

B2103
MAWWT

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

B210330598

FACILITY: DETROIT WASTEWATER TREATMENT PLANT		SRN / ID: B2103
LOCATION: 9300 W. JEFFERSON AVE, DETROIT		DISTRICT: Detroit
CITY: DETROIT		COUNTY: WAYNE
CONTACT: Wendy Barrott , General Manager		ACTIVITY DATE: 08/13/2015
STAFF: Stephen Weis	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Compliance inspection of the Detroit Water and Sewerage Department's Wastewater Treatment Plant (WWTP). The WWTP facility is scheduled for inspection in FY 2015.		
RESOLVED COMPLAINTS:		

Location:

City of Detroit Water and Sewerage Department
Wastewater Treatment Plant (SRN B2103)
9300 West Jefferson Avenue
Detroit

Date of Activity:

Thursday, August 13, 2015

Personnel Present:

Steve Weis, DEQ-AQD Detroit Office
Melvin Dacres, Water Systems Chemist – WWTP Process Control Team

Purpose of Activity

A self-initiated inspection of the Detroit Water and Sewerage Department's ("DWSD") Wastewater Treatment Plant facility (hereinafter "Detroit WWTP", or "WWTP") was conducted on Thursday, August 13, 2015. The Detroit WWTP was on my list of sources targeted for an inspection during FY 2015. The purpose of this inspection was to determine compliance of operations at the Detroit WWTP facility with applicable rules, regulations and standards as promulgated by Public Act 451 of 1994 (NREPA, Part 55 Air Pollution Control), and Federal standards. The facility is also subject to the terms and conditions of Renewable Operating Permit (ROP) No. MI-ROP-B2103-2014a.

Facility Description

The Detroit WWTP is located along Jefferson Avenue in the southwest portion of the City of Detroit. The facility is located just north of the Rouge River, and most of the wastewater treatment operations are located west of Jefferson Avenue. The new Biosolids Drying Facility, which is part of the Detroit WWTP stationary source but will be operated by New England Fertilizer Company (NEFCO), is located on the east side of Jefferson Avenue, directly across the street from the Detroit WWTP. The construction of the Biosolids Drying Facility is complete, and the facility should begin to be operational sometime in September 2015. The Detroit WWTP is located adjacent to primarily industrial properties, but there are residential neighborhoods in relatively close proximity. The City of River Rouge is located across the Rouge River from the WWTP, and the northern edge of the residential area in this city is just over ¼ mile south of the WWTP's southern property line. There are also residential areas in Detroit to the north and northwest of the northern portion of the WWTP, which contains the secondary treatment tanks, that are located less than 100 yards from the WWTP property line. The areas to the south and east of the Detroit WWTP contain some heavy industrial facilities. Zug Island, which contains some of U.S. Steel's operations (blast furnaces) and other activities associated with steelmaking, such as EES Coke's coke oven, lies just to the east and northeast of the Detroit WWTP, across the original Rouge River channel. U.S. Gypsum and Carmeuse Lime, Inc. are located directly across the Rouge River in the city of River Rouge.

The Detroit WWTP is a publically-owned wastewater treatment plant. The facility collects and treats domestic and industrial wastewater from the Metro Detroit area, serving the City of Detroit and 76 other communities in Southeast Michigan. The facility receives wastewater via three (3) major interceptors – the Detroit River interceptor, which contains flow from Detroit; the Oakwood/Rouge interceptor, which directs flow from the west side of Detroit and western suburbs; and the North interceptor, which contains flow from some of Detroit's northern suburbs. The Detroit WWTP is one of the largest such facilities in terms of design treatment capacity in the world. The treatment capacity, or wet weather capacity, of the WWTP is 1.7 billion gallons per day primary treatment capacity, and up to 930 million gallons per day (MGD) can receive secondary treatment (activated sludge, disinfection and dechlorination); the average dry weather flow is 750 MGD.

The wastewater treatment process involves the removal of large solids from the influent wastewater stream using bar racks and grit chambers; primary and secondary biological treatment to remove suspended and dissolved solids; secondary treatment, which involves the use of oxygen activated sludge tanks and clarifier tanks; and chlorination of water from secondary clarifiers, followed by dechlorination of the effluent stream prior to discharge. The treated wastewater is discharged as effluent to Rouge and Detroit Rivers. Solids generated during the primary and secondary biological treatment are gravity thickened, then the resulting sludge/biosolids are dewatered through the use of centrifuges and belt filter presses. After dewatering, the sludge is currently either incinerated in the WWTP's on-site incineration complex, or trucked off-site for either land application or disposal via landfilling. Once the Biosolids Drying Facility is completed and operational, it will be able to process up to 576 dry tons of sewage sludge per day in its four dryers; this sludge will be dried into pellets that will be used either as a fertilizer pellet, or as a fuel for cement kilns.

Facility Operations

The Detroit WWTP is a municipal utility that operates 24 hours per day, 7 days per week, and every day of the year.

