

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

G506750575

FACILITY: WILLIAM BEAUMONT HOSPITAL		SRN / ID: G5067
LOCATION: 3601 W. 13 MILE RD., ROYAL OAK		DISTRICT: Southeast Michigan
CITY: ROYAL OAK		COUNTY: OAKLAND
CONTACT: Amy Blazejewski, Director of Environment and Life Safety		ACTIVITY DATE: 09/09/2019
STAFF: Kerry Kelly	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Evaluation of Beaumont's compliance with the Federal Clean Air Act, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, Michigan's Air Pollution Control Rules, and the conditions established in Permit to Install (PTI) 95-19 and Renewable Operating Permit (ROP) No. MI-ROP-G5067-2014.		
RESOLVED COMPLAINTS:		

On September 9, 2019, I (Kerry Kelly, EGLE, Environmental Quality Analyst) conducted an inspection of William Beaumont Hospital -Royal Oak Campus (Beaumont), State Registry Number (SRN): G5067, located at 3601 W 13 Mile Road, in Royal Oak, Michigan. The purpose of this inspection was to determine Beaumont's compliance with the Federal Clean Air Act, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, Michigan's Air Pollution Control Rules, Permit to Install Number 95-19; and the conditions established in Renewable Operating Permit (ROP) No. MI-ROP-G5067-2014.

### **CONTACTS**

The following Beaumont and contract employees assisted me during the inspection by showing me relevant equipment, answering questions, and providing records:

Ms. Amy Blazejewski, Senior Director, Environment and Life Safety  
Mr. Rocco Ottolino, Beaumont, Manager, Biomedical Engineering  
Mr. Jim Gibson, Beaumont, Bio-medical Technician  
Mr. Howard Bosch, Beaumont, Lead Tech RO Power Plant  
Mr. Andy Rusnak, Impact Compliance and Testing, Technical Manager

### **FACILITY OVERVIEW**

The Beaumont Royal Oak Campus is located in Southeastern Oakland County which is currently designated by the United States Environmental Protection Agency (USEPA) as a non-attainment area with respect to the 8-hour ozone standard. The Beaumont campus is approximately four million square feet and is immediately surrounded by residential properties to the east, west, and south and a high school to the north.

### **MI-ROP-G5067-2014 and PTI 95-19**

Currently William Beaumont is operating under MI-ROP-G5067-2014 via permit shield since MI-ROP-G5067-2014 expired September 2, 2019 and an administratively complete ROP application was received by EGLE on time (before March 2, 2019). The proposed ROP was sent to EPA for review on August 26, 2019. EPA's review period ends October 10, 2019.

Equipment permitted in MI-ROP-G5067-2014 consists of five boilers (EU-BOILER1, FG-BOILERS2&3, FG-BOILERS4&5), 13 stationary internal combustion engines (ICE) (FG-EMERGENCY & FG-ELECGEN1&2R), four ethylene oxide (EtO) sterilizers (FG-ETOSTERILZERS), a paint booth (EU-WOODSHOP), and a cold cleaner (EU-CCGARAGE). A flexible group (FG-FUELOIL) is also included in the ROP and contains sulfur dioxide emission standards and fuel oil certification or analysis requirements.

William Beaumont applied for a permit to install (PTI 95-19) to change the recordkeeping requirements pertaining FG-BOILERS2&3, FG-BOILERS4&5, FG-FUELOIL, and FG-EMERGENCY from daily to monthly. The recordkeeping changes resulted in changes to the emission limits for FG-BOILERS2&3 and FG-BOILERS4&5 as well. Three previously permitted emergency engines (EU-ELECGEN3, EU-ELECGEN4, and EU-ELECGEN5) were removed from the flexible group FG-EMERGENCY in PTI 95-19 because these engines were dismantled and removed from the facility.

### **BOILERS**

The five permitted boilers at Beaumont Royal Oak, located in the West Powerhouse, are used to provide steam for equipment sterilization, cooking, and building heating. The primary fuel used in these boilers is natural gas, however, the Michigan Department of Community Health 2007 Minimum Design Standards for Health Care Facilities requires hospitals to have an emergency fuel supply for boilers at hospitals. As a result, the facility's

boilers are capable of combusting fuel oil No. 2.

Permit conditions for the boilers are included in the following tables in the ROP and PTI: EU-BOILER1, FG-BOILER2&3, FG-BOILER4&5, and FG-FUELOIL. At the time of my inspection, Boilers 3 and 4 were operating. Mr. Bosch explained Beaumont typically only needs to operate two boilers at a time. Occasionally, on very cold days, three boilers are operated at the same time.

#### EU-BOILER 1 (Boiler #1)

Boiler #1 nameplate states it is a E. Keeler Co. boiler manufactured in 1977 with a capacity of 39,000 cubic feet per hour natural gas or 1940 lbs per hour of fuel oil number 2. This equates to a maximum heat input between 37.050 MMBtu/hour to 40.095 MMBtu/hour depending on the Btu content of the the natural gas used which typically varies between 950 to 1050 Btu/scf. The ROP description states the boiler's heat input capacity is 39.0 MMBtu/hour.

The Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units promulgated in 40 CFR Part 60, Subparts A and Dc does not appear to apply to the Boiler #1 because Boiler #1 was constructed prior to June 9, 1989 and does not appear to have been reconstructed or modified.

