Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
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January 31, 2013

Mr. Kevin Rousseau
Regional Facility Manager
Pittsfield Resource Recovery Facility
Covanta Pittsfield, LLC
500 Hubbard Avenue
Pittsfield, MA 01201

RE: Pittsfield
Transmittal No.: X253844
Application No.: WE-13-001
Class: OP
FMF No.: 50772
AIR QUALITY PLAN APPROVAL

Dear Mr. Rousseau:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Waste Prevention, has reviewed your Limited Plan Application ("Application") listed above. This Application concerns the the 2012 Standard Operating & Maintenance Manual at the Pittsfield Resource Recovery Facility (Covanta Pittsfield) in Pittsfield, Massachusetts.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

Pursuant to Table 6d, Condition # 27 of Operating Permit #1-O-07-022, Covanta Pittsfield submitted a Limited Plan Application for an updated Standard Operating and Maintenance Manual (SOM) for the Pittsfield Resource Recovery Facility on December 21, 2012.

This SOM has been submitted to reflect the facility operation as it currently exists. The revisions to the 2012 version of the SOM consist of minor wording changes to clarify and reflect current operating practices as well as updates to operating parameters, equipment and operating procedures. The following list details specific changes made to the SOM which consisted of more than formatting and minor wording changes. In the list below, the section of the SOM where the revision occurs is identified and followed by an explanation of the revision.

- **Section 1.3 Truck Scale** – The description of the truck scale has been updated to state that the scale is 70 feet instead of 34 feet long and is an Emery hydraulic pit scale with a capacity of 200,000 pounds instead of 80,000 pounds. Language was added to state that the scale platform is equipped with red/green traffic lights to control inbound and outbound truck traffic.
- **Section 1.5.4.2.1 Commercial Collection Vehicles** – This section has been updated to reflect current operating practices.
- **Section 3.1.1 Basic Combustion Theory Applicable to a Municipal Waste Combustor Unit** - This section has been revised in its entirety.
- **Section 3.6.1.2 Oxygen Analyzer** – The required operating temperature of the electromechanical cell as been revised from 1283°F to 1382° F.
- **Section 3.8 Normal Operations** – The description of the over fire air damper has been changed to the Primary RFG damper and the Secondary RFG damper.
- **Section 3.9.4 Low Oxygen Levels** – An item was added to be checked which stated the following: "Verify the main combustion air blower is on and locally the fan is turning. Make sure the local disconnect is on and the drive belts are on and tight."
- **Section 4.2.3.1 Turbine Generator Heat Exchanger –** The feed water temperature is preheated to 160-180°F instead of just 160°F.
- **Section 4.11.3.3 Fluctuating Boiler Drum Level –** Additional language has been added to item #6 to reflect current operating practices.
- **Section 5.4.4.3 Under Fire Air Dampers –** Additional language has been added to reflect current operating practices.
- **Section 5.5.1 System Description** – The carbon feed rate has updated to reflect the current rate of 6 pounds per hour. Other language was added to state that the carbon usage is checked on a per shift basis, by performing a timed collection test to calculate exactly how much carbon is being fed.
- **Section 5.5.2 Definitions –** The Darco FGD carbon has been changed to ADA carbon.
- **Section 5.5.9 Troubleshooting –** The following language was added to item #8 for volumetric feeder failure: "In the event of a complete failure of one PAC injection system, the back-up "Y" pipe configuration shall be implemented on an operating unit. The "Y" pipe

shall be connected on the outlet of the operating unit and supply both boiler trains with carbon. The operating unit shall be set to operate at a rate no less than 2 times the normal carbon feed requirement.