As described in the last section of this report, the wastewater treatment portion of the facility consists of a multitude of treatment tanks that provide primary and secondary treatment of wastewater influent to the WWTP. The resulting treated effluent is discharged to the Rouge and Detroit Rivers. Many of the wastewater treatment tanks are open to the atmosphere, and the presence of odorous material in the tanks could potentially cause an odor in the ambient air. However, the wastewater treatment processes, including the treatment tanks, are not permitted by the Air Quality Division as this type of equipment is exempt from air quality permitting requirements.

The primary sources of air emissions at the WWTP have been the fourteen multiple hearth sewage sludge incinerators. The incinerators are located in two "Complexes" – Incinerators 1-6 are located in Complex I, while incinerators 7-14 are located in Complex II. The Complex I incinerators were built in the 1940's, while the Complex II incinerators, which are slightly larger multi-hearth incinerators, were built in the 1960's and 1970's. The exhaust air flow from each of the incinerators is directed through a series of scrubbers to treat the air emissions. The treated exhaust is discharged to the ambient air via three tall stacks that discharge 254 feet above grade.

As part of recent permitting activities (which resulted in the issuance of Permit to Install Nos. 61-13 and 61-13A, and subsequent modifications to the ROP), there are several changes being made to the Detroit WWTP regarding sewage sludge disposal. First, DWSD will be permanently shutting down the Complex 1 incinerators. The Complex 2 incinerators are in the process of undergoing what is being called "air quality control improvements", or AQCI, which involves modifying some of the hearths, air ports and burners in these incinerators to achieve improved combustion and emissions control. In addition, the scrubbers are being improved as part of the AQCI. The scrubber improvements involve:

- Installing new quench sprays and a quench duct section upstream of the scrubber to ensure proper saturation of the exhaust from the Complex 2 incinerators. The ductwork leading to the scrubber is also being reconfigured to allow for the new scrubber components.
- Fitting the existing impingement tray scrubbers with new trays and water sprays. Per the information presented in the application materials for Permit to Install 61-13, this part of the scrubber system removes

larger and medium-sized particles, further cools the exhaust gases, and removes acid gases and metals, not including mercury.

- Installation of new venturi scrubbers following the impingement tray section of the scrubber system. The venturi scrubbers are being equipped with inlet and throat sprays.
- Installation of mist eliminators following the venturi section of the scrubber system to remove water droplets from the exhaust stream.

The improvements to the Complex 2 incinerators and their associated emission controls are being done in an effort to ensure compliance of the incinerators with Federal emission standards, specifically the New Source Performance Standards found in 40 CFR Part 60, Subpart M (Emission Guidelines and Compliance Times for Existing Sewage Sludge Incineration Units). Subpart M becomes effective on March 21, 2016.

As referenced in the last section of this report, the new Biosolids Drying Facility, or BDF, is nearing completion, and should be operational soon. The BDF is located on the east side of Jefferson Avenue, and it consists of a building that contains four natural gas-fired rotary dryers that will be used to dry sludge produced by the treatment processes at the Detroit WWTP into pellets that will be used as fertilizer, or as a fuel in cement kilns. Sludge is to be transported from the WWTP to the BDF via underground piping. Emissions from operation of the four dryers are to be controlled by low-NOx burners, exhaust recirculation, and a cyclone product collector. Exhaust from the cyclone will be controlled by a three-stage impingement tray scrubber followed by a regenerative thermal oxidizer. The air inside of the BDF building will be exhausted to alkaline hypochlorite scrubbers to control potential odors.

Inspection Narrative

I arrived at the Detroit WWTP at about 1:00pm. I checked in at the security office, and was met by Melvin Dacres of DWSD. We proceeded to Melvin's office to review the compliance status of the facility.

I told Melvin that the purpose of my visit was to review the applicable portions of ROP No. MI-ROP-B2103-2014a, and to check how DWSD determines that the Detroit WWTP is compliant with the terms and conditions of the ROP and applicable regulations. During the course of my visit, Melvin and I went through the ROP, starting with the Source-Wide Conditions and proceeding through the various Emission Unit and Flexible Group tables.

As we went through the permit and regulatory requirements, Melvin would describe how DWSD addresses the requirements. He would show me records, some kept at his desk, some accessible via spreadsheets, and others accessible via logs and records kept in other parts of the Detroit WWTP offices. Melvin also showed me some of the records and tracked parameters via the facility's Ovation data software system, which we accessed via a stand-alone computer in a conference room. I requested and received copies of examples of some of the records.

The section that follows will provide details regarding the compliance demonstration presented during the August 13, 2015 site visit.

I left the facility just before 4:00pm.

Permits/Orders/Regulations

Permits

The primary source of the regulatory requirements that are currently applicable to the Detroit WWTP are found in the facility's current Renewable Operating Permit No. **MI-ROP-B2103-2014a**, which was effective on June 13, 2014, and **Permit to Install No. 61-13A**, which was issued via correspondence from DEQ-AQD to DWSD dated July 7, 2015. The ROP is currently being modified to incorporate the terms and conditions of PTO No. 61-13A. As of the date of the writing of this report, the ROP modification has been approved by both DEQ-AQD and DWSD, and the US EPA 45-day review period was initiated on August 31, 2015. The 45-day review period is scheduled to end on October 15, 2015.

