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**west virginia department of environmental protection**

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**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: R13-0882M  
Plant ID No.: 039-00663  
Applicant: Optima Belle LLC  
Facility Name: Belle  
Location: Belle, Kanawha County  
NAICS Code: 325199  
Application Type: Class II Administrative Update  
Received Date: October 27, 2016  
Engineer Assigned: Mike Egnor  
Fee Amount: \$300.00  
Date Received: October 19, 2016  
Complete Date: November 27, 2016  
Due Date: January 26, 2017  
Applicant Ad Date: October 28, 2016  
Newspaper: *The Charleston Gazette*  
UTM's: Easting: 451.90 km      Northing: 4,232.60 km      Zone: 17  
Description: An alternative operating scenario for the production of D-Mannose from d-Mannose syrup which is diluted in alcohol, filtered, crystallized, and dried. Emissions from this scenario include 2.40 lbs/hr and 0.17 TPY of VOC's, 0.09 lbs/hr and 0.02 TPY of Methanol, 2.31 lbs/hr and 0.15 TPY of ethanol, 0.24 lbs/hr and 0.03 TPY of Particulate Matter, and 0.09 lbs/hr and 0.02 TPY of Total HAP's.

**INTRODUCTION**

On October 27, 2016 Optima Belle LLC submitted a Class II Administrative Update for the proposed revisions to an operating scenario for the production of D-Mannose at the Belle Plant.

On November 4, 2016, Optima submitted an affidavit of publication indicating that the required legal notice was run in the Charleston Gazette on October 28, 2016, initiating the 30-day public notice period. Optima also submitted the application fee of \$300 on October 31, 2016 to meet the requirements associated with the Application for Modification Permit.

## DESCRIPTION OF PROCESS

### D-Mannose Process Overview:

D-Mannose, a crystalline solid, is produced from d-Mannose syrup which is diluted in alcohol, filtered, crystallized, and dried.

The syrup and alcohol are charged to a reactor, mixed, and filtered. The filtered material is then crystallized before being sent to a centrifuge and then a dryer for moisture removal. The final product is dry d-Mannose crystals.

## SITE INSPECTION

No site inspection was performed by the permitting engineer for this modification as the facility is well known to the DAQ and is frequently inspected by members of the DAQ Enforcement Section.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

### **D-Mannose Process**

Emission Point 104.014, which is the exit of the incinerator (009) is stated as 99.9% efficient. The facility is not claiming any reduction in emissions for the Dust Collector (023) for Emission Point 107.022. Total emissions from this modification are estimated to be 2.40 lbs/hr and 0.17 TPY of VOC's, 0.09 lbs/hr and 0.02 TPY of Methanol, 2.31 lbs/hr and 0.15 TPY of ethanol, 0.24 lbs/hr and 0.03 TPY of Particulate Matter, and 0.09 lbs/hr and 0.02 TPY of Total HAP's.

### **Emissions Summary**

The proposed changes addressed in permit application R13-0882M shall result in the affected emission points undergoing emissions as shown in the following Table 1 - Emissions Summary.

Table 1 - Emissions Summary Operating Scenario: D-Mannose Process

Emission Point ID	Device Type	Pollutant	Air Pollution Control Device ID	Maximum Potential Uncontrolled Emissions		Maximum Potential Controlled Emissions	
				lbs/hr	tons/yr	lbs/hr	lbs/yr
104.014	Incinerator	VOC's	009	2.85	0.22	0.02	40
		Ethanol		2.57	0.20	0.01	20
		Methanol		0.28	0.02	0.01	20
		Total HAPs		0.28	0.02	0.01	20
107.022	Dust Collector	PM	023	0.24	0.03	0.24	60
Fugitive	Filter Changing/ Cleanout	Ethanol	None	2.31	0.15	2.30	280
		Methanol		0.08	0.01	0.08	20
		VOC's		2.38	0.15	2.38	300
		Total HAPs		0.08	0.01	0.08	20

### REGULATORY APPLICABILITY

The following State and Federal regulations were considered for applicability to the subject facility:

The following regulations apply to this production unit: West Virginia Regulations 7, 13, 21, 30 and US EPA MACT Standards for the Miscellaneous Organic NESHAP.

### RULE 7 - PARTICULATE MATTER FROM MANUFACTURING SOURCES

The end process of the D-Mannose Process, where the dried crystalized D-Mannose material is sent through product packout. This is a "Type a" Source Operation under Rule 7. The mass limits contained in 45CSR§7-4.1 would be 7.08 lbs/hr for the Dust Collector (023) (based on the production rate of 7,088 lbs/hr). There are no claimed reductions in particulate matter from Dust Collector 023. The PM emissions are 0.24 lbs/hr, which are well below the Rule 7 limit. The opacity requirements for these sources are already permitted under their Title V Permit.

### RACT

45CSR21-40.3.c requires RACT analysis on a case by case basis for those VOC emissions greater than 6 pph which are constructed, modified, or begin operation after the date 45CSR 21 becomes effective. The proposed changes to R13-0882M do not include an increase of VOC's greater than 6 pph.

This class II permit amendment application is being filed under 45CSR13 since a change in batch production is being requested. Overall, 0.17 TPY of VOC's, 0.02 TPY of Methanol, 0.15 TPY of ethanol, 0.03 TPY of Particulate Matter, and 0.02 TPY of Total HAP's will be emitted

### TOXICITY OF CRITERIA REGULATED POLLUTANTS

#### D-Mannose

None listed except as follows:

Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used.

Skin Contact: After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Methanol has the following exposure limits:

#### ACGIH TLV

200 ppm TWA

STEL 250 ppm

#### NIOSH REL

200 ppm TWA

260 mg/m<sup>3</sup> TWA

6,000 ppm IDLH

#### OSHA PEL

200 ppm TWA

260 mg/m<sup>3</sup> TWA

Ethanol has the following exposure limits:

#### ACGIH TLV

1,880 mg/m<sup>3</sup> STEL

1,000 ppm TLV

#### NIOSH REL

1,900 mg/m<sup>3</sup> TWA

1,000 ppm

#### OSHA PEL

1,900 mg/m<sup>3</sup> TWA

1,000 ppm

MONITORING OF OPERATIONS

The Title V Permit provides monitoring requirements due to opacity readings. The facility is already required to monitor visible emissions (Condition 4.2.2), monitor their production (Condition 4.2.1), and to monitor the temperature of the incinerator (Condition 4.2.3).

Changes to R13-0882M include:

1. Updated the Permit Number to R13-0882M.
2. Added Condition 4.1.2.12.1 to require that the Dust Collector (023) be used during the D-Mannose process when the product packout (210) is being operated.
3. Added Condition 4.1.2.12.2 to require that the incinerator (009) be used at emission point 114.014 during all periods of the D-Mannose process. A limit for the total number of batches per year has also been added.
4. Added Condition 4.1.2.12.3 to require specific emissions limits for Particulate Matter, VOC's, Methanol, and Ethanol, for the D-Mannose process.
5. Added "R13-0882M" to Condition 2.5.1.

RECOMMENDATION TO DIRECTOR

Permit application, R13-0882M, submitted by Optima Belle, LLC, for the administrative permit update of the production facility located at the Belle Plant in Belle, Kanawha County, WV, has been reviewed and determined to meet all applicable requirements, and is therefore, recommended for approval.

  
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Mike Egnor  
Engineer

  
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Date