may cause de-bottlenecked increases in throughput and emissions plant-wide (wet and dry wood maximum hourly throughputs will increase to 20 and 40 TPH, respectively), no other physical changes are being proposed.

## SITE INSPECTION

Due to the nature of the proposed modification, a site inspection by the writer was deemed as not necessary. On February 11, 2014, a site inspection of the Beryl Plant was conducted by Mr.

Karl Dettinger of the DAQ Compliance/Enforcement (C/E) Section. This inspection found the facility to be "Status 30 - In Compliance."

## AIR EMISSIONS AND CALCULATION METHODOLOGIES

Kingsford included in Attachment N updated post-modification facility-wide emissions calculations for the Beryl Plant. Calculations for the emissions from the ACC were based on stack test data. Emissions from material handling, truck traffic and other equipment/processes at the facility were based emission factors given under AP-42 Section 1.4 (AP-42 is a database of emission factors maintained by USEPA). Variables used in the material handling and truck traffic calculations of these emission factors were based on an estimation of actual plant and material conditions.

### *Emissions Summary*

The new post-modification potential-to-emit (PTE) of the Beryl Plant is given in Table N-1 of Attachment N of the permit application. The change in PTE as a result of the proposed modifications evaluated herein is given in the following table:

**Table 1: Change In Facility-Wide Annual PTE**

| Pollutant | Pre-Modification(1) | Post-Modification | Change |
|---|---|---|---|
| | tons/year | tons/year | tons/year |
| CO | 29.02 | 32.94 | 3.92 |
| $NO_X$ | 182.16 | 208.00 | 25.84 |
| $PM_{2.5}$ | 65.53 | 80.75 | 15.22 |
| $PM_{10}$ | 98.74 | 111.86 | 13.12 |
| PM | 166.85 | 167.63 | 0.78 |
| $SO_2$ | 42.00 | 48.00 | 6.00 |
| VOCs | 8.10 | 9.26 | 1.16 |
| HAPs | 4.50 | 0.24 | -4.26 |

(1) Emissions taken from R30-05700003-2012 Fact Sheet.

## REGULATORY APPLICABILITY

The following will discuss only the regulatory applicability/non-applicability of general rules and specific rules to the emission units that have been proposed to be added or modified as part of this permitting action.

***45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse (Non-Applicability)***

The particulate matter emission standard from 45CSR7 (§45-7-4.1) applies to the emissions of the ACC and is more stringent than those given under 45SR6, Section 4.1. Because of the "inconsistency between rules" provision in 45CSR6 and 7, the more stringent rule will apply and, therefore, the particular matter standard from 45CSR6 was deemed not applicable.

***45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations***

45CSR7 has two substantive requirements potentially applicable to the drying and charring process as controlled and emitted from the ACC. These are the opacity requirements under Section 3 and the mass emission standards under Section 4. Each of these sections will be discussed below.

45CSR7 Opacity Standards - Section 3

Section 3.1 sets an opacity limit of 20% on the ACC emission point. As the furnace and dryer both exhaust first through high-efficiency cyclones to remove particulate matter, proper maintenance and use of the propane-fired ACC should mitigate any from opacity issues from the unit.

45CSR7 Weight Emission Standards - Section 4

Section 4.1 of 45CSR7 requires that each manufacturing process source operation or duplicate source operation meet a particulate matter limit based on the weight of material processed through the source operation. As determined by the DAQ during the review of Permit Number R13-2117, the drying and charring process as controlled and emitted from the ACC is defined as a type 'a' source type operation under §45-7-2.38. Further, based on the compliance determination methodology determined during the review of Permit Number R13-2117, the DAQ uses an aggregating method to determine compliance with the weight emission standards under 45CSR7 for the drying and charring process. Each source is considered to generate a separate Section 4 limit based on the process weight rate (PWR) of each source. The particulate matter limit at the ACC stack is then based on summing each individual limit. Section 4.1 compliance is given in the following table:

**Table 2: 45CSR7 Section 4.1 Compliance**

| Source Operation | Source Type | Process Weight Rate (lb/hr) | Table 45-7A Limit (lb/hr) | PTE (lb/hr) | % of Limit | Control Device |
|---|---|---|---|---|---|---|
| Wood Dryer | A | 80,000 Wet Wood | 32.20 | 50.00 | n/a | ACC |
| Retort Furnace | A | 40,000 Dry Wood | 28.00 | | n/a | ACC |
| | | | 60.20 | 50.00 | 83.06% | |

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

45CSR10 has requirements limiting in-stack $SO_2$ concentrations of "manufacturing processes." Previously, the DAQ has regulated drying and charring process "manufacturing processes" subject to section 4.1 of 45CSR10.