These two DEQ-AQD permits reference the applicable State air regulatory requirements, as well as the applicable Federal air regulatory requirements. The primary regulation that is applicable to the operations at the Detroit WWTP is **40 CFR Part 60, Subpart M**. This standard has an effective date of March 21, 2016, but the incinerator and scrubber upgrades described earlier in this report, as well as the issuance of Permits to Install 61-13 and 61-13A, were done as part of the effort to ensure compliance with this regulation. The requirements of Subpart M are referenced in **Michigan Administrative Rule 972 (R 336.1972)**, which is listed as an applicable requirement in Permit to Install 61-13A.

The following paragraphs provide a summary of the compliance of the operations associated with the Detroit WWTP with the terms and conditions put forth by the ROP, with the headings representing the sections of the ROP.

Source-Wide Conditions

The Source-Wide Conditions table in the ROP addresses two separate items:

- Emission standards put forth in 40 CFR Part 61 for beryllium and mercury;
- Fugitive dust control measures on the Detroit WWTP property.

40 CFR Part 61, Subparts C (National Emission Standards for Beryllium) and E (National Emission Standards for Mercury) are applicable to the Detroit WWTP due to the potential presence of these materials in the wastewater influent treated at the facility, as well as the sludge/biosolids produced by the treatment process. Section "I. Emission Limits" of the Source-Wide Conditions section contains emission limits for these two elements, while under section "V. Testing/Sampling", Special Condition V.1 requires that monthly samples of the sewage sludge be tested for mercury content. Melvin described that three samples are taken – one from the Central Offload facility, where sludge is prepared for off-site use/disposal; one from the Complex 1 Incinerator sludge feed belts; and one from the Complex 2 Incinerator sludge feed belts. The samples are analyzed at the WWTP's on-site analytical lab, and the results go into the report required by 40 CFR Part 503 (Standards for the Use or Disposal of Sewage Sludge). The Part 503 report is sent to DEQ-Water Division staff in October of each year, and to EPA in January. The Part 503 report requires analysis of cadmium, chromium, mercury, beryllium, arsenic, lead and nickel content of the sludge samples. In addition, DWSD sends reports of the mercury sampling results to DEQ-AQD. The facility is **in compliance** with these requirements.

The requirements in this section of the ROP that relate to fugitive dust management cite **Consent Order SIP No. 11-1993** as an applicable requirement. This Consent Order is part of the State of Michigan's State Implementation Plan (SIP); this part of the SIP was submitted by the State of Michigan as part of the attainment demonstration for PM-10. The Michigan Department of Natural Resources submitted the PM-10 SIP to EPA on June 11, 1993, and, after a couple of revisions, the nonattainment area PM SIP for Wayne County, Michigan was approved and became effective on February 16, 1995. One element of the SIP was the requirement that facilities with designated standard industrial classifications that are located in the area designated in Table 36 of Michigan Administrative Rule 371 "...develop and implement an approved fugitive dust control operating program and to have the program embodied in a legally enforceable order..." (this quote was taken from the preamble to the Consent Order). Many of the larger facilities in the portion of Wayne County designated in Table 36 were issued Orders as part of the SIP. The Detroit WWTP was issued the Consent Order referred to as SIP No. 11-1993.

The fugitive dust-related conditions in the Source-Wide Conditions section of the ROP contain requirements to perform daily sweeping in the material handling area when material handling takes place (Special Condition IX.1.1.a); weekly sweeping of paved roadways (IX.1.1.b); adding gravel cover to gravel parking areas as needed (IX.1.2.); washing sludge from the exterior of vehicles that haul sludge from the facility (IX.1.7); and daily washings/cleanings of roadways in the sludge haul area (IX.1.8). Melvin told me that the areas that require daily maintenance are checked daily, and that logs of the dust management activity are kept at the Central Offload facility. He also stated that the other tasks are being performed. The facility is **in compliance** with the fugitive dust management requirements.

EULIMEPAD

EULIMEPAD is the only Emission Unit identified in the ROP that is not part of a Flexible Group. The ROP contains the following description for EULIMEPAD:

"The old sludge/lime mixing facility and the Lime Pad have been replaced with indoor Central Offloading Facility (COF) and a new outdoor Lime Pad facility. Belt conveyors transfer sludge cake from Complex 1 and Complex 2 dewatering units to three holding tanks and the cake is then transferred to three cake mixers where lime from three silos are added by gravity to mixers. All the cake mixers are connected to a scrubber, where any residual dust and gases are scrubbed. The mixture is dropped directly into trucks for transport to a landfill. Occasionally, the mixture of cake and lime is dropped into the Lime Pad area, where scum or ash is added and mixed with front loaders. Lime Pad is an outdoor three-sided concrete/steel mixing area used to prepare residuals for disposal in a sanitary landfill. The mixture is allowed to stabilize, then loaded into trucks for transport to a landfill."

