M4777
MANILA

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

M477744152

FACILITY: BASF CORP		**SRN / ID:** M4777
LOCATION: 1609 BIDDLE AVE, WYANDOTTE		**DISTRICT:** Detroit
CITY: WYANDOTTE		**COUNTY:** WAYNE
CONTACT: Tom Wharton , EHS Specialist		**ACTIVITY DATE:** 04/18/2018
STAFF: Todd Zynda	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

REASON FOR INSPECTION: Scheduled Inspection
INSPECTED BY: Todd Zynda, AQD
PERSONNEL PRESENT: Bryan Hughes, EHS Team Leader; Tom Wharton, EHS Specialist; Stephanie Weirts, EPC EHS; Barry Kish, EPC Engineering Technician; George Rinke, Cellasto Plant EHS; Jason Graham, Cellasto Operations Engineer; Mark Knowles, ETPU Plant Manager
FACILITY PHONE NUMBER: (734) 324-5042
FACILITY WEBSITE: www.basf.com

FACILITY BACKGROUND

BASF Corporation (BASF) is located in Wyandotte, Michigan on the east side of Biddle Avenue, along the Detroit River, between Goddard Road and Ford Road in a primarily industrial setting. A mixture of commercial and residential areas is located immediately to the west across Biddle Avenue.

BASF's Wyandotte operations comprise three separate stationary sources: (1) chemical production plants with a Standard Industrial Classification (SIC) major grouping of 28 and identified as State Registration Number (SRN) B4359; (2) plastics production plants with an SIC major grouping of 30 and identified as SRN M4777; (3) laboratory and research operations with an SIC major grouping of 87 and identified as SRN M4808.

The Plastics Plants stationary source, M4777, the subject of this report, comprises the Engineering Plastics Compounding (EPC) Operations, the Cellasto Plant, and Expanded Thermoplastic Urethane (ETPU) Operations.

Historically, up until April 30, 2003, the expanded polyolefin (EPO) Operations facilities located at 1609 Biddle Avenue, Wyandotte, Michigan, were owned and operated by BASF Corporation. On April 30, 2003, the facilities were sold to Concepp Technologies Inc. and on August 1, 2009, Polytech Moulding Industries, Inc. (Polytech) assumed ownership of the plants. During this time, Polytech (under SRN: N7238) applied for and received a separate ROP for the EPO Operations facilities; ROP No. MI-ROP-N7238-2011. The ROP renewal application (No. 201500137) for permit No. MI-ROP-N7238-2011 was submitted by Polytech on August 12, 2015.

On February 6, 2017, the Department of Environmental Quality (DEQ), Air Quality Division (AQD) received a letter from BASF Corporation stating that as of January 1, 2017, BASF once again owns Polytech's EPO Operations facilities. With this letter BASF accepted responsibility for the conditions of permits MI-ROP-N7238-2011 and MI-PTI-N7238-2011 and the ROP renewal application. In addition, BASF reported a change to the raw materials used in this process; BASF replaced the polyolefin with thermoplastic urethane. On July 13, 2017, BASF provided the AQD with an exemption applicability determination for the change in raw materials; BASF believes the change in raw materials is exempt from obtaining a permit to install pursuant to Rule 285(2)(c)(iii). Following the change in the raw material, the process is now identified as ETPU Operations.

PROCESS OVERVIEW

The EPC Operations produces plastic pellets from seven extruder lines. Solid raw materials (filler, fiberglass, nylon, pigment) are poured from supersacs into mixing vessels which are then fed into the extruder hoppers. The solids are melted into semi-solids under heat and extruded into thin wires which are cooled to harden, cut into pellets, and packaged. Material handling and hopper charging operations are controlled by dust collectors. Vapors from the extruders are controlled by water scrubbers. EPC is divided into two sub-plants, EPC II and EPC III, each operating with its own extruders, dust collectors, and scrubber.

The Cellasto plant manufactures automobile suspension parts by curing a mixture of polyol and diisocyanate with catalysts/inhibitors. Polyol and diisocyanate are initially reacted under heat into a prepolymer in one of five reactors. The prepolymer is dosed with an initiator into a heated mold and a urethane plastic is produced. The plastics are cured in ovens and shaken ("deburred") to remove imperfections. Storage vessels and reactor vessels are controlled by carbon adsorption units. Curing oven emissions are controlled by demisters (called scrubbers by the plant). Deburring machines either vent to the general in-plant environment or vent to outside ambient air through the control of knock out boxes and mesh filters (filter socks).

The ETPU operations is comprised of two ETPU plants; the operations at the two plants, ETPUI and ETPUII, are nearly identical. Water and the thermoplastic urethane beads are charged to an impregnation vessel, followed by a nitrogen purge and an addition of butane gas. After agitation under heat and pressure, the butane gas is expanded across an orifice into the rundown vessel, thus expanding the thermoplastic urethane beads to a desired density.

Butane and nitrogen in the rundown vessel flash off into an off-gas recovery tank (TK-780 for ETPUI and TK-880 for ETPUII). The aqueous solution is pumped out to a settlement tank. After washing, the beads are dried through a spin dryer, a flash dryer, and then stored in batch silos; this equipment vents to a fabric filter control device (i.e., F-780 for ETPUI and F-880 for ETPUII). After remaining in the batch silos for a sufficient time to allow for the majority of residual butane to off-gas to atmosphere, the beads are transferred to bulk storage silos in the bulk loading facility and thereafter shipped to customers.