Boiler #1 is not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources promulgated in 40 CFR 63 Subpart JJJJJJ if it operated as a gas-fired boiler as defined in the subpart per 40 CFR 63.11195. A gas-fired boiler is defined as any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or for periodic testing, maintenance, or operator training on liquid fuel. Periodic testing, maintenance, or operator training on liquid fuel shall not exceed a combined total of 48 hours during any calendar year. The ROP limits the number of hours Boiler #1 can be operated on liquid fuel for periodic testing to no more than 48 hours. Mr. Bosch provided records of the number of hours Boiler #1 operated on fuel oil during 2018 and 2019 (Attachment 1). According to these records Boiler #1 was operated for 3 hours in calendar year 2018 and for 1.25 hours between January and September 2019. This boiler appears to be operating as a gas-fired boiler and therefore is not subject to 40 CFR 63 Subpart JJJJJJ.

SO<sub>2</sub> emissions from EU-BOILER1 are limited to 0.33 lb/MMBtu. Compliance with this condition is demonstrated through EU-BOILER1 SC VI.3 and FG-FUELOIL SC VI.1. Based on the emission calculations/records (Attachment 2) and fuel supplier certification (Attachment 3) provided by Mr. Rusnak and Mr. Bosch, the daily SO<sub>2</sub> emissions are being calculated in accordance with Appendix 7 and the sulfur content of the fuel is 0.0015 percent by weight. Based on 0.0015 percent by weight sulfur content of the fuel and a heat rating of 19,453 Btu/pound of fuel oil #2 (data is from last fuel analysis conducted) the SO<sub>2</sub> lb/MMBtu is 0.001542, which is below the 0.33 lb/MMBtu limit in the ROP.

Mr. Bosch provided records of the daily fuel use and daily NO<sub>x</sub> and SO<sub>2</sub> emissions for Boiler #1 (Saved as G5067 William Beaumont Hospital Emissions in S:\Air Quality Division\STAFF\Kerry Kelly), as required in SC VI. 2, 3, and 4 of MI-ROP-G5067-2014, for July 2017 through August 2019. Beaumont is using NO<sub>x</sub> emission factors of 0.035 lb per gallon of fuel oil and 0.00013 lb per cubic foot for natural gas which are higher than the 0.02 lb per gallon and 0.0001 pound per cubic foot emission factors noted in Appendix 7.2 in the ROP. There are no daily, monthly, or yearly emission limits in the ROP or PTI for Boiler #1.

The routine preventative maintenance events for all hospital equipment, including the boilers, are recorded in a computer software program. Mr. Bosch provided the daily, monthly, quarterly (now 4 month), semi-annual, and annual maintenance procedures for the permitted boilers (Attachment 4). A list of completed preventative maintenance activities for EU-BOILER1 for 2018 – 2019 was also provided by Mr. Bosch (Attachment 5). These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

#### FG-BOILER2&3 (Boiler #2 and Boiler #3)

I inspected the nameplate for Boiler #2. The nameplate states Boiler #2 is a 48.136 MBtu/hour, Cleaver-Brooks boiler manufactured in 1997 and capable of firing natural gas or fuel oil number 2. Boiler #3, per the nameplate, is a Cleaver-Brooks boiler manufactured in 2001. The specification sheets show that Boiler #3 has a heat input capacity of 43.078 MMBtu/hour when firing fuel oil number 2 and 44.596 MMBtu/hour when firing natural gas. The descriptions in the ROP and PTI state that Boiler #2 and Boiler #3 each have a heat input capacity of 48.2 MMBtu/hour using natural gas fuel and 46.4 MMBtu/hour using fuel oil No. 2. The heat input stated in the PTI and ROP are greater than the actual sizes of these boilers.

Boiler #2 and Boiler #3 are not subject to the NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources promulgated in 40 CFR 63 Subpart JJJJJJ if they are operated as gas-fired boilers as defined in the subpart per 40 CFR 63.11195. Mr. Bosch provided records of the number of hours Boiler #2 and Boiler #3 were operated on fuel oil during 2018 and 2019 (Attachment 1). According to these records Boiler #2 was operated for 1 hour in calendar year 2018 and for 4.25 hours between January and September 2019. Boiler #3 was operated for 1.5 hours in calendar year 2018 and for zero hours between January and September 2019. These boilers appear to be operating as gas-fired boilers and therefore are not subject to 40 CFR 63 Subpart JJJJJJ.

EU-BOILER2 and EU-BOILER3 are subject to 40 CFR Part 60 Subpart Dc. FG-BOILERS2&3 in the ROP and PTI contain conditions from 40 CFR Part 60 Subparts Dc applicable to EU-BOILER2 and EU-BOILER3.

In MI-ROP-G5067-2014, each boiler in FG-BOILER2&3 is limited to 247.2 pounds of SO<sub>2</sub> per day and 23.0 tons of NO<sub>x</sub> per 12-month rolling period. The SO<sub>2</sub> limit was changed to 1.7 pounds per day based on a calendar month average in PTI 95-19. Compliance with the SO<sub>2</sub> and NO<sub>x</sub> emission limits are demonstrated through recordkeeping requirements in the ROP and PTI. Daily emission records provided by Mr. Bosch for July 2018 – August 2019 (Saved as G5067 William Beaumont Hospital Emissions in S:\Air Quality Division\STAFF\Kerry Kelly ) indicate neither Boiler #2 nor Boiler #3 emitted SO<sub>2</sub> during the time period covered in the records. Mr. Bosch also provided 12-month rolling SO<sub>2</sub> and NO<sub>x</sub> emission records (Attachment 2). The highest recorded 12-month rolling NO<sub>x</sub> emissions for Boiler #2 was 11.48 tons reported in August 2019 and for Boiler #3 was 8.28 tons reported in September 2018.