The Emission Unit table only contains two permit Special Conditions – IX.1, which requires that all trucks hauling sludge from the facility have their wheels cleaned, and IX.2, which requires that all sludge conveyors and conveyor transfer points be inspected one per shift. Melvin explained that there is a weight ticket for each inbound and outbound sludge hauling truck on which the weights if the truck is entered. In addition, there is a check box indicating whether the tires were washed. Melvin provided me with copies of two random forms dated 9/5/14 and 8/12/15, which are attached to this report. One of the forms does not have the "Tires Washed" field checked. This has happened in the past, and DWSD has reported the failure to properly check this box as a ROP deviation in the facility's Annual/Semi-annual ROP Certification Reports.

Regarding the conveyor inspections, Melvin told me that inspection log sheets, referred to as the "Residual Disposal Shift Report", are completed for each shift, and are kept on file at the Central Offload facility. Melvin showed me a copy of one of the log sheets.

Aside from occasionally not checking the "Tires Washed" box on the weight tickets, the facility is **in compliance** with the conditions in EULIMEPAD.

FGC1ASH and FGC2ASH

This Flexible Group addresses the incinerator ash conveyance and storage systems associated with Incinerator Complexes 1 and 2. The ash is stored prior to being transported to a landfill for disposal.

These two Flexible Groups have been grouped together for the purposes of this compliance discussion because they have, essentially, the same permit requirements. The paragraphs that follow provide a summary of the Detroit WWTP's compliance with the Special Conditions in this Flexible Group.

I. Emission Limits

There are two Special Conditions- I.1 contains a DEQ-AQD Air Pollution Control Part 3-based particulate limit of 0.2 lbs. of particulate matter per 1,000 lbs. of exhaust air, and I.2 is an opacity limit put forth by Subpart MMMM. The primary method of compliance with the particulate limit has been to monitor and record the pressure drop across the baghouse, and perform visible emission observations. The opacity limit also requires that the same tasks be performed. In addition, the Monitoring/Testing Method column in the "I. Emission Limits" references Special Condition V.1 as one of the compliance basis for the particulate limit. Table 3 to Subpart MMMM states that, for the visible emission limit, the test method for demonstrating compliance with these Special Conditions is an EPA Method 22 visible emission test to check for the presence of visible emissions. From my read, the Monitoring/Testing Method column in the "I. Emission Limits" section should reference Special Condition V.1 for the visible emissions limits, but not for the particulate matter limit. This correction will be made to the ROP. The Detroit WWTP is **in compliance**, but at the next scheduled Complex 2 incinerator test, which will be discussed later in the report, I will check if the official Method 22 compliance determination, as required by Subpart MMMM, has been performed.

III. Process/Operational Restrictions

Special Condition III.1 limits the pressure drop across each baghouse controlling particulate emissions to 10 inches of water. Melvin told me that log sheets are kept on a daily basis. He showed me some entries in the "Ash System Shift Report". This report is completed by DWSD staff during each shift, and is accessible via the facility's central data system. Melvin provided me with a print out of the Complex 1 Ash System Shift Report for the day of the inspection, August 13. This report showed no visible emission observation during the first 7 hours of the work shift due to darkness (visible emission readings are not valid without daylight), but other entries that I

looked at showed observations made during the daylight hours. **In compliance.** A copy of the Complex 1 Ash System Shift Report for August 13 is attached to this report.

V. Testing/Sampling

Special Conditions V.1 and V.2 contain requirements put forth by Subpart M MMM. In relation to this particular Flexible Group, the language in Subpart M MMM addresses fugitive emissions from ash conveying systems, including conveyor transfer points. As discussed in the "I. Emission Limits", these testing requirements relate to the visible emissions limit in Special Condition I.2, and involve performing Method 22 VE readings over three 1-hour observation periods to check for compliance with the 5% opacity limit. The facility is performing visible emission readings for this equipment, and I will check with DWSD staff as to whether readings have been performed to satisfy the Subpart M MMM requirement.

VI. Monitoring/Recordkeeping

Special Conditions:

VI.1 – Compliance. DWSD is monitoring and recording the pressure drop across the baghouses, and performing and logging visible emission observations.

VI.2 – Compliance. DWSD submitted a Site-Specific Monitoring Plan that included the ash handling system. It was received by DEQ-AQD on February 10, 2015.

VII. Reporting

Compliance. All of the required reports for these Flexible Groups are being submitted for the Detroit WWTP.

FGCOMPLEX1

During this site visit, I did not include the Complex 1 incinerators in my compliance review. As the sludge dryers in the Biosolids Drying Facility are brought into operation, the five remaining incinerators in Complex 1 will be permanently shut down. Special Condition IX.1 in FGDryIncTrans states that the Complex 1 incinerators must permanently cease operating by March 20, 2016. The Flexible Group table for FGCOMPLEX1 contains Subpart M MMM requirements that would be applicable to the operation of these incinerators after March 21 of 2016, but the incinerators should have permanently ceased operating by that time.