The butane from the off-gas recovery tanks passes through a nitrogen condensation system for recovery and reuse in the impregnation vessels; one condensation system serves both ETPUI and ETPUII. Residual butane lost to off-gassing during the remainder of the process is replaced with fresh butane from storage as needed.

COMPLAINT/COMPLIANCE HISTORY

There have been no recent complaints for this facility.

On June 17, 2014 a violation notice was issued to BASF Plastics for failure to submit a renewal application to MI -ROP-M4777-2009 by the June 10, 2014 deadline. As a result, Consent Order No. 47-2014 (effective date October 2, 2014) was issued.

INSPECTION NARRATIVE

On April 18, 2018 the Michigan Department of Environmental Quality (MDEQ) Air Quality Division (AQD) inspector, Mr. Todd Zynda, conducted an inspection of BASF Plastics Plants at 1609 Biddle Avenue, Wyandotte, Michigan. During the inspection, Mr. Bryan Hughes, EHS Team Leader, Mr. Tom Wharton, EHS Specialist, Stephanie Weirts, EPC EHS, Barry Kish, EPC Engineering Technician, George Rinke, Cellasto Plant EHS, Jason Graham, Cellasto Operations Engineer, and Mark Knowles, ETPU Plant Manager, provided information and a tour of facility operations relating to air quality permits. The inspection was conducted to determine the facility's compliance with the Natural Resources and Environmental Protection Act (NREPA), Act 451, Part 55, and ROP No. MI-ROP-M4777-2015a.

At 8:30 AM, Mr. Todd Zynda (AQD) arrived onsite and was greeted by Mr. Wharton. Prior to the inspection a visitor pass was obtained at the administration building.

During the opening meeting the BASF operations and MI-ROP-M4777-2015a conditions were discussed. A records request was sent to BASF via email on April 16, 2018. Records were provided via email on April 24, 25, and 27, 2018.

Following the opening meeting, inspection of the EPC Plant, Cellasto Plant, and ETPU Operations was conducted.

EPC Plant

The EPC Plant was visited from approximately 8:45 AM to 9:30 AM. During the inspection, Ms. Stephanie Weirts and Mr. Barry Kish provided information and a tour of the EPC Plant. The inspection began with observation of EPC II. According to previous inspections, EPC II was installed in 1992, while EPC III was installed in 1999. EPC II operates extruder lines 4, 5, and 6, while EPC III operates extruder lines 7, 8, 9, and 10.

During the inspection, the EPC material staging area, extruder lines, and pollution control equipment were observed. The EPC II water scrubber, which controls vapors from the extruding lines, was operating at 121 liters per minute. The extruders within EPC II use material that is mixed prior to entering the extruder. EPC II's dust collectors filter particulate emissions when raw materials are blown in to the mixers from the hopper (filler) and storage silos (nylon). Mixed material also includes copper, fiberglass, talcum powder, and coloring. EPC II dust collectors are located on the roof of the building and were observed during the inspection from the rooftop door. Dust collector F-1040Z-3 services line 4, F-1040Z-4 services line 5, and F-1040Z-2 services line 6. The fourth dust collector (F-405Z-1) draws on the mixers to filter a combined flue. In addition, the four dust collectors are also equipped with a secondary filter after the exhaust from the primary dust collector. This secondary filter provides a backup control in case of a dust collector malfunction. During the inspection there were no visible emissions observed from dust collector exhaust. Pressure drop readings were not obtained as the roof access requires double ear protection (plugs and muffs). At the time of inspection, ear muffs were not available.

Following observation of the EPC II, EPC III was observed. In EPC III, dust collectors are housed in a single room on the ground floor. These pulse-jet baghouses with circular filters are not equipped with pressure drop gauges; the casings are opened and the filters cleaned and inspected according to a schedule. These filters were observed during the inspection. The filter room and the filters themselves were clean; there is no other visual gauge to determine if the filters are operating properly. The stacks for the filters, are directed into a rectangular structure equipped with baffles. The structure is designed to reduce the noise generated from the exhaust; emissions are now exhausted at the bottom of the rectangular structure near to ground level.

The venturi water scrubber servicing EPC III is located in a room on the ground floor. The scrubber continually runs at a set flow and there are not any gauges observable measuring the flowrate. The EPC III stack vents out the east wall of the EPC building. No odors were observed from the EPC III venturi scrubber area during the inspection. According to past inspection reports, the EPC III scrubber was the cause of a confirmed odor event in 2002.

Storage silos are located outside along the southern end of the plant. Fabric filters are installed on the top of each silo to filter particulate entrained in air displaced when filling. The filters on top of these silos were not inspected during the site visit. According to Mr. Kish, the filters on each silo are inspected once a year.

The EPC oven was also observed during the inspection. The natural gas oven, which operates at 1600 degrees Fahrenheit (°F) and is equipped with an afterburner, is operated approximately once a week. The oven is used to clean die plates for extruders and other equipment associated with the extruders. The oven was not in use during the inspection.

During the inspection, the cold cleaner located in the "oil storage shed" was observed. The cold cleaner is equipped with a manual lid. Operation instructions were posted in a conspicuous location near the cold cleaner. The solvent is not heated or agitated.

