

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
**ACTIVITY REPORT: On-site Inspection**

N342264798

<b>FACILITY:</b> OAKLAND UNIVERSITY		<b>SRN / ID:</b> N3422
<b>LOCATION:</b> 408 Meadow Brook Road, ROCHESTER		<b>DISTRICT:</b> Warren
<b>CITY:</b> ROCHESTER		<b>COUNTY:</b> OAKLAND
<b>CONTACT:</b> Cora Hanson , Environmental Health and Life Safety Manager		<b>ACTIVITY DATE:</b> 08/24/2022
<b>STAFF:</b> Iranna Konanahalli	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> SM OPT OUT
<b>SUBJECT:</b> FY 2022 scheduled Synthetic Minor CMS inspection of Oakland University ("Oakland U" or "Oakland") located at 2200 North Squirrel Road, Rochester Hills, Michigan 48309-4402.		
<b>RESOLVED COMPLAINTS:</b>		

**Oakland University (N3422)****2200 North Squirrel Road****Rochester Hills, Michigan 48309-4402****NAICS: 611310 & SIC Code: 8221 - Colleges, Universities, and Professional Schools****Phone: 248-370-4196 or 248-370-4427 for Ms. Hanson****Phone: 248-370-4196 for Ms. Peterson****Fax: 248-370-4376**

**VN: AQD issued October 12, 2021, Violation Notice (VN) for failure to demonstrate compliance with PTI No. 419-92C, FG-TURB/WHRU#1 (EU-TURBINE#1 & EU-WHRU#1) and federal New Source Performance Standard, 40 CFR, Part 60, Subparts A and KKKK (NSPS 4K). As a result of this Oct 2021 VN, Oakland U, completed NSPS 4K Turbine NO<sub>x</sub> performance testing and modified the permit (PTI No.: 419-92C → PTI No.: 419-92D) such that NO<sub>x</sub> testing requirements in the permit and NSPS 4K are compatible with each other.**

**Active Permit-to-Install (PTI) No.: 419-92D (ROP Opt-out, APP-2022-0076, Janelle Trowhill) dated May 23, 2022, for a combined cycle heat and power cogeneration system (Centaur 50-6201S gas turbine generator set). The purpose of this revision (PTI No.: 419-92C → PTI No.: 419-92D) is to modify conditions within FG-TURB/WHRU#1 to, principally, fix inconsistencies with NSPS Subpart KKKK and to modify special conditions and equipment descriptions for FGGENERATORS.**

**A combined cycle heat and power cogeneration system (Centaur 50-6201S gas turbine generator set) consists of a natural gas fired turbine (51 MMBtu/hr) and a waste heat recovery unit (equipped with a 10 MMBtu/hr duct burner for additional heat for a total of 60 MMBtu/hr), with attendant demolition of existing boilers (EU-HTWGEN#3 and EU-HTWGEN#4) to make room for the Cogen System.**

**PTI No. 110-07: Based upon FY 2021 Inspection, PTI No. 110-07 (Approved: 8/7/2007) has been voided on September 07, 2021, because two emergency diesel generators are now covered by 419-92C (FG-GENERATORS: EU-00006 & EU-00007, consisting of two (2) Mitsubishi S16R-PTA engines) and, in a subsequent PTI revision, incorporated into PTI No. 419-92D.**

**Oakland's boilers (about 255 °F >> 212°F & 250 psi >> 14.7 psi = 1 atm ≈ bar ≈ 100 kilopascal (kPa) high pressure hot water) may NOT be subject to emission limits: Area Source NESHAP / MACT 6J, 40 CFR Part 63, Subpart JJJJJJ / 6J National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers, Page 15554, Federal Register / Vol. 76, No. 54 / Monday, March 21, 2011 / Rules and Regulations / Final rule. This rule does NOT apply to boilers that burn only gaseous fuels or any solid waste. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate the applicability of NESHAP / MACT 6J. A gas-fired boiler that periodically fires liquid fuels during gas curtailment and supply emergencies or for periodic (not to exceed a total of 48 hours during any calendar year) testing is still considered a gas-fired boiler.**