- **Section 5.9.2 Slurry Tank Level Control –** The Lookout PLC has been changed to a GE Fanuc PLC that controls and monitors the slurry tank level using the I nput from the ultrasonic level probe mounted in the top of the tank.
- **Section 5.9.4 Bin Discharger** – The bin discharge is activated by the GE Fanuc PLC instead of a pre programmed controller.
- **Section 5.9.5 Volumetric Feeder –** The desired feed rate of the soda ash slurry has ben changed from 0 to 100 percent of capacity to 0 to 100 pounds per minute, only after a timed drop test is performed.
- **Section 5.9.10 Slurry Production** – The slurry production is control by the GE Fanuc PLC instead of the slurry tank level controller. The volumetric feeder is activated when the slurry level drops to the lower limit of 40 inches instead of 42 inches.
- **Section 5.9.11 Portec Operation** – The mixer heater high limit controller is set at 130° F instead of 250°F. The Multi Ranger level controller has been changed to the Ultrasonic level controller.
- **Section 5.11 Opacity Monitors** – The description of the opacity monitor has been updated to a Teledyne Light Hawk Model 560. No solvent is required to be used to clean the cover glass, lens wipes are to be used.
- **Section 5.12 Continuous Emission Monitors** – The model number of the SO2/NOx/CO CEMS has been updated from 300 to PRO902C.
- **Section 6.2 Ash Handling** – Language has been added to this section to state the following: "To prevent the accumulation of ash that resists settling in the trough, an automated air sparge or "Pit Bubbler" directs compressed air to the base of the quench pit. The air header to each of the combustor ash drop zones is cast into the concrete floor in the basement and each supplies air to the pit via four ¾"stainless pipes. Automation is accomplished with a solenoid and an adjustable timer."
- **Section 6.4 Bottom Ash Quench and the Wastewater Treatment System** – This section has been updated to state that the solids are transferred to the bottom ash conveyor instead of first going to a solids holding tank and then to the bottom ash conveyor or a filter press.
- **Section 7.4.1 GE Fanuc PLC and HMI** – This section has been updated to include a PLC for the industrial sludge/fly ash. There are now five, instead of three, touch screens for the PLCs. The fifth touch screen is in the control room subpanel and connected directly to the GE Fanuc PLC network. This touch screen is a backup to all the computers in teh control room, and all plant wide screens can be controlled from this touch screen.
- **Section 7.7 Vent Turbine** – This section has been updated to reflect a generator power output of approximately 800 kW at the output shaft when flowing 27,000 pounds per hour of 265 psi superheated steam.
- **Section 7.8 Industrial Sludge Injection System –** The following language has been added to this section; "The receiving tank sample is submitted to the laboratory for % solids and specific gravity testing. Since the lab results require several days to process, the contents of the receiving tank will have been transferred to the day tank and combusted before the

laboratory results from the receiving tank have been received by the facility. However, based upon the acceptance criteria for the specific industrial sludge and process experience, the industrial sludge is injected at a conservative rate to account for the maximum solids expected from the sources."

- **Section 8.4.3 Power Outage to Facility** – This section has been updated to reflect current operating practices

STANDARD OPERATING & MAINTENANCE MANUAL STRUCTURE

The SOM is structured as follows:

- Section 1 Receiving
- Section 2 Cranes
- Section 3 Combustors
- Section 4 Boiler System
- Section 5 Flue Gas System
- Section 6 Residue Processing System
- Section 7 Miscellaneous
- Section 8 Operating Procedures
- Section 9 Recordkeeping and Reporting

The facility is located at 500 Hubbard Avenue, Pittsfield, MA 01201. It is owned and operated by Covanta Pittsfield, LLC (Covanta Pittsfield), a subsidiary of Covanta Berkshire Operations, Inc. The facility, which began commercial operation in 1981, consists of three municipal waste combustors (MWCs) with two waste heat boiler/economizers and associated air quality control equipment. Under normal operation, all three combustors are on-line simultaneously. Heat is recovered from the combustion process in the form of steam which is sold to Crane & Company, Inc. and used to generate electricity for the internal needs of the facility. The permitted municipal solid waste (MSW) disposal capacity of Covanta Pittsfield is 84,000 tons per year (tpy).