Cellasto Plant

The Cellasto Plant was visited from approximately 9:30 AM to 10:30 AM. During the inspection, George Rinke, Cellasto Plant EHS and Jason Graham, Cellasto Operations Engineer provided information and a tour of the Cellasto Plant.

The inspection of the Cellasto Plant began in the north and south reactor rooms. The north reactor room contains three reactors (EUELAREACTOR210, 220, and 230), while the south reactor room contains two reactors (EUELAREACTOR240 and 250). The plant operates the five reactors for the combination of polyol, diisocyanate, and catalysts/inhibitors. Each reactor is operated with a vacuum pump and a carbon adsorption unit for volatile organic compound (VOC) control.

During the inspection on February 25, 2015 (see MACES report CA_M477728626), there was an issue with naphthalene diisocyanate (NDI) levels being greater than the permissible exposure limit (PEL) in the reactor rooms. As a result, the facility installed a glove box for NDI transfer and also installed a ventilation system to control the addition of NDI to the reactors. Any potential dust created during NDI transfer or addition to the reactors is vented to two dust collectors located on the north side of the Cellasto building. Previously any dust generated during NDI transfer/addition activities were released to the general in-plant environment. The facility claims the dry material handling of NDI which is controlled by the new dust collectors is exempt from permit to install (PTI) requirements per Rule 290.

During the inspection the carbon adsorption units in the reactor rooms were inspected. Transparent carbon-filled sleeves are installed on the top of each adsorption unit as a color gauge. The carbon is initially purple in color and turns brown as the carbon in the drum is exhausted. These sleeves were inspected and were approximately 50% purple, indicating that the carbon was approximately 50% exhausted.

During the inspection, Mr. Graham explained the transfer of the reacted material to the mold lines. Liquid product is drawn from the bottom of the reactor and piped to transport vessels; air displaced during filling is vented uncontrolled to atmosphere through a flexible hood. The transport vessels are wheeled across the room and fitted to the metering machine, programmed to mix the proper amounts of prepolymer with component B, the catalyst/inhibitor mixture received in drums and also fitted to the machine. The metered dose of prepolymer/component B is poured into the dose machine feeding each individual mold at a line. According to BASF from a previous inspection, no blowing agent is used; when in the mixhead of the dosing machine the prepolymer/component B mix foams, creating the pressure necessary to push it out of the mixhead and into the mold.

During the inspection the eleven mold lines were observed. Each line contains space for approximately 250 of the numerous molds employed for the various automobile suspension parts produced. At the time of inspection most mold lines were producing "joynce bumpers". The heated mold cures the part approximately 70%. The part is ejected from the mold and the mold is ready to be refilled.

Parts released from the molds are cured to completion in one of twelve ovens (101 through 112), which were observed during the inspection. According to Mr. Graham, ovens 111 and 112 began operation on March 22, 2018. Oven 110 is expected to begin operation in May 2018. Oven exhaust gas is approximately 108°C and vents to one of two mist eliminators ("de-mister") which drops out particulates and condensable VOCs; one demister controls ovens 101 through 106 and the second ovens 107 through 112. Both de-misters are located on the upper "mezzanine" level. The two demisters were observed during the inspection and the pressure drop ranged from at 0.25 inch to 0.5 inch of water for each; the demisters require servicing at 2 inches of water.

Cured parts are tumbled together in one of three "deburring" machines to remove chaff (extraneous folds and ridges on the parts). Two of the three machines have been replaced with newer units that do not have particulate exhaust to outside ambient air (any potential emissions are released to the general in-plant environment. Exhaust from the one older machine is blown through a drop-out box and the remainder is collected in filter socks. The deburring machines were in operation during inspection and no visible emissions were observed from the filter sock for the older machine. The filter sock for the older unit did not have any holes or tears in the fabric and appeared to be in good condition.

In addition to the deburring machines, an automated "cutting" machine used to cut molds in half was observed. Emissions from the cutting machines are released uncontrolled to the general in-plant environment.

Storage tanks 111 and 112 for NMP (N-methyl-2-pyrrolidone) are located outside the north face of the Cellasto building. NMP is used to clean miscellaneous equipment (there is a 200-gallon tank in the plant filled from the east tank as needed) and for the cleaning of reactors and pumps (NMP in the west tank recirculates to the reactors and back and the solvent is periodically changed). Emissions from each tank are controlled by a carbon adsorption unit. The carbon cannisters are used to capture VOCs due to tank breathing losses. Indicator "sleeves" on top of each carbon bed change color from purple to brown as carbon saturates. Viewed during the inspection, the indicators showed 10% purple for both tanks indicating the carbon was approximately 90% exhausted. Working losses during the filling of tanks 111 and 112 are controlled by vapor balance.

The inspection concluded with observation of the Cellasto Plant cold cleaner. The cold cleaner is equipped with an agitator and the lid is motorized.

ETPU Operations

ETPU Operations was visited from approximately 10:30 AM to 12:00 PM. During the inspection, Mark Knowles, Plant Manager provided information and a tour of ETPU Operations.

The inspection began with observation of the Bulk Loading Facility (BLF). Within the BLF, BASF has installed a physical testing laboratory. Within the laboratory, ETPU is tested for tensile, compression and density. The plastic extruder previously located in the BLF has been removed. At the time of inspection the majority of the

BLF was used for material storage (super sacks). A temporary packing area was observed where finished product is loaded into super sacks.

