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Harold D. Ward, Cabinet Secretary
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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2093I
Plant ID No.:	039-00663
Applicant:	Optima Belle, LLC
Facility Name:	Belle Facility
Location:	Belle, Kanawha County, WV
NAICS Code:	325199
Application Type:	Modification
Received Date:	March 29, 2023
Engineer Assigned:	Jonathan Carney
Fee Amount:	$1,000.00
Date Received:	March 30, 2023
Complete Date:	April 21, 2023
Due Date:	July 11, 2023
Applicant Ad Date:	April 6, 2023
Newspaper:	*The Charleston Gazette-Mail*
UTMs:	Easting: 451.90 Northing: 4,232.60 Zone: 17
Description of Change:	Optima Belle, LLC proposes to add new equipment and a new product to the site.

DESCRIPTION OF PROCESS

Optima Belle, LLC is, by this application, requesting the ability to add to the site proposed equipment and a new proposed chemical process. Additionally, the application identifies equipment that needs to be removed from the permit as it is no longer operable and has been removed from the site. With the new equipment, Optima will return to full operational status and will be able to process the list of materials from which the potential to emit of the site is based. There is also a requested increase in the potential to emit for the new chemical process which adds new hazardous air pollutants to the permit.

Equipment to be Removed from the Permit

Equipment that was damaged in the incident with the double cone dryer in 2020 needs to be removed from the permit. The equipment is not usable and has already been removed from the Building 216 processing area. The equipment to be removed includes one tank Xylene/Toluene Storage Tank (101), Reactor #1(205), Reactor#9 (233), Super Sack Unloading to Double Cone Dryer (234A, Super Sack Filling from Double Cone Dryer (235A), Caustic Storage Tank (SLM0074), Filter Dryer (236), Reactor #10 Condenser (237C) and Dust Collector 117. The equipment that was damaged has been removed and will not be returned to service.

New Equipment

The new equipment will be used in the same operating manner as the existing permitted equipment. Therefore, Optima can have one material in process or multiple materials in process at one time. Some of the higher volume materials such as Glypure will be in production more consistently since Optima is installing equipment which will be dedicated to mostly Glypure production. The amounts of each material that can be made in a year have not changed, but the process units (reactors) used to make the material may change with the new equipment.

The proposed new equipment includes the relocation of Reactor #5 and its associated condenser which were placed into storage at the site when equipment had to be removed after the 2020 incident. New equipment includes Reactor #5 Stripper (219S), Alumina Column (AC1-through 3), Mole Sieve Columns (MSC1 and 2), Bag Dump Station (BDS), nine reactors (R-11, R-12, R-13, R-14, R-15, R-16, R-17, R-18, and R-19), Reactor #13 Condenser (R-13C), Rail Loading at Building 114 for HMAPS (RL114), Charge Vessels (V80 and V90), Filter Dryr (FD2), Vacuum Pump (VP), Centrifuge #2, West Cake Bin (WCB), Centrate Tank (CT), Dryer (DR), Wet Cake Conveyor (WCC), four filters (FL1-4), Truck Loading and Unloading (TLU3) and Dust Collector (DCFD).

This equipment will be utilized in the same fashion as the equipment that was removed. The equipment will allow the site to be more flexible in production and will allow certain operations more of an ability to operate as needed. Specifically, the Glypure operations will operate using Reactor #11 (R-11) and Reactor #12 (R-12) and then feed to Centrifuge #2 (C2), to the Wet Cake Bin (WCB), Wet Cake Conveyor (WCC), then to Dryer (DR) and then the final product is finished. Material from the Centrifuge is sent to the Centrate Tank (CT) and then to truck. Material is also recycled to Reactor #14 (R-14). This process does not have VOCs.

As with the existing system the controls remain the same. If a reactor or other process equipment is venting materials that need to be controlled, then they will vent to the main control devices as necessary to control the emissions.

The main control devices are the Main Scrubber, the Incinerator, and the Incinerator Scrubber. If a process is venting something that does not require the Main Scrubber to be operational, then the Main Scrubber can be taken off line.

The emissions estimates for production of the materials that were contained in the existing permit submissions are still appropriate for the production of the same batch sizes and yearly quantities and are, therefore, sufficient for the process emissions if the existing or new equipment is used to make or process the materials.

New Material Production

HMAPS is a product that is a low molecular weight polystyrene. The polymer is used as a backbone for a fire retardant compound. HMAPS is being proposed to be produced. Emissions from the processing of the material will include VOC, styrene, and ethylbenzene. This is a batch process. More than one batch can be in process at a time.