Visible emissions from each boiler in FG-BOILERS2&3 are limited to a 6-minute average of 20% opacity, except for one 6-minute average per hour of not more than 27% opacity. The underlying applicable requirement for this condition (40 CFR 60.43c (c) & (d)) states this limit applies to affected facility that combust coal, wood, or oil and has a heat input capacity of 8.7 MW (30 MMBtu/h) or greater. 40 CFR 60.47c(c) allows owners and operators of an affected facilities that burn only distillate oil that contains no more than 0.5 weight percent sulfur and/or liquid or gaseous fuels with potential sulfur dioxide emission rates of 26 ng/J (0.060 lb/MMBtu) heat input or less and that do not use a post-combustion technology to reduce SO<sub>2</sub> or PM emissions to follow the applicable procedures in 40 CFR 60.48c(f) to show compliance with the emission limit in 40 CFR 60.43c (c). 40 CFR 60.48c (f) requires fuel supplier certification records indicating the name of the oil supplier, a statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c, and the sulfur content or maximum sulfur content of the oil. Mr. Bosch provided fuel oil certification records for the last shipments of fuel oil received (Attachment 3). The certification records indicated the fuel was supplied by RKA Petroleum and contains less than 0.0015% sulfur by weight.

The ROP establishes a natural gas usage limit of 420 MMscf and a fuel oil No. 2 usage limit of 200,000 gallons per 12-month rolling period for each boiler individually. Compliance with these material limits is demonstrated through recordkeeping requirements per the ROP and PTI. Based on the fuel use records provided by Mr. Bosch for July 2018 – August 2019 (Attachment 2), the highest 12-month rolling natural gas usage for Boiler #2 was 176.6 MMscf reported in August 2019 and for Boiler #3 was 127.4 MMscf reported in September 2018. The highest reported 12-month rolling No.2 fuel oil usage between July 2018 - August 2019 for Boiler #2 was 183 gallons and for Boiler #3 was 190 gallons.

The routine preventative maintenance events for all hospital equipment, including the boilers, are recorded in a computer software program. Mr. Bosch provided the daily, monthly, quarterly (now 4 month), semi-annual, and annual maintenance procedures for the permitted boilers (Attachment 4). A list of completed preventative maintenance activities for EU-BOILER2 & EU-BOILER3 for 2018 – 2019 was also provided by Mr. Bosch (Attachment 6). These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

Outside of the West Powerhouse I inspected the stacks for Boiler #3 and did not observe any visible emissions from the stack.

#### FG-BOILER4&5

Information on the nameplate and boiler for Boiler #4 indicates it is an Erie City boiler capable of combusting natural gas or fuel oil No. 2 with a heat input capacity of 59,000,000 Btu/hour and manufactured in 1973. The information on the nameplate is consistent with the description in PTI 95-19.

Boiler #5, according to the nameplates I observed, is a Keeler boiler manufactured in 1975 with a natural gas throughput capacity of 52,100 cfh (heat input between 49.495 MMBtu/hour and 54.705 MMBtu/hour) and fuel oil capacity of 2,585 pounds per hour (approximately 50.264 MMBtu/hour based on fuel oil density of 7.2 lbs/gallon and 140,000 Btu/gallon). The description in PTI 95-15 states Boiler #5 has a heat input capacity of 52.1 MMBtu/hour.

Boiler #4 and Boiler #5 are not subject to the NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources promulgated in 40 CFR 63 Subpart JJJJJJ if they are operated as gas-fired boilers as defined in the subpart per 40 CFR 63.11195. Mr. Bosch provided records of the number of hours Boiler #4 and Boiler #5 were operated on fuel oil during 2018 and 2019 (Attachment 1). According to these records Boiler #4 was operated for 2 hours in calendar year 2018 and for zero hours between January and September 2019. Boiler #5 was operated for zero hours in calendar year 2018 and for zero hours between January and September 2019. These boilers appear to be operating as gas-fired boilers and therefore are not subject to 40 CFR 63 Subpart JJJJJJ.

EU-BOILER4 and EU-BOILER5 are subject to 40 CFR Part 60 Subparts Dc. FB-BOILERS4&5 in the ROP and PTI contains conditions from 40 CFR Part 60 Subparts Dc applicable to EU-BOILER4 and EU-BOILER5.

Boilers #4 and #5 share a 240 pounds per calendar day SO<sub>2</sub> emission limit in the ROP and a 1.1 pounds per calendar day limit based on a calendar month average in PTI 95-19. Both the ROP and PTI include a 48.5 tons NOx emission limit per 12-month rolling period for both Boilers #4 and #5 combined. Compliance with the SO<sub>2</sub> and NOx emission limits are demonstrated through recordkeeping requirements. Emission records provided by Mr. Bosch for July 2018 – August 2019 (Saved as G5067 William Beaumont Hospital Emissions in S:\Air Quality Division\STAFF\Kerry Kelly) indicate the highest combined daily SO<sub>2</sub> emissions for Boiler #4 and Boiler #5 between July 1, 2018 and July 31, 2019 were 5 pounds reported for September 27, 2018 which is below the limit in the ROP. Zero emissions were reported for Boiler #4 and #5 combined for August 2019 which is within the PTI limit. Beaumont is not keeping 12-month rolling NOx emission records for Boiler #4 and Boiler #5 combined, however, they are keeping records of the total 12-month rolling NOx emissions for Boilers #1 through #5 combined (Attachment 2). The highest recorded 12-month rolling NOx emissions between July 2018 – August 2019 for Boilers #1 through #5 was 34.55 tons reported in July 2019, which is less than the 48.5 ton 12-month rolling NOx emission limit for Boiler #4 and Boiler #5 combined.

The ROP establishes natural gas usage limit of 693.8 MM cubic feet and a fuel oil usage limit of 5,250 gallons for Boilers #4 and #5 combined per 12-month rolling period. Beaumont is not keeping 12-month rolling fuel usage records for Boiler #4 and Boiler #5 combined, however, they are keeping records of the total 12-month rolling fuel usage records for Boilers #1 through #5 (Attachment 1). The highest recorded 12-month rolling natural gas usage between January 2017 – July 2018 for Boilers #1 through #5 was 514 MM cubic feet. The highest fuel oil #2 usage for Boilers #1 through #5 between January 2017 – July 2018 was 479 gallons. Both the highest natural gas usage and fuel oil #2 usage between January 2017 – July 2018 for Boilers #1 through #5 were less than the material limits for just Boiler #4 and Boiler #5 combined.