The facility consists of three Enercon combustors and two separate heat recovery/air pollution control trains. Each MWC has a combustion capacity of 120 tons per day, assuming a higher heating value of 4,400 Btu per pound of waste. Under normal operation with all three MWCs on-line, throughput is approximately 80 tons per day of MSW per combustor. The combustion rate of the facility is regulated on a 4-hour block average basis which is limited to 110% of the steam production rate measured during the most recent air emissions test. Annual throughput for the facility is limited to 84,000 tons.

Most MSW is delivered to the facility in trucks. Vehicles are weighed on the truck scale, which generates a weigh ticket for the driver and stores the information in a computerized database. The database generates daily, weekly, and monthly reports for billings, MSW inventory management and regulatory compliance.

Trucks leave the scale and proceed to the waste handling area where they dump either into the receiving pit or onto the tipping floor. An overhead crane mixes waste in the pit and piles waste for short-term storage. A front-end loader moves waste on the tipping floor and loads waste into the MWCs. The tipping, storage and combustion facilities are located inside a large building, permitting air from the waste receiving and storage area to be drawn into the combustion process, thereby minimizing odors.

An industrial sludge injection system was installed at the facility in 2011. It is designed to inject approximately 500 dry pounds per hour of dry sludge solids into each of the three MWC units at the facility on a daily average basis. The industrial sludge injection system at the facility is designed to receive industrial sludge by transport trucks. A 25,000 gallon receiving tank and a 25,000 gallon day tank from which the industrial sludge will be injected into the combustors were installed. Each tank is equipped with an agitator, a pumping system and an odor control system to accommodate the receipt of industrial sludge. The receiving tank, the day tank and associated equipment are located within the main building. Each MWC has a dedicated sludge injection nozzle that utilizes air for atomization of sludge particles. The sludge flow is controlled by a set point in the control room and a control valve at each nozzle with a flow meter for display and recording a control input. Each nozzle projects into the MWC and is designed such that it discharges the atomized sludge in a helical pattern into the furnace. Sludge flow through the nozzle is modulated in response to the secondary chamber temperature of the combustor which is continuously measured utilizing a sensor located in the secondary chamber.

Each MWC has a primary and a secondary combustion chamber which operate in an excess air mode. Combustion air is a combination of fresh air and recirculated flue gas. The primary combustion chamber consists of five progressively lower refractory lined hearths resembling steps. MSW fuel is introduced at the first hearth and tumbles from step to step by the action of hydraulic rams. When the MSW reaches the final step, the fifth hearth, what remains are ash and other non-combustible materials such as glass, metal and stone. This material, collectively termed bottom ash, is discharged into a water trough. The water trough quenches the bottom ash and seals the combustor from outside air. A drag chain conveyor at the bottom of the trough transports the bottom ash to the ash building. Presently, the ash is screened and the accepts are shipped to a landfill for utilization as sub grade fill material in the closure process. The screened rejects are passed over a drum magnet for ferrous recovery. The recovered ferrous is shipped out for recycling. The non-ferrous overs are either re-burned or hauled offsite for landfill disposal.

Flue gas flows from the primary chamber into the secondary chamber where sufficient time and temperature is provided to assure complete combustion. Flue gas from the secondary chamber of each MWC flows into a common tertiary chamber before dividing again and entering one of the two heat recovery systems/air quality control trains (train).

The heat recovery system of each train consists of a Bigelow Water Tube waste heat boiler with superheater, a United McGill steaming economizer and a Bigelow trim economizer. Each heat recovery system has a rated capacity of approximately 34,000 pounds per hour of 220 psi, 540°F superheated steam. Most of this generated steam is sold to Crane & Company. Steam not sold

passes through a turbine generator or is vented into the atmosphere. The air quality control system for each train consists of a Norit activated carbon injection system, a United McGill electrostatic precipitator (ESP), an induced draft fan, a Heil quench-venturi scrubber and a counter current packed tower scrubber with a demister.