When HMAPS is not in production, the equipment identified for HMAPS production will be used in the production of other materials. The equipment being identified for HMAPS production is six reactors (R-5, R-1, R-12, R-14, R-15, and R-19), Reactor 5 Stripper (219S), and Reactor 5 Condenser (219C), Mol Sieve Columns (MSC1 and 2), Alumina Columns (AC1-3) and filters (Filters 1 through 7 (FL1 through FL7)).

VOC Control Devices

The main process control devices will continue to be the existing Main Scubber (003), the Incinerator (009), and the Incinerator Scrubber (010). These are existing control devices at the site and will be used to control the emissions consistent with the existing requirements.

SITE INSPECTION

The writer did not visit the site for this permit update. The site was last inspected on December 11, 2020, by DAQ's Compliance and Enforcement (C&E) Inspector John Moneypenny. According to Mr. Moneypenny's inspection report:

This inspection was conducted along with Mike Egnor of Planning. The focus was an investigation and to gather information regarding the recent incident in the Small Lots Area in which a dryer ruptured with resulting fire and loss of life.

The inspection was described in the database as a part-on-site inspection. The facility was given the inspection code of 30 for in compliance.


Optima Belle
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ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Change in Total Emissions

Pollutant	ton/yr
VOC	0.41
Ethylbenzene	0.00096
Styrene	0.00002
Total HAPs	0.00099

Emissions from the Small Lots Manufacturing

Pollutant	lb/hr (Max Rate)	ton/yr
PM	4.08	6.23
PM10	1.99	3.41
PM2.5	0.36	1.46
SO_2	0.04	0.13
NOx	0.99	4.34
CO	0.83	3.64
VOC	22.95	13.64
Acetonitrile	0.05	0.02
Benzene	0.01	0.01
Butyl Carbitol	0.01	0.01

Catechol	0.16	0.03
Chromium Compounds	0.89	0.05
Ethylbenzene	0.0052	0.00096
Hexane	0.96	0.27
Hydrogen Chloride	0.06	0.05
Methanol	4.77	2.92
Methylene Chloride	1.87	0.23
Methyl Tert-Butyl Ether	0.86	0.19
p-Xylene	0.04	0.01
Styrene	0.00003	0.00002
Titanium Tetrachloride	0.01	0.01
Toluene	1.77	0.34
HAPS (MAX)*	7.78	3.43

*The HAPs (MAX) is the sum of the controlled HAPs emissions per processes and not the sum of individual HAPs.

REGULATORY APPLICABILITY

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 permittee has requested a Modification in accordance with this rule and Permit R13-2093H Condition 4.1.2.2.

Optima Belle LLC paid the appropriate fee of $1000.00 on March 30, 2023 and published the required legal advertisement for a Modification application in *The Charleston Gazette-Mail* on April 6, 2023.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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 Station is classified as an area source of hazardous air pollutants. Listed below is a description of the additional hazardous air pollutant that will be emitted from this facility.

Ethylbenzene - Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

Styrene-Styrene is primarily used in the production of polystyrene plastics and resins. Acute (short-term) exposure to styrene in humans results in mucous membrane and eye irritation, and gastrointestinal effects. Chronic (long-term) exposure to styrene in humans results in effects on the central nervous system (CNS), such as headache, fatigue, weakness, and depression, CSN dysfunction, hearing loss, and peripheral neuropathy. Human studies are inconclusive on the reproductive and developmental effects of styrene; several studies did not report an increase in developmental effects in women who worked in the plastics industry, while an increased frequency of spontaneous abortions and decreased frequency of births were reported in another study. Several epidemiologic studies suggest there may be an association between styrene exposure and an increased risk of leukemia and lymphoma. However, the evidence is inconclusive due to confounding factors. EPA has not given a formal carcinogen classification to styrene.