The inspection continued with observation of the volatile organic compound (VOC) recovery system (referred to as the Polaris by the facility), the ETPU Building, and the control room. Production equipment is housed within the ETPU building and around its perimeter. BASF monitors production and pollution control equipment on computer consoles displaying valve position, temperature/pressure controls, tank levels, pressure drops, etc. on ETPUI, ETPUII, and raw material equipment in the plant. These parameters were viewed in the control room. At the time of the inspection, ETPUI was not in operation. According to Mr. Knowles, ETPUI is likely to not run until 2020, due to the amount of work and logistics to get the equipment back up and running. According to Mr. Knowles the major changes at the plant when converting from EPO to ETPU is that the facility no longer uses tricalcium phosphate (TCP) powder or nitric acid. The ETPU process uses a "soap" product Disponil followed by a City water rinse. The fabric filter formerly used for the TCP bag dump station is currently still in place but no long in use. Similarly, the nitric acid tank (emptied) and associated scrubber are still in place but no longer in use.

Emissions of butane, a VOC, are the predominant air emission at the plant. At 3,800 cubic feet for TK-780 in EPOI and 5,500 cubic feet for TK-880 in EPOII, each of the two waste gas tanks has the capacity to accommodate an entire waste gas vent from its respective process vessel. A computer interlock prevents the pressure/temperature from rising above specified levels in a process vessel until the respective waste tank registers sufficient capacity to accept the volume of waste gas to be released after a completed batch.

The condensation system consists of a non-contact water chiller, two (alternating) dehydrators, a nitrogen-coolant condenser, and a butane collection tank. The chiller and a dehydrator condense out the water vapor and the nitrogen condenser liquefies the butane for collection. The remaining waste gas, composed almost entirely of nitrogen, is vented to atmosphere at a discharge point approximately 10 feet above ground. The liquid butane is collected in the in-process butane collection tank and reused in the process. The liquid nitrogen coolant is stored in a vertical storage tank. An interlock prevents the release of butane from a waste gas tank if one or more indicators reflect a malfunction in the condensation system, such as a gas temperature exiting the condenser in excess of -50°F. Taken with the interlock linked to the waste gas tanks, this system is designed to prevent an emergency release of butane to atmosphere due to a breakdown in either a waste gas tank or the condensation system; upon detection of an irregularity operations are halted at points where the butane gas may be contained until the problem is corrected.

The condensation system recovers approximately 99% of the butane entering the system if the top of the condensation column maintains a temperature of -186°F or lower. From the computer display in the control room, the temperature gauge at the top of the column registered -118°F at the time of the inspection (process in regeneration). Overall, the condensation recovers approximately 55% to 66% of the butane used in a given batch; the remainder is lost as fugitive emissions emitted after the expanded beads exit the process vessels. Butane lost to atmosphere is replaced with fresh butane from a 16,000 gallon storage tank. At the time of the inspection, the tank contained 25,766 pounds butane, approximately 37% of capacity.

The condensation unit is a part of the ambient butane monitoring system installed at the plant wherein 32 butane detectors are placed at locations of known possible butane release points. All sensors are set to alarm and shutdown that section of the process should the sensor read a butane concentration of 1100 ppm or greater, 10% of butane's lower explosive limit. Four of the butane sensors are installed at the condensation system – one near the waste gas vent and three near ground level (because butane is heavier than air at ambient conditions). None of the sensors were displaying an alarm in the control room when observed during the inspection.

Within the control room, the pressure drop for the bag house F-880 was observed. According to Mr. Knowles, F-780 and F841 are not in use as ETPUI and the TCP station are not in operation. The measured pressured drop for baghouse F880 was 1.2 inches water.

The stacks for the three baghouses were observed. All three baghouses vent vertically unobstructed to the ambient air. There were no visible emissions present at the time of inspection.

No spillage was noted in the ETPU Building, in the BLF, or on the surrounding grounds. No odors were noted and no opacity emissions were observed from the process equipment viewed.

APPLICABLE RULES/PERMIT CONDITIONS

ROP No. MI-ROP-M4777-2015a

MI-ROP-M4777-2015a general conditions (GC) and special conditions (SC) are listed as appropriate. For brevity, permit conditions and the language of federal and state rules have been paraphrased.

General Conditions

These general conditions (GC) are repeated at the beginning of each ROP section and are addressed here in total.

GC 9, GC 10 – **COMPLIANCE** – Collected air contaminants shall be removed to maintain controls at required collection efficiency; air cleaning devices installed and operated in a satisfactory manner. Controls were installed and operating as directed by the ROP during the April 18, 2018 inspection.

GC 11 – **COMPLIANCE** – Visible emissions limited to 20% over a six-minute average, with the exception of one 27% opacity per hour unless otherwise specified in the ROP or in a federal new source performance standard. This limit applies to point source (non-fugitive) emission units at the plant. Visible emissions exceeding 20% opacity were not observed during the April 18, 2018 inspection.

GC 12 – **COMPLIANCE** – Nuisance emissions prohibited – No citizen complaints has been received by the AQD's Detroit Office for the BASF Wyandotte operations in the period since the last inspection.