Visible emissions from each boiler in FG-BOILERS4&5 are limited to a 6-minute average of 20% opacity, except for one 6-minute average per hour of not more than 27% opacity. The underlying applicable requirement for this condition (40 CFR 60.43c (c) & (d)) states this limit applies to affected facility that combust coal, wood, or oil and has a heat input capacity of 8.7 MW (30 MMBtu/h) or greater. 40 CFR 60.47c(c) allows owners and operators of an affected facilities that burn only distillate oil that contains no more than 0.5 weight percent sulfur and/or liquid or gaseous fuels with potential sulfur dioxide emission rates of 26 ng/J (0.060 lb/MMBtu) heat input or less and that do not use a post-combustion technology to reduce SO<sub>2</sub> or PM emissions are allowed to follow the applicable procedures in §60.48c(f) to show compliance with the emission limit in 40 CFR 60.43c (c). 40 CFR 60.48c(f) requires fuel supplier certification records indicating the name of the oil supplier, a statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c, and the sulfur content or maximum sulfur content of the oil. Mr. Bosch provided fuel oil certification records for the last shipments of fuel oil received (Attachment 3). The certification records indicated the fuel was supplied by RKA Petroleum and contains less than 0.0015% sulfur by weight.

The ROP and PTI establish a natural gas usage limit of 693.8 MM cubic feet and a fuel oil usage limit of 5,250 gallons for Boilers #4 and #5 combined per 12-month rolling period. Beaumont is not keeping 12-month rolling fuel usage records for Boiler #4 and Boiler #5 combined, however, they are keeping records of the total 12-month rolling fuel usage records for Boilers #1 through #5 (Attachment 2). The highest recorded 12-month rolling natural gas usage between July 2018 – August 2019 for Boilers #1 through #5 was 531.3 MMcf. The highest fuel oil #2 usage for Boilers #1 through #5 between July 2019– August 2019 was 920 gallons. Both the highest

natural gas usage and fuel oil #2 usage between July 2018 and August 2019 for Boilers #1 through #5 were less than the material limits for just Boiler #4 and Boiler #5 combined.

The routine preventative maintenance events for all hospital equipment, including the boilers, are recorded in a computer software program. Mr. Bosch provided the daily, monthly, quarterly (now 4 month), semi-annual, and annual maintenance procedures for the permitted boilers (Attachment 4). A list of completed preventative maintenance activities for EU-BOILER4 & EU-BOILER5 for 2018 – 2019 was also provided by Mr. Bosch (Attachment 7). These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

## **FUEL OIL USAGE**

### FG-FUELOIL

FG-FUELOIL is comprised of emission units that are subject to sulfur dioxide emission standards and a fuel oil certification; these units include: EU-BOILER1, EU-BOILER2, EU-BOILER3, EU-BOILER4, EU-BOILER5, EU-COGEN1, EU-COGEN2, EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1, and EU-RESGEN2. Each shipment of fuel for these emission units is required to contain no more than 0.20% sulfur by weight in the ROP and 15 ppm for each shipment in the PTI.

According to records of the fuel storage tanks deliveries certification for July 1, 2018 and December 31, 2018 (Attachment 3), there were the following two "fills":

Tank No. 11 received 3319.5 gallons on December 14, 2018  
 Tank No. 14 received 9,002 gallons on December 13, 2018  
 Tank No. 16 received 9,000 gallons on December 13, 2018  
 Tank No. 15 received 17,998 gallons on December 12, 2018  
 Tank No. 15 received 3,612 gallons on December 11, 2018

As required by their permit, Beaumont provided the certification received from the fuel supplier for the December 2018 shipment (Attachment 3) stating the fuel contained less than 0.0015% by weight if sulfur which is below the ROP and PTI permit limit.

EU-ELECGEN6 and EU-ELECGEN7 are limited to 65,000 gallons combined of fuel oil No. 2 usage per year. EU-ELECGEN8 and EU-ELECGEN9 are also limited to 65,000 gallons fuel oil No. 2 per year combined. Beaumont is not keeping 12-month rolling records of the fuel oil No. 2 used in EU-ELECGEN6 and EU-ELECGEN7 combined and EU-ELECGEN8 and EU-ELECGEN9 combined, however, Mr. Bosch did provide 12-month rolling fuel oil No. 2 usage for all permitted boilers and generators at the facility combined (Attachment 2). The highest reported 12-month rolling fuel oil No. 2 usage for all permitted boilers and generators at the facility between July 2018 and August 2019 was 30,016 gallons reported in December 2018, which is less than the limits for EU-ELECGEN6 and EU-ELECGEN7 combined and EU-ELECGEN8 and EU-ELECGEN9 combined.

Records of the routine preventative maintenance events for EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1 and EU-RESGEN2 are required in the PTI. As noted previously, the routine preventative maintenance events for all hospital equipment is recorded in a computer software program. Mr. Bosch provided records of the maintenance procedures (Attachment 8) and events (Attachment 9) performed for EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1 and EU-RESGEN2 for September 2018 through September 2019. These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

Beaumont is required to submit semiannual reports consisting of fuel oil analyses either conducted by the fuel oil supplier or an independent laboratory and a certified statement signed by a responsible official indicating that the analysis submitted represents all of the fuel oil combusted during the reporting period. AQD received the semi-annual fuel oil certification records for July 1, 2018 through December 31, 2018 and January 1, 2019 through June 31, 2019 on time.