**Boilers (09/3/1971) are NOT subject to: New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Db or Dc [ NSPS Db or Dc]) based upon installation dates (installed before June 19, 1984, with respect to boilers >= 100 million BTU per hour heat input and June 9, 1989, with respect to boilers (Small Boilers) >= 10 million BTU per hour heat input).**

**Oakland's two (2) emergency generators are NOT subject to: NSPS IIII or 4I, New Source Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 39154 Federal Register / Vol. 71, No. 132 / Tuesday, July 11, 2006 / Rules and Regulations / Final Rule. Two generators are not subject to NSPS 4I based upon manufacture date (before April 1, 2006) and PTI review. Oakland U bought these as used engines.**

**Oakland's two (2) emergency generators may be subject to: RICE MACT 4Z, Area Source NESHAP / MACT ZZZZ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines / Final rule (Page 3568, Federal Register / Vol. 73, No. 13 / Friday, January 18, 2008 / Rules and Regulations / Final rule). US EPA revised RICE MACT several times (75 FR 9648**

[03/03/10], 75 FR 51570 [08/20/10], 76 FR 12863 [03/09/11], 76 FR 37954 [06/28/11], 78 FR 6674 [01/30/13], 80 FR 68808 [11/06/15 - Proposed Amendment]. AQD has decided not to take delegation of these standards and therefore no attempt has been made to evaluate Oakland's compliance with NESHAP / RICE MACT 4Z.

**Not Subject to: NESHAP/ MACT T, area source National Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T; NESHAP/ MACT T); Correction; 29484 Federal Register / Vol. 60, No. 107 / Monday, June 5, 1995 / Rules and Regulations; amended National Air Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T); Final Rule; Page 25138 Federal Register / Vol. 72, No. 85 / Thursday, May 3, 2007 / Rules and Regulations. Oakland U does NOT use the MACT T listed halogenated HAP solvents (>5%w: methylene chloride (CAS No. 75-09-2), perchloroethylene (CAS No. 127-18-4), trichloroethylene (CAS No. 79-01-6), 1,1,1-trichloroethane (CAS No. 71-55-6), carbon tetrachloride (CAS No. 56-23-5), and chloroform (CAS No. 67-66-3)) in the cold-cleaners.**

**GHG: Although AQD does not regulate Green House Gases (GHG), it issues opt-out permits for Title V (ROP) or US EPA GHG reporting requirements. US EPA is regulating GHG via PSD program using a rule known as "tailoring rule". If GHG (e.g.CO<sub>2</sub>) > 100 tpy and CO<sub>2e</sub> >100,000 tpy (both conditions must be met) based upon potential-to-emit (PTE), then the facility in question is subject to ROP / Title V permit. The deadline (July 1, 2012) to either obtain a ROP opt-out permit or ROP has passed based upon FY 2013 inspection. In June 2019, EPA issued GHG emission regulations for existing fossil fuel-fired power plants in the Affordable Clean Energy (ACE) Rule. The U.S. Court of Appeals for the District of Columbia Circuit federal appeals court, in January 2021, struck down the Trump administration's Clean Power Plan replacement.**

**Gas Turbines subject to: 40 CFR, Part 60, subpart KKKK (NSPS 4K), Standards of Performance for Stationary Combustion Turbines; Final Rule (Thursday,**

**July 6, 2006), Page 38482 Federal Register / Vol. 71, No. 129 / Thursday, July 6, 2006 / Rules and Regulations/ Final Rule. The standards reflect changes in nitrogen oxides (NO<sub>x</sub>) emission control technologies and turbine design since standards for these units were originally promulgated in 40 CFR part 60, subpart GG. The NO<sub>x</sub> and sulfur dioxide (SO<sub>2</sub>) standards have been established at a level which brings the emissions limits up to date with the performance of current combustion turbines. NSPS 4K is effective from July 6, 2006. Regulated entities are stationary combustion turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (GJ) (10 million British thermal units (MMBtu)) per hour that commenced construction, modification, or reconstruction after February 18, 2005. The applicability of the final rule is similar to that of 40 CFR part 60, subpart GG, except that the final rule applies to new, modified, and reconstructed stationary combustion turbines, and their associated heat recovery steam generators (HRSG) and duct burners. The stationary combustion turbines subject to subpart KKKK, 40 CFR part 60, are exempt from the requirements of 40 CFR part 60, subpart GG. Heat recovery steam generators and**