GC 19 through GC 23, GC 25 (and under individual EU/FG tables at SCs VII.1 through 3) – **COMPLIANCE** – Certification of reports and prompt reporting of deviations – Annual certifications and semiannual deviation reports were received or postmarked March 15, 2018, September 14, 2017, and March 15, 2017.

GC 24 – **COMPLIANCE** – Submissions to the Emissions Inventory – The AQD received this facility's 2016 and 2017 MAERS databases on (or postmarked) March 15, 2017 and March 15, 2018.

Source-Wide Conditions

These general conditions are repeated at the beginning of each ROP section and are addressed here in total.

SC I.1 and 2, VI.1 through 3 – **COMPLIANCE** – Hazardous Air Pollutant (HAP) emissions limited to less than 9.0 tons per 12-month rolling time period for each individual HAP and 22.5 tons per 12-month time period for combined HAPs; records; these requirements apply to the three stationary sources B4359, M4777, and M4808 combined.

BASF provided site-wide HAP emissions totals for the period December 2016 through March 2018 in the April 24, 2018 submittal. Monthly total HAP emissions range between 0.947 and 1.127 tons. Acrylic acid registered the highest total of any single HAP for a 12-month rolling period at 2.915 tons. BASF reported that the highest 12 -month rolling total HAPs occurred at the end of December 2017 at 12.73 tons.

Section 1 - FGEPCCOLDCLEANERS and Section 2 - FGELACOLDCLEANERS

During a phone call on May 7, 2018, Mr. Wharton stated that the cold cleaner at EPC is empty and has not been in use for over four years. The EPC cold cleaner was moved from the EPC plant to the oil storage shed approximately 4 years ago and has not been in use since the move. Therefore, the conditions for the FGEPCCOLDCLEANERS were not evaluated. Mr. Wharton states that EPC is currently evaluating if the cold cleaner will be continued to be stored onsite. Mr. Wharton states that the if the cold cleaner begins operation again, that BASF believes the cold cleaner is exempt under R 336.1281(2)(k). Thee product used (Extreme Simple Green Aircraft & Precision Cleaner) is less than 5% VOC, meeting the definition of an aqueous based part washer (R 336.1101(q)).

SC II.1 – **COMPLIANCE** – Less than 5% of any combination of methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform – The safety data sheet (SDS) for the cleaning solvent, "Extreme Simple Green Aircraft & Precision Cleaner", was provided in the April 24, 2018 submittal and indicates the solvent is water based and contains triethanolamine (<10%), ethoxylated alcohol (<5%), propylene glycol butyl ether (<5%), tetrapotassium pyrophosphate (<1%), and potassium silicate (<1%).

SC III.1 and 2, SC IV.1 through 5, SC VI.1 through 4 – **COMPLIANCE** – Cold cleaner operational requirements, including draining parts, closing cover when not in use, posting operating procedures near the cleaner, and storing waste solvents in closed containers; cold cleaner operational requirements are based on the type of cleaner and the vapor pressure of the solvent; information on each cold cleaner to be maintained on file.

In the April 24, 2018 submittal, BASF provided cold cleaner information, SDS, cold cleaner dimensions, locations, and air/vapor interface area. The vapor pressure of the solvent used in cold cleaners located at EPC and Cellasto is reported at 20 mmHg (0.386 psia). During the inspections, the cover on the cold cleaners were observed to be closed and signs posted near or on the cleaner with proper procedures (keep cover closed when not in use, etc.). Therefore, the cold cleaners were judged in compliance with SCs IV.3 and VI.3. The air/vapor interfaces appeared to be less than 10 square feet, which demonstrated compliance with SC IV.1.a. The cold cleaner in the Cellasto Plant was observed with the capability of solvent agitation and motorized lid, in compliance with SC IV.4.

Section 1 - FGEPCRULE290

EPC contains two emission units (EUEPCFILLERHNDLG, EUEPCOVEN) relating to Rule 290 subject equipment. R 336.1290 exempts from R 336.1201 those sources with limited emissions. The rule is divided into three general sections and further divided into subsections, depending on the type of emission (VOC, particulate, etc.), the carcinogenicity of the emissions, and the health-based screening level(s) of the emissions. Only those rules applicable to the Rule 290 emission units at the stationary source will be addressed. Rule 290 was recently revised on December 20, 2016. The citations listed below coincide with the existing ROP conditions and the former Rule 290 (prior to Rule revision). Each of emission units where installed prior to the rule revision and have not been modified.

R 336.1290(a) through (d) – **COMPLIANCE** – Emissions less than 1000 lbs. uncontrolled and 500 lbs. controlled with more restrictive limits for certain initial threshold screening levels (ITSL) and initial risk screening levels (IRSL); particulates limited to emissions of 0.01 lbs. particulate per 1000 lbs. gas, controlled by dust collector or equivalent installed and maintained, 5% opacity limit and monthly visible emission observation; description on file and records maintained. Required records are as follows for each emission unit: written description of the emission unit and control device, including the design control efficiency and exhaust gas flowrate; identify air contaminants emitted, carcinogenicity, screening level, and level of control; monthly emissions calculations; record of monthly visible emission readings.