## **EMERGENCY GENERATORS**

There are 13 permitted ICE in MI-ROP-G5067-2014. These ICE are used for emergency power generation. Three of the permitted ICE have been removed. The ICE that have been removed are EU-ELECGEN3, EU-ELECGEN4, and EU-ELECGEN5. EU-ELECGEN3, EU-ELECGEN4, and EU-ELECGEN5 were not included in PTI 95-19. Conditions for the ICE are located in two flexible groups in the ROP: FG-EMERGENCY and FG-ELECGEN1&2R. Conditions pertaining to EU-COGEN1, EU-COGEN2, EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1, EU-RESGEN2 are contained in FG-EMERGENCY in PTI 95-19.

The 2007 Minimum Design Standards for Health Care Facilities Hospitals requires hospitals be capable of providing not less than 72 hours of service at full load in emergency situations. Eight of the 10 stationary ICE at Beaumont are emergency generators that fire No. 2 fuel oil. The remaining two ICE are cogeneration engines capable of firing No. 2 fuel oil and natural gas. Cogeneration units generate electricity and useful heat simultaneously. The heat generated in the cogeneration units at Beaumont can be used in a heat recovery boiler capable of producing 2,000 lbs of steam per hour. According to Mr. Bosch and documentation provided by Beaumont, the co-generation units are currently only using No. 2 fuel oil. At this time the co-gen units are classified in the ROP and PTI as emergency engines.

#### FG-EMERGENCY

FG-EMERGENCY is comprised of EU-COGEN1, EU-COGEN2, EU-ELECGEN6, EU-ELECGEN7, EU-ELECGEN8, EU-ELECGEN9, EU-RESGEN1, EU-RESGEN2.

The engines in FG-EMERGENCY do not appear to be subject to the NESHAP for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR, Part 63, Subparts A and ZZZZ per 40 CFR 63.6585(f)(3) because they are existing institutional emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40 CFR 63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in 40 CFR 63.6640(f)(4)(ii). Michigan has not accepted delegation to enforce 40 CFR 63 Subpart ZZZZ at area sources of HAP emissions.

Each engine in FG-EMERGENCY reportedly commenced construction on or before July 11, 2005 and as such do not appear to be subject to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines in 40 CFR 60 Subpart IIII.

During the inspection I read the manufacturer, size, and fuel capabilities listed on the nameplates of each engine in FG-EMERGENCY. The manufacturer, size, and fuel capabilities for each engine were the same as stated in the ROP. Records of the engine manufacturer, date engine was manufactured, engine model number, engine horsepower, engine serial number, engine specification sheet, date of initial startup of the engine, and date engine was removed from service at this stationary source was provided by Mr. Rusnak (Attachment 10). The information in this document corresponds with the information I observed on the nameplates for the engines in FG-EMERGENCY.

The ROP requires each engine not operate for more than 500 hours per year on a 12-month rolling time period basis and each engine must have non-resettable hours meter to track the operating hours. Mr. Meeks provided records of each engines operating hours for January 2017 through April 2018 (Attachment 8). Based on these records, each engine operated less than 500 hours in 2017.

A NOx emission limit of 82.2 tons for EU-COGEN1&2 is established in this FG-EMERGENCY in both the PTI and ROP. Mr. Rusnak provided records for natural gas and fuel oil usage as well as 12-month rolling NOx emission records as required is SC VI. 2, 3, and 4 (Attachment 2). Beaumont is calculating NOx emissions in accordance with Appendix 7.3 in the PTI. Beaumont is not keeping 12-month rolling NOx emission records for EU-COGEN1&2 combined, however, they are keeping records of the total 12-month rolling NOx emissions for the permitted boilers and generators at the facility, including EU-COGEN1&2. The highest recorded 12-month rolling NOx emissions between July 2018 and August 2019 for the permitted boilers and generators at the facility was 35.5 tons, reported in July 2019. This is less than the 12-month rolling NOx emission limit for EU-COGEN1&2.

The ROP requires each engine not operate for more than 500 hours per year on a 12-month rolling time period basis and each engine must have non-resettable hours meter to track the operating hours. During the inspection I noted that each engine in FG-EMERGENCY is equipped with a non-resettable hour meter. The readings on each hour meter reported during the inspection are:

EMISSION UNIT	START-UP DATE	HOURS RECORDED AT INSPECTION
EU-ELECGEN6	2/1/1998	1401.6
EU-ELECGEN7	2/1/1998	1407
EU-ELECGEN8	7/31/2002	658
EU-ELECGEN9	7/31/2002	620
EU-COGEN1	6/1/1992	Did not note
EU-COGEN2	6/1/1992	Did not note

EU-RESGEN1	1/1/1999	689
EU-RESGEN2	1/1/1999	663

Mr. Rusnak provided records of each engines operating hours for January 2018 through August 2019 (Attachment 11). Based on these records, each engine was operated less than 500 hours 2018 - 2019.

Records of the routine preventative maintenance events for EU-COGEN1&2 are required in the PTI. As noted previously, the routine preventative maintenance events for all hospital equipment, including EU-COGEN1&2, are recorded in a computer software program. Mr. Bosch provided records of the maintenance procedures (Attachment 12) and events (Attachment 13) performed on EU-COGEN1&2 for September 2018 through September 2019. These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

#### FG-ELECGEN1&2R

This flexible group includes two 2,000 kilowatts, diesel-fueled, CAT 3516C, emergency engines. During the inspection, I inspected the nameplates on each of the engine FG-ELECGEN1&2R and verified the manufacturer, size, and fuel capabilities for each engine were the same as stated in the ROP. These engines are subject to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 CFR, Part 60, Subpart IIII.