duct burners subject to subpart KKKK are exempt from the requirements of 40 CFR part 60, subparts Da, Db, and Dc. The pollutants that are regulated by the final rule are NO<sub>x</sub> and SO<sub>2</sub> (40 CFR § 60.4315). The limits are stated in 40 CFR, Subpart KKKK, Table 1 and Permit No. 419-92C, I.1: 25 ppmv dry at 15% oxygen for new turbine firing natural gas (> 50 MMBtu/h and ≤ 850 MMBtu/h HHV at peak load). Or 150 ng/J of useful output (1.2 lb/MWh) per NSPS 4K. In order to demonstrate compliance with the NO<sub>x</sub> limit, an initial performance test is required. Oakland U is prohibited from burning any fuel other than pipeline quality sweet natural gas (PTI No. 419-92C, FG-TURB/WHRU#1 [EU-TURBINE#1& EU-WHRU#1], II.1). According to 40 CFR § 60.4340, Oakland must perform annual (biennial if certain conditions are met as stated in the permit) performance tests in accordance with 40 CFR § 60.4400 to demonstrate continuous compliance. Alternatively, Oakland U must either install and maintain (1) Continuous Emission Monitoring System (NO<sub>x</sub> CEMS) as described in §§ 60.4335(b) and 60.4345, or (2) Continuous Parameter Monitoring System (NO<sub>x</sub> CPMS). Oakland U must establish a valid parameter range (40 CFR § 60.4410) if it has chosen to continuously monitor parameters indicative of proper operation of NO<sub>x</sub> emission controls in accordance with 40 CFR § 60.4340. The parameters are to be established during 40 CFR § 60.8 performance test.

#### PTI No. 419-92C Emission Units (EUs)

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

#### PTI No. 419-92C Flexible Groups (FGs)

Title V / ROP opt-out PTI No. 419-92B regulated only four boilers. Potential-to-Emit (PTE) NO<sub>x</sub> emissions corresponding to four boilers (PTI No. 419-92B, SC 14 limit: 84 tpy NO<sub>x</sub> and 1,200 million SCF NG / 12-mo) and two diesel generators (PTI No. 110-07, SC 1,2 & 1.3 limits: 110,000 gallons of diesel / 12-mo and 1,000 hours / 12-mo) is 98 (84 for four boilers and the generators) tons per year. The other process equipment at Oakland such as two 0.63 MM BTU / hour boilers, two dynamometers (one engine using gasoline and one chassis using diesel) at Science & Engineering building were not included. The Permit-to-Install Install revision (PTI No. 419-92B → PTI No. 419-92C dated January 19, 2016) addressed this issue by consolidating all process equipment into it. The further revision (PTI No. 419-92C → PTI No. 419-92D) corrected the testing issues. PTI No. 419-92C, FGTURB/WHRU#1, V.1 required testing at 50%, 75% and 100% loads and this %load requirement has been removed in the latest revision to be consistent with NSPS 4K. The latest revision also requires *annual* (if NO<sub>x</sub> emissions > 75 percent of the NO<sub>x</sub> emission limit) or *biennial* (if NO<sub>x</sub> emissions ≤ 75percent of the NO<sub>x</sub> emission limit) stack testing. PTI No. 419-92D, FGTURB/WHRU#1, I.1 limit is 25 ppmv dry at 15% oxygen. Based upon the 2022 stack test biennial NO<sub>x</sub> tests are required.

**On August 24, 2022, I conducted a level-2 FY 2021 scheduled Synthetic Minor CMS inspection of Oakland University (“Oakland U” or “Oakland”) located at 2200 North Squirrel Road, Rochester Hills, Michigan 48309-4402. The inspection was conducted to determine compliance with federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) rules; and the permit (PTI No. 419-92D) conditions.**

**During the inspection, Ms. Cora Hanson (Phone: 248-370-4427 or 248-370-4196; Cell: 248.421.6858; Fax: 248-370-4376; E-mail: cHanson@oakland.edu), Environmental Health and Life Safety Manager, assisted me. Also present were:**