The following emission units are listed as Rule 290 subject in the 2017 MAERS with their reported annual emissions in pounds:

2017 MAERS emissions reported (in pounds)

Section	Emission Unit	VOC	PM10	NOx	SO2
1	EUEPCFillerHndlg	------	237.00	------	------
1	EUEPCOven	22.00	43.00	821	4.9

According the MAERS submittal, the above reported emission units operate 12 months of the year. Fabric filters control particulate emissions from EUEPCFillerHndlg. Reported emissions for EUEPCFillerHndlg total to less than 500 pounds per year and therefore meet the monthly limit. Reported emissions for EUEPCOven are less than 500 pounds per year for both VOCs and PM10 combined.

In the April 24, 2018 submittal, the facility also submitted EPC monthly emission calculations. BASF reports PM emissions from EPC for 2016, 2017 and 2018. The reported emissions are significantly less than 500 pounds per month. In addition, BASF provided the visible emission records for EPC (December 2016 through March 2018).

Exemptions are not applicable to emission units that represent a PSD major source or major modification nor an ROP significant or minor modification. None of the emission units cited as Rule 290 sources in Section 1 of the ROP are excluded from the classification. As reported in the 2017 MAERS, the annual emission from each Rule 290 source is less than the significance levels in Rule 119(e).

R 336.1286(2)(a)

R 336.1286(2)(a) excludes from the requirement to obtain a Permit to Install "[p]lastic extrusion . . . and associated plastic resin handling, storage, and drying equipment." This exemption applies to the EPC extruding lines and plastic storage silos. This equipment is still required to comply with R 336.1301, R 336.1331, R 336.1901, and R 336.1910. Observations during the inspection on April 18, 2018 suggest compliance with these

requirements, as visible emissions and off-site odors were not noted during the site visit. There is also no evidence suggesting this equipment is excluded from exemption under R 336.1278. In MAERS 2017, BASF reports VOC emissions at approximately 2.7 tons for all emission units within EUEPCEXTRUSION combined.

Section 2 - EUELAREACTOR
This emission unit covers the reactors used to generate the prepolymer for polyurethane molding operations.

SC I.1, SC III.1, SC VI.1 – **COMPLIANCE** – VOC emissions from the reactors, thinning tanks, and blending tanks, requires a maximum emission rate of 0.5 pounds per 1000 pounds of completed organic resin; requires records be kept to demonstrate compliance.

In the April 24, 2018 submittal, BASF calculates monthly emissions per reactor for each month in the period. The monthly VOC emissions from each reactor, and the combined monthly VOC emissions from all reactors, calculate to less than 0.5 pounds per 1,000 pounds of product. On April 27, 2018, BASF provided the spreadsheet for 2017 calculations. Calculations were spot checked for accuracy.

SC IV.1 – **COMPLIANCE** – Carbon units on each reactor to be installed and operating properly.
During the inspection the carbon units on each reactor appear to be installed and operating properly.

Section 2 - EUELAMACTS
The equipment constituting EUELAMACTS at the stationary source is subject to the National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production promulgated in Title 40 of the Code of Federal Regulations (CFR), Part 63, Subparts A and III. On October 8, 2001, the first compliance date of the standard for an existing source, the stationary source M4777 was a part of a group of stationary sources (B4359, M4777, and M4808) that met the definition of a "major source" as defined at paragraph (a)(1), section 112, title I, of the Clean Air Act.

SC III.1, SC VI.1 –**COMPLIANCE** – Under MACT III at 63.1300(a), HAPs and HAP-based materials cannot be used to flush the mixhead or clean other equipment, with the exception of diisocyanate, which may be used to flush the mixhead and piping during startup or maintenance as long as the diisocyanates are used in a closed-loop system and re-used in production.

According to the December 6, 2016 submittal, the material used to flush the mixhead and lines is "CHEVRON Superla White Oil". The MSDS lists the chemical component as 100% white mineral oil with a CAS #8042-47-5. No HAPs are listed on the MSDS.

SC III.2, SC VI.2 – **COMPLIANCE** – Under 63.1300(b), a HAP cannot be used as a mold release agent.

According to the December 6, 2016 submittal, the mold release agent is "münch chemie international Release Agent 621/E7 special". The Technical Data Sheet indicates this is an aqueous emulsion and does not contain organic solvents.

SC VII.1 through 4 – **COMPLIANCE** – Semiannual deviation reports, Rule 912 reports, compliance certifications and report certifications, including certifications for compliance with MACT III - There have not been deviations reported for this flexible group in the semiannual reports.

SC IX.1 – **COMPLIANCE** – Comply with all applicable provisions of 40 CFR 63, Subparts A, III – Applicable requirements are included in the flexible group table.

Section 2 - FGELARULE290
The Cellasto Plant contains the following emission units relating to Rule 290 subject equipment listed in MI-ROP-M4777-2015a: EUELAREACTOR210, EUELAREACTOR220, EUELAREACTOR230, EUELAREACTOR240, EUELAREACTOR250, EUELAOVEN101, EUELAOVEN102, EUELAOVEN103, EUELAOVEN104, EUELAOVEN105, EUELAOVEN106, EUELAOVEN107, EUELAOVEN108, EUELAOVEN109, EUELADEBURRING, and EUELAMOLDING. The facility is also claiming the dry material handling of NDI which is controlled by two dust collectors is exempt from PTI requirements per Rule 290.

As described above in FGEPCRULE290, R 336.1290 exempts from R 336.1201 those sources with limited emissions.