The engines in FG-ELECGEN1&2R do not appear to be subject to 40 CFR 63 Subpart ZZZZ because they are new stationary RICE located at an area source.

Emissions from each engine in FG-ELECGEN1&2R are limited to the following in the ROP:

Pollutant	Limit
NMHC + NOx	6.4 g/kW-hr
CO	3.5 g/kW-hr
PM	0.2 g/kW-hr

Compliance with these emission limits is demonstrated by purchasing an engine certified by the manufacturer to meet the emission limits and by operating the engines according to the manufacturer's emission-related written instructions. At the time of my inspection, I noted that each engine had a certified engine plate identifying them as certified Caterpillar engines belonging to engine family: ECPXL78.1NZS.

Per EPA's Engine Family Spreadsheet, (<https://www.epa.gov/sites/production/files/2016-09/nrci-cert-ghg-14d.xls>), the engines' certificate number is ECPXL78.1NZS-024 and each engine has the following certified emission factors (g/kW-hr2):

Steady State NMHC	Steady State NOx	Steady State NMHC + NOx	Steady State CO	Steady State PM	Steady State CO2
0.26 g/kW-hr	5.07 g/kW-hr	5.3 g/kW-hr	0.9 g/kW-hr	0.12 g/kW-hr	688.40 g/kW-hr

These emission factors are in compliance with the Subpart IIII emission limits as well as the emissions limits established in the ROP.

The ROP requires each engine not operate for more than 500 hours per year on a 12-month rolling time period basis and each engine must have non-resettable hours meter to track the operating hours. During the inspection I noted that each engine in FG-ELECGEN1&2R is equipped with a non-resettable hour meter. The readings on each hour meter reported during the inspection are:

EMISSION UNIT	START-UP DATE	HOURS RECORDED AT INSPECTION
EU-ELECGEN1R	2/26/2015	391.8
EU-ELECGEN2R	1/15/2016	307

Mr. Rusnak provided records of each engines operating hours for January 2018 through August 2019 (Attachment 14). Based on these records, each engine was operated less than 500 hours 2018 - 2019.

Records of the routine preventative maintenance events for EU-ELECGEN1&2R are required in the ROP. Mr. Bosch provided preventative maintenance procedures (Attachment 15) and events (Attachment 16) for EU-ELECGEN1&2R for September 2018 through September 2019. These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the Preventative Maintenance Plan.

#### ETHYLENE OXIDE STERILIZERS

Beaumont Royal Oak personnel use four ethylene oxide (EtO) sterilizers to sterilize temperature sensitive surgical tools such as scopes and lenses. The permit conditions for all four sterilizers are included in MI-ROP-G5067-2014 under the Flexible Group FG-ETOSTERILIZERS. These EtO sterilizers are subject to the National Emission Standards for Hazardous Air Pollutants for Hospital Ethylene Oxide Sterilizers, 40 CFR, Part 63, Subpart WWWW. Three Advanced Technology Safe-Cell System sulfuric acid scrubbers and dry bed chemical filters are used to control emissions from the EtO sterilizers.

The entire process of sterilization takes 14 hours at 55 degrees Celcius and 15 hours at 37 degrees Celcius. The actual sterilization period lasts for 2-3 hours. After sterilization, gas is immediately purged from the chamber and the chamber is aerated for 12 hours to remove any residual EtO. The exhaust from each sterilizer is vented to a sulfuric acid scrubber and through a dry chemical bed filter. The EtO is converted to ethylene glycol after being sent through the sulfuric acid scrubber and is collected in a holding tank at the bottom of the scrubber.

I inspected the four EtO sterilizers located in the Lower Level of the North Tower at Beaumont Royal Oak. The sterilizers and scrubbers are separated from the adjacent work area by sliding glass doors that require a key-card for entry. The sterilizer room is separated from the scrubber room by a wall with a steel access door. For employee protection, both the room with the sterilizers and the room with the scrubbers are under negative pressure. In the event of an uncontrolled EtO release from the sterilizers or scrubbers, the emissions in the EtO sterilizer room and/or scrubber room will be exhausted directly into the ambient air. In addition, both the EtO sterilizer room and the scrubber room have EtO monitors. The EtO monitor readings can be seen from outside of each of these rooms. At the time of my inspection the readings on each of these monitors was 0.0 ppm. A monitor located in the closed cabinet where EtO containers are stored also read 0.0 ppm during my inspection. The container storage cabinet exhausts to the ambient air through the acid scrubber bypass stack. AQD permit section staff indicated that the container storage cabinet is intended to be a safety device and is not expected to be a source of continuous EtO emissions. According to Mr. Gibson, the EtO monitors are set to alarm at 5.0 PPM triggering the air handlers to release to the atmosphere.

Of the four sterilizers I inspected, two (5A and 6A) were Model 8XL and two (7A and 8A) were Model 5XL. The EtO for the sterilizers comes in individual one-time use canisters. All of the EtO contained in one canister will be used in one load. Use of single-use canisters is another safety measure aimed at ensuring that if a canister leaks or if there is a problem with the sterilization process, only a relatively small, finite amount of EtO will be released into the atmosphere. Mr. Gibson showed me the EtO canisters used in the 8XL and the 5XL sterilizers. The label on one canister listed the weight as 5.99 oz (0.37 lbs) and the other 3.52 oz (0.22 lbs).

EtO emissions from FG-ETOSTERILIZERS are limited to 0.0059 lb/hour and 3.69 lb/year.

Compliance with the lb/hour limit is demonstrated through manufacturer's stated emissions reduction for the scrubbers and verification of the emission rates if requested by the EGLE. Stack testing was conducted on the scrubbers in December 2003 when the facility had 3 sterilizers. The stack test summary report indicated the destruction efficiency of each scrubber was greater than 99.96 percent. Beaumont's Proposed ROP, currently in EPA review, includes a requirement for Beaumont to verify the destruction efficiency of the scrubbers through stack testing. A copy of the specification sheet from the voided permit files at the EGLE Warren District office states the removal efficiency of the Safe-Cell System 2002 is typically 99.9% and that actual specifications and dimensions may vary according to process conditions.

