

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

B596649172

FACILITY: Sun Chemical Corp		SRN / ID: B5966
LOCATION: 4925 EVANSTON AVE, MUSKEGON		DISTRICT: Grand Rapids
CITY: MUSKEGON		COUNTY: MUSKEGON
CONTACT: John Hamann , HSE Manager		ACTIVITY DATE: 06/19/2019
STAFF: Chris Robinson	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: FY '19 on-site inspection		
RESOLVED COMPLAINTS:		

Chris Robinson (CR) from the Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) was onsite to conduct an unannounced inspection of Sun Chemical Corporation (SRN B5966) to determine the facility's compliance status with respect to the following Permits: Permit to Install (PTI) No's. 1058-84D, 153-13, 154-13, 155-13, and 156-13A as well as any additional applicable State and Federal Air Quality Rules and Regulations. The facility is located at 4925 Evanston Avenue in Muskegon, Muskegon County, Michigan. CR met with Mr. John Hamann, HSE Manager and Mr. Bernard Nsengimana, Operations Manager. Intent of the inspection was relayed, and identification provided.

Weather conditions were cloudy, approximately 70°F with winds coming out of the north-northwest at approximately 7mph (www.weatherunderground.com). CR surveyed the perimeter of the facility upon arrival for odors and visible emissions, none were observed.

#### Facility Description

Sun Chemical manufactures and/or processes red, yellow, and blue pigments, and is believed to be the world's largest pigment manufacturing facility. The pigments are used in numerous industries such as cosmetics and printing inks. The manufacturing process includes taking raw materials to create pigments, and then manipulating those pigments until they become the final product. The plant consists of four areas, the main plant, High Volume Flush (HVF), Intermediate Building Tetrazo (IBTZ), and the boiler area. The Muskegon facility has approximately 140 employees and operates 24/7.

#### Compliance Evaluation

Sun Chemical operates under the following Permits:

PTI No.	Process
1058-84D	Boilers
153-13	Tetrazo/B Building
154-13	High Volume Flush (HVF) Building
155-13	Pigment Manufacturing (Main Plant Building)
156-13A	Pigment Processing (Main Plant Building)

Exhaust stacks were not explicitly measured. However, visual observations seemed to match permitted requirements. In addition, per Mr. Hamann, no changes have taken place since the last inspection. Per observations all of the equipment is labeled as required by the applicable permit and monitoring frequency is conducted as stated in the MAP. All scrubbers and filters are equipped with liquid flow indicators and absolute filters are equipped with pressure sensors as required by the associated permit. The scrubbers, filters and baghouses are equipped with differential pressure gauges and audible alarms as required by the associated permit. A MAP Alarm Overview is included in **Attachment A**. In addition, all of the control devices are "interlocked" with the process equipment, preventing the use of the process equipment without operating the proper control device.

#### **PTI No. 1058-84D**

This permit covers the 750 HP Johnston Boiler (EU-S1) that operates on both natural gas and landfill gas which is tracked via meters as required per FGFACILITY SC IV.1 and IV.2. Meter readings were as follows: 164,052 ccf for natural gas and 336,378 ccf landfill gas. These meters only track "total" usage, therefore staff take readings monthly to satisfy permit requirements SC VI.3. Records required by the PTI per SC EU-S1 VI.2-4 and FGFACILITY VI.2-6 have been provided and are included in **Attachment B**. Based on this information approximately 140.14 MMcf of natural gas and 42.55 MMcf of landfill gas has been used since June 1, 2018. This boiler is subject to a maximum landfill gas usage of 492.0 MMcf per year. Current usage is well under this limit.

This permit is considered an opt-out permit with facility-wide emission limits. Per FG-FACILITY SC I.1-3, the facility is limited to 89.9 tpy of NOx, 89.9 tpy of PM and 89.9 tpy of SO2. Emission Unit EU-S1 is also subject to an SO2 emission limit of 89 tpy (EU-S1 SC I.1). The highest calculated totals based on a 12-month rolling time period were; NOx = 12.77 tons in October 2018, PM= 0.76 tons in August - November 2018 and SO2=0.05 tons from August - November 2018. All appear to be well below the permitted limits.