FGCOMPLEX2

The permit conditions in this Flexible Group were carried over from the last version of the ROP. These conditions do not consider Subpart M MMM. Permit to Install Nos. 61-13 and 61-13A addressed the incinerator and scrubber/control equipment upgrades discussed in the "Facility Operations" section of this report.

As the upgrades are made to the Complex 2 incinerators, the permit conditions in FGCOMPLEX2 no longer apply. Instead, the incinerators will be subject to the requirements in the FGAQCI and FG-4M-INCIN Flexible Groups. The Complex 2 incinerators are undergoing the upgrades in pairs. After the upgrades are complete, emissions testing is to be performed on the upgraded incinerators to satisfy the initial compliance testing requirements of Subpart M MMM. To this point, Incinerators 7 and 8 have been upgraded, and the required compliance emissions testing was performed from April 17 through 21, 2015. The upgrades of Incinerators 9 and 10 are currently nearing completion, and the emissions testing has been scheduled for October of this year.

The Detroit WWTP is still performing monitoring and recordkeeping on the incinerators that have not yet been upgraded. The existing scrubbers are maintained and operated whenever their associated incinerator is operating (Special Condition, or "S.C." III.1). Incinerator hearth temperatures are being monitored (S.C. III.2, VI.3), as well as scrubber operating parameters (S.C. III.3, VI.3). Melvin confirmed that the monthly incinerator inspections required by S.C. VI.2 are being performed, as well as the monitoring and recordkeeping of scrubber liquid flow rate, pressure differential, and incinerator hearth #1 temperature as required by S.C. VI.3. Records of this information are kept electronically, and the WWTP's Air Emissions Group, which Melvin is a part of, check the information on a daily basis.

I inquired about Special Conditions VI.6 and VI.9, which require that preventative maintenance be performed on the incinerators in accordance with the Malfunction Abatement Plan (MAP) that was required to be put in place

for the Complex 1 and 2 incinerators. These tasks are not always being performed, and DWSD has been reporting the times that the tasks related to the MAP haven't been performed in their Annual/Semi-Annual ROP Certification Reports as deviations. Melvin told me that the facility has not had the number of qualified staff at the WWTP to perform all of these tasks as required. Presumably some of this is due to the resources being directed to the Complex 2 incinerator upgrades and compliance with Subpart Mmmm. Melvin also told me that there has been progress at the facility in terms of getting the preventative maintenance activities performed on a timely basis, and in accordance with the MAP. The WWTP is substantially in compliance with the terms and conditions in FGCOMPLEX2, and the reported deviations are minor in nature.

FGLIMESTORAGE

This Flexible Group includes the storage devices that are used to store lime, which is used to stabilize the sludge that is hauled offsite for landfilling. There are Special Conditions in this Flexible Group that put forth emission limits for particulate matter and opacity (S.C. I.1 and I.2). Special Conditions VI.1 through VI.3 serve as the compliance method for these emission limits, requiring that the baghouses associated with the Flexible Group are inspected at least once per month, that the pressure drop across the baghouse is monitored, and that visible emission readings be performed and recorded during daylight hours.

Melvin told me that the Ovation software system in use at the facility keeps track of the pressure drop, and contains set points and alarms to ensure that the proper range is maintained. This Flexible Group is associated with the Central Offload Facility, so this information is monitored from there. The Detroit WWTP is **in compliance** with these conditions.

FGENGINES

This Flexible Group addresses the seventeen emergency engines at the Detroit WWTP. These engines are a mix of natural gas and diesel-fired units. I inquired about the sulfur in fuel requirement (S.C. III.1 and VI.4). Melvin told me that each incoming load of fuel to be used in the generators is sampled by staff from DWSD's Central Services Facility (CSF). This is consistent with some of the emergency generators that I have inspected at pump stations, where CSF staff keep track of the sulfur content of the fuel used in those locations, as well as the amount of fuel. Melvin showed me a copy of a record from CSF that he had, and stated that the fuel has been compliant with the sulfur in fuel limit.

Tracking of the hours of operation of the engines and the NOx emission calculations are performed and kept on site at the WWTP. Melvin showed me the electronic records that summarize this information. The information is updated at the end of each calendar month. I received a printout of the engine information from the end of July, which is attached to this report. Based on these records, the 12 month rolling NOx emissions from FGENGINES, as of July 31, 2015, is 0.69 tons, well below the permit limit of 36 tons. The Detroit WWTP is **in compliance** with FGENGINES.

FGCIENGINES

This Flexible Group also addresses emergency diesel-fired engines, separating out five of the seventeen engines from FGENGINES into a different Flexible Group. These five engines are diesel-fired units, and are subject to the requirements of 40 CFR Part 60, Subpart IIII (New Source Performance Standards for Stationary Compression Ignition Engines). This Flexible Group describes the separate, specific requirements that these five engines are subject in addition to the requirements found in FGENGINES.