Records of the daily and monthly number of loads for each unit and calculations of the 12-month rolling emissions of EtO are required to demonstrate compliance with the 3.69 lbs/year limit. During the inspection, Mr. Gibson provided records of the number of loads per day and month and EtO emissions for June 2018 through August 2019 (Attachment 17). Beaumont is using a control efficiency of 99.5 percent to calculate emissions. The records provided by Mr. Gibson indicate the highest 12-month rolling EtO emissions between June 2018 and August 2019 was 1.20 lbs reported for December 2018.

The ROP for Beaumont Royal Oak prohibits the operation of any sterilizer in FG-ETOSTERILIZERS unless the acid scrubbers and dry bed filters are installed, maintained, and operated properly and a malfunction abatement plan (MAP) is submitted and implemented and maintained.

During the inspection, I verified the emissions from each sterilizer in FG-ETOSTERILIZERS were ducted to one of three Advanced Air Technologies Safe-Cell System Model 2002 acid scrubbers and dry bed chemical filters. EU-ETOSTERILIZER1 and Scrubber 7 were operating during the inspection. I noted the following exhaust ventilation differential pressures and scrubber flows during the inspection:

Emission Unit ID in ROP	Unit ID	Model	Associate Scrubber ID	Scrubber Flow Rate (gallons/minute)	Scrubber Exhaust Fan Differential Pressure
EU-ETOSTERILIZER1	5a	8XL	#7	2.8 and 3.2	~2.2" WC
EU-ETOSTERILIZER2	6a	8XL	#8	NA	~2.2" WC
EU-ETOSTERILIZER3	7a	5XL	#9	3.4, 3.2	~2.8" WC
EU-ETOSTERILIZER4	8a	5XL	#9	3.4, 3.2	~2.8" WC

Mr. Gibson also provided preventative maintenance procedures for weekly and monthly safe-cell inspections (Attachment 18) and records of the preventative maintenance checks and alarms for the sterilizers and scrubbers (Attachment 19). These records appear to indicate the maintenance is done following the procedure, and according to the schedule, outlined in the MAP.

The weekly scrubber inspection procedures include checking scrubber liquid levels and re-filling to manufacturer's recommended height. In addition, according to Mr. Gibson, the scrubber will alarm if the level falls below the manufacturer's recommendations. Mr. Gibson said there haven't been any scrubber alarms between September 2018 and August 2019.

The pH of the acid scrubbing solution in each scrubber is checked monthly to ensure the control is properly working. The MAP indicates that if the pH exceeds 3, the scrubbing solution should be changed. Mr. Gibson explained the scrubbing solution is changed approximately every three years or if the pH is greater than 1, per company policy. The last scrubbing solution replacement occurred in September 2018. During the inspection Mr. Gibson conducted a pH test of the scrubber solution in scrubber 7. The pH for this scrubber was 0. Based on records of the pH readings provided by Mr. Gibson, the pH was never above 1 in any scrubber for April 2016 – August 2019 (Attachment 20).

Proper operation of the scrubber includes, according to the MAP, maintaining the scrubber fluid recirculation rate between 3 and 4 gallons per minute. Mr. Gibson provided records of the monthly scrubber fluid recirculation rate recorded between March 2017 and August 2019 (Attachment 21). These records indicate the recirculation rate for all scrubbers was between 3.0 and 3.6 gallons per minute for all recordings.

Mr. Gibson also provided records of the exhaust fan differential pressure readings recorded during the monthly preventative maintenance for January 2015 through June 2019 (Attachment 22). The proper range, according to the MAP, is within 1 inch water column of the correct air flow rate determined during the initial setup. The range of differential pressure readings during the reporting period was 2.0 – 2.5 inches water column.

According to Mr. Gibson, there have been no events in the past two years when EtO emissions bypassed the scrubbers and were released to the ambient air uncontrolled.

#### WOODSHOP

Beaumont has a sanding area in the woodshop where particulate emissions are controlled by a Torit baghouse

located along the outside of the building. The woodworking operations appear to be exempt from obtaining a PTI pursuant to Rule 285(2)(l)(vi)(C). During my inspection, I noted that the dust collector appeared to be maintained and I did not observe any fugitive dust.

The flexible group FG-287(c) addresses a paint spray booth located in Beaumont's woodshop. At the time of my inspection, I observed the paint booth and the room the paint booth is located in are being used as storage space with no room to perform painting. This is the same condition I observed during the inspection I conducted on July 25, 2018. According to Ms. Blazewski, the paint booth has not been used in several years.

#### FG-COLDCLEANERS

There are two parts washers at Beaumont Royal Oak. One of the parts washers is located in the West Powerhouse and the other is located in the garage. The parts washer in the West Powerhouse uses ArmaKleen 4 in 1 which is considered an aqueous solution (VOC content less than 5 % by weight).

The cold cleaner in the garage uses Safety Kleen Premium Gold cleaning solvent. Mr. Rusnak provided the SDS for the Premium Gold solvent (Attachment 23). According to the SDS, Safety Kleen Premium Gold is composed of 100% by weight petroleum distillates, hydrotreated light and has a vapor pressure of 0.6 mm Hg (0.012 psia) at 100 degrees Fahrenheit. The air/vapor interface of this cold cleaner was less than 10 square feet, there were proper cold cleaning operating procedures posted, the emissions were released to the general in-plant environment, and the lid was closed as required in the ROP.