CHANGES TO PERMIT R13-2093I

The table in Section 1.0 of the permit had the following emission units removed:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
~~101~~	~~104.014~~	~~Tank (Xylene Tank)~~	~~1980~~	~~<20,000 gal~~	~~009, 010~~
~~205~~	~~104.014~~	~~Reactor #1~~	~~1988~~		~~003, 009, 010~~
~~209~~	~~104.014†~~ ~~104.014K*~~	~~Reactor #8~~	~~1977~~		~~003, 009, 010~~
~~227~~	~~104.014~~	~~Tank (PCF Tank)~~	~~2005~~	~~<20,000 gal~~	~~009, 010~~
~~228~~	~~104.014~~	~~Centrifuge Feed Tank~~	~~2016~~	~~<20,000 gal~~	~~009, 010~~
~~230~~	~~104.014~~	~~Double Cone Dryer~~	~~2016~~		~~009, 010~~
~~232~~	~~104.014~~	~~Reactor #7~~	~~2016~~		~~009, 010~~
~~233~~	~~104.014~~	~~Reactor #9~~	~~2016~~		~~009~~
~~236~~	~~104.014~~	~~Filter Dryer~~	~~2018~~		~~009 010~~
~~237C~~	~~104.014~~	~~Reactor #10 Condenser~~	~~2018~~		~~009 010~~
~~SLM0074~~	~~N/A~~	~~Caustic Storage Tank~~	~~1980~~	~~<20,000 gal~~	
~~117~~	~~107.03~~	~~Dust Collector~~	~~2016~~	~~1,200 cfm~~	

The table in Section 1.0 of the permit had the following changes and emission units added:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
219S	104-014	Reactor #5 Stripper	2023		003, 009, 010
AC1-3	AC1-3	Alumina Columns	2023		
MSC1-2	MSC1-2	Mole Sieve Columns	2023		
BDS	BDS	Bag Dump Station	2023		DC
R-11	104-014	Reactor #11	2023	4,000 gal	003, 009, 010
R-12	104-014	Reactor #12	2023	4,000 gal	003, 009, 010
R-13	104-014	Reactor #13	2023	3,000 gal	003, 009, 010
R-13C	104-014	Reactor #13 Condenser	2023		003, 009, 010
R-14	104-014	Reactor#14	2023	2,000 gal	003, 009, 010
R-15	104-014	Reactor #15	2023	4,000 gal	003, 009, 010
R-16	104-014	Reactor #16	2023	4,000 gal	003, 009, 010
R-17	104-014	Reactor #17	2023	4,000 gal	003, 009, 010
R-18	104-014	Reactor #18	2023	4,000 gal	003, 009, 010
R-19	104-014	Reactor #19	2023	4,000 gal	003, 009, 010

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
RL114	104-014	Rail Loading at Building 114	Existing/2023		Vapor Returned to R-14, 003, 009, 010
V80	104-014	Charge Vessel V80	2023	750 gal	003, 009, 010
V90	104-014	Charge Vessel V90	2023	750 gal	003, 009, 010
FD2	FD2	Filter Dryer 2	2023	5.0 sq meter	Dust Collector Vapor to R-13
VP	104-014	Vacuum Pump	2023		003, 009, 010
C2	C2	Centrifuge #2	2023		
WCB	WCB	Wet Cake Bin	2023		
CT	CT	Centrate Tank	2023	6,000 gal	
DR	DR	Dryer	2023	150 cu ft	Vapor to R-14
WCC	WCC	Wet Cake Conveyor	2023		
FL1	FL1	Filter 1	2023		
FL2	FL2	Filter 2	2023		
FL3	FL3	Filter 3	2023		
FL4	FL4	Filter 4	2023		
FL5	FL5	Filter 5	2023		
FL6	FL6	Filter 6	2023		
FL7	FL7	Filter 7	2023		
TLU3	TLU3	Truck Loading and Unloading	2023		

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
226	104.014	Caustic Tank (ISO Tank Storing Caustic)	1988	<20,000 gal	009, 010
DCFD	DCFD	Dust Collector	2023		

Section 2.12 Emergency section was changed to Reserved. The emergency affirmative defense sections of the permit were derived from state regulations (45CSR30) as reasonable conditions in the New Source Review permit. Since, the emergency affirmative defense sections of 45CSR30 have been removed from 45CSR30 to align with changes in federal regulations, the conditions in Section 2.12 are no longer considered reasonable conditions.

Rows were deleted from Table 4.1.7.1 for equipment that has been removed from the site. The rows removed from Table 4.1.7.1 include the equipment with ID numbers 101, 205, and 209.

Emission units 234 and 235 were deleted by request from Section 1.0 Table 1 by request of the applicant.

RECOMMENDATION TO DIRECTOR

The information submitted in this Modification (R13-2093I) for Optima's production facility located at the Belle Plant in Belle, Kanawha County, WV, has been reviewed and determined to meet all applicable State and Federal requirements, and is therefore, recommended for approval.

Jonathan Carney

Digitally signed by: Jonathan Carney
DN: CN = Jonathan Carney email = Jonathan.W.Carney@wv.gov C = US O = West Virginia Department of Environmental Protection OU = Division of Air Quality
Date: 2023.06.06 15:28:50 -04'00'

Jonathan Carney

June 6, 2023