R 336.1290(a) through (d) – **COMPLIANCE** – Emissions less than 1000 lbs. uncontrolled and 500 lbs. controlled with more restrictive limits for certain ITSL/IRSLs; particulates limited to emissions of 0.01 lbs. particulate per 1000 lbs. gas, controlled by dust collector or equivalent installed and maintained, 5% opacity limit and monthly visible emission observation; description on file and records maintained. Required records are as follows for each emission unit: written description of the emission unit and control device, including the design control efficiency and exhaust gas flowrate; identify air contaminants emitted, carcinogenicity, screening level, and level of control; monthly emissions calculations; record of monthly visible emission readings.

The following emission units are listed as Rule 290 subject in the 2017 MAERS with their reported annual emissions in pounds:

2017 MAERS emissions reported (in pounds)

Section	Emission Unit	VOC	PM10
2	RGElaReacs&Molds	3,880	---------
2	RGElaCuringOvens	3,834	2,180
2	EUELADEBURRING	------	33

According the MAERS submittal, the above reported emission unit or reporting group operates 12 months of the year. Carbon adsorption units control volatile organic compound emissions from RGElaReacs&Molds. Demisters control particulate and volatile organic compound emissions from RGElaCuringOvens. Filter socks and/or knock out boxes control PM emissions from deburring lines.

The April 24, 2018 submittal contains records demonstrating that emissions are less than 500 pounds per month. According to Mr. Wharton, the emissions reported for EUElaCuringOvens are "worst case scenario" emissions for the ovens operating 24 hours a day, seven days a week. For EUElaCuringOvens the highest reported VOC emissions were 319 pounds per month (for all 12 months) and the highest reported PM emissions were 182 pounds. While the reported monthly emissions from all nine ovens is greater than 500 lbs (combined VOC and PM = 501 lbs), the combined VOC and PM emissions from each individual oven in EUElaCuringOvens are less than 500 lbs (assume 501 pounds divided by 9). EUELADEBURRING emissions are significantly less than 500 pounds per month with reported emissions of 2.3 pounds per month during 2017. The highest reported VOC emissions for EUELAMOLDS occurred in March 2016, March 2017, and March 2018 at 228 pounds. . The highest reported VOC emissions for FGELAREACTOR occurred in December 2017 at 9 pounds. In addition, the April 24, 2018 submittal included Cellasto Environmental Inspection Records for April 6, 2018 which contains records of inspection of control equipment and visible emissions records.

The facility submitted Rule 290 records for the dry NDI material handling. Records indicate that monthly PM10 emissions vary between 0.22 to 0.34 lb/month and with annual emissions at 3.4 pounds per year.

Emissions include MDI (CAS #101-68-8, 24-hr ITSL of 0.6 micrograms per cubic meter), NDI (CAS #3173-72-6, no current screening level), DIPPI (CAS #28178-42-9, no current screening level), NMP (CAS #872-50-4, 24-hr ITSL of 700 micrograms per cubic meter), and DIPA (CAS #110-97-4, annual ITSL of 4 micrograms per cubic meter). NDI (1,5-naphthylene diisocyanate) and DIPPI (2,6-diisopropylphenyl isocyanate), do not have an associated screening level. During the inspection on September 27, 2013 (MACES report M477723230), the 12th Report on Carcinogens was consulted, published by the National Toxicity Program of the U.S. Department of Health and Human Services. Searching on-line under the two categories in the report, the "Known to be Human Carcinogens" and the "Reasonably Anticipated to be Human Carcinogens", the only chemical with the term "cyanate" found in its name is toluene diisocyanate (TDI). Therefore, it appears the current pollutant (aggregate of VOC, PM10, etc.) threshold for the emission units is 500 pounds per month controlled.

Exemptions are not applicable to emission units that represent a PSD major source or major modification nor an ROP significant or minor modification. None of the emission units cited as Rule 290 sources in Section 2 of the ROP are excluded from the classification. As reported in the 2017 MAERS, the annual emission from each Rule 290 source is less than the significance levels in Rule 119(e).

NSPS Subpart Kb

40 CFR Part 60, Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels [including Petroleum Liquid Storage Vessels] for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) does not apply to storage tanks that have a capacity less than 75 cubic meters (m^3). The storage tanks at BASF Plastics Plants have a capacity less than 75 cubic meters (m^3), with the exception of EUELATK-103 which has a capacity of 25,000 gallons or 94.63 m^3. Subpart Kb (§60.110b(b)) also states that "the subpart

does not apply to storage vessels...with a capacity greater than equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kilopascals (kPa)." Currently, storage tanks located at BASF Plastics Plants store liquids having a true vapor pressure less than 1.5 pounds per square inch absolute (psia) or 10.34 kPa. Therefore, the BASF Plastics Plants storage tanks (including EUELATK-103) are not subject to 40 CFR Part 60, Subpart Kb.

SECTION 3 - FGETPU

SC I.1, II.1, VI.3 – **COMPLIANCE** – VOC emissions limited to 129 tons per 12-month rolling time period; fresh butane usage limited to 129 tons per 12-month rolling time period; records of fresh butane usage.

In the information submittal received April 24, 2018 BASF reports fresh butane usage from January 2016 through March 2018. The highest 12-month rolling amount reported occurred at the end of April 2016 with 88 tons butane.