The sulfur in fuel information is, again, maintained by staff with DWSD's Central Services Facility. The hours of operation, as required by S.C. III.2, is tracked on site. Melvin showed me logs titled "Monthly Generator Total Run Time Report at WWTP", through which the hours meter reading is recorded, as well as the fuel level in the diesel tank. Melvin provided me with a copy of the report that was completed for July 2015; it is attached to this report for reference. In addition, staff at the WWTP maintain a spreadsheet that tracks the level of diesel fuel in each engine each month, as well as any fuel additions, to produce a record of the diesel fuel usage. In addition, all of the maintenance activities associated with these engines are tracked using an internal software system. This information is used to track the amount of hours operated for maintenance and testing purposes, which is limited by Subpart IIII to 100 hours for these purposes. In summary, all of the required records relating to the operation of the engines in FGCIENGINES, as well as FGENGINES, are kept and maintained by DWSD staff, either at the WWTP or at the CSF.

Regarding Special Condition V.1, DWSD received manuals for each engine that included the manufacturer emission certifications. Thus, the engines did not need to have an initial performance test conducted. The Detroit WWTP is **in compliance** with FGCIENGINES.

FGNSPSBOILERS

This Flexible Group addresses four small natural gas-fired boilers that, due to their relative small heat input rating, are exempt from DEQ-AQD permitting requirements. These boilers are still subject to 40 CFR Part 60, Subpart Dc. The only permit requirements associated with this Flexible Group are one limited the fuel fired in the units to natural gas only (S.C. III.1), and a requirement to record the amount of natural gas used in each boiler on a calendar month basis (S.C. VI.1). Detroit WWTP staff keep track of facility-wide natural gas usage. There is a separate natural gas meter for each boiler, and the gas usage is recorded in a spreadsheet on a monthly basis. The WWTP is **in compliance** with FGNSPSBOILERS.

FGCOLDCLEANERS

I did not walk around the facility during this visit. This Flexible Group is a template that is placed into the ROP for facilities in which there are cold cleaners. The status of the cold cleaners at the facility was not discussed during this particular inspection.

FGAQCI

The description for this Flexible Group reads:

"This flexible group covers the Complex 2 incinerators for which the air quality control improvements (AQCI) have been completed. When the AQCI have been completed, it will consist of eight (8) multiple hearth sewage sludge incinerators, each with a venturi scrubber followed by an impingement tray wet scrubber and a mist eliminator. (PTI No. 61-13A)"

As the Complex 2 incinerators are upgraded (i.e. upgrades to incinerator hearths, air ports and burners, upgrades to the scrubber system), the requirements found in FGCOMPLEX2 no longer apply to the upgraded incinerators; these upgraded incinerators are then subject to the permit conditions found in FGAQCI. To this point, Incinerators 7 and 8 have been fully upgraded, and are now subject to this Flexible Group.

The following paragraphs describe the compliance of Units 7 and 8 with FGAQCI.

I. Emission Limits and V. Testing/Sampling

When an incinerator is upgraded, new emission limits and emissions testing requirements are triggered; the testing is the method through which compliance with the emission limits in section "I. Emission Limits" of FGAQCI is determined. Some of the pollutants, and their associated emission limits, listed in this section are taken directly from Subpart MMMM. The other pollutants/emission limits were analyzed as part of the review of Permit to Install No. 61-13.

Emission testing was performed in April 2015 to demonstrate compliance with the emission limits in FGAQCI, to satisfy the testing requirement of Special Condition V.1, and to satisfy the initial compliance requirement of paragraph 60.5185 of 40 CFR Part 60 Subpart MMMM. The test results are summarized as follows, comparing the test results to the permitted limit:

For Incinerator 7:

<u>Pollutant</u>	<u>Test result</u>	<u>Permit limit</u>
Particulate matter	12.79 mg/dscm	80 mg/dscm
PM2.5	0.94 lb/hr	1.2 lb/hr
PM10	0.97 lb/hr	1.2 lb/hr
Hydrogen chloride	0.15 ppmvd	1.2 ppmvd
Carbon monoxide	1,210.3 ppmvd	3,800 ppmvd

VOC	0.46 lb/hr	3.2 lb/hr
Dioxins/furans	1.61 ng/dscm 0.042 ng/dscm TEF	5.0 ng/dscm 0.32 mg/dscm TEF
Mercury	0.062 mg/dscm	0.28 mg/dscm
Nitrogen oxides	90.8 ppmvd	220 ppmvd
Sulfur Dioxide	1.3 ppmvd	26 ppmvd
Sulfuric acid	0.048 lb/hr	1.3 lb/hr
Cadmium	0.017 mg/dscm	0.095 mg/dscm
Lead	0.098 mg/dscm	0.3 mg/dscm
Fluorides	<0.0034 lb/hr	1.73 lb/hr

For Incinerator 8:

<u>Pollutant</u>	<u>Test result</u>	<u>Permit limit</u>
Particulate matter	7.58 mg/dscm	80 mg/dscm
PM2.5	0.56 lb/hr	1.2 lb/hr
PM10	0.65 lb/hr	1.2 lb/hr
Hydrogen chloride	<0.18 ppmvd	1.2 ppmvd
Carbon monoxide	2,194.7 ppmvd	3,800 ppmvd
VOC	0.95 lb/hr	3.2 lb/hr
Dioxins/furans	2.55 ng/dscm 0.062 ng/dscm TEF	5.0 ng/dscm 0.32 mg/dscm TEF
Mercury	0.034 mg/dscm	0.28 mg/dscm
Nitrogen oxides	96.2 ppmvd	220 ppmvd
Sulfur Dioxide	2.8 ppmvd	26 ppmvd
Sulfuric acid	0.29 lb/hr	1.3 lb/hr
Cadmium	0.015 mg/dscm	0.095 mg/dscm
Lead	0.053 mg/dscm	0.3 mg/dscm
Fluorides	<0.0038 lb/hr	1.73 lb/hr

These results are well in compliance with the applicable emission limits for each pollutant listed in FGAQCI.

II. Material Limits

The Complex 2 incinerators are limited to 129,564 dry tons per year. Records reviewed during the inspection for the 2014 calendar year showed that 74,582 dry tons of sludge was fired in the Complex 2 incinerators. The

facility is **in compliance** with this limit. The method by which DWSD monitors feed rate will be discussed in a later section.

III.Process/Operational Restrictions

Special Conditions:

III.1 – **Compliance**. The facility maintains and operates the upgraded scrubber system when the incinerators are operating.

III.2 and III.3– **Compliance**. DWSD has a Malfunction Abatement Plan (MAP) with established scrubber and incinerator hearth temperature parameters. In accordance with paragraph 60.5190 of Subpart Mmmm, as well as Special Condition V.5 of FG-4M-INCIN, DWSD established new operating parameters for incinerator temperature, scrubber liquid flow rate, and pressure drop across the scrubber, along with scrubber liquid pH, as part of the April 2015 emissions test.

IV. Design/Equipment Parameters

Special Conditions IV.1, IV.2, and IV.3 – the WWTP is **in compliance** with these requirements. All of the required monitoring equipment was installed during the upgrades in Incinerators 7 and 8. There is already an existing, certified continuous opacity monitoring system (COMS) in operation for all of the incinerators.

VI. Monitoring/Recordkeeping

Special conditions:

VI.1 – **Compliance**. DWSD is continuously monitoring oxygen.

VI.2 - **Compliance**. Visible emissions/opacity are continuously being monitored.

VI.3 – **Compliance**. Periodic inspections are performed on the incinerators, and records of inspections and any resulting maintenance are kept by WWTP staff.

VI.4 and VI.5– **Compliance**. The required incinerator and scrubber operating parameters are being monitored and recorded. The MAP is being revised after the upgrades are made.

VI.6 and VI.8 – These conditions address the monitoring of sludge feed rate. VI.6 requires that the daily sludge feed rate, on a wet ton basis, be monitored and recorded. VI.8 requires that the sludge feed rate, on a dry tons basis, be monitored and recorded on a calendar month and 12 month rolling time period basis.

Melvin and I discussed the procedure for monitoring sludge feed rate. A periodic data report is kept each day that summarizes the hourly average feed rates for each sludge belt and conveyor associated with each incinerator. Once each shift (or every 8 hours), sludge samples are taken to determine certain properties, including percent dry solids and pH. In addition, readings are taken from the weightometers (devices that measure the weight of the sludge on the belts and conveyors) at the beginning and end of each shift, which measures the amount of sludge in wet tons. This information is factored with the sludge sample data taken once per shift that provides percent dry solids data. Melvin took me to a stand-alone computer in one of the conference rooms to pull up some screens from the Ovation computer system. He showed me how the Ovation system continuously monitors the belts/conveyors and weightometers. The data from Ovation and the lab samples are used to determine the dry ton throughput. Melvin and I agreed to some additional follow-up regarding this procedure for determining sludge feed rate. I sent him an e-mail on August 17, 2015, to which he replied with a synopsis of the procedure, and an example spreadsheet that provides the monthly operating hours and dry tons of sludge sent to the Complex 2 incinerators in 2014. This information is attached to this report for reference.

The Detroit WWTP is **in compliance** with the sludge feed rate monitoring requirements.

VI.7 – As a result of the emissions testing, the WWTP will have site-specific emissions information for each upgraded incinerator. This information will be the basis for some of the emissions calculations required by this permit condition.

VII. Reporting

Special Conditions:

VII.1 – **In compliance.** DWSD informed DEQ-AQD when the modifications to Incinerators 7 and 8 were completed in accordance with this condition.

VII.2 – DWSD submitted the closure notification for Incinerator No. 2.

IX. Other Requirements

Special Conditions:

IX.1 – **In compliance.** This condition states that FGAQCI becomes applicable when the upgrades are made to the Complex 2 incinerators, and that the terms and conditions of FGCOMPLEX2 are no longer applicable.

IX.2 – **In compliance.** The WWTP has implemented a Malfunction Abatement Plan.

IX.3 – **In compliance.** The WWTP has permanently shut down Incinerator No. 2.