Flue gas initially passes through the waste heat boiler, the steaming economizer, and the trim economizer. Approximately 45% of the flue gas leaving the trim economizer is recirculated to a MWC by the recirculated flue gas (RFG) system. The RFG system includes a Zurn multiclone which removes particulate matter (PM) from the flue gas before it passes through the RFG fan. The RFG system provides relatively cool, low O_2 content flue gas (approximately 400°F and 10% O_2) to the combustion chambers to inhibit the formation of nitrogen oxides (NO_X) and slag. The remaining 55% of the flue gas passes through an ESP, through an induced draft fan and into a quench-venturi scrubber. Preceding each ESP is an activated carbon injection system which provides for the addition of activated carbon to reduce mercury emissions from the stack. The quench-venturi scrubber lowers the flue gas temperature by evaporation from approximately 400^oF to approximately 140^oF. The venturi section removes particulate matter and fresh water is added to replace water lost through evaporation and continuous bleed to control specific gravity.

Particulate matter, also known as fly ash, is collected from the multiclones and the ESPs via hopper and conveyors. Presently, the fly ash is delivered to the pug mill, then it is mixed with lime at a 5:1 ratio, fly ash to lime. The conditioned fly ash is then transferred to Supersacks for disposal at a licensed landfill.

Flue gas exiting the quench-venturi scrubber enters a counter current packed bed scrubber to control acid gas emissions. The scrubber utilizes a counter current flowing solution of water and soda ash to remove sulfur dioxide (SO_2) and hydrogen chloride (HCl) from the flue gas. Scrubber liquid collects in the base of the scrubber. Pumps return the liquid to a distribution spray header at the top of the scrubber. A pH control system monitors the pH of the scrubber solution and controls the soda ash feed rate. Finally, fresh water is added to replace water lost through evaporation and continuous bleed to control specific gravity.

Exhaust gas from the scrubbers, located at the discharge end of both air pollution control trains, is combined and discharged to the atmosphere through a 115 foot FRP lined steel stack. The stack is equipped with reference method sampling ports which are accessible via a platform.

Gases exiting each of the two ESPs pass separate opacity monitors. The monitors provide a continuous indication of each ESPs performance in controlling PM emissions. A slipstream of flue gas is extracted by the continuous emissions monitoring system (CEMS) from the duct connecting the scrubber outlets to the stack. The CEMS provides an indication of facility performance relative to permit standards for SO_2, NO_x, and CO.

The existing emission limits applicable to the three MWCs located at Covanta Pittsfield are listed in Table 1.

Table 1: MWC Existing Emission Limitations

Particulate Matter	27.0 mg/dscm
Sulfur Dioxide	10 ppmvd or 75% reduction
Hydrochloric Acid	20 ppmvd or 95% reduction
Carbon Monoxide	100 ppmvd (4-hour block average)
Nitrogen Oxides	192 ppmvd (24-hour daily block average) 0.180 pounds per million Btu of heat input (365-day rolling average) 105 ppmvd (365-day rolling average) ≤75.5 tons in any 12 consecutive month period
Cadmium	0.040 mg/dscm
Lead	0.440 mg/dscm ≤ 0.0095 lb/hr when combusting only industrial sludge and operating two or three waste combustors ≤ 0.0047 lb/hr when combusting only industrial sludge and operating only one waste combustor.
Mercury	0.080 mg/dscm (1 test) 0.028 mg/dscm (4 quarter rolling average)
PCDD/PCDF (tetra-octa)	36 ng/dscm
Opacity	≤10% (6 minute block average)
Fugitive Dust	No visible emission for more than 5% of 3-hour observation period.

Concentration limits are corrected to 7% O_2.

Any changes to the SOM shall be reported to MassDEP pursuant to Table 6d, Condition # 26 of Operating Permit #1-O-07-022.

2. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

3. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Cortney Danneker by telephone at 413-755-2234, or in writing at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

_____

Marc Simpson
Air Quality Permit Chief
Bureau of Waste Prevention
Western Region

cc: WERO AQ plan file
WERO AQ approval file

ecc: Yi Tian – MassDEP Boston
Peter Czapienski – MassDEP WERO