SC III.1, IV.1, VI.1 and 2 – **COMPLIANCE** – ETPUI, ETPUII, or the raw material storage shall not be operated unless the baghouse operating procedures are installed and implemented; F-780, F-880, F-841 shall be installed and operating properly, including maintaining pressure drops within specified ranges; pressure drops shall be monitored and recorded daily.

An operating procedure is maintained for the three dust collectors and was provided in the April 24, 2018 submittal. The proper ranges are quoted at 0.2 to 5 inches water column for F-780 (during pellet transfer), 0.4 to 5 inches water column for F-880 (during pellet transfer), and 0.1 to 5 inches water column for F-841 (when making a tricalcium phosphate batch – no longer applicable). Pressure drop data for February 2, 2018 through April 16, 2018 indicates that the baghouses were operating with pressure drop readings within specified operating ranges. During the inspection, Mr. Knowles indicated that the blowers have continued to operate on F841 and F780 even though ETPUI is idle and TCP is no longer in use. Visible emissions or fallout from these dust collectors have not been identified during past plant visits in 2015, 2014, 2012, 2010, 2008, 2006, 2004, 2003, and 2002.

SC III.2, III.3, IV.2, IV.3 – **COMPLIANCE** – ETPUI or ETPUII shall not be operated unless the butane collection system and condensation system are installed and operating properly and in accordance with operating procedures required to be developed and implemented; ETPUI or ETPUII shall not be operated unless the two systems are installed and operating properly and in accordance with operating procedures required to be developed and implemented.

Operating procedures have been developed (April 24, 2018 submittal). These procedures, and others concerning the rundown vessels, etc., are carried over with slight modifications from previous Polytech Molding procedures. The levels in hold tanks TK-780 and TK-880 are measured by dual monitors in each tank. The computer logic, operating the control of valves and blowers, etc., will not allow transfer to a hold tank unless the tank can accommodate the transfer, will abort a transfer from a hold tank to the condensation system if the hold tank is nearly empty, will abort a transfer if one of the area monitors detects a butane release, and will abort a transfer if the condensation system ("Polaris" system) alarms. The condensation system operates at its peak efficiency when the temperature at the top of the condensation column is less than -186°F; the monitored temperature at the top of the column was observed to be -118°F during the inspection. According to Mr. Knowles the process was in regeneration and the temperature would drop closer to -186°F following the process cycle.

SC VI.4 – **COMPLIANCE** – Monthly records kept of all instances where butane collection and tank or condensation system fails to capture butane as designed, including amount failed to capture – BASF reports there were no instances during the past two years (March 2016 through March 2018).

R 336.1201, R 336.1278, R 336.1278a, R 336.1284(b) & (j)

The following exemptions from the requirement to obtain a permit to install apply to the, butane storage tank and nitrogen storage tank provided the equipment is not excluded from exemption pursuant to R 336.1278 and provided records are maintained according to R 336.1278a. Previously the facility claimed exemptions for the nitric acid storage tank, acid neutralization tank, tricalcium phosphate tank, and plastic extrusion system. It was verified that the nitric acid storage tank, acid neutralization tank, and tricalcium phosphate tank was either no longer in use and the plastic extrusion line has been removed.

R 336.1278 excludes from exemption any of the following activities: prevention of significant deterioration (PSD) and nonattainment new source review (NSR) activities, significant actual emissions increases, new or reconstructed major Hazardous Air Pollutants (HAPs) sources subject to case-by-case Maximum Achievable Control Technology (MACT) standards, National Emission Standards for Hazardous Air Pollutants (NESHAP) sources. R 336.1278a specifies that to be eligible for an exemption, the owner or operator must be able to provide the following within 30 days of a written request for information:

1. A description of the exempt process or process equipment, including the date of installation;
2. The specific exemption being used by the process or process equipment.
3. An analysis demonstrating that R 336.1278 does not apply to the process or process equipment.
4. Any other records required for a specific exemption.

R 336.1284(2)(b) – **COMPLIANCE** – Storage of butane, propane, or liquefied petroleum gas in a vessel with a capacity less than 40,000 gallons – This exemption applies to the 16,000 gallon capacity liquid butane storage tank and the small butane recovery tank within the condensation system.

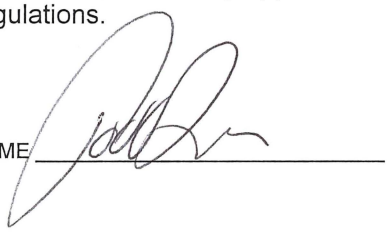
R 336.1284(2)(j) – **COMPLIANCE** – Pressurized storage of gases, including nitrogen, with boiling points less than 0°C – The nitrogen storage tanks used in the condensation system are exempt by this rule.

SECTION 3 - PTI 88-17

On September 29, 2017, PTI 88-17 was approved for the process modification of EPTUI and ETPUII, to allow an increase in material limits for fresh butane usage, and the installation/modification of associated equipment, including the installation of new degassing silos and regenerative thermal oxidizer for VOC emissions control. During the inspection it was observed that BASF has begun construction of the new degassing silos and other utility and foundation work necessary for the installation. At this time PTI 88-17 is not applicable as the installation is not complete.

FINAL COMPLIANCE DETERMINATION:

At this time, this facility appears to be in compliance with MI-ROP-M4777-2015a and federal and state regulations.

NAME  DATE 5/7/18 SUPERVISOR JK