FG4M-INCIN

This Flexible Group contains the requirements associated with 40 CFR Part 60 Subpart Mmmm that apply to the incinerators at the Detroit WWTP. These requirements become effective on March 21, 2016. As described in the last section, as the Complex2 incinerators are upgraded, emissions testing is performed that serves to meet the initial compliance demonstration requirements of Subpart Mmmm, which is also presented in Special Condition V.1 of this Flexible Group.

DWSD has been submitting plans that are required by Subpart Mmmm. The Site Specific Monitoring Plan, addressed in paragraph 60.5200, was received by DEQ-AQD on February 10, 2015. The Operator Certification Training Program was submitted on August 26, 2015.

FGDryerTrains and FGDryerFacility

The Biosolids Drying Facility has not yet begun full operation. I visited the facility on July 1, 2015 for a tour. At that time, the sludge dryers and some of their associated equipment were still undergoing final construction. I was contacted by James Kyzar of NEFCO on August 27 regarding the company's upcoming responsibilities regarding complying with the Detroit WWTP ROP. I discussed some of the requirements with him, and I sent him the link for the WWTP's ROP documents on the DEQ website.

On August 26, 2015, DEQ-AQD received written notice from DWSD that all of the sludge dryers had been installed. Trial operation of Dryer No. 3 had taken place, and the other four would begin trial operation sometime in the short-term.

FG2013Project

DWSD has worked with DEQ's Air Monitoring Group to set up the ambient NO₂ monitoring program to satisfy the requirements of Special Conditions VI.2, VII.1 and VII.2 DWSD is keeping emissions records for the WWTP portion of the facility. As mentioned in the last section of this report, the Biosolids Drying Facility has not yet begun full operation; when it does, similar emissions calculations will be performed to contribute to the emission estimates for the processes associated with FG2013Project.

FGDryIncTrans

This Flexible Group was created as a result of the review of Permit to Install No. 61-13A. The Flexible Group description, as presented in the PTI and the ROP that is currently being modified (MI-ROP-B2103-2014b), is as follows:

"This flexible group contains requirements to ensure that during operation of the biosolids drying facility before incinerators 1, 3, 4, 5, and 6 permanently cease operating, there is not a significant emissions increase of a regulated new source review pollutant. The flexible group requires that these incinerators permanently cease

operating no later than March 20, 2016. The flexible group terminates when incinerators 1, 3, 4, 5, and 6 have permanently ceased operating, at which time its conditions will no longer be applicable requirements for any of the equipment in the flexible group. (PTI No. 61-13A)"

This Flexible Group places a limit on the amount of sludge that can be fired in the entire Detroit WWTP stationary source, which includes the Complex 1 and 2 incinerators and the Biosolids Drying Facility, until the time when all of the Complex 1 incinerators permanently cease operation. This date is to be no later than March 20, 2016.

The WWTP is **in compliance** with the sludge limit in Special Conditions II.1, as well as the sludge feed monitoring requirements in Special Condition VI.2. The operations associated with the Biosolids Drying Facility (namely the four sludge dryers) will monitor the sludge feed rate when they are operational. The WWTP is **in compliance** with the conditions in "VII. Reporting".

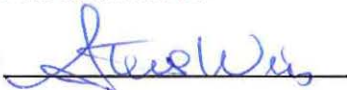
Compliance Determination

Based upon the results of the August 13, 2015 site visit and subsequent records review, along with the results of the emissions testing that occurred in April 2015, the Detroit WWTP appears to be in substantial compliance with the terms and conditions of Renewable Operating Permit MI-ROP-B2103-2014a and Permit to Install No. 61-13A, and, in turn, applicable State and Federal regulations. DWSD has reported deviations in their Annual/Semi-annual ROP Certification Reports, but these tend to be minor in nature, some being isolated incidents, while others are of a short duration and are being addressed. This compliance determination serves as a snapshot in time, as the permits contain many time-specific future requirements. The WWTP will be completing the upgrades on Incinerators 9, 10, 11, 12, 13 and 14, and will be performing emissions testing to satisfy and demonstrate compliance with the emission limits and testing requirements in FGAQCI, as well as the initial compliance demonstration requirements in 40 CFR Part 60 Subpart M. These activities are to be completed by the effective date of Subpart M – March 21, 2016.

The Biosolids Drying Facility will be commencing operation very shortly. When the sludge dryers in the BDF are operational, NEFCO staff will be required to monitor and record sludge feed rate to the BDF, estimate emissions, and perform some emission testing of their own. As time passes, different permit/regulatory requirements will become applicable. DEQ-AQD staff will be visiting the facility for the various emissions testing events.

Attachments to this report: copies of a couple of weight tickets associated with the sludge loadout area, showing the "tires washed" field; a copy of the "Complex 1 Ash System Shift Report" for 8/13/15 (the date is incorrect at the top of the form); printouts of usage and NO_x emission estimate logs for the engines; a copy of the hours usage log sheet for the engines; correspondence and a spreadsheet relating to tracking of the sludge feed rate to the incinerators.

NAME



DATE

9/18/15

SUPERVISOR