#### EQUIPMENT NOT INCLUDED IN ROP

##### **WELDING EQUIPMENT**

In the garage hand welders are occasionally used; these activities appear to be exempt from obtaining a PTI pursuant to Rule 285(2)(i).

##### **BOILERS**

I inspected 10 boilers and 2 water heaters in the research building and attic. There were two 6.277 MMBtu/hour Cleaver Brooks boilers capable of firing natural gas and fuel oil #2 (EU-RESBOILER1 & EU-RESBOILER2), eight Lochinvar boilers with a heat input capacity of 2.07 MMBtu/hour capable of firing natural gas (EU-RESBOILERHH), and two Lochinvar hot water heaters with a heat input capacity of 0.3 MMBtu/hour (EU-RESBOILERDH). The information on the nameplates of each boiler and water heater matches the description of permit exempt equipment provided in MAERS and the ROP application. All 12 of these boilers/water heaters appear to be exempt from PTI requirement in Rule 201 pursuant to Rule 282(2)(b)(i). Three additional boilers are listed in the ROP application under exempt equipment as being located in the research building (EU-BOILER9, EU-BOILER10, and EU-BOILER11). During the inspection, Mr. Bosch indicated that EU-BOILER11 was removed years ago and showed me the space where EU-BOILER11 used to be located. I observed, during the inspection, that EU-BOILER9 and EU-BOILER10 were dismantled.

The boilers in the research building do not appear to be subject to 40 CFR 60 Subpart Dc because they each have a maximum heat input of less than 10 MMBtu/hour.

As stated previously, boilers that meet the definition of natural gas-fired boilers, are not subject to 40 CFR 63 Subpart JJJJJJ. Meeting the definition on natural gas-fired boiler includes not exceeding 48 hours of operation on liquid fuel for periodic testing, maintenance, or operator training not to exceed a combined total of 48 hours during any calendar year. Beaumont reported in the Michigan Air Emissions Reporting System (MAERS) that all research boilers, including EU-RESBOILER1 & EU-RESBOILER2, only used natural gas for calendar year 2018. As a result, it appears all boilers in the research building are not subject to 40 CFR 63 Subpart JJJJJJ.

##### **FUEL STORAGE TANKS**

Beaumont has seven diesel storage tanks ranging in size from 6,000 gallons to 40,000 gallons used for storing fuel for the boilers and ICE at the facility. These tanks appear to be exempt from the requirement to have a PTI pursuant to Rule 284(2)(d). The 6,000 gallon (22.7 m<sup>3</sup>) tank does not appear to be subject to 40 CFR, Part 60, Subpart Kb because it is less than 19,812.9 gallons (75 m<sup>3</sup>). It appears the 20,000 gallon (75.7 m<sup>3</sup>) and 40,000 gallon (151.4 m<sup>3</sup>) tanks are not subject to 40 CFR, Part 60, Subpart Kb per 40 CFR 60.110b(b) because the true vapor pressure of ultra low sulfur diesel at 100 degrees Fahrenheit is less than 3.5 kPa

In addition to the diesel fuel storage tanks, Beaumont has two, 2,000 gallon gasoline storage tanks used to store gasoline that will be dispensed, via one of three pumps, to a variety of vehicles at Beaumont. These tanks appear to be exempt from an obtaining a PTI pursuant to Rule 284(2)(g)(ii) and do not appear to be subject to 40

CFR, Part 60, Subpart Kb because they are less than 19,812.9 gallons (75 m<sup>3</sup>). Records of the gasoline dispensed from the three pumps between August 2017 and July 2019 and the calculated monthly gasoline throughput for August 2018 through July 2019 were provided (Attachment 19). Based on the records provided, monthly usage ranged from 8,891 gallons to 9,522 gallons. Beaumont is subject to the NESHAP for Gasoline Dispensing Facilities, 40 CFR, Part 63, Subpart CCCCCC for facilities that have less than 10,000 gallons monthly throughput. This rule requires Beaumont to minimize gasoline spills, clean up spills as expeditiously as practicable, cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use, and minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/water separators. During the inspection I did not see any gasoline spills, open gasoline containers, or open waste collection systems.

#### XYLENE RECYCLING

In a room connected to the autopsy room in the South Tower, there is a batch xylene recycling unit. This unit has a capacity of 10 gallons of waste xylene. Waste xylene is generated in the surgical pathology unit and is used to get alcohol out during lab, slide stainer, and tissue processing. This emission unit appears to be exempt from the requirement to have a PTI per Rule 285(2)(u).

#### MICHIGAN AIR EMISSION REPORTING SYSTEM (MAERS)

For 2018, Beaumont reported the following emissions:

Pollutant	Amount
NOx	34.67 tons
CO	24.08 tons
VOC	2.40 tons
PM 10	2.04 tons
PM 2.5	2.04 tons
SO <sub>2</sub>	1173.29 lbs
Ammonia	259.98 lbs
Lead	0.26 lbs
Ethylene Oxide	1.20 lbs

The reported emissions appear to be comparable with the records reviewed during my inspection.

#### SEMI-ANNUAL AND ANNUAL COMPLIANCE REPORTS

Beaumont submitted all semi-annual and annual reports required in the ROP for July 1, 2018 through June 30, 2019. The reports indicate that during the entire reporting period, ALL monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred. The reports included information specified in Rule 213(4)(c)(i) through (v) and a certification by the Authorized Representative that states "based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete."

#### CONCLUSION

Based on information gathered and reviewed for this inspection, William Beaumont Hospital - Royal Oak appears to be in compliance with the Federal Clean Air Act, Michigan's Air Pollution Control Rules, and the conditions established in PTI 95-19 and ROP No. MI-ROP-G5067-2014.

NAME

K. Kelly

DATE

9/30/19

SUPERVISOR

Janice [Signature]