1. Randy Powell (Phone: 248-370-4558; Cell: 248-914-3477; Fax: 248-370-4595; rPowell@Oakland.Edu), Facilities Management
2. David Schroudt (Phone: 248-370-4952; Cell: 586-703-5365; Fax: 248-370-4376; Schroudt@Oakland.Edu), Safety Specialist

**Oakland University is a higher educational institute and is one of the state universities in Michigan. Oakland has student population of 20,519 (fall 2014). Most students are from Southeast Michigan (Oakland = 44.7%, Macomb = 30.8%, Wayne = 6.2%). Oakland offers 130 bachelors and 135 graduate degrees). Oakland with Beaumont admitted medical students beginning in 2011.**

**Oakland has two (Boiler Nos. 1 [International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3256] and 2 [International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3337] of design capacity 100 million BTU per hour were installed in CY 1969 and 1971) natural gas fired boilers (no fuel oil back-up) for comfort air space heating and two Diesel / Bio-diesel / natural gas emergency generators to handle power supply interruptions. About June 2016, Boiler Nos. 3 (34 MM BTU per hour) and 4 (32 MM BTU per hour) were replaced by one gas-fired turbine (occupying Boiler No. 4 space) for electric power generation and a waste heat recovery unit with a duct burner (occupying Boiler No. 3 space). The change has been reflected in PTI No. 419-92C and subsequently in PTI No. 419-92D.**

**All equipment such as boilers, turbine with WHRU, etc. generate 250 psi high pressure hot water for space heating and not steam.**

**PTI No. 419-92D, FG-BOILERS (EU\_HTWGEN#1, EU\_HTWGEN#2)**

**Two natural gas fired boilers known as hot water generators Nos. 1 & 2 (100 MMBtu/hr, each).**

1. EU\_HTWGEN#1 (09/03/1971): High Temp Water (HTW) Generator #1. International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3256
2. EU\_HTWGEN#2 (09/03/1971): High Temp Water (HTW) Generator #2. International Boiler Works Model TJW-C-10,000 HTW Generator. Serial # M-3337

**As stated before, about 2016, Boiler Nos. 3 and 4 were replaced with a turbine and a waste heat recovery unit utilizing the same space.**

**PTI No. 419-92D, FG-BOILERS, III.1**

**The boilers are capable of burning only natural gas (PTI No. 419-92D, FG-BOILERS, III.1: only combust NG). No fuel oil backup. Natural gas meets MPSC Specs.**

**PTI No. 419-92D, FG-BOILERS, VI.1**

**Natural gas usage records are kept, and NOx emission calculations are done (PTI No. 419-92C, FG-BOILERS, VI.1: NG usage and NOx calculations).**

**CY 2020: 15.11 & 0.1858 MM SCF of pipeline quality sweet natural gas was used in hot water generators Nos. 1 & 2, respectively.**

**CY 2021: 26.941 & 0.285 MM SCF of pipeline quality sweet natural gas was used in hot water generators Nos. 1 & 2, respectively.**

**PTI No. 419-92D, FG-GENERATORS****EU-BACKUPGEN#1 & EU-BACKUPGEN#2:**

**Emergency back-up diesel and natural gas fired generator. The generator produces 1650 kilowatts (kW) or 1.65 megawatts (MW) of electricity per hour and is equipped with a Mitsubishi S16R-PTA engine. The engine is equipped with a dual fuel control system to allow the blending of natural gas and diesel fuels**

**The generators are installed and fully commissioned. The diesel generators are as follows:**

1. Engine1: Mitsubishi S16R-PTA; 1.5 MW; Serial No. 11121; equipped with dual-fuel (natural gas and diesel) control system; January 6, 2016, non-resettable hour meter reading: **652** hours. During CY 2020 the engine was not used. CY 2018: 23 gallons of Diesel and 0.0072 MM SCF of NG in Engine1. CY 2019: 167 gallons of Diesel and 0.0123 MM SCF of NG in Engine1 running 53 hours.
2. Engine2: Mitsubishi S16R-PTA; 1.5 MW; Serial No. 11123; equipped with dual-fuel (natural gas and diesel) control system; January 6, 2016, non-resettable hour meter reading: **1,398** hours. During CY 2020 the engine was not used. CY 2018: 71 gallons of Diesel and 0.0227 M SCF of NG in Engine2. CY 2019: 486 gallons of Diesel and 0.0187 MM SCF of NG in Engine2 running 175 hours.