Section 4.1 of Rule 10 requires that no in-stack $SO_2$ concentration exceed 2,000 parts per million by volume ($ppm_v$) from any manufacturing process source operation. As noted, the drying and charring process is defined as a "manufacturing process." Based on the estimated maximum revised $SO_2$ emission rate of the units as emitted from the ACC (48 lb-$SO_2$/hr) and the stack parameters given in the application (Emission Point Data Summary Sheet), the estimated worst-case in-stack $SO_2$ concentration was calculated to be 55.91 $ppm_v$ or 2.80% of the limit.

***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 changes to the Beryl Plant have the potential to increase the PTE of the facility in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant (see Table 1 above) and, therefore, pursuant to §45-13-2.17, the changes are defined as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, KMC is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), KMC placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on June 25, 2016 in the *News Tribune* and the affidavit of publication for this legal advertisement was submitted on July 7, 2016.

***45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration (NON-Applicability)***

The Beryl Plant is an existing major stationary source located in Mineral County, WV. Mineral County is classified as "in attainment" with all National Ambient Air Quality Standards (NAAQS). Pursuant to 45CSR14, the proposed increase in the annual char production rate is considered, under §45-14-2.40, a "physical change or a *change in the method of operation*." As the proposed increase in annual char production rate is a relaxation of the synthetic minor limit established under Permit Number R13-2117B issued on June 21, 1999 (which was a modification of the original synthetic minor limit established under R13-2117 on June 18, 1997), it is appropriate to retroactively review the impact of the current requested change based on the PSD applicability analysis done in 1997 for R13-2117. This is based on the language given under §45-14-19.7 that states:

[§45-14-19.7]
Any person who owns or operates any particular source or modification which *becomes* a major stationary source or major modification solely by virtue of a relaxation in any limitation, enforceable by the Administrator or the Secretary, on the capacity of the source or modification otherwise to emit a pollutant (such as a restriction on hours of operation), shall become subject to the requirements of this rule as though construction had not yet commenced on the source or modification.

KMC followed this methodology in PSD applicability analysis included under Attachment N of the permit application. As the char production increase may have de-bottlenecking effects upstream and downstream of the dryer/furnace/ACC, the applicability analysis was done on a facility-wide basis. The original baseline actual emissions (BAE = annualized actual emissions from the calendar years 1994/1995) were used again and are based on the configuration of the plant at that time. New potential emissions are based on the proposed post-modification annual char production limit of 32,000 TPY and were based on, as mentioned above, the most recent stack test data at the facility. As the Beryl Plant is a constituent process in charcoal production and also has a SIC code that begins with 28 (based on EPA guidance, all facilities that have SIC codes that begin with 28 are classified as a "Chemical Process Plant"), fugitive emissions were also considered in the applicability analysis.

For a complete discussion of the PSD applicability analysis see Attachment N of the permit application. The following is a summary of the facility-wide BAE-PTE calculation:

**Table 2: Summary Facility-Wide BAE-PTE Calculation (TPY)**

| Pollutant | BAE(1) | PTE | Change | Significant Level(2) | PSD? |
|---|---|---|---|---|---|
| CO | 78.60 | 32.94 | -45.66 | 100.00 | No |
| $NO_X$ | 174.20 | 208.00 | 33.80 | 40.00 | No |
| $PM_{2.5}$ | 101.11 | 80.75 | -20.36 | 10.00 | No |
| $PM_{10}$ | 154.90 | 111.86 | -43.04 | 15.00 | No |
| PM | 161.10 | 167.63 | 6.53 | 25.00 | No |
| $SO_2$ | 11.70 | 48.00 | 36.30 | 40.00 | No |
| VOCs | 129.10 | 9.26 | -119.84 | 40.00 | No |

(1) Based on the annualized actual emissions from the calendar years 1994/1995.
(2) §45-14-2.74(a)

### *45CSR30: Requirements for Operating Permits*

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Beryl Plant, defined under Title V as a "major source," was last issued a Title V renewal permit on December 4, 2012 (R30-05700003-2012). Proposed changes evaluated herein must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There is no proposed increase in currently emitted non-criteria regulated pollutants or emissions of new non-criteria regulated pollutants as part of the changes evaluated herein.

## AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions of the modified facility are less than applicability thresholds that would define the proposed changes as a "major modification" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature and location of the modified source, an air quality impacts modeling analysis was not required under 45CSR13, Section 7.

## MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

There was no changes to the existing monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR).

## PERFORMANCE TESTING OF OPERATIONS

There were no substantive changes to the performance testing requirements made as a result of the changes evaluated herein.

## CHANGES TO PERMIT R13-2117D

Draft Permit Number R13-2117E was put into the new NSR boilerplate format and is, therefore, completely different than R13-2117D.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2117E to Kingsford Manufacturing Company for the proposed modification of the Beryl Plant located near Piedmont, Mineral County, WV.

Joe Kessler, PE
Engineer

9/17/16
Date