As noted in EU-S1 SC IX.1 of this permit, EU-S1 is subject to New Source Performance Standards (NSPS), Part 60 Subparts A and DC which require the facility to submit an Initial notification of applicability and track fuel usage. Although fuel usage is being tracked it does not appear that the facility has submitted an initial notification. Therefore, CR will notify Mr. Hamann and request that one be submitted to the AQD. This boiler is considered to be a gas-fired boiler as defined in 40 CFR Part 63.11237. Therefore, not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAPs) 40 CFR, Part 63, Subpart JJJJJJ.

**PTI No. 153-13**

This PTI consists of Flexible Groups FG-IB and FG-TZ. **FG-IB** covers the intermediate building and houses the DCB unpacking and mixing process. Solid, dry DCB is brought onto the site in drums. Drums are stored in a DCB warehouse room, which is part of the same building but a separate room from the unpacking and mixing process (FG-IB). The drums are brought into the FG-IB room which is kept under negative pressure. A robotic arm picks up the drum, takes off the seal and the lid, and pours the drum into the mixing tank, pounding the sides to shake out all the DCB. The drum is punctured by the robot to make sure all the DCB exits the drum. Raw materials are "charged" in this manner to minimize fugitive dust as required per FG-IB SC III.1 of the PTI. The North and South mixing tanks (EU-NSlurry04T018 & EU-SSlurry04T008) both exhaust to the same "absolute filter" (4AF7010) and scrubber (04S7010) in series to control emissions of DCB. In case of spills inside the IB, there are two decontamination tanks holding sodium hypochlorite (bleach) solution to neutralize the DCB. All the emission units in FG-IB are controlled by the filter and scrubber, and exhaust to SV-Stack6.

Flexible Group **FG-TZ** includes all of the process equipment utilized in the formation of the tetrazo component. The tetrazo process includes two nearly identical process lines. They each have a head tank holding sodium nitrite (uncontrolled, exhausts inside building), a tank holding HCl, a tank holding DCB slurry, and the reaction tank for production of the Tetrazo component, which is used to manufacture diarylide yellow pigments. Each of the two process lines also has a caustic deluge tank to quench the reaction in case it gets out of control. The caustic tanks are both uncontrolled and exhaust into the room. The two process lines each have a caustic scrubber controlling emissions (04S7020 and 04S7120). One of the lines exhausts to Stack 4 while the other line exhausts to Stack 4a.

Also, per discussions with Mr. Hamann, no solid materials are charged to FG-TZ. Chemicals are premixed into slurry form prior to being charged. Based on the records provided, Sun chemical calculates DCB emissions monthly and annually based on a 12-month rolling time period. The highest calculated emissions for DCB was 0.0028 tons in May 2019. Both FG-IB and FG-TZ are subject to emission limits for HCL, DCB and PM. The HCL and DCB limits are based on "Test Protocol" requiring the facility to conduct DCB testing. Testing is being conducted as required. PM emission limits are also based on "Test Protocol" but require proper operation and maintenance of the control device. Based on discussions and observations, the facility appears to be operating and maintaining the control device as required.

Compliance with the emission limits outlined in FG-IB SC I.1-3 and FG-TZ SC I.1-2 of this PTI are demonstrated by operating the control devices in a satisfactory manner. This includes following the facility's MAP. An updated MAP has been provided and is included in the site file. Per observations and discussions, the facility appears to be following the requirements specified in the MAP.

Emission Unit/Flex Group	Device	ID	Ph	DP ("w.c)	Water Flow (GPM)
FG-IB	Absolute Filter	4AF7010	--	1.4	--
	Caustic Scrubber	04S7010	10:33	1.38	--
FG-TZ	Caustic Scrubber	04S7020	11.6	4.1	26.5
	Caustic Scrubber	04S7120	11.78	2.6	22.7

Per FG-IB SC VI.1 and FG-TZ SC VI.1 Sun Chemical is required to monitor and record DCB emissions on a quarterly basis. As noted above, Sun Chemical is doing this more frequently than quarterly. Testing is conducted as needed to meet customer requirements but at least quarterly. Records are provided in **Attachment B**. Testing Certificates were reviewed onsite.

#### PTI No. 154-13

PTI No. 154-13 covered equipment utilized in the blue pigment process and associated equipment. Per Mr. Hamann, the equipment was last used on February 1, 2016. Removal of the equipment was completed in May 2019. Visual observations confirmed that all equipment has been removed. Per Mr. Hamann, the source will be requesting to void this PTI.

#### PTI No. 155-13

This PTI consists of two (2) Flexible Groups (FG-Azo and FG-Main) and Source-wide Conditions (FG-FACILITY). Flexible Group **FG-Azo** includes the pigment manufacturing process, along with associated tanks and other equipment servicing red and yellow pigment processing and strike tanks. Pollution control equipment for this flex group includes absolute filter 03F3020 and caustic scrubbers 03S7010 and 03S7110. Flexible Group **FG-Main** is the main pigment manufacturing process, which includes associated tanks and other equipment servicing red and yellow pigment processing and strike tanks. Pollution control equipment consists of air filters 02F7010 (coarse filter), 02AF3020 (absolute filter) and Caustic scrubbers 02S7010 and 02S7110.

As outlined in FG-Azo SC I.1-4, FG-Avo SC II.1-3, FG-Main SC I.1-13 and FG-Main SC II.1-2 of this PTI, these flex groups are subject to emission limits for PM, BNA and HCl, all of which are based on "Test Protocol". Control devices appear to be operating properly and any required testing is being conducted as required.

Usage of Red and Yellow Pigment is subject to an annual limit. The facility tracks usage monthly and annually (**Attachment B**), which is summarized in the table below. Usage of these pigments is well under the allowed limit.

Material	Limit	Max used (6/2018 – 5/2019) per 12-mth rolling time period.	Equipment
Red Pigment	12,500,000 lbs/year	3,464,445 lbs	FG-Azo
Yellow Pigment	18,500,000 lbs/year	2,636,806 lbs	
BNA content of tobias acid used	0.1% by weight	66 ppm (0.0066%)	
Red pigment	5,000,000 lbs / year	1,737,784 lbs	FG-Main
BNA content of tobias acid used	0.1% by weight	66 ppm (0.0066%)	

Per email correspondence on June 28, 2019 and a review of records provided, no batches of diarylide yellow product exceeded the 0.5% by weight limit for the 3,3'-dichlorobenzidine (DCB). Therefore, notification to the AQD was not required. During the inspection, Mr. Hamann stated that empty tobias bags are placed into a closed container inside the building prior to being disposed of. Also, raw materials are charge in a manner to minimize fugitive air contaminant emissions.

PH and pressure drops are continuously monitored and recorded electronically. The following readings were taken during the inspection.

Description	Flow Rate (GPM)	PH	Pressure Drop
Caustic Scrubber 03S7010	281	12.5	4.8
Caustic Scrubber 03S7110	502	12.8	5.4
Absolute Filter 03F3020	--	--	Bypassed
Caustic Scrubber 02S7010	197	12.3	2.23
Caustic Scrubber 02S7110	255	12.1	6.84

Sun Chemical uses multiple suppliers for raw ingredients. To ensure that the product meets the customers' requirements, Sun Chemical tests for the DCB content of diarylide yellow product from FG-Azo and FG-Main more frequently than the quarterly requirement specified in the permit (FG-Azo SC VI.1-2 & FG-Main SC VI.1-2). In addition, Sun chemical conducts their own testing of the BNA content for the tobias acid. CR reviewed results

for both DCB and BNA onsite. Monthly and annual emissions data is included in **Attachment B**, which is based on test data.

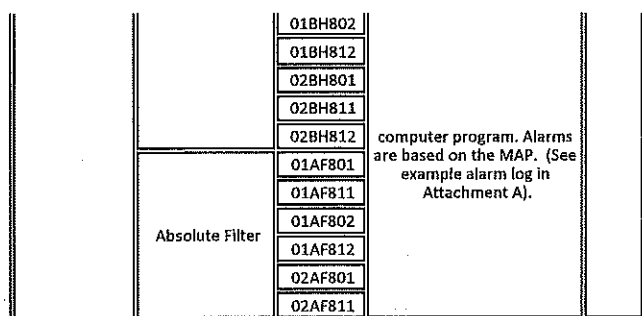
Sun Chemical is a synthetic minor source for Hazardous Air Pollutants (HAPS) and has accepted federally enforceable restrictions, limiting the facility's potential to emit for HAPS to below Title V thresholds. Through **FG-FACILITY** of this PTI, Sun Chemical is subject to a facility-wide emission limit of less than 25tpy for aggregate HAPs and less than 10tpy for any individual HAP. As required in FG-FACILITY SC VI.1, calculations are being maintained and were provided (**Attachment B**). Based on the records for June 2018 through May 2019, the maximum 12-month rolling total for aggregate HAPs was 0.0028 tons. This demonstrates compliance with both the aggregate and individual HAP limits.

**PTI No. 156-13A**

This PTI is for process equipment covered under EU-EirichBlender, EU-BeltDryer, EU-SprayDryer, FG-TrayDry and FG-SpinDry. None of this equipment was operating during this inspection. As noted below separate emission limits apply to each of these emission units and flexible groups. Compliance with these limits is demonstrated by following the procedures and operating parameters outlined in the facility's MAP. Based on observations, discussions and a records review, it appears that the facility is complying with the MAP. Emissions generated by these emission units and flexible groups are controlled, as noted below. Per Mr. Hamann, all of the equipment and control devices are "interlocked" preventing the process equipment from operating without proper emission controls, as required in the permit. Also as required by the permit, all of these systems are equipped with pressure sensors and audible alarms which are monitored continuously, see alarm log example in **Attachment A**. Emission units EU-EirichBlender, EU-BeltDryer, and Flexible Groups FG-Blend and FG SpinDry are subject to emission limits for PM. Compliance with these limits is demonstrated by properly operating and maintaining the associated pollution control device(s).

Emission Unit **EU-EirichBlender** is a rotary vacuum blender 06D633 used in the pigment manufacturing process. Emissions are controlled by baghouse 06BH634. **EU-BeltDryer** 01D610 is used in pigment processing and a product with emissions control by baghouse 01BH650, which is equipped with filter 01AF650, separator 01SE630, water quench 01S630, and Venturi Scrubber/Cyclone 01P630. **EU-SprayDryer** consists of spray dryer (02D609) used in pigment processing and two (2) product receiving baghouses (02BH610N, 02BH610S). The baghouses are equipped with a shared filter (02AF610). Flexible Group **FG-TrayDry** consists of three (3) tray dryers used in pigment processing, with pack-out operation. Pollution control equipment consists of baghouse 06BH634 and wash filters 06WF612, 06WF622, 06WF632. FG-TrayDry is subject to emission limits DCB, DMB and Dichlorobiphenyl which are based on "Test Protocol". Testing is being conducted as required. Flexible Group **FG-Spin Dry** consists of two (2) spin flash dryers to dry pigment equipped with baghouses 06BH607 and 06BH617 and absolute filters 06AF607 and 06AF617. Flexible Group **FG-Blend** consists of four (4) blenders (3 Nauta, 1 Ribbon) and AC Mill used to grind and blend dry pigment, with associated pack-out operations. Each blender is equipped with a baghouse and filter for PM control. The following readings were collected during the inspection and were within limits specified in the MAP.

	Equipment	ID #	DP Reading	Water Flow Rate
EU-EirichBlender	packout baghouse	06BH634	Not Operating	
EU-Beltdryer	baghouse	01BH650		
	absolute filter	01AF650		
	venturi scrubber/cyclone	01P630		
	water quench	01S630		
EU-Spraydryer	Baghouse	02BH610N		
		02BH610S		
	Absolute Filter	02AF610		
FG-TRAYDRY	wash filter	06WF612		
		06WF622		
		06WF632		
FG-SpinDry	Baghouse	06BH607		
		06BH617		
	Absolute Filter	06AF607		
		06AF617		
FG-Blend (Equipped with DP but no display)	Baghouse	01BH801	Gauge installed without readout. Readings are continuously monitored and recorded in the facility's	NA
		01BH811		



DCB emissions are monitored and recorded for EU-BeltDryer & FG-TrayDry more frequently than the permit requirements of quarterly (EU-Beltdryer SC VI.1 & EU-TrayDry SC VI.1). Monthly and annual calculations were provided and are based on actual testing data which was reviewed onsite.

**Emergency Generators**

Sun Chemical has two (2) diesel fired emergency generators (Gen 101 & 102). Generator 101 is an Onan model 150 PGFA 37.3 KW generator installed in the fall of 2004 and Generator 102 is a John Deer 80 kw model 2093539 4.5L generator installed in the Fall of 2012 and manufactured in March 2006. Both generators appear to be exempt from Rule 201 permitting per Rule 285(2)(g) for internal combustion engines that have a maximum heat input of less than 10,000,000 Btu/hour. The KW ratings for Generator 101 and 102 calculate to be less than 1,000,000 Btu/hr.

Two Federal Standards typically apply to diesel fired engines (NSPS Subpart IIII and NESHAP Subpart ZZZZ). Generator 101 is not subject to NSPS Subpart IIII for Stationary Compression Ignition Internal Combustion Engines because it was installed prior to 7/11/2005. Generator 102 is not subject because it was manufactured prior to 4/1/2006. The RICE MACT (40 CFR Part 63 Subpart ZZZZ) for Stationary Reciprocating Internal Combustion Engines appears to be applicable to both generators.

The facility operates one (1) parts washer that appears to be exempt from Rule 201 permitting requirements per Rule 281(2)(h). The parts washer is maintained by Safety Kleen and instructions were posted. This is a non-agitating and non-heated unit.

**MAERS**

Emissions data for 2018 was submitted by Sun Chemical on time and complete on March 19, 2019. CR reviewed and passed the submittal on May 23, 2019. A copy of the 2018 MAERS report is included in **Attachment C** and summarized below.

Pollutant	Amount (lbs)
Ammonia	128.77
CO	4,976.48
Lead	0.02
NOx	10,471.16
PM10	1,061.58
PM2.5	702.62
SO2	24.45
VOC	661.57

**40 CFR, Part 60, Subpart VVVVV**


Per 63.11494(a) facilities are subject to the NESHAP Subpart, VVVVV (40 CFR, Part 63, Subpart VVVVV) if they own or operate a Chemical Manufacturing Process Unit (CMPU) that meets the conditions specified in 63.11494(1) and 63.11494(2)(i-iv). Sun Chemical is an Area Source that owns and operates a CMPU as noted in 63.11494(1). Mr. Hamann evaluated a list of raw materials provided by Sun Chemical's Regulatory Department and identified two (2) that contained one or more of the chemicals listed on Table 1 of 63.11494. They are Darvan No. 1 spray dried (Quinoline < 0.09%) and Bio-Soft N91-8 (Acetaldehyde < 0.1%). Safety Data Sheets are included in **Attachment D**. Based on discussions and information provided by Mr. Hamann, see attached email correspondence in **Attachment D**, Sun Chemical does not appear to be using any raw materials that contain chemical(s) in excess of the allowable percent by weight identified in Table 1 of 63.11494. Therefore, Sun Chemical does not appear to be subject to NESHAP 6(V).

**Conclusion**

Based on observations, discussions and a record review, Sun Chemical Corporation appears to be in compliance with PTI No's. 1058-84D, 153-13, 154-13, 155-13, and 156-13A as well as applicable State and Federal Air Quality Rules and Regulations.

**Attachments**

- A - MAP Alarm Overview
- B - Records
- C - 2018 MAERS Report
- D - Safety Data Sheets and Email Correspondence

NAME 

DATE 8/1/2019

SUPERVISOR 