**CY 2021: Neither natural gas nor ULSD has been used in generator in CY 2021, i.e., generators have been idle.**

**Only Ultra-low Sulfur Diesel (ULSD 15 ppm Sulfur diesel) is used in the engines (see Crystal Flash of Monroe (734-241-8633) Invoice (08/31/2020))**

**Obviously, the sulfur and fuel usage limits are met (PTI No. 419-92D, FG-GENERATORS, II.1: 7,962 gallons of distillate oil per year; III.1: 1,000 generator-hours per year; III.2: 0.05%S)**

**Two 2,000-gallon diesel tanks are present to serve the generators. The generators were purchased used and are not subject to NSPS 4I based upon installation dates and PTI review (PTI No. 110-07).**

**The dual fuel (NG & ULSD) RICE generators (2) are fired for testing once in a year. The generators hardly are used for emergency electricity due to power interruption. The generators have not been even test fired ever since COVID-19 pandemic.**

**PTI No. 419-92D, FG-TURB/WHRU#1 (EUTURBINE#1, EU\_WHRU#1)**

**Centaur 50-6201S gas turbine generator set package with SoLoNO<sub>x</sub> natural gas fired. The turbine has a heat release capacity of approximately 51.53 MMBtu/hr. Custom waste heat recovery unit with duct burner for a total of 60 MMBtu/hr. No steam or hot water generation on the back side, but the WHRU can run as a standalone boiler for a total of 35 MMBtu/hr**

**PTI No. 419-92D, FG-TURB/WHRU#1, I, 1-2.**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>	<b>Equipment</b>	<b>08/02/18 Stk Tst</b>	<b>ICT Project No.: 2100188 February 9, 2022</b>
<b>1. NO<sub>x</sub></b>	<b>25 ppmv dry at 15% oxygen</b>	<b>30-day rolling average as determined each day the turbine operates</b>	<b>FGTURB/WHRU#1</b>	<b>25.17 ppm @ 15% O<sub>2</sub></b>	<b>11.7 ppmvd at 15% O<sub>2</sub></b>
<b>2. NO<sub>x</sub></b>	<b>8.44 pph (turbine and waste heat recovery unit)</b>	<b>24-hour rolling average as determined each hour the boiler operates</b>	<b>FGTURB/WHRU#1</b>		<b>8.44 pounds per hour and 1.2 lb/MW-hr</b>

**\*Test protocol shall specify averaging time. ppmv = parts per million by volume (ppmv) at 15 percent oxygen. ppmvd = parts per million by volume on dry basis (ppmvd) at 15 percent oxygen.**

**Custom Stack Analysis, LLC (Brian E. Lemasters), conducted stack sampling on August 02, 2018, on Cummins Model GTA28 Generator Outlet.**

**Impact Compliance & Testing, Inc. of Farmington Hills, MI 48331 (E-mail: Rob.Harvey@ImpactCandT.com; Phone: 517-268-0043) conducted sampling on January 09, 2022, according to PTI No. 419-92C, and NSPS 4K. Turbine operated at 92% load producing 4.23 MW power using 2,314 pounds of natural gas per hour. Impact used US EPA Reference Method 7E for exhaust gas NO<sub>x</sub> concentration (chemiluminescence instrumental analyzer). NO<sub>x</sub> pollutant concentrations in the turbine exhaust gas streams were determined using a Thermo Environmental Instruments, Inc. (TEI) Model 42i High Level chemiluminescence NO<sub>x</sub>. Instrument response for the analyzer was recorded on an ESC Model 8816 data acquisition system that logged data as one-minute averages. Prior to, and at the conclusion of each test, the instrument was calibrated using upscale calibration and zero gas to determine analyzer calibration error and system bias.analyzer.**



Pollutant	Limit	Time Period/ Operating Scenario	Equipment	08/02/18 Stk Tst	ICT Project No.: 2100188 February 9, 2022
Based upon the results 2022 stack test results (11.7 ppmvd at 15% O <sub>2</sub> < 75% of NO <sub>x</sub> limit of 25 ppmvd at 15% O <sub>2</sub> ), biennial (within 26 calendar months) testing is required per NSPS 4K and PTI No. 419-92D FGTURB/WHRU#1, V.1, less than or equal to 75 percent 75 percent of the NO <sub>x</sub> emission limit.					

**PTI No. 419-92D, FG-TURB/WHRU#1, II**

Only pipeline quality natural gas is burned in the turbines and duct burner (FG-TURB/WHRU#1, II.1: only NG)

**PTI No. 419-92D, FG-TURB/WHRU#1, III, MAP**

Oakland U submitted Malfunction Abatement Plan (MAP) for Central Heating Plant - Cogeneration Natural Gas-Fired Turbine (combined heating and power (CHP) cogeneration plant). The cogeneration plant will be consuming more natural gas than existing boilers but will contractually displace 31,888 MWH ( $\approx$  32 GWH) of electricity from DTE.

**PTI No. 419-92D, FG-TURB/WHRU#1, IV, Maximum design heat input capacity**

**EU\_TURBINE#1 = 51. 53 MMBtu per hour**

**EU\_WHRU#1 = 35 MMBtu per hour.**

The waste heat recovery duct burner is used only in winter months if outside ambient air is very cold.

**PTI No. 419-92D, FG-TURB/WHRU#1, V, Testing**

As stated above, Impact Compliance & Testing, Inc. of Farmington Hills, MI 48331 (E-mail: Rob.Harvey@ImpactCandT.com; Phone: 517-268-0043) conducted sampling on

January 09, 2022, according to PTI No. 419-92C (yes, previously issued permit), and NSPS 4K. Based upon the results ( $\text{NO}_x << 75\%$  the limit) , biennial (within 26 calendar months) testing is required per NSPS 4K and PTI No. 419-92D FGTURB/WHRU#1, V.1, less than or equal to 75 percent 75 percent of the  $\text{NO}_x$  emission limit.

**PTI No. 419-92D, FG-TURB/WHRU#1, VI, records and calculations**

**Oakland U is keeping natural gas usage records and performing the required emissions calculations.**

**CY 2021: Turbine = 340.535 and Ductburner = 27.416 MM SCF, respectively.**

**Spec. Sheet: Oakland U uses MPSC No. 3 natural gas containing less than 5 ppm  $\text{O}_2$ , 0.5 grains of total sulfur, 0.25 grains of  $\text{H}_2\text{S}$ , 0.5 grain mercaptan sulfur per 100 SCFT and less than 2 percent  $\text{CO}_2$ .**

**Oakland U has kept a record of January 2022 Impact Compliance & Testing, Inc. of Farmington Hills, MI 48331 (E-mail: Rob.Harvey@ImpactCandT.com; Phone: 517-268-0043) stack test report. See above for the results.**

**PTI No. 419-92D, FG-FACILITY**

**Natural gas usage in hot water generators:**

1. **CY 2018:** EU-HTWGEN#1 = 20.45, EU\_HTWGEN#2 = 23.8, EU-TURBINE#1 (gas turbine) = 351.4, EU-WHRU#1 (ductburner) = 34.8 MM SCF
2. **CY 2019:** EU-HTWGEN#1 = 22.18, EU\_HTWGEN#2 = 0.0, EU-TURBINE#1 (gas turbine) = 386.3, EU-WHRU#1 (ductburner) = 6.94 MM SCF
3. **CY 2020:** EU-HTWGEN#1 = 15.1, EU\_HTWGEN#2 = 0.37, EU-TURBINE#1 (gas turbine) = 345, EU-WHRU#1 (ductburner) = 29 MM SCF
4. **CY 2021:** EU-HTWGEN#1 = 26.941, EU\_HTWGEN#2 = 0.285, EU-TURBINE#1 (gas turbine) = 340.535, EU-WHRU#1 (ductburner) = 27.416 MM SCF

**Diesel (ULSD) used only in emergency generators during mostly testing.**

1. **CY 2018:** Gen1 = 23 gallons of Diesel & 0.0072 MM SCFT of natural gas and Gen2 = 71 gallons of Diesel & 0.0227 MM SCFT of natural gas.
2. **CY 2019:** Gen1 = 167 gallons of Diesel & 0.012 MM SCFT of natural gas and Gen2 = 486 gallons of Diesel & 0.0187 MM SCFT of natural gas.
3. **CY 2020:** Gen1 = 0 gallons of Diesel & 0.00 MM SCFT of natural gas and Gen2 = 14 gallons of Diesel & 0.0 MM SCFT of natural gas
4. **CY 2021:** Gen1 = 0 gallons of Diesel & 0.00 MM SCFT of natural gas and Gen2 = 0 gallons of Diesel & 0.0 MM SCFT of natural gas

**(PTI No. 419-92D, FG-FACILITY, II.1-2 Material Limits: 850 million standard cubic feet of natural gas per year and 8,000 gallons of diesel per year)**

**CY 2021 emissions are: CO = 16.5, NO<sub>x</sub> = 61.4 (PTI No. 419-92D, FG-FACILITY, I.1-2 limits: 89 tons of NO<sub>x</sub> and 89 tons of CO per year, respectively.**

**The above natural gas composition (maximum) limits such as 0.0005 %v (5 ppmv) oxygen by volume; 0.25, 0.5 & 5.0 grain hydrogen sulfide, mercaptan sulfur & total sulfur, respectively, per 100 SCF; maximum 2 percent carbon dioxide, maximum 7 pounds of moisture per MM SCF, maximum temperature 100 °F, etc. is regulated by Michigan Public Service Commission (MPSC). The spec sheet is effective November 05, 2021. (PTI No. 419-92D, FGTURB/WHRU#1, II.2 limit: 20 grains of sulfur per 100 standard cubic feet of gas, (40 CFR 60.4365(a)))**

**Cold-cleaners**

**The cold-cleaners are located at the following sites:**

1. Vehicle Maintenance and Building / Grounds (ZEP Dyna 143)

2. Golf-course Katke Maintenance (aqueous ARMAKAKLEEN MPC Cleaning Solution). Neither subject to RACT VOC rules nor NESHAP / MACT T because water based alkaline solution (pH = 11.5) is used. Non-combustible liquid; but may decompose upon heating.
  
3. SAE Grizz Racing PSS Garage (ZEP Dyna 143)

**Two (2 of 3) Safety-Kleen cold-cleaners which use Safety-Kleen solvent (and not halogenated solvents) are present.**

**The cold-cleaners are subject rule 336.611 or 336.1707 depending on if it is new or existing. A cold-cleaner is exempt from Rule 336.1201 pursuant to Rule 281(h) or Rule 285(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.**

**About 2012, AQD sent DEQ's decals for "cold-cleaner operating procedures" for posting and complying with work-practice rules. I asked the university to follow the common sense work practice in the procedures.**

**The lids are mechanically assisted and kept closed when access is not required.**

**The Cold-cleaners are NOT Subject to: 40 CFR, Part 63, Subpart T, NESHAP/ MACT T, since solvents containing halogenated compounds are not used.**

#### **ZEP Dyna 143 Product Code 0366 Solvent**

**100% VOC solvent. Flash Point (FP) = 147 °F Pensky-Martens Closed Cup. Auto Ignition = NA °F. Boiling Point (BP) = 368 °F @ 760 mm Hg. Vapor Pressure (VP) = 1 mm Hg at 68 °F. Specific Gravity (SG, Water = 1.0) = 0.79. Density (ρ) @ 68 °F = 6.58 lbs / gallon (0.789 kg /L). Flammability range = 1 %v (LEL) – 7%v (UEL).**

**Oakland U also uses PURPLE CLEANER 1340 containing <5% Boric Acid or Sodium metaborate tetrahydrate (CAS 10555-76-7 Boric acid sodium salt tetrahydrate or Sodium Metaborate) and ,5% 2-Butoxyethanol (CAS 111-76-2 ethylene glycol monobutyl ether).**

**Conclusion:**

**AQD issued October 12, 2021, Violation Notice (VN) for failure to demonstrate compliance with PTI No. 419-92C, FG-TURB/WHRU#1 and federal New Source Performance Standard, 40 CFR, Part 60, Subparts A and KKKK (NSPS 4K). Oakland U attained compliance with its permit & NSPS 4K upon testing and keeping improved records.**

NAME *J S Marshall*DATE September 28, 2022SUPERVISOR